UNIVERSITY OF CAPE COAST

INFLUENCE OF DEMOGRAPHIC FACTORS, ANXIETY AND SELF-CONFIDENCE ON PENALTY KICK PERFORMANCE: THE CASE OF CAPE COAST EBUSUA DWARFS FOOTBALL CLUB OF GHANA

BY

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Thesis submitted to the Department of Health, Physical Education, and Recreation, Faculty of Science and Technology Education of the College of Education Studies, University of Cape Coast, in partial fulfilment of the requirements for the award of Doctor of Philosophy Degree in Physical Education (Sports Psychology)

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature: ..... Date: 25/06/18

Name: Prosper Narteh Ogum

Supervisors' Declaration

We hereby declare that the preparation and presentation of this project work were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

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ABSTRACT

The stressful nature of elite sport and the competitive environment surrounding it places many demands on participating players resulting in varying levels of anxiety and self-confidence. Players who have similar skill level often rely upon their psychological ability to gain an advantage over their opponents. This study sought to investigate the influence of demographic factors (age, experience, position), anxiety and self-confidence on penalty kick performance among Ebusua Dwarfs players in the Ghana Premier League. A quantitative descriptive survey design was used to collect data for this study. All 30 registered players of Ebusua Dwarfs, a Cape Coast based professional premier league club, participated in this study. Data was analyzed using one-way mixed repeated measures ANOVA and multiple regression. Findings from the study revealed no interaction effect between age, experience and position and changes in anxiety and self-confidence levels on penalty kicks (F (6, 22) = 0.70, $p > 0.05$, Wilks' Lambda = 0.08, $\eta^2 = 0.72$). However, the age of the players was significant in predicting the success or failure in penalty kick ($\beta = .53$, $t = 2.42$, $p<.05$) with older players (25 and above) executing their kicks successfully. It was concluded that the subjective feelings of anxiety and self-confidence that players experience during penalty kicks influence their perceived control over the situation. It was therefore recommended that coaches select older players to execute the penalty kick since they are able to concentrate on important cues to be successful.

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DEDICATION

To my mentor, Prof. Joseph Kwame Mintah

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CHAPTER ONE

INTRODUCTION

Background to the Study

Participating in sport requires intense physical demands and high psychological pressures that some athletes struggle to handle, potentially leading to negative consequences (Balaguer, González, Fabra, Castillo, Merce, & Duda, 2012). The stressful nature of elite sport and the competitive environment surrounding it places many demands on participating athletes resulting in varying levels of anxiety and self-confidence (Jones, 1995). Players who have similar skill level often rely upon their psychological ability to gain an advantage over their opponents (Hassmen, & Blomstrand, 1995). Research indicates that anxiety and self-confidence contribute to athletic performance (Balaguer *et al.*; Hassmen, & Blomstrand, 1995).

Anxiety is a negative emotional state characterized by nervousness, worry, and apprehension and is associated with activation or arousal of the body (Weinberg, & Gould, 2011). This state is likely to arise in situations where athletes have to perform under pressure or when they feel they do not have the proper skills to cope with the upcoming challenges (Cox, 2007). These demands are usually stressful, indicating to the athletes a perception of imbalance between the demand given and their abilities to fulfill the demand which may hinder athletic performance (Gould, Greenleaf, & Krane, 2002; Tamorri, 2004). Anxiety therefore manifests the uncertainty in how to cope with stress (Worchel, & Goethals, 1989) and is experienced when approaching or perceiving stress which is rooted in an increased state of arousal. This may

produce a positive or a negative affect including drive, fear, motivation, pressure, excitement and/or exhilaration which may influence performance.

Arousal is a blend of physiological and psychological activity in a person, and it refers to the intensity dimensions of motivation at a particular moment (Gould, Greenleaf, & Krane, 2002). The intensity of arousal falls along a continuum ranging from not at all aroused (comatose) to completely aroused (frenzied). Studies have shown that highly aroused individuals experience increased heart rates, respiration, and sweating (Gould, Greenleaf, & Krane, 2002; Weinberg, & Gould, 1996). And, that arousal is not automatically associated with either pleasant or unpleasant events; thus an individual may be highly aroused by learning that he has won $10 million or he might be equally aroused by the death of a loved one.

Anxiety has both mental and physiological components. The cognitive or mental component (worry) is caused by negative expectations or low levels of confidence in one's self and abilities (Martens, Vealey, & Burton, 1990). For example, an athlete who feels that he/she does not have the necessary skills to cope with the demands of an upcoming event will lose focus on the task at hand and exhibit low self- confidence which can be debilitative to performance. Conversely, an athlete who feels that he/she possesses the necessary skills to help him stay focused will exude high self-confidence throughout the event which can facilitate performance. The physiological component called somatic anxiety is the degree of physical activation perceived (Martens, Vealey, & Burton, 1990). It entails a series of physical symptoms (heightened levels of activation of physiological functions) that are automatically produced by the demands of competition which is usually accompanied by symptoms of nervousness and tension (Dosil, 2004).

Anxiety also has a state and a trait component. State anxiety refers to "the ever-changing mood component" (Spielberger, 1966, p.19). It is an emotional state "characterized by subjective, consciously perceived feelings of apprehension and tension, accompanied by or associated with activation or arousal of the autonomic nervous system" (Spielberger, 1966, p.17). For example, a basketball player might have a slightly elevated level of state anxiety (feeling somewhat nervous and noticing her heart pumping) prior to tip-off, a lower level once she settles into the pace of the game, and then an extremely high level (feeling very nervous, with the heart racing in the closing minutes of a tight contest). State anxiety therefore, is a moment- to- moment physiological changes in the body (Gould, Greenleaf, & Krane, 2002). Contrarily, trait anxiety is a personality disposition. It is an acquired behavioural tendency or disposition that influences behaviour. It predisposes an individual to perceive as threatening a wide range of circumstances that objectively are not actually dangerous physically or psychologically. The person then responds to these circumstances with state anxiety reactions or levels that are disproportionate in intensity and magnitude to the objective danger (Spielberger, 1966; Gould, Greenleaf, & Krane, 2002). For instance, two soccer players having equal physical skills and placed under identical pressure to kick the winning penalty goal at the end of a soccer game may have entirely different state anxiety reactions because of their personalities. The low trait anxious player who perceives kicking the winning penalty goal as not threatening may not experience much state anxiety. However, the high trait anxious player who perceives the chance to kick and miss the winning penalty goal as very threatening will respond with high state anxiety much more than would be expected in such a situation.

Attentional control theory (ACT) by Eysenck, Derakshan, Santos, and Calvo (2007) contends that anxiety manifests in impaired attentional control, which leads to performance deficits in tasks involving the central executive of the working memory system. This theoretical position is founded in the assumption that attention is regulated by a goal-directed attentional system (task at hand) and a stimulus-driven attentional system (external stimuli) (Corbetta, & Shulman, 2002). The goal-directed attentional system is governed by expectations, knowledge, and current goals and exemplifies top-down attentional control. In contrast, the stimulus-driven attentional system is sensitive to salient stimuli, and exemplifies bottom-up attentional control. Importantly, ACT proposes that anxiety modulates the balance between these two attentional systems with increased anxiety leading to "...an increased influence of the stimulus-driven attentional system and a decreased influence of the goal-directed attentional system" (Eysenck et al., 2007, p.338). These attentional systems cause feelings of worry and influence the brain to reduce the attentional control of the task while more attention is paid to threatening stimuli. Additionally, they make athletes suffer physiological effects like increased heart rate, muscle tension and others due to anxiety which negatively influences athletic performance through changes in attention and concentration (Weinberg, & Gould, 1995).

Pre-competitive anxiety (anxiety prior to competition) and competitive anxiety (anxiety during competition) can have debilitating and facilitating effect on athletes' performance (Athan, & Sampson, 2013; Cox, 1990; Krane, 1994; Lious, 2006; Nelson, Edgard, Marco, & Ronald, 2007; Hoffman et al., 2005; Jarvis, 2002; Martens, Vealey, & Burton, 1990). Cox (1990) stated that pre-competitive anxiety is such feelings that an athlete may endure during the

week, hours and minutes leading up to the start of an event or competition. Perceived stress and how athletes think about the sports competition and not the competition itself could be a source of pre-competitive anxiety (Athan, & Sampson, 2013). This is because pre-competitive anxiety results from an imbalance between perceived capabilities and the elements of the sports environment. When the perceived demands are balanced by the perceived capabilities, athletes experience optimal arousal. At this stage everything appears to go on smoothly. However, if athletes perceived capabilities exceed the sport challenge, arousal decreases resulting in boredom or lack of motivation. Yet, if perceived challenge occurs and exceeds capabilities, the athlete becomes over aroused resulting in worry and anxiety. Thus, pre-competitive anxiety results when skills and abilities are not perceived as equivalent to the sport challenge (Jones, 1995; Tamorri, 2004). Nelson, Edgard, Marco, and Ronald (2007) postulate that competitive anxiety and stress in important competitions with numerous audiences weakens performance. The results of findings of Pigozzi, Sapataro, Alabiso, Parisi, and Rizzo (2008) confirmed that an athlete's skill level is an important factor in controlling his/her competitive stresses. For example, elite athletes who are able to control their competitive anxiety through mental skills such as imagery and feeling in control have good motivation and self-confidence.

It is evident from these discussions that anxiety as a negative emotional state, affect perceptions in sport competitions making a large majority of athletes consider it to be debilitative towards performance, which may result in decreases in performance (Weinberg & Gould, 2011; Raglin & Hanin, 2000). It is therefore no surprise that successful performance or winning in a competition has been shown by both past and current studies to

depend on how an athlete can control his/her anxiety level (Bar-Eli, & Azar 2009; Jordet, Hartman, Visscher, & Lemmink, 2007; Jordet, Elferink-Gemser, Lemmink, & Visscher, 2006; Jordet, 2009a; Jordet, 2009b).

Self-confidence is another important psychological construct that affects sport performance. It is the belief in one's abilities to perform a desired behaviour successfully (Weinberg, & Gould, 2011; Vealey, 1986; 2001). Research indicates that self-confidence is the most consistent factor that distinguishes between successful and less successful performance (Jones, & Hardy, 1990). It plays a critical role in the success or failure of an athlete. It affects the way one feels, thinks and behaves, and thus has an important influence upon sporting performance (Bandura, 1997; Hays, Thomas, Maynard, & Bawden, 2009; Jones, & Hanton, 2001; Vealey, 2001; Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). Confident athletes believe in themselves. Most importantly, they believe in their ability to acquire the necessary skills and competencies, both physical and mental to reach their potential.

Self-confidence has both trait and state components (Vealey, 1986; 2001). Trait sport confidence is the perceptions an individual usually possesses about his/her ability to be successful in sport. For example, a soccer player who believes in himself will perceive the chance to kick the winning penalty goal as an opportunity to exhibit his skill and competence and thus approach the situation with high self-confidence. However, a soccer player who doubts whether he is good enough or have what it takes to be successful to kick the winning penalty goal will perceive the situation as threatening and approach it with low self-confidence. Conversely, state sport confidence is the perceptions an individual has at a particular moment, about his/her ability to

be successful in sport (Vealey, 1986; 2001). For example, a volleyball player might have high level of state self–confidence (feeling very confident and poised for action) prior to the start of a volleyball game, a lower level of self-confidence once his receptions do not get to the intended team mate and then a high level of self–confidence when his spikes begin to land in the opponent's court for his team to accumulate more points and widen the point gap. Although an athlete might have a general or overall self–confidence, this can change from situation to situation or even within a competition. An individual's disposition toward being self-confident in sport or trait sport confidence influences the state sport confidence (Vealey, 1986; 2001).

Hays, Maynard, Thomas and Bawden (2007) identified the sources of confidence that are instrumental to athletes and found preparation, performance accomplishments, coaching, innate factors, social support, experience, competitive advantage, self-awareness, and trust to be key to performance accomplishment. They found these sources to either facilitate or debilitate the general or overall performance and success of an athlete. Hays et al. (2007) examined how these sources of self-confidence can affect elite athletes' performance and found a significant effect in time-to-competition as a key determinant of athletes' confidence. They indicated demonstration of ability, physical/mental preparation, physical self-presentation, and situational favorableness as factors relating to sport-confidence during the pre-competition phase.

Jones, Swain, and Cale (1990) examined antecedents of self-confidence in elite male middle distance runners. A main finding in this study was that both perceived readiness and runners' perceptions of the external environment such as the weather and track conditions contributed positively to

the prediction of self-confidence. That is, both factors positively related to self-confidence in that the greater the perceived readiness and the more positive the perception of the external environment, the higher the self-confidence response. Pineda-Espejel, López-Walle, Rodríguez, Villanueva, and Gurrola (2012) examined self-confidence among gymnasts who participated in the 2011 Pan American Games and found self-confidence to be negatively correlated with the intensity of cognitive anxiety. They concluded that high levels of self-confidence decreased the perception of cognitive anxiety as being debilitative to gymnasts competing at the Pan American level. Similarly, Craft, Magyar, Becker, and Feltz (2003) and Besharat, and Pourbohlool (2011) found that self-confidence before and during competition is correlated with low anxiety levels. Studies of team sports by Ntoumanis and Biddle (1997) and Kais and Raudsepp (2005), as well as studies on players of individual sport by Pozo (2007) found self-confidence to correlate negatively with the intensities of cognitive and somatic anxieties and positively with their directions. The authors concluded that high levels of self-confidence were linked to low levels of anxiety. However, Martens, Burton, Vealey, Bump and Smith (1990) proposed that athletes in individual sports who are subjectively judged in competition exhibit more intense symptoms of cognitive anxiety and lower self-confidence. It is obvious from the aforementioned studies that self-confidence influences an athlete's perception of his/her capacity to face a particular task. It indicates the belief one has about one's own internal resources or abilities to achieve success in different specific situations (Horn, 2008). According to the strength of the belief one has over one's abilities to perform in a specific situation, self-confidence can be high or low which can lead to performance success or failure.

Demographic factors (age, experience and position) among athletes have been identified to influence the development of anxiety and self-confidence on performance. This is because as athletes age and compete in their sport for a considerable period, they tend to understand the physical, tactical and psychological dynamics of the sport making them deal with their anxiety and self-confidence. Modroño and Guillén (2012) affirmed this when they found in a sample of windsurfers that age was inversely related to cognitive anxiety. That is, older athletes (25 years and above) experienced less cognitive anxiety than younger athletes. They attributed this to the differences in the level of experience between older and younger athletes. Studies of cognitive and motor skills suggest performance can be maintained at high levels in spite of advanced aging and that most players peak between 25 and 35 years based on their experience (Baker, Horton, Pearce, & Deakin, 2006; Deakin, Horton, Pearce, & Baker, 2005). Similarly, the positions that players play during a game influence their anxiety and self-confidence thus affecting their performance. This is because the tactical responsibilities associated with these positions put some amount of stress on these players leading to high anxiety and low self-confidence levels and thus affecting performance (Sanjay, 2017). Clearly, these studies give credence that there is a potential relationship between age, experience and position on penalty kick performance which demands an inquiry.

Penalty kicks are perceived to be important because their outcome determines if a team advances or is eliminated from a tournament, or alternatively, they determine a team's final rank (such as winning a tournament or being placed third). The outcome of these kicks is typically attributed to factors such as psychology (e.g. coping with stress), skill (e.g.

kicking technique), physiology (e.g. overcoming the fatigue of 120 min play), and chance (e.g. in what direction the goalkeeper moves) (Jordet, Hartman, Visscher, & Lemmink, 2007). In major tournaments, the importance of each kick is further underscored by the widespread public interest and the vast numbers of people who watch the games live at the stadium and on television. This creates a situational stress on the kicker due to a supportive audience or a hostile audience resulting in performance failure. Studies have found that performance declines with a hostile audience and some indicating that a supportive audience is more detrimental to performance (Jordet, 2009a; Jordet, 2009b; Butler, & Baumeister, 1998). These studies explain penalty takers' perceptions of control and why some 'choke' under the pressure of the shootout and why some succeed. In a sense, players with low perceived competence and contingency experience more cognitive anxiety symptoms than those who perceive their competence and contingency level as high resulting in performance failures (Jordet, 2009a; Jordet, 2009b).

Statement of the Problem

A quest for every player is to identify and manipulate performance variables or indicators to achieve positive results. Age, position, experience, self-confidence and anxiety have been found to predict performance among players. A large majority of players perceive anxiety to be negative due to its debilitative effects on performance (Raglin, & Hanin, 2000; Weinberg, & Gould, 2011). Players who experience feelings of nervousness, muscular tension and sweaty palms (Martens et al. 1990; Jones, 2000; Jarvis, 2002) experience performance failures. Studies have shown that anxiety changes during competition (Cashmore, 2002; Weinberg, & Gould, 2011) based on the time and situation (Caruso, Dzewaltowski, Gill, & McElroy, 1990). Similarly,

players who lack confidence focus on their shortcomings rather than their strengths, distracting themselves from the task at hand (Bandura, 1997; Jones, & Hanton, 2001; Vealey, 2001; Weinberg, & Gould, 2011) affecting performance negatively. Thus, a player's lack of confidence or overconfidence can be debilitative to performance while optimal self-confidence can be facilitative to performance (Weinberg, & Gould, 2011).

Players worldwide compete at the highest level during each soccer season for laurels. One of the key performance routines that these players go through during each soccer season is the taking of penalty kicks. Investigations on goals scored during games have shown that majority of goals are scored through penalty kicks making it play a pivotal and decisive role in the outcome of many important matches at both national and international level (McGarry, & Franks, 2000). The success rate of these penalty takers in major competitions worldwide has been established to lie between 75% and 86% for top male professionals (McGarry, & Franks, 2000).

Players of the Ghana Premier League particularly Ebusua Dwarfs are not an exception from this important and pressure filled task. Even though unavailable data on the Ghana Premier League makes it difficult to estimate the total number of goal scored from the penalty spot, it has been observed that quite a number of goals are scored or missed from the penalty spot in the Ghana Premier league of which Ebusua Dwarfs are no exception. The incessant attacking play of some of the teams (i.e. Ebusua Dwarfs) coupled with the support of their teeming vociferous fans puts their opponents under unbearable pressure making them commit fouls in the penalty area resulting in the award of penalties against them. However, the pressure to score due to high expectation from the teeming fans and the pressure to miss due to the

incessant distraction (booing, hooting and jeering) from the opposing fans puts tension on the kicker resulting in high anxiety and low self-confidence levels in the kicker. This breaks the reflex action of skill performance resulting in performance failure (DeCaro, Thomas, Albert, & Beilock, 2011).

The above description is in support of both explicit monitoring and distraction theories which states that the influence of pressure on the performer to perform at an optimal level provokes an increase in situational stress and state anxiety which leads to decrements in self-confidence and performance (Beilock, & Carr, 2001; Wang, Merchant, & Morris, 2004). The importance of scoring on each of the kicks from the penalty mark in the penalty shootout for the outcome of an entire game due to the difficulty of scoring in open play puts high pressure on the players to perform well during penalty kicks causing a decrease in performance despite the relatively large target area, and the shorter distance within which these players must kick to score. This situation is surprising since players frequently pass the ball through acute angles to team mates over much longer distances within game situations. Such performance failure in penalty kicks among Ebusua Dwarfs players in the Ghana premier league may be attributed to high anxiety and lack of self-confidence. Searches done so far on available research indicates that nothing has been done in Ghana to synthesize these research streams to predict penalty kick performance among soccer players in the Ghana Premier League. It is therefore based on the researcher's observation that quite a number of goals are scored or missed from the penalty spot by players of Ebusua Dwarfs and the lack of studies on these demographic factors/psychological variables on this pressure filled task in Ghana that this study is deemed important to be conducted.

Purpose of the Study

The purpose of this study was to investigate the influence of demographic factors (age, experience, position), and psychological variables (anxiety, self-confidence) on penalty kick performance among Ebusua Dwarfs players in the Ghana Premier League.

Research Questions

1. What is the interaction effect between age, experience, position, anxiety, and self-confidence on penalty kick performance among Ebusua Dwarfs players?
2. Which variable (age, experience, position, anxiety, and self-confidence) is more likely to predict penalty kick success among Ebusua Dwarfs players?

Significance of the Study

The penalty kick or penalty shootout is one of the most dramatic and stressful situations in world football. Its execution places a lot of physical and psychological demands on the kicker. The findings of this study would help coaches to identify which of the demographic (age, experience, position) and/or psychological variables (anxiety, self-confidence) affect performance in this task. Again, the results of this study will help coaches to have a predetermined list of each penalty taker together with a specific running order for all eleven players. This will help reduce anxiety on players immediately prior to taking part in the shootout since players would be aware of the order of the kicks and when they will take their turns. Also, the findings of this study will help educate players and coaching staff on the typical anxiety symptoms experienced by penalty takers in shootout scenarios. Such information can be used to create more realistic training regimes that will help to prepare players to cope with the thoughts and feelings that they are likely to

experience. Furthermore, the outcome of this study will help coaches to manipulate the training environment in order to be as representative of a real shootout as possible. Finally, it will be a source of reference material for Physical Education students and professionals in the field.

Delimitations

The study was delimited to players of Ebusua Dwarfs, a professional football club based in Cape Coast in the central region of Ghana. The study was also delimited to only demographic and psychological variables of age, experience, position, anxiety and self-confidence on penalty kick performance.

Limitations

The small sample size was a limitation to the findings of the study. With a larger sample size, more significant results would have been reported thereby increasing the ability to generalize the findings across all the clubs in Ghana. Again, the sensitive nature of some questions could have affected the responses of the respondents. A player may answer according to what is socially desirable. That is, he may not want to tell the researcher that he is extremely nervous or that he is extremely excited. Rather, he is more likely to say that he is "average" feeling on every question. Again, the number of spectators present compared to that of a typical match day might have also affected the performance outcome. Also, the ability of the respondents to understand and answer appropriately to the questions could also affect the choices of the respondents. Furthermore, the duration of data collection (3 hours) might have been too long which might have affected the psyche of the players which made them confident through motivation and encouragement by team mates. Finally, winning a cash prize and being selected to take the team's penalty kick or being part of the team's penalty takers during shootouts was

not enough motivation to induce high anxiety and low self-confidence in the players compared to taking the kick to score to win the maximum points or trophy for the team.

Definition of Terms

Age: How old a person is or biological age.

Experience: Number of years that the person has played soccer.

Ghana Premier League: The top male domestic professional soccer division of the soccer league system in Ghana organized by the Ghana Football Association.

Position: The position or the role the player plays on the field of play and the responsibilities associated with it.

Organization of the Study

This study is organized into five chapters. Chapter one presents the background to the study, the statement of the problem as well as the research questions. Chapter two discusses concepts, theories and literature on anxiety, self-confidence, age, experience and position on penalty kick performance. Chapter three explains the methods of the study which includes the study design, population, sampling procedure, instrument for data collection and data analysis. Chapters four and five elucidate the presentation of the results and findings, discussions with reference to the literature, conclusions and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The purpose of this study was to investigate the influence of demographic factors (age, experience, position), anxiety and self-confidence on penalty kick performance among Ebusua Dwarfs players in the Ghana premier league. For this reason, books, research articles, journals, magazines, newspapers, conference proceedings and basic research reports were searched and the literature reviewed under the following headings:

1. Concept of anxiety
2. Sources of anxiety
3. Theories of anxiety in sport
4. Components of anxiety
5. Types of anxiety
6. Mediators of anxiety
7. Multidimensional anxiety theory
8. Temporal patterning of anxiety
9. Pre-competitive anxiety versus competitive anxiety and sport performance
10. Measurement of anxiety in sport
11. Research perspectives on anxiety and sport performance
12. Concept of self-confidence
13. Sources of self-confidence
14. Components of self-confidence
15. Types of self-confidence
16. Importance of self-confidence in sport performance enhancement
17. Debilitating factors of sport confidence
18. Strategies to enhance sport performance

19. Confidence-performance spirals
20. Theories of self-confidence in sport
21. Measurement of self-confidence in sport
22. Research perspectives on self-confidence and sport performance
23. Concept of penalty shootout
24. The brain and penalties
25. Explaining the penalty kick from an information-based approach
26. Format for soccer penalty shootout
27. Penalty kicking strategies
28. Theories of sport performance under pressure
29. Conceptual framework
30. Research perspectives on performance success and failure in penalty kicks and other sport
31. Summary

Concept of Anxiety

The theoretical aspects of athletes' performances contain four dimensions namely physical, technical, tactical and psychological (Moran, 2004). Players often prepare for the technical aspects of their sport but not the psychological aspects. However, when the result of an activity matters most, psychological pressure may adversely affect performance. This can be the case whether an individual is sinking a putt on the final hole of a golf tournament to earn a huge check, executing a free throw when there is less than a two point difference between the teams and less than five seconds left in the game, or scoring the penalty kick to win a major championship. These situations have enormous rewards designed to elicit maximum effort (Ehrenberg, & Bognanno

1990; Lazear, 2000). However, these large rewards also create a great deal of pressure, potentially leading to anxiety and resulting in underperformance.

Anxiety is the most significant psychological construct that influences competitive performance. It is an important facet of personality that can have meaningful effects on competitive performance. It is a construct that has consistently been studied in the field of sport psychology, and has become the most heavily researched psychological variable that influences athletic performance (Cox, 2007). Anxiety is generally defined as an emotional response to a stimulus or situation that is perceived as dangerous (Raglin, & Hanin, 2000). However, such stimuli or situations are subjective, indicating that some individuals may view a given stressor as threatening, while others may see that same stressor as beneficial in some way. Thus, anxiety occurs only when one identifies some danger or threat, regardless of how the situation may appear to others. Weinberg and Gould (2011) defined anxiety as "a negative emotional state characterized by nervousness, worry, and apprehension and associated with activation or arousal of the body" (p. 78). In essence, anxiety is a negative and unpleasant emotional feeling. When anxiety is increased due to pressure conditions, a shift of attention often occurs. Thus, attention to irrelevant cues can be caused by an increase in arousal and anxiety (Weinberg, & Gould, 2011). Worchel and Goethals (1989) defined anxiety as the uncertainty in how to cope with stress. That is, when one feels that she or he does not have the capacity to deal with stress or that the stress is overwhelming. Therefore, anxiety is experienced when approaching or perceiving stress which is rooted in an increased state of arousal. This anxiety (arousal) may produce a positive or a negative affect, including drive, fear, motivation, pressure, excitement and exhilaration. Leary and Kowalski (1993)

defined anxiety as an unfavorable and self-defeating emotional response to perceived physical or psychological danger, along with physiological stimulation and with the purpose of evading the physical location or emotional state where the on-set of anxiety took place. Sport literature often associates anxiety with the level of perceived competition or risk (Hoar, Kowalski, Gaudreau, & Crocker, 2006). Based on the above definitions, I will define anxiety as an uneasiness that is characterized by nervousness, fear and uncertainty which breaks the reflex action of skill performance resulting in performance failure.

Sources of Anxiety

Anxiety, as a negative emotional state, affect perceptions in sport competitions making a large majority of athletes consider it to be debilitative towards performance, which may result in decreases in performance (Weinberg, & Gould, 2011; Raglin, & Hanin, 2000). Research has showed that winning in a competition depend on how an athlete can control his/her anxiety level (Humara, 2001). Humphrey, Yow and Bowden (2000) have indicated that pressure to win, frustration, conflict, irritation and fear significantly lead to excessive anxiety in athletes which affect their mental or emotional health. Similarly, heavy playing schedules, competition for team places, the media and fans as well as the pressure to win trophies all play a part in players developing high stress and anxiety levels (Heather, 2010). Furthermore, Worchel and Goethals (1989) indicated fear, anger, increased heart and perspiration rate, trembling, and being mentally off balance, each of which is directly involved with the autonomic nervous system, create anxiety to athletes. Moreover, Cox (2007) suggested fear of injury, presence of audience, past unpleasant experiences, fear of lose, negative evaluation, knowledge of

the opposition team, uncertainty, playing at the opposition's place, high hope, and perceived sport events as among the very important sources of anxiety. These sources can build up high intensities of anxiety in athletes leading to underperformance or performance failures. According to Hann (2000) high levels of anxiety during competition are harmful, worsening performance and even leading to dropout. It is very important, therefore, to identify the sources of athletes' anxiety and also know the level of anxiety especially the cognitive anxiety in order to take all necessary preparation to reduce it (Strongman, 1995).

Theories of Anxiety in Sport

The characteristics of anxiety as an emotion are that it is distressing and its sources are indefinite. The theories of anxiety fall into groups that can be most simply labelled as psychoanalytic, learning/behavioural, physiological, phenomenological/existential, cognitive and finally and most importantly those that are based on the idea of uncertainty which cuts across the other categories.

Psychoanalytic theory

Psychoanalytic theory is primarily concerned with the dynamics of mental processes and individual experience that are influenced by biological, social, and environmental contributions. How these domains are elaborated and interact over the course of development is central to psychoanalytic inquiry. Psychoanalytic theories of anxiety began with Freud and have not developed a great deal since his time. Freud had two theories of anxiety (1917, 1926) in both of which he saw anxiety as an everyday phenomenon and as a way of explaining neuroses. Everyday anxiety is a realistic anxiety which refers to real objects which has often been referred to as fear rather than

anxiety. Neurotic anxiety can take the form of being free-floating, phobic or involved in a panic attack. In the first formulation, Freud regarded anxiety as being a transformed libido, the transformation coming about through repression. So, if a person is prevented or thwarted from carrying out some instinctive (sexually driven) act through repression, then anxiety is the result. The anxiety generated then acts to produce whatever symptoms that, in their turn, will stop more anxiety from developing. In his second formulation, Freud reversed the anxiety formulation linkage and viewed repression as occurring because of the experience of anxiety. In this theory, anxiety is the signal from the ego about real (existing) or potential danger. The unpleasantness of a threat causes anxiety which in turn leads to repression as a way of getting the person out of danger.

In both of these theories, a central core is given to the avoidance overstimulation, but in the earlier theory, there is a greater concern with 'automatic' anxiety which results from the trauma of birth and the infant's experiences immediately after birth. These points are reflected in later theories. With both the earlier and later Freudian theory however, there seems to be three aspects of anxiety - an unpleasant feeling, some sort of discharge process, and the perception of the phenomena involved with this discharge. The sort of events that Freud believed to be significant in the development of what he termed primary (that is, from birth) anxiety are the birth trauma, the possible loss or withdrawal of the 'mother', uncontrollable impulses or threats that might occur at about this time, and the fears of castration (presumably only in males, although this might be a moot point). Because of all these, the mental apparatus is flooded and overwhelmed, the person is helpless and passive and the emotional experiences of anxiety follow automatically. So in

Freud's conceptualisation, anxiety is either inherited or learned at birth, but with later additions being possible. Other types of anxiety such as fear differ from primary anxiety only in what gives rise to them.

Learning /Behavioural theory

Theories of anxiety whose provenance lies in the learning area derive originally from Pavlov (1902) and Watson (1913). Whatever form they take, their main function is to explain punishment. Put simply, the argument is that organisms learn to avoid noxious stimuli through some or other mediating mechanism. This mediating mechanism is normally called fear or anxiety. The typical post-Pavlov, post-Watson analysis has it that a conditioned stimulus which is paired with (contiguous with) an unconditioned stimulus (which happens to be noxious and to cause pain) will after several pairing lead to a conditioned response. The conditioned response is fear or anxiety and is seen as secondary to acquired drives which have arisen through the process of classical conditioning. Generally, these types of theory have it that the threat of discomfort, an increase in primary drives or overstimulation lead to anxiety only if they have autonomic components. Once established, fear/anxiety can function as a secondary drive and establish new behaviour through drive reduction. Moreover, a conditioned emotional response may interfere with ongoing behaviour. Again, there is a similarity here with psychoanalytic theory in that anxiety is seen as incompatible with other behaviours (thoughts).

Physiological theory

Physiological theories are based largely on an exposition of what parts of the central nervous system might be involved in emotion in general and fear/panic/anxiety in particular. Such physiologically based theories rely on a model of human psychology which rests on natural science. They account for

anxiety as involving particular parts of the central nervous system (CNS), with the addition of general arousal (Strongman, 1995). One of the most interesting physiological expositions of emotions comes from Gray (1982; 1987) who regards the behavioural inhibition system as underpinning anxiety. Gray (1982) argues that the behavioural inhibition system suppresses any behaviour that threatens an unwelcome outcome, so it only does this if there is another system that is mediating the threat. This is likely to be the fight/flight system and the outcome is likely to be negative when the system being suppressed is fight/flight. Gray speaks of a complex septal-hippocampal system as at the basis of anxiety (and other emotions) and in particular as acting as an interface between emotion and cognition. However, other parts of the brain are involved in anxiety but the septo-hippocampal is central. He also draws attention to the neocortical projection of the septo-hippocampal system in the frontal lobe, and the monoaminergic afferents arising from the brain stem thus drawing attention to cognition.

Phenomenological/Existential theory

Phenomenological and existing theories of anxiety have their origin in Kirkegaard (1844). Here anxiety is seen as a naturally occurring state of the person. This way of looking at things pivots on the idea that development and maturity depend on freedom, which in turn depends on being aware of the possibilities that exists in life. To consider such possibilities means that anxiety must be involved. Growing towards the maturity that freedom brings means dealing with the anxiety that is an integral part of experiencing possibility. Humans are presented as a natural part of life with a series of choices, from birth onwards. At every choice point, there is anxiety. To

become truly actualised, we must face this anxiety and deal with it since anxiety is unavoidable.

It is interesting that Kirkegaard made a distinction between fear and anxiety that is very similar to which is still often made. Fear is of specific object, whereas anxiety is independent of any object, instead being a necessary condition of choice. Anxiety only develops after the development of self-awareness allows a person also to form a self-hood. A fearful person moves away from a feared object, whereas an anxious person is in conflict and unsure. For the person to develop properly, the anxiety must be faced and dealt with.

Fischer (1970) has done much to bring a phenomenological or experiential approach to understanding anxiety into the twentieth century. He does by attempting to integrate all the previous theories. Although this approach is somewhat wanting, it nevertheless led to a theory. Fischer brings everything together in terms of anxious experiencing. This involves five components. First, there is an identity which takes the form of milestones towards a way of living. If any of these milestones are threatened so that they might be lost, then anxiety results. Second, there is a world which consists of a network of relations and involvements for each milestone. If anything in this world seems insurmountable, and the world thus becomes threatened, then anxiety will result. Third, there is motivation in which the world and the person's identity is perpetuated. Fourth, there is an action, which is involved in achieving a milestone and which expresses being. Finally, there is ability which is a lived evaluation of uncertain competence. For Fischer, anxiety is both anxious experience and the experience of the self or the other being anxious. As should be obvious from this brief description, Fischer's

conceptualisation is vague, although it is experiential or phenomenological and he does not really succeed in fitting all the other types of formulation into the theory, even though the vagueness helps.

Cognition theory

Most theories of emotion have found a place for cognition and theories of particular emotions including anxiety are no exception to this. One of such major cognitive theory is that of Eysenck's (1957) theory of cognition. Eysenck argues that the cognitive system acts as a gateway to the physiological system, so in understanding anxiety, it is important to consider both systems. He also talks of self-schema theories, self-schema depending on the personal relevance of any particular trait to the individual and assumes that these self-schemas are part of the cognitive system. As a background to his theory, Eysenck (1988) shows that there are differences between people who are high and low in trait anxiety in the information that they have stored in the long-term memory. This view is supported by the work on mood-state-dependent retrieval and mood-congruent learning (Izard, 1977, 1991; Lazarus, 1991; Le Doux, 1994). According to Eysenck (1988), people who are high or low in anxiety also vary in their mood states and so the content of their memory should also vary. This memory approach to trait anxiety also helps to account for changes in trait anxiety that occur over time and also to deal with the fact that some people are anxious in stress-producing situations but not in others. He further argues that those who are high or low in trait anxiety may also differ in the process side as well as the structure of their cognitive systems.

The theory proper begins with a consideration of why people differ in their susceptibility to stress. Eysenck (1988) demonstrates that those who are

high or low in anxiety do in fact differ in the structure (content) and process of cognition. Their memory differs both in broad schemata and in specific items, such as the type and amount of specific worries that they might have. He offers two reasons why those who are high in trait worry more than those who are low. First, they have more frequent and more highly organised set of worries in long-term memory. Secondly, the worries of the more anxious may be more accessible because their more negative mood states assist mood-state-dependent retrieval. According to the theory, it follows from this that high and low anxiety people will also differ in cognitive appraisal of ambiquity. Moreover, a person might be more susceptible to stress and anxiety in some stress situations than others. Eysenck points out that the evidence about the role of the cognitive system in accounting for the differences in the susceptibility to stress is unclear but there are differences in cognitive functioning. In the end what is important about Eysenck's theory of (trait) anxiety is that it draws attention to the importance of taking into account the cognitive system as well as the physiological and behavioural.

Uncertainty

Uncertainty is the core part of anxiety and is seen as being unsure of the future or of what course of actions to take in the face of threat (Lazarus, 1991). The notion of uncertainty is taken by Lazarus who brackets anxiety with fright. Fright occurs when there is imminent physical harm whereas anxiety is characterised by uncertain, ambiguous, existential threat. His distinction between fright and anxiety is similar to Freud's distinction between objective and neurotic anxiety.

As an appraisal theorist, Lazarus (1991) suggests that there are various primary appraisals that might contribute to anxiety. Thus, if there is perceived

goal relevance, then any emotion might ensue, including anxiety. Finally and most importantly, if the ego involvement is protection of personal meaning and the protection of ego-identity against existential threat, then anxiety is the only possible emotional reaction. Uncertainty, as the core of anxiety, produces a strong drive to justify it, to make whatever the threat is external and objective to reduce the uncertainty. The problem with anxiety as Lazarus sees it is that once one objective threat has been coped with, another takes it place since the basic problem is existential.

The obvious concluding statements to draw from these consideration of theories of anxiety is that the various approaches set off from a very similar set of starting point to those of theories of emotion in general. Again the weight of opinion makes it clear that anxiety cannot be fully understood without taking some account of its cognitive aspects and influences. Furthermore, there seems to be a general agreement amongst most of the theorists that anxiety can be distinguished from fear or fright in that the object of the latter is 'external', 'real', 'known' or 'objective'. Anxiety is characterised by its genesis being, yet again, uncertain to the individual. Moreover, anxiety is clearly a negative, unpleasant emotion, it is motivating, can be associated with a wide range of new stimuli or events, and appears to be an inevitable or even in some views, an essential part of human condition.

Components of Anxiety

Anxiety consists of a mental (cognitive) component and a physiological (somatic) component. Both components influence performance (Jarvis, 2002; Martens, Vealey, & Burton, 1990). Cognitive anxiety is characterized by negative expectations about success or self-evaluation. It includes negative self-talk, worries about performance, inadequacies, images

of failure, inability to concentrate, and disrupted attention (Ampofo-Boateng, 2009; Gallucci, 2008; Jarvis, 2002; Martens, Vealey, & Burton, 1990). And, it is caused by negative expectations about success or by negative self-evaluation (Craft, Magyar, Becker, & Feltz, 2003). In other words, cognitive anxiety is the fear from anticipated consequences of failure (Hardy, & Parfitt, 1991). It only changes when the subjective probability of success changes. For examples, less experience and non-elite performers experience a steady increase in anxiety right up to and even during performance, whereas, the experience and elite performers demonstrate a similar pre-event increase, but then a reduction just prior to and during performance (Martens et al. 1990). Also, research has found that a strong negative linear relationship exists between cognitive anxiety and performance (Martens, Vealey, & Burton, 1995). Thus, as cognitive anxiety increases, performance decreases in a linear fashion.

Somatic anxiety is the physiological element which is related to autonomic arousals and characterised by negative symptoms such as feelings of nervousness, high blood pressure, dry throat, muscular tension, rapid heart rate, sweaty palms, butterflies in your stomach and a keyed up feeling (Jarvis, 2002; Martens, Vealey, & Burton, 1990). Somatic anxiety is a conditioned response to entering a performance arena, so it should disperse once performance begins (Martens *et al.*, 1990). Antecedents of somatic anxiety are thought to be of shorter duration and are comprised mostly of conditioned responses to stimuli (e.g., precompetitive warm ups, field/court change, etc.) (Gould, Petlichkoff, & Weinberg, 1984; Martens *et al.*, 1990). Martens et al. indicated that the relationship between somatic anxiety and performance is curvilinear. As anxiety increases, performance increases to a point then begins

to decrease as anxiety continues to increase). Somatic anxiety is generally best measured using blood pressure and heart rate measures. It is important to note however, that the systolic reading of blood pressure is the more reactive measure as it is the measure that responds to situations. Diastolic reading of blood pressure is a "health" reading. It is the measure that responds to how well blood is moving through the arteries during the heart's relaxation period (American Heart Association, 2004). Martens, Vealey and Burton (1995) looked at the relationships between somatic anxiety and performance and found that the relationship between somatic anxiety and performance was a less power curvilinear relationship where both lower and higher levels of somatic anxiety were detrimental to performance.

Types of Anxiety

Anxiety has state and trait elements. Speilberger (1966) proposed a state-trait theory in order to differentiate between anxiety as a mood state and as a personality trait. Thus, Speilberger (1966) was the first researcher to adopt an anxiety-based approach that established the state-trait theory concurrently with his measuring instrument, the State-Trait Anxiety Inventory (STAI) (Speilberger, Gorsuch, & Lushene, 1970). Speilberger (1966) defined state anxiety as "an emotional state characterized by subjective, consciously perceived feelings of apprehension and tension, accompanied by or associated with activation or arousal of the autonomic nervous system" (p. 17). Hence, state anxiety is considered a 'right now' response which may change from moment to moment as the perception of threat varies in a given situation. In sports, competitive state anxiety is considered as the existing or current emotional state in competitive situations characterized by feelings of

apprehension and tension and associated with activation of the organism (Martens *et al.*, 1990).

In contrast, Speilberger (1966) defined trait anxiety as "a motive or acquired behavioral disposition that predisposes an individual to perceive a wide range of objectively non dangerous circumstances as threatening and to respond to these with state anxiety reactions disproportionate in intensity to the magnitude of the objective danger" (p. 17). Thus, trait anxiety refers to how one 'generally' responds and is thought of as a relatively stable individual disposition. Specifically, Speilberger's (1966) state-trait anxiety theory predicts that individuals who are high in trait anxiety will perceive more situations as threatening and will therefore respond with higher state anxiety intensity in a greater variety of situations than will individuals with low trait anxiety.

In sports, competitive trait anxiety (A-trait) is the tendency to perceive competitive situations as threatening and to respond to these situations with competitive state anxiety (A-state) (Martens *et al.*, 1990). Therefore, individuals who have a tendency to perceive competitive situations as threatening will respond to these situations with competitive state anxiety. Support for this relationship was found in a study conducted by Scanlan (1978) who assessed competitive A-state in 27 high and 27 low competitive A-trait males performing a ring-peg test under three conditions: basal (at rest), non-competitive and competitive. Results demonstrated that the A-trait groups were affected differently by the situation in which they were performing as A-state was higher when performing the task under the competitive condition than in the basal and non-competitive conditions, and high competitive A-trait subjects showed the highest increase in competitive A-state in the competitive

condition. These results demonstrate a significant interaction between situation and competitive A-trait.

Dietmar, Renan and Sebastião (1998) investigated the effects of state and trait anxiety on physical performance under both neutral and stressful conditions among male and female track athletes. In Study I, 43 male and female track athletes answered the State-Trait Anxiety Inventory and twice underwent ergometric testing in the physiology laboratory after receiving a neutral or a stress-inducing instruction. In Study II, these 43 runners completed the state scale shortly before a test run in a practice session and once again just before the start in an official competition. Results showed a significant increase in self-reported state anxiety under the stress condition in both the laboratory and the field setting. At the same time, the mean physical performance, measured as physiological performance parameters (maximum oxygen intake, physical work capacity) or as running performance, significantly deteriorated under stress. The induced stress affected the heart rate in addition to the mere physical work load, with no sign of compensation occurring during the entire period of ergometric testing. For both laboratory situations and for the practice situation as well, no significant relationships, neither linear nor nonlinear, were detected with regard to effects of anxiety on performance. In the competition situation, however, an inverted-U relationship was found in the low trait-anxious subgroup.

Mediators of Anxiety

Researchers have proposed several different constructs that are considered mediators of both trait and state anxiety (Cox, 2007; Modroño, & Guillén, 2012; Baker, Horton, Pearce, & Deakin, 2006). Although a single cause of feelings of anxiousness has not been pinpointed, many associate

anxiety with perfectionism, age, experience, level of competition, audience effect and positional role (Whiteley, 2013).

Perfectionism

Like anxiety, perfectionism is multidimensional. Functional perfectionism is evaluated as innately positive while dysfunctional perfectionism is considered inherently negative (Cox, 2007). Functional perfectionism is related to superior personal standards, a keen want for organization, aspiring to perfection, and striving for success for oneself and others. On the contrary, dysfunctional perfectionism is characterized largely by concern over perfection and expectations, worry about mistakes and criticism, and self-doubt (Cox, 2007).

General perfectionism has been correlated with heightened levels of both cognitive and somatic anxiety (Stoeber, Otto, Pescheck, Becker, & Stoll, 2007). However, when this construct is divided between functional and dysfunctional perfectionism, results have yielded different correlations. In a study by Stoeber et al, a sample of both high school and university athletes completed perfectionism scales and competitive anxiety measures prior to an athletic competition. Pushing oneself to achieve perfection was not positively correlated with heightened levels of anxiety. However, a negative response to a failure to achieve perfection was correlated with elevated levels of both cognitive and somatic anxiety. As associated with performance, functional perfectionism is largely perceived as beneficial, whereas dysfunctional perfectionism generally has adverse effects on performance (Cox, 2007).

Age, experience and anxiety

Researchers have also examined the effects of age on anxiety. For example, George (1994) found that college athletes experienced significantly

less somatic anxiety and more self-efficacy than did high school athletes, although differences in performance quality were not significant. Modroño and Guillén (2012) found in a sample of windsurfers that age was inversely related to cognitive anxiety, that is, older athletes experienced less cognitive anxiety than younger athletes. The researchers proposed that this effect likely came as a result of differences in the level of experience between older and younger athletes. Golfers tend to peak later than athletes in most aerobically based sports (Schulz, & Curnow, 1988). Berry and Larkey (1999) reported that most players peak between 30 and 35 years of age in their ability to score in majors such as British Open and U.S. Open. This makes the learning of psychological skills applicable to golfers of all ages. Studies of cognitive and motor skills suggest performance can be maintained at high levels in spite of advanced aging (Baker, Horton, Pearce, & Deakin, 2006; Deakin, Horton, Pearce, & Baker, 2005; Krampe, & Ericsson, 1996). These studies provide evidence of the ability of players to continue playing high level golf despite increasing age, giving further impetus to explore psychological skills and their influence on golf performance. These results appear to indicate that age and experience are related to both cognitive and somatic anxiety, although a potential relationship between age, experience, and performance is unclear. Anxiety also plays a role in the attitudes and performance of youth athletes. In a study of athletes between the ages of nine and thirteen, results indicated that as perceived competence increased, anxiety decreased and vice versa (Wong, & Bridges, 1995). Jordet and his colleagues (2006) analyzed 41 shootouts, comprising 409 penalty kicks, from the World Cup, European Championships and Copa America between 1976 and 2004. They evaluated the effects of the players' age on their chances of success. Age was found to be important with

younger players doing better. Players aged 22 or younger successfully convert 85.2% of attempts. Those aged between 23 and 28 convert 77.6%, and those aged over 29 years convert 78.1%. This result may be due to low expectations placed on younger players.

Landers, Wang and Courtet (1985) analyzed both experienced and inexperienced shooters to establish links between stress conditions and peripheral narrowing. They found that increased levels of arousal subsequently result in a narrowing of the athlete's field of attention. Past studies in this area typically find weak to no results for the impact of experience on performance under pressure. Dohmen (2008) indicates that performance improves with experience, but comments that this results may be due to selection bias. Players are chosen to take penalty kicks and players that often miss are frequently removed from taking future penalty kicks. Cao, Price and Stone (2011) found that experience has no effect on free throw performance in pressure situations. Hickman and Metz (2015) showed that pressure affects less experienced players more than those that have earned more money throughout their careers, and that the impact of pressure on performance varies based on how well the player has been putting in the tournament up to that point.

Level of competition and anxiety

In a sample of windsurfers, those athletes who experienced less somatic anxiety had higher overall rankings, and that those who were listed as members of the "top five" also had higher self-confidence than lower ranked athletes (Modroño, & Guillén, 2012). These findings suggest that high caliber athletes who experience success in their sports benefit from reduced anxiety and increased self-confidence. In the same study, however, Modroño and

Guillén also found that differences between the anxiety and self-confidence experienced by professional and amateur windsurfers were non-significant, perhaps indicating that only the most elite athletes experience significantly reduced anxiety as a result of their level of competition. In a sample of elite and non-elite rugby players, significant differences were found between the way in which anxiety is interpreted by elite and non-elite athletes, indicating that level of competition may not only have an effect on anxiety intensity, but also on anxiety direction (Neil, Mellalieu, & Hanton, 2006). Thus, elite competitors, who were defined according to their professional status, interpreted worry symptoms as less debilitative and somatic anxiety responses as more facilitative than their non-elite counterparts who competed at semi-professional levels or lower.

Audience effects

Although several aspects of performance and anxiety can be attributed to internal factors such as self-efficacy and team orientation, it is also probable that external factors play an important role in shaping performance. Such factors can include the audience in front of which an athlete competes and the location of the competition. Audiences can largely be categorized as supportive, neutral, or hostile, while competitions are classified as either home or away (Butler, & Baumeister, 1998). Prior research assessing a wide variety of performance tasks has yielded mixed conclusions about audience effects, with some studies finding that performance declines with a hostile audience and some indicating that a supportive audience is more detrimental to performance (Butler, & Baumeister, 1998; Bray, & Martin, 2003; Bray, Jones, & Owen, 2002). Butler and Baumeister (1998) sought to explore these conflicting results by first asking participants to complete a mental arithmetic

task while theoretically being observed by either a supportive friend or neutral strangers. Results indicated that those who believed they were carrying out the task in front of friends became more cautious and made more mistakes than those in the stranger condition. However, they believed that they had performed well. Butler and Baumeister's overall findings indicated that challenging tasks requiring great skill are adversely affected by a supportive audience. Bray and Martin (2003) examined individual alpine skiers and determined that neither performance nor anxiety levels were influenced by whether the competition was held at home or away. Additionally, research has suggested that athletes report higher self-efficacy and self-confidence and lower cognitive and somatic anxiety prior to home games as opposed to away games (Bray, Jones, & Owen, 2002). However, the researchers are careful to note that there are moderating variables that lead to mixed results when comparing home competitions to away competitions. Athletes in a study by Bray, Jones and Owen had extensive playing experience and competed at very high levels, indicating that perhaps these factors impact and moderate the effects of home and away competition on an athlete's psychological state.

Positional role anxiety

Performance executed by different players in different position is also influenced by psychological factors. According to the Eysenck's study (1982), the playing position in the team and the level of sports should be considered in research study to identify the factors influence on sports performance. Sanjay (2017) compared competition anxiety between offensive and defensive positions of handball players. A total of 40 subjects of inter college level handball players within the age of 18-25 years were selected randomly as subject for this study. Positional competition anxiety was studied by

measuring the competition anxiety of players who played mainly in attacking and defending position and bear separate responsibility in handball match. Competition anxiety level was the criterion measure in this study. Competition anxiety was measured by Illinois Competition Anxiety Test Questionnaire (Martens, 1977). The result revealed that anxiety level was higher for defensive position than that of offensive position for handball players. However, the significance of difference of competition anxiety for these two different positions for players in handball was not statistically significant. Thus, there was no significant difference in the competition anxiety between defensive and attacking positions of handball players. Jordet, Hartman, Visscher and Lemmink (2007) collected data from soccer statistics internet sites on 41 penalty shootouts and 409 kicks taken in the World cup, European championships and Copa America between 1976 and 2004 to determine percentage success rate of players of different positions. The results showed that attackers successfully convert 83.1% of their penalties, midfield players convert 79.6% and defenders convert 73.6%. The authors concluded that the result is not surprising since it is reasonable to assume that players whose most important task or one of their most important tasks is to score goals are better goal scorers than other players.

The Multidimensional Anxiety Theory

This current study was built on this theory. It predictions for cognitive and somatic competitive anxiety have been based on the empirical findings reported by other researchers, predominantly in the area of test anxiety research. This theory assumes that because cognitive anxiety misdirects attention from task relevant cues to task relevant self or social evaluation cues (Wine, 1980), performance should decrease linearly with increases in

cognitive state anxiety. In addition, cognitive state anxiety is assumed to be the primary influence upon performance because it is predicted to be influenced by an athlete's performance expectations and the perception of their ability. On the other hand, somatic anxiety is considered to be a conditioned response to environmental cues associated with the onset of competition but will dissipate rapidly once the competition begins. This prediction is based on previous anxiety theory (Davidson, & Schwartz, 1976; Borkovec, 1976). Thus, somatic anxiety is considered to be the physiological and affective components of the anxiety experience that develop from autonomic arousal. Although the anxiety components are considered to be separate and that an individual may respond to a situation with primarily cognitive state anxiety or primarily somatic state anxiety (Davidson, & Schwartz, 1976), it has been highlighted that cognitive and somatic anxiety may serve as a conditional function to each other (Borkovec, 1976). Specifically, Borkovec noted that a conditioned response to an environmental cue could also trigger an individual to worry because of the somatic symptoms present. In addition, cognitive concerns about oneself could trigger a patterned somatic response. Consequently, Martens et al. (1990) predicted that self-confidence would be linearly and positively related to performance. A criticism of multidimensional anxiety theory is that it makes predictions about the separate effects of cognitive anxiety and somatic anxiety upon performance, and makes no specific predictions about the combined effects of cognitive and somatic anxiety (Hardy, 1996).

Temporal Patterning of Anxiety

Some researchers have corroborated the idea that athletes need not necessarily perceive pre-competitive anxiety as unfavourable but, rather, it can

encourage positive results (Hanin, 1997; Jones, & Hanton, 2001; Jones, & Hardy, 1990). Jones (1995) built his directional interpretation of anxiety model on these notions, positing that anxiety's impact on sports performance does not depend on the anxiety's intensity but, rather, upon whether the athlete perceives it as facilitating or debilitating in relation to their performance of a positive outcome. Thus, an increase in anxiety could, for some athletes, be perceived as favouring good performance, while others might interpret it negatively, which has an impact on cognition.

Utilizing the multidimensional approach, researchers investigating the separate responses of cognitive and somatic pre-competitive anxiety have found that cognitive and somatic anxiety components follow different patterns of change during the time leading up to competition (Gould, Petlichkoff, & Weinberg, 1984; Jones, & Cale, 1989; Martens, Vealey, & Burton, 1990). In addition, these temporal changes found in the empirical literature have generally been supportive of multidimensional anxiety theory predictions. Specifically, the multidimensional anxiety (MAT) theory as determined by Martens *et al.* (1990) predicts that pre-competitive cognitive anxiety is influenced by athletes' performance expectations and the perception of their ability and is predicted to remain relatively unchanged as the time-to-competition approaches unless expectations of success/failure change. In contrast, somatic anxiety has been termed by researchers as being a conditioned anxiety response to the competitive environment, and is predicted to remain relatively low until approximately 24 hours before the competition and then increases rapidly as the competition approaches. Once performance begins, somatic anxiety is hypothesized to dissipate rapidly.

Research conducted to date has investigated temporal patterning by measuring an athlete's levels of cognitive and somatic anxiety two days prior to competition, 24 hours, two hours and one hour prior to competition, and are generally supportive of MAT predictions (Jones, Swain, & Cale, 1991; Lane, Terry, & Karageorghis, 1995; Wiggins, 1998). Specifically, the majority of studies have found that somatic state anxiety remained low in the days nearing competition, but increased rapidly once athletes were at the competition site just prior to competition. In addition, cognitive anxiety levels remained stable as time to competition neared. For example, Wiggins (1998) conducted a study to investigate the pre-performance temporal patterns of cognitive and somatic anxiety in high school soccer and swimming teams and college track and field athletes. Results revealed that athletes' levels of cognitive anxiety remained relatively stable before the competition, whereas somatic anxiety levels increased significantly from 24 hours to 1 hour prior to competition making these findings consistent with MAT pre-competition temporal patterning predictions.

Certain studies have found that elite athletes score low on measures of anxiety symptoms' intensity, but high on perceived self-confidence (Jones, & Hanton, 1996; León-Prados, Fuentes, & Calvo, 2011; Lundqvist, Kentä, & Raglin, 2011). Those factors increase the tendency to perceive anxiety symptoms as facilitative to competitive performance (Bejek, & Hagtvet, 1996; Jones, & Hanton, 1996; Jones, Swain, & Hardy, 1993; Kais, & Raudsepp, 2005; León-Prados, Fuentes, & Calvo, 2011; Lundqvist, Kentä, & Raglin, 2011; Spink, 1990), downplaying the threatening aspects of anxiety and increasing their own sense of control. Hanton and Jones (1994) established in their study that high-and low-level athletes do not differ from one another in

terms of cognitive and somatic anxiety levels but that high-level athletes interpret their symptoms as more facilitative of their sports performance. They concluded that this may be due to high-level athletes' higher reported self-confidence. In the same vein, Jones (1995) argues that athletes who perceive themselves as capable of achieving the goals they strive towards interpret their anxiety symptoms as facilitative. Meanwhile, athletes with negative expectations about achieving their goals interpret their symptoms as detrimental to performance. Woodman and Hardy (2001) reported that people with high anxiety levels (high intensity) usually perceive them as debilitative or as negatively affecting performance.

Studies of team sports by Ntoumanis and Biddle (1997) and Kais and Raudsepp (2005), as well as studies of players of individual sports (none being elite athletes) by Pozo (2007), related the intensity of anxiety components to their directions and found that self-confidence correlated negatively with the intensities of cognitive and somatic anxieties and correlated positively with their directions. Therefore, high levels of self-confidence were linked to low levels of anxiety intensity and to the perception of cognitive and somatic anxieties as facilitative. The intensity of cognitive anxiety was positively correlated with the intensity of somatic anxiety and negatively correlated with the direction for both types of anxiety. The intensity of somatic anxiety was negatively associated with the direction of cognitive anxiety, while the direction of cognitive anxiety, in turn, was linked to that of somatic anxiety. Ntoumanis and Biddle added that such subjects seem to direct their feelings of pre-competitive cognitive and somatic anxiety towards improving their performance. However, Mellalieu, Hanton, and O'Brien (2004) reported that the type of sport and competitive experience influences how people interpret

their symptoms while Martens, Vealey and Burton (1990) proposed that athletes in individual sports who are subjectively judged in competition exhibit more intense symptoms of cognitive anxiety and lower self-confidence.

Jones, Swain and Hardy (1993) conducted a study of gymnasts and suggested that exhibiting sustained, low anxiety levels with a perceived facilitative direction was the best predictor of optimal competitive performance. Lundqvist, Kentä and Raglin (2011), however, argued that high levels of self-confidence were also influential towards successful performance. Raising the issue of gender, Mellalieu, Hanton, and Jones (2003), and Pozo (2007) observed no differences in the intensity and directions of anxiety and self-confidence. Jones and Swain (1992) examined differences in intensity and direction of competitive state anxiety in high and low competitive (i.e., the desire to enter and strive for success in sport competition) participants from a variety of team sports. Findings revealed that although there were no differences in levels of cognitive anxiety between high and low competitive participants, the highly competitive group perceived their cognitive anxiety as more facilitating and less debilitating than the low competitive group. No differences in somatic anxiety intensity and somatic direction were found between the two groups. The findings of this study, therefore, indicated that the presence of the individual variable competitiveness was related to participants' interpreting their cognitive anxiety symptoms as being more facilitating than debilitating.

Jones and Hanton (1996) assessed 91 competitive swimmers on the intensity and direction of their cognitive and somatic anxiety responses prior to competing, together with scales examining outcome, performance and process goals. Overall, results revealed that over half of the swimmers'

cognitive and somatic anxiety levels were experienced as facilitative with only 23% of the swimmers experiencing both anxiety components as debilitative. In the case of interpretation and goal attainment expectancies, none of the swimmers set solely outcome goals, 22 of the swimmers set performance and process goals only, and 45 of the swimmers set outcome, performance, and process goals. Furthermore, results revealed that of the swimmers who set all three types of goals, 33 had positive and 12 had negative / uncertain attainment expectancies regarding outcome goals. Specifically, the two groups did not differ on levels of cognitive and somatic anxiety intensity. However, the group that had positive attainment expectancies regarding outcome goals scored higher on direction of both cognitive and somatic anxiety and therefore interpreted anxiety symptoms as being more facilitative to performance than the group that had negative/uncertain attainment expectancies regarding outcome goals.

Hanton and Connaughton (2002) conducted qualitative interviews to examine elite and sub-elite swimmers' explanations of the relationship between pregame anxiety symptoms, perceived control, self-confidence and performance. Findings indicated that perceived control was a moderating variable in the resulting facilitating or debilitating directional interpretations of anxiety symptoms experienced. Specifically, responses from both elite and sub-elite swimmers indicated that they were able to interpret their cognitive and somatic anxiety symptoms as being more facilitative towards performance than debilitating when the anxiety symptoms were deemed under personal control. For example, when swimmers were able to provide a rational explanation as to why their thoughts and feelings could improve performance or if they associated the anxiety symptoms with previous sporting success,

then they were able to increase positive thoughts and self-confidence, which in turn were seen to increase performance. In contrast, swimmers who perceived their cognitive and somatic anxiety symptoms to be outside of their control (e.g., preparation for the competition had been unsuccessful) tended to interpret their anxiety as more debilitating and as having a negative influence on performance.

In the case of self-confidence, the findings from this study provided further support for the notion that higher levels of self-confidence may in some way protect against the possible debilitating effects of anxiety, and also that a positive relationship may exist between self-confidence and sport performance. Specifically, Hanton and Connaughton (2002) found that both elite and sub-elite swimmers consistently reported a positive performance outcome if they were experiencing anxiety in conjunction with feelings of self-confidence and perceived control. In contrast, swimmers reported decreases in performance as they experienced anxiety in conjunction with decreases in self-confidence.

Research findings from Wiggins (1998) and Kais and Raudsepp (2005) suggest that while the intensities of self-confidence and cognitive anxiety remain stable before competition, somatic anxiety increases between 24 hours and one hour before the event, indicating that once an athlete evaluates his or her anxiety symptoms as either facilitative or debilitative, the symptoms persist during the 24 hours leading up to the competition. Conversely, the direction scale remains stable throughout the 24 hours prior to competition on all three anxiety subscales (Wiggins, 1998).

Indeed, the majority of research that have examined the antecedents and temporal patterning of pre-competitive cognitive and somatic anxiety have

found support for multidimensional anxiety theory, as delineated by Martens, Vealey and Burton (1990). However, little support has been found for the performance predictions of multidimensional anxiety theory.

Pre-competitive Anxiety versus Competitive Anxiety and Sport Performance

Anxiety can enhance focus and sharpen athletic skill. Pre-competitive anxiety is the tendency to assess confrontational situations as dangerous and respond accordingly with feelings of tension and apprehension (Martens, Burton, Vealey, Bump, & Smith (1990). This anxiety quickly escalates immediately before competition and quickly decreases afterwards (Gould, Petlichkoff, & Weinberg, 1984). This specific sensation, which typically occurs during the 24 hours leading up to a competition, is known as pre-competitive anxiety which has been a major focus of research in the field of sports psychology. Studies have verified that a high level of anxiety prior to competition can hinder athletic performance (Burton, 1988). For some athletes, however, the stress of performing well takes its toll in the form of performance anxiety, which dulls skill and performance execution. A great deal of the literature on the relationship between anxiety and performance has come from a cognitive-behavioral perspective.

Athletes can face anxiety as they prepare to compete, which can carry over into competition. Given that precompetitive anxiety can be debilitating to performance within competition (Weinberg, & Genuchi, 1980), understanding individual differences that predispose athletes to experience elevated anxiety prior to competition would be useful information for sport psychology consultants, coaches, and athletes. Several individual differences predispose an athlete to experience precompetitive state anxiety including trait anxiety

(Gould, Horn, & Spreeman, 1983; Hanton, Mellalieu, & Hall, 2001; Scanlan, & Lewthwaite, 1984), experience and ability (Fenz, & Jones, 1972; Heckhausen, 1990; McGregor, & Abrahamson, 2000), and elite versus non-elite status (Morgan, & Johnson, 1977; Weinberg, & Genuchi, 1980).

Anshel and Porter (1996) determined that elite swimmers were more self-confident, better at managing pre-competition stress, less likely to be irritated at distractions before a race, and possess a higher state of concentration. However, Hanton, Evans and Neil (2003) discovered that non-elite athletes interpret their anxiety as negative in regards to an upcoming performance situation. Although previous studies have shown that elite and non-elite athletes both experience the same intensity of anxiety, elite athletes are better able to facilitate this response (Jones, Hanton, & Swain, 1994). Hanton and Connaughton (2002) found that although elite performers initially view cognitive state anxiety as debilitative, they use cognitive strategies to overcome negative thoughts and change them to positive ones.

Duda and Gano-Overway (1996b) revealed in their study with young gymnasts that, the feeling of apprehension was strongly associated with performing skills involving learning new skills, performing a difficult or scary skill or doing skills for the first time in a meet. On the other hand, since the tasks are artistic performance and are watched and evaluated by any number of individuals such as parents, judges or coaches, these gymnasts mentioned that they feel nervous in a competitive environment (especially those deemed as important) when there are judges. And that is hardest when they try their hardest and their coaches say they are doing bad, or when in a very big meet and they know that their biggest competitor is there. In moderate form the

anxiety was generated by falls a lot during warm-ups or for the rushing in timed warm-ups.

Previous research has reported that athletes who possess a high level of skill in their sport experience lower intensities of anxiety before a competitive situation (Campbell, & Jones, 1997; Gal-Or, Tenenbaum, & Shimrony, 1986). In a study using tennis players, Ryska (1998) found that ability level was significantly related to levels of competitive anxiety. This may be from the adaptation of cognitive behavioral strategies (such as mental imagery and positive self-talk) that athletes develop and adopt over time (Anshel, 1994; Cox, 1990; Mahoney, Gabriel, & Perkins, 1987).

Hall and Kerr (1998) examined the predictors of achievement anxiety from a social-cognitive perspective among fencers. The participants took the surveys one week, two days, one day, and thirty minutes before the competition. Through this method, they were able to contrast the levels of somatic anxiety leading up to the event. They were able to find that low perceived ability was a significant predictor of somatic anxiety across each time period, while win orientation significantly predicted somatic anxiety only within thirty minutes prior to the start of competition.

Krohne and Hindel (1988) similar to Martens, Vealey and Burton (1990) argued that the effect of competitive anxiety on athletic performance could not be predicted by general measures of anxiety due to the inadequate nature of such measures. During his research in determining the effectiveness of coping methods employed by tennis players, Krohne and Hindel did, however, find that trait anxiety affects competitive athletic performance. Because trait anxiety is to a great degree indicative of personality, Krohne and

Hindel determined that techniques of extensive self-regulation have a significant balancing effect on anxiety due to a competitive activity.

Swain and Jones (1996) determined that cognitive and somatic anxiety provided important explanations for a variety of sporting task outcomes. Swain and Jones study was based on Martens, Vealey and Burton (1990) and proposed to determine the relevance of competitive state anxiety and self-confidence in terms of their influence on performance. By examining intensity levels and direction (i.e., debilitative or facilitative) of competitive state anxiety and self-confidence, Swain's study served to explain variations in performance. To allow for a within-subjects analysis of the Competitive State Anxiety Inventory-2 (CSAI-2) and performance data, the study utilized a longitudinal design. Subjects graded their experienced intensity as either facilitative or debilitative to performance by completing the inventory's scales: an original scale as well as a directional scale. The study was comprised of 10 subjects from Loughborough University men's basketball team who completed an adopted CSAI-2 20 minutes before each of six league matches. The measure, used to objectively evaluate basketball performance, was designed by Sonstroem and Bernardo (1982). All of the subjects' modified CSAI-2 scores and performance scores were standardized and computed with the purpose of invalidating variation in between-subject responses.

Polynomial trend analyses expressed that, in terms of cognitive anxiety, the relationship between intensity and performance was most easily explained as an Inverted-U relationship, while the relationship between direction and performance could more easily be explained as a positive linear relationship. The Inverted-U relationship accounted for 18.4% of the variance

while the positive linear relationship accounted for 23.4%. For somatic anxiety, 17% of performance variance was explained by a positive linear relationship between direction and performance, but less that 2% was explained by somatic anxiety intensity. An Inverted-U relationship expressed intensity in self-confidence and explained 21.2% of performance variance. These findings serve as further support and confirmation that the assessment of symptoms experienced based on the perception of the performers is of utmost importance. Furthermore, these findings call into question the relevance of using conventional competitive anxiety questionnaires which, in most cases, only represent measures of cognitive and physiological symptoms that have been labelled as anxiety only by the developers of the questionnaires themselves.

Parfitt and Pates (2005) confirmed Swain and Jones (1996) claims and elaborated on the findings by applying the study to a variety of college athletes, positing the effectiveness of mediating therapy techniques. The hypothesis of the study claimed that hope is inversely proportional to athletic performance anxiety due to its function as protection against perceived threats, fear of being judged or evaluated negatively by others, and feelings of a loss of control. An evaluation measuring state and trait hope, fear of negative evaluation, perceived threat, causation origin, state and trait competitive sport anxiety, state anxiety, and self-efficacy, was completed by 80 Division I-AA undergraduate athletes. The results were evaluated using path analysis to determine the reliability of a causal relationship between hope and performance anxiety based on the aforementioned variables of perceived threats, fear of negative evaluation, and feeling of uncontrollability. The results were conclusive for a model of trait hope which leads to a reduced state

of trait performance anxiety through reduced fear of negative evaluation, lessened susceptibility to perceived stress, and a stronger origin of causation. State hope and state performance anxiety showed similar results, although the model's only significant aspect was shown in the self-confidence subscale of state competitive anxiety. The implications of these results indicate that athletic performance anxiety may be decreased by intervening increased trait hope.

Similarly, Plante and Booth (1995) also determined that anxiety has a significant effect on the performance of college level basketball players. Like Lazarus (2000), who linked emotional anxiety to competitive performance with four meta-theoretical and theoretical positions: (a) stress and emotion should be considered as a single topic; (b) discrete emotion categories offer the richest and most useful information; (c) appraisal, coping, and relational meaning are essential theoretical constructs for stress and emotion; and (d) although process and structure are both essential to understanding, Plante and Booth agreed that sport-task performance could most definitely be explained by a biopsychosocial model. Substantiating the work of Lazarus (2000) and Plante and Booth (1995), Legrand and LeScanff (2003) suggested that performance outcome of competitive javelin throwers could be predicted by the mood and anxiety level of participants.

Campen and Roberts (2001) provide a significant study involving recreational runners, which can also be applied to competitive runners, demonstrating possible effects of anxiety on athletic performance. Campen and Roberts agree with the idea that trait and state anxiety, and an individual's perception of stress, were reliable in determining performance. Similarly, Purge, Jurimae, and Jurimae (2005) established that pre-competition stress

levels were also indicative, and effectively so, in determining success amongst competitive rowers. In contrast, two other pre-competition studies, conducted by Burton and Naylor (1997) and Males and Kerr (1996) concluded that sport-performance cannot always be effectively predicted based on pre-competition stress. For example, based on a study conducted on nine elite slalom canoeists lasting an entire season, Males and Kerr found that performance success could not, in fact, be predicted efficiently by pre-competitive stress. Adding to this evidence, Burton and Naylor (1997) found competitive anxiety to be ineffective in predicting success in athletic performance and furthermore, not exclusively impairing. According to Burton and Naylor, reasonable levels of pre-competition anxiety may serve to motivate the athlete and regulate focus on the immediate competitive task. This self-awareness, focus, and attentiveness to an individual's performance may therefore motivate the athlete to strive for greater success. While the study's findings are convincing, the sample group was of such a modest size that some would argue that this hypothesis requires further study on greater numbers.

Measuring Anxiety in Sport

A multitude of sport specific psychological tools, surveys and inventories, have been developed to assess both trait and state anxiety. Some of these inventories are: Sport Competition Anxiety Test (Martens, 1977), Competitive State Anxiety Test (Martens, 1977), Competitive State Anxiety Inventory-2 (Martens, Burton, Vealey, Bump, & Smith, 1990), Sport Anxiety Scale (Smith, Smoll, & Schutz, 1990), Psychological Skills Inventory for Sport (Mahoney, Gabriel, & Perkins, 1987), Athletic Coping Skills Inventory-28 (Smith, Schutz, Smoll, & Ptacek, 1995) and the Trait-State Sport Confidence Inventory (Vealey, 1986). Several of these are reviewed next.

Sport competition anxiety test (SCAT)

The SCAT was developed by Martens in 1977 as a questionnaire meant to be completed by athletes shortly before competition (Martens, Burton, Vealey, Bump, & Smith, 1990). The test consists of 10 items with an additional 5 that are included to deter participant response monotony. Each item contains a statement about how a person feels while competing in a sport. Athletes select the option that best represents the frequency at which they agree with a statement. Options were: (1) hardly ever, (2) sometimes and (3) often.

Ommundsen and Pedersen (1999) found that the SCAT was able to effectively detect the variation in the athletes' perception of their own competence as well as their experience of cognitive and somatic anxiety in sport competitions. Martens conducted extensive validity and reliability testing to assure that the items on the SCAT were effective in identifying high and low anxiety competitors (Gill, 2000). Gill also reported that the SCAT meets and usually exceeds all generally accepted standards for psychological tests and that the test is reliable in sports competition, in the lab and in field research.

Competitive state anxiety inventory-2 (CSAI-2)

The CSAI-2 developed by Martens, Burton, Vealey, Bump and Smith, (1990) measures competitive anxiety with the added modifications of a direction scale (Jones, & Swain, 1992) as well as a scale to measure the frequency of disturbance (Swain, & Jones, 1993). The CSAI-2 measures competitive anxiety by presenting participants with 27 items separated into the three categories of cognitive anxiety, somatic anxiety, and self-confidence. Each of the three categories consists of nine items to represent the specific

anxiety-related construct. Participants rate their anxiety for each item on a scale of 1 (no anxiety at all) to 4 (very high level of anxiety) resulting in a score of 9 to 36 for each anxiety-related construct. Cronbach's alpha indicated that the CSAI-2 is highly reliable, scoring consistently in the range of 0.79 to 0.90 (Martens, Burton, Vealey, Bump, & Smith, 1990).

In 1992, Jones and Swain added the direction scale to measure the intensity of their symptoms in terms of negative, meaning debilitative, or positive, meaning facilitative, and the relation of symptom intensity to subsequent competitive performance. The direction scale provides a numerical continuum from -3 ("very debilitative") to +3 ("very facilitative") where a score of 0 indicates no variation. Using the direction scale, participants prescribe scores of -3 to +3 to each item in each of the three categories. Therefore, the end result is a score ranging from -27 (least intensity and least effect on competitive performance) to +27 (greatest intensity and greatest effect on competitive performance) for each category: cognitive anxiety, somatic anxiety, and self-confidence. For this portion of the assessment, Cronbach's alpha shows a reliability rating of 0.80 to 0.89 for cognitive anxiety and 0.72 to 0.84 for somatic anxiety (Hanton, Jones, & Mullen, 2000; Jones, & Hanton, 1996). The final modification to the CSAI-2, the frequency of intrusion scale, developed by Swain and Jones (1993), measures the frequency of symptom occurrences, including thoughts and sensations, on a scale from 1 (never) to 7 (constant) for each inventory item. Resulting scores range from 9 to 63 for each of the three categories. Currently there are no reliability scores available for the frequency of intrusion scale as the scale has only been investigated on a basic or primary level.

Sport anxiety scale-2 (SAS-2)

Sport Anxiety Scale-2 (SAS-2) by Smith, Smoll, Cumming and Grossbard (2006) measures and distinguishes somatic anxiety, worry, and concentration disruption. The SAS-2 is a multidimensional measure of cognitive and somatic trait anxiety in sport-performance settings. According to Sepulvelda (2008), Smith et al. (2006) suggested that the SAS-2 has stronger factorial validity than the original scale did, and construct validity research indicates that scores relate to other psychological measures as expected.

The revised competitive state anxiety-2 (SCAI-2R)

The SCAI-2R developed by Martens, Burton, Vealey, Bump and Smith (1990) examined the multidimensional pre-competitive state anxiety among athletes shortly before competition. The (SCAI-2R) has three-factor structure with 7 items measuring somatic anxiety, 5 measuring cognitive anxiety and 5 measuring self-confidence. The (SCAI-2R) has stronger psychometric properties in terms of its factor structure than the original instrument hence it is recommended that both researchers and clinicians use the SCAI-2R in place of the SCAI-2. It require subjects to respond on a 4-point Likert scale where categories vary from not at (1), somewhat (2), moderately so (3), to very much so (4). The reliability estimate for the CSAI-2R is .84.

Research Perspectives on Anxiety and Sport Performance

Several investigations have been conducted to test the proposed relationships between cognitive anxiety and performance and between self-confidence and performance. For example, Martens et al. (1990) predicted that cognitive anxiety should remain high and fairly stable during the time prior to competition, while somatic anxiety peaks later. Klavora's (1977) work was supported with this finding by Martens et al which found that athletes with

moderate levels of anxiety performed the best overall and scored the most points. In contrast, the high anxiety players performed the worst indicating that high levels of cognitive anxiety during competition are harmful, worsening performance and even leading to dropout.

Parnabas, Parnabas and Parnabas (2015) investigated the cognitive anxiety among 113 track and field players, including the national athletes, state athletes, district athletes, and university athletes during sport between universities competition. The Competitive State Anxiety Inventory–2 (CSAI-2) and the Psychological Performance Inventory (PPI) were distributed among the athletes. The result showed that track and field athletes of university level exhibited higher cognitive anxiety level than those in state and district categories, whereas national athletes showed the lowest level of cognitive anxiety. The result revealed there exists of negative correlation between cognitive anxiety and sport performance among track and field athletes. It means the higher the level of cognitive anxiety experienced by track and field athletes, the lower the sport performance level. Bridges and Knight (2005) tested twenty three starting collegiate athletes from Division III football, women's basketball and men's basketball teams for somatic anxiety (measured blood pressure and heart rates) and cognitive anxiety (self-report questionnaire) during leisure time and 10 to 45 minutes prior to a collegiate competition. Athletic performance was assessed by the appropriate coaching staff. Results indicated that there is actually a significant positive linear relationship between cognitive anxiety and performance for basketball players, while no other significant findings were determined across sport or type of anxiety.

Parffit and Plates (1999) considered the influence of competitive anxiety and self-confidence state responses upon components of performance. Twelve basketball players were trained to self-report their cognitive anxiety, somatic anxiety and self-confidence as a single response on several occasions immediately before going on court to play. Performance was video-recorded and aspects of performance that could be characterized as requiring either largely anaerobic power (height jumped) or working memory (successful passes and assists) were measured. The results indicated that somatic anxiety positively predicted performance that involved anaerobic demands while self-confidence was the main predictor of performance scores with working memory demands. It would appear that different competitive state responses exert differential effects upon aspects of actual performance. Identifying these differences will be valuable in recommending intervention strategies designed to facilitate performance. In a study using wrestlers, Morgan and Johnson (1977) found that competitors who were successful experienced lower levels of anxiety than their unsuccessful counterparts. Positive and negative consequences that come from success and failure may build up over the course of a competitive career leading to the development of trait anxiety (McGregor, & Abrahamson, 2000).

Donzelli and Dugoni (1990) compared successful runners and non-elite runners and found that runners with high trait anxiety showed more state anxiety than runners with low trait anxiety. Similarly, Gould, Horn and Spreeman (1983) found among wrestlers that those with high trait anxiety reported more state anxiety than wrestlers with low trait anxiety. The research of Krane and Williams (1987) using golfers concluded that competitive trait anxiety was a predictor of cognitive and somatic anxiety. Along similar lines,

Hanton and Connaughton (2002, pp.1133) used male collegiate soccer players and concluded that participants with high "competitive trait anxiety symptoms responded with greater state levels than those with low trait anxiety". The same study also concluded that performers high in trait concentration disruption, and subsequently easily distracted, will be unable to maintain focus in the presence of increased state anxiety, adopting a negative debilitating view of competitive state anxiety symptom. As high trait anxious performers typically respond with strong physiological levels, in addition to experiencing high cognitive state symptoms, they are more likely to be susceptible to performance catastrophes, and subsequently expected to perceive competitive state anxiety symptoms experienced as more debilitating to performance than their low trait anxious counterparts. Covassin and Pero (2004) reported similar finding in a study using collegiate tennis players. They reported that those who had low anxiety levels were not affected by negative circumstances. In their study to examine how competitive level predicts state anxiety among track and field athletes, Krane and Williams (1994) indicated that track and field athletes who competed in highly complex events experienced more cognitive anxiety than those who competed in lower complexity events. However, Matheson and Mathes (1991) found that difficulty of routines had no impact on levels of state anxiety among high school gymnasts.

Whiteley (2013) investigated how trait and state anxiety, self-efficacy, team orientation, age, gender, and experience level affect competitive athletic performance among 96 college athletes and 57 high school athletes. The State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970), Sources of Sport Confidence Questionnaire (SSCQ; Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998), Team Orientation Questionnaire (Caplan,

Bourgeois, LeUnes, Hudson, & Meyers, 2011) and Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Burton, Vealey, Bump, & Smith, 1990) were used to measure trait anxiety, self-efficacy, team orientation and competitive anxiety among the participants. Results showed that high trait anxious individuals experience more state cognitive and state somatic anxiety and less state self-confidence than low trait anxious athletes. Additionally, high school athletes experienced more somatic state anxiety than did college athletes. High school females experienced more cognitive and somatic state anxiety and less state self-confidence than college females, however this effect did not appear between male high school and college athletes. These results indicate that there is a high level of variation in the anxiety experienced by different athletes that may have implications in the techniques that coaches use to improve an athlete's performance.

Concept of Self-confidence

Self-confidence is one of the most important variables related to sport performance (Robazza, & Bortoli, 2007). It is a construct that is used to explain successful and unsuccessful performances among athletes. Poor performances are explained with a lack of self-confidence and good performances with strong self-confidence. Various terms such as "self-confidence," "self-efficacy," "perceived ability," and "perceived competence" have been used to describe one's perceived capability to accomplish a certain level of performance. Bandura (1977) uses the term "self-efficacy" to describe the conviction one has to execute successfully the behaviour (e.g., a sports performance) required to produce a certain outcome (e.g., a trophy or self-satisfaction) and, thus, can be considered as a situationally specific self-confidence. In addition, as Bandura (1986) notes, self-efficacy is not

concerned with the skills an individual has but with the judgments of what an individual can do with the skills he or she possesses. He also distinguishes between perceived self-efficacy and self-confidence. Self-confidence, for him, refers to the strength of the belief or conviction but does not specify the level of perceived competence. Bandura (1986) prefers to use the term "self-efficacy" to specify the level of perceived competence and the strength of that belief. "Perceived competence" and "perceived ability" are terms that have been limited in use to the achievement and mastery motivation literature, and indicate the sense that one has the ability to master a task resulting from cumulative interactions with the environment (Harter, 1978; Nicholls, 1984). In the specific area of sport and movement, Griffin and Keogh (1982) use the term "movement confidence" to describe an individual's feeling of adequacy in a movement situation, whereas Vealey (1986, p. 222) defines "sport confidence" as "the belief or degree of certainty individuals possess about their ability to be successful in sport".

Self-confidence is conceptualized as one's belief in meeting the challenge of the task to be performed (Martens, Vealey, & Burton, 1990). It can be defined as a feeling of belief in one's abilities and qualities to be successful in sport (Feltz, 1988). Dosil (2004) defined self-confidence in the sports field as the level of certainty, in terms of past experiences, that an athlete reaches in relation to his/her ability to succeed in a specific task. It is the belief in an athlete that he/she can execute a wished behaviour. Similarly, Nicolás (2009) describes self-confidence as someone's belief in developing the necessary skills to successfully perform the required behaviour and achieve a specific result. This author extrapolates the concept to the sports field and states that self-confidence usually refers to someone's perception of

his/her capacity to face a particular task. Also, self-confidence indicates "the belief one has about one's own internal resources or abilities to achieve success in different specific situations" (Horn, 2008, p.66). According to the strength of the belief one has over one's abilities to perform in a specific situation, self-confidence can be high or low. If the athlete doubts his or her performance skills, even though the coach, training hours and results prove the opposite, then it is believed that the athlete displays low levels of self-confidence.

Self-confidence increases perceived ability to emotion management and provides possibility for athlete to control negative emotions more effectively. Empirical research has shown that in athletes, high levels of self-confidence are associated with perceived useful ability (Martens, Vealey, & Burton, 1990; Robazza, & Bortoli, 2007). Self- confidence also moderates competitive anger symptoms (Hanton, & Connaughton, 2002; Hanton, O'Brien, & Mellalieu, 2003), facilitates coping resources for encountering anxiety (Jones, & Hanton, 2001; Hanton, & Connaughton, 2002; Robazza & Bortoli, 2007), and causes to maintenance and continuation of control during the match. Therefore, self-confidence before and during the match determines lower level of competitive anxiety and often correlates with better performance (Craft, Magyar, Becker, & Feltz, 2003).

Sources of Self-confidence

Understanding where confidence plays a role in sport starts with the recognition of how confidence is developed in sport. A variety of research shows that there are sources of confidence that help establish and strengthen the confidence level of a person (Bandura, 1977; Hays, Maynard, Thomas, & Bawden, 2007; Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998; Wilson,

Sullivan, Myers, & Feltz, 2004). According to several researchers, athletes use different sources to develop, enhance, and sustain confidence, and research has supported this notion by distinguishing the sources athletes use to judge confidence in sport (Magyar, & Feltz, 2003; Vealey, 1986; Bandura, 1997). Kingston, Lane and Thomas (2010) suggested that understanding where an athlete's confidence derives from before competition is essential for the development of the athlete's confidence. Bandura (1977) established that there were four sources of efficacy (confidence): personal accomplishments, vicarious experience, verbal persuasion, and physiological states. Descriptive research has provided strong support of these four sources (Moritz, Feltz, Fahrbach, & Mack, 2000), with performance accomplishments consistently emerging as the most significant source. However, the question remained whether these four sources were the most relevant to athletes within a sport-specific context. Vealey's original intent on developing her own model of sport confidence and incorporating the various sources of sport confidence.

Vealey, Hayashi, Garner-Holman, and Giacobbi (1998) added onto Bandura by establishing the Sources of Sport Confidence Questionnaire (SSCQ) to identify sources of confidence in athletes within the sport confidence framework created by Vealey (1986; 1988). The purpose of their study was to develop a reliable measure of sources of sport confidence, extend the conceptual framework of sport confidence to include sources, and test predictions made by the expanded model. The researchers examined high school basketball players over the course of several phases of their study and found nine sources of confidence: (a) mastery (mastering or improving personal skills); (b) demonstration of ability (when athletes show off their skills to others or demonstrate more ability than their opponents); (c)

physical/mental preparation (feeling physically and mentally prepared with an optimal focus for performance); (d) physical self- presentation (athletes' perceptions of their physical selves); (e) social support (perceiving social support from significant others in sport, e.g., coaches, family, and teammates); (f) coach's leadership (confidence derived from believing in one's coach's skills in decision-making and leadership); (g) vicarious experience (gaining confidence from watching others, such as teammates or friends); (h) environmental comfort (feeling comfortable in a competitive environment such as the specific gymnasium or pool where competition will occur); and (i) situational favourableness (feeling the breaks of the situation are going in one's favour).

All nine of the aforementioned sources were found to have an effect on sport confidence. However, several of the sources were much stronger than others, e.g., mastery, social support, coach's leadership, physical/mental preparation, and demonstration of ability. Their results indicated that different types of athletes' sport confidence were associated with the importance athletes place on different sources of confidence. The researchers concluded that it is imperative to understand each athlete's particular sources of sport confidence before making an effort to enhance that confidence (Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). Wilson, Sullivan, Myers and Feltz (2004) found that a confirmatory factor analysis failed to find the same 9-factor structure found by the SSCQ, but rather an 8-factor minus the situational favourableness as well as fewer items. However, Hays, Maynard, Thomas and Bawden (2007) found that nine sources of confidence were instrumental in confidence: Preparation, performance accomplishments,

coaching, innate factors, social support, experience, competitive advantage, self-awareness, and trust.

Vealey, Hayashi, Garner-Holman, and Giacobbi (1998) suggested that the dynamic nature of confidence over time depends on the sources upon which that specific confidence is based. Athletes who rely on controllable sources (mastery, demonstration of ability, physical/mental preparation) would likely have more stable confidence than athletes who rely more on uncontrollable sources (social support, environmental comfort). If an athlete relies on something he or she can control, such as their own ability to perform a task successfully, as opposed to an uncontrollable source, such as coach's leadership, the athlete will likely have stable levels of confidence or efficacy. Again, athletes who derive their confidence from uncontrollable sources could develop weaker or unstable perceptions of control and competence. Corbin (1981) found that the threat of playing "a good opponent" could create a vulnerability in women that is not experienced by men. Consequently, with regard to perceptions of sport confidence, female world-class athletes might be more susceptible to factors associated with the organizational culture of world-class sports performance. Previously, researchers have demonstrated that while male athletes generally demonstrate greater confidence than female athletes (Krane, & Williams, 1994; Lirgg, 1991), they are also less susceptible to changes in self-confidence during the pre-competition period (Jones & Cale, 1989; Jones, Swain, & Cale, 1991). Kingston, Lane, and Thomas (2010) examined how the sources of sport-confidence can affect elite athletes' performance. They found a significant effect in time-to-competition citing that demonstration of ability, physical/mental preparation, physical self-

presentation, and situational favourableness was viewed as factors relating to sport-confidence during the pre-competition phase.

Components of Self-confidence

Confidence has been described in two categories namely trait sport confidence and state sport confidence (Vealey, 1986). Trait sport confidence is the belief or degree of certainty individuals usually possess about their ability to be successful in sport. Trait sport confidence is concerned with how athletes rate their ability to perform across a wide range of sports. State sport confidence is the belief or degree of certainty individuals possess at one particular moment about their ability to be successful in sport. State sport confidence is concerned with how athletes rate their ability to perform in a specific setting, that is, in the moment (Vealey). State sport confidence is generally considered the most important moderator of efficacious behaviour because it is based on the mutual influence of situational and individual factors (Vealey). State sport confidence is based on the specific situation one is in, combined with individual personality characteristics, making this concept integral in determining efficacious behaviour. Thus, an individual's nature toward being self-confident in sport can influence state sport-confidence. Vealey (1988) found that athletes high in trait-sport confidence who held a competitive performance orientation were also high in state sport-confidence. Using the baseline research of Vealey (1986; 1988), Martin and Gill (1991) examined the relationship among competitive orientation, sport-confidence, self-efficacy, anxiety, and performance. Through their research, Martin and Gill (1991) found that the trait-sport confidence inventory (TSCI) predicted state sport confidence in athletes, thus confirming that how an athlete feels and talks about themselves will determine how they behave.

Types of Sport Confidence

Vealey and Knight (2002) identified three multidimensional components of sport confidence important to athletes: (a) physical skills and training, (b) cognitive efficiency, and (c) resilience. Sport-confidence with physical skills and training refers to an athlete's degree of confidence or belief in his or her ability to successfully execute the necessary skills to perform in a sport (Vealey, & Chase, 2008). Cognitive efficacy is defined as how certain an athlete is that he or she can mentally focus while maintaining enough concentration to make well thought-out decisions and perform successfully (Vealey, & Chase). Third, resiliency is defined as how certain an athlete is that he or she can regain focus after performance errors; bounce back from performing badly; and overcome doubts, problems, and setbacks to perform successfully (Vealey, & Chase). These three types of sport confidence (physical skills and training, cognitive efficiency, and resilience) have proven to be independent, which falls in line with Bandura's (1977) self-efficacy theory and further supports the multidimensionality of self-confidence in athletes. In other words, resiliency does not depend on cognitive efficiency or physical skills and training; they operate independently of each other. These multidimensional components are important in order to fully understand the idea of sport confidence and its role in athlete performance. How these three components interact plays a key role in the resulting sport performance.

Importance of Sport Confidence in Sport Performance Enhancement

The importance of self-confidence in sporting success has been researched in a variety of sport settings (Feltz, 1994; Mahoney, & Avener, 1977; Vealey, 1999; Woodman, & Hardy, 2003). Self-confidence is widely acclaimed by theorists, researchers, and practitioners as the most critical

psychological characteristic influencing sport performance (Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). There is well documented evidence of the dramatic influence that self-confidence exerts on both the increase and decrease of sports performance. Several studies have documented the positive influence that self-confidence has on performance (Vealey, & Knight, 2000; Feltz, 1994; Maddux, & Lewis, 1995; Vealey 1986; Vealey et al., 1998; Jones, Hanton, & Swain, 1994; Grove, & Heard, 1997; Moritz, Hall, Martin, & Vadocz, 1996; Bandura, 1997; Maddux, & Lewis, 1985; Feltz, 1994).

Vealey and Knight (2000) outlined four points that detail the relationship between self-confidence and sport. First, self-confidence elicits adaptive emotional states, while a lack of confidence relates to anxiety, depression, and dissatisfaction (Feltz, 1994; Vealey 1986; Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). Second, self-confidence is associated with productive belief systems in which negative emotions are reframed and viewed as necessary and facilitative (Jones, Hanton, & Swain, 1994). Third, confident individuals are more skilled and efficient in using cognitive resources that are necessary for sport success (Grove, & Heard, 1997; Maddux, & Lewis, 1995; Moritz, Hall, Martin, & Vadocz, 1996; Vealey, 1986). Fourth, self-confidence elicits productive achievement behaviours (Bandura, 1997) and enhances performance (Feltz, 1994; Vealey, 1986). These points clearly indicate not only the relevance of self-confidence in sport, but also the significant benefits that continued research into self-confidence in sport could bring to the performance enhancement literature and practice.

Debilitating Factors of Sport Confidence

Researchers have identified several factors that exist that may decrease or debilitate sport confidence (Vealey, & Knight, 2002; Hays, Thomas,

Maynard, & Bawden 2009). Hays et al. (2009) postulated seven main categories of debilitation: (a) poor performances, (b) injury/illness, (c) poor preparation, (d) coaching, (e) pressure and expectations, (f) psychological factors, and (g) athlete specific factors. First, poor performance means unsuccessful results or starting a competition badly, reducing confidence for the remainder of the competition. Second, injury/illness is defined as a physical condition negatively affecting an athlete's performance. Third, poor preparation relates primarily to poor physical training, or simply not doing enough training, which leads to a feeling of unpreparedness. Fourth, coaching is referenced as a debilitating factor when athletes note a lack of one-on-one contact with a coach, have a falling out or argument with a coach, or doubt a coach's ability. Fifth, pressure and expectations are associated with debilitation when related to unrealistically high expectations that create self-doubt. Interestingly, pressure and expectations have been shown to negatively affect confidence levels in female athletes but increase levels in male athletes (Hays et al.). Sixth, psychological factors such as focusing on uncontrollable situations, worrying about losing control, negative thinking, and stress have been shown to negatively affect sport confidence. This is in opposition to focusing on controllable psychological situations, such as mastering one's own skill. Finally, athlete-specific factors such as fate and a volatile crowd, though dependent on the individual athlete, have been shown to negatively affect levels of sport confidence (Hays et al.). It is important to understand what can essentially take away from an athlete possessing high levels of sport confidence in order to hopefully prevent these things from happening.

Strategies to Enhance Sport Confidence

In contrast to debilitating factors, there are a number of mental training strategies and training intervention studies shown to increase sport-confidence in athletes. Hanton and Jones (1999) implemented a multidimensional intervention program consisting of several aspects. First, they suggested it is possible to ensure performance accomplishments by utilizing specific goal-setting, good instruction, and reinforcement; focusing on technique improvement instead of outcome; and emphasizing on lack of effort instead of lack of ability for failure. Second, they posited the ability to improve or increase vicarious experience by imagery training and modeling. Third, the researchers stated that utilizing positive self-talk and thought-stopping techniques could enhance verbal persuasion. Finally, the researchers argued that one can control arousal and anxiety by implementing relaxation training, or learning to view anxiety as readiness and not fear, and changing the way athletes view their own levels of stress--essentially turning stress into a positive, motivational tool (Hanton, & Jones).

Confidence-Performance Spirals

Confidence for an athlete has been previously thought to be high and stable in order for an athlete to have success. Research in the confidence-performance relationship found that performance affects confidence and confidence affects performance (Lindsley, Brass, & Thomas, 1995). A change in either will elicit a change in the other, for good or bad. This concept has been termed "confidence-performance spirals" by Lindsley, Brass, and Thomas (1995) who suggest that upward spirals might not always be beneficial citing that success will typically occur after an athlete has been

faced with failure and learns from it. Bandura and Jourden (1991) found that consistent success leads to complacency and eventually overconfidence.

However, Bandura (1997) found that developing a "resilient" confidence is needed to weather the obstacles and problems that can arise in sport. Elite athletes described this resilient confidence as an "unshakable self-belief" as necessary for success (Jones, Bray, Mace, MacRae, & Stockbridge 2002; Bull, Shamrock, James, & Brooks 2005; Vealey, & Chase, 2008). Having a level of confidence high enough for athletes to rise over obstacles but low enough that they understand that work can be done to better themselves might be key to having consistent success. Confidence still must be strong, leading researchers to determine from a qualitative analysis, with a small focus group and individual interviews of elite athletes, that in order to have a "robust" sport-confidence level, the athlete(s) need to have "A set of enduring, yet malleable positive beliefs that protect against the ongoing psychological and environmental challenges associated with competitive sport." Emphasis was placed on a "set" of positive beliefs and not just one factor (Thomas, Lane, & Kingston, 2011). Understanding the need for steady, strong, and modest confidence, Vealey and Chase (2008) suggests that research is needed to investigate the resiliency of athletes' confidence across time and different obstacles.

Theories of Self-confidence in Sport

Several theories have been propounded to explain the relationship between confidence and successful or unsuccessful performance among elite and non-elite performers. All these theories have shown a strong link between athlete's self-confidence and performance factors (Bandura, 1977; Harter, 1978; Griffin, & Keogh, 1982; Vealey, 1986).

Self-efficacy

Bandura's (1977) theory of self-efficacy has been the most extensively used theory for investigating self-confidence in sport and motor performance. Bandura originally proposed the theory to account for the different results achieved by the diverse methods used in clinical psychology for treating anxiety. It has since been expanded (Bandura, 1982) and applied to other domains of psychological functioning, including motivation (Bandura, & Cervone, 1983), achievement behaviour (Bandura, & Schunk, 1983; Schunk, 1984), and career choice and development (Betz, & Hackett, 1981; Hackett, & Betz, 1981) in addition to sport. This theory, developed within the framework of a social cognitive theory (Bandura, 1986), poses self-efficacy as a common cognitive mechanism for mediating people's motivation and behaviour. People's judgment of their capability to perform at given levels affects their behaviour (that is, choice of activities, effort expenditure, persistence), their thought patterns, and their emotional reactions in demanding or anxiety-provoking situations. Self-efficacy is a major determinant of behaviour, however, only when proper incentives and the necessary skills are present.

Bandura (1977) outlined four sources of information that individuals employ to judge their efficacy: performance outcomes (performance accomplishments), vicarious experiences, verbal persuasion, and physiological feedback (emotional arousal). These components help individuals determine if they believe they have the capability to accomplish specific tasks. First and foremost, performance outcomes or past experiences are the most important source of self-efficacy (Bandura). Positive and negative experiences can influence the ability of an individual to perform a given task. If one has performed well at a task previously, he or she is more likely to feel competent

and perform well at a similarly associated task. Thus, mastery experiences are the most influential source of efficacy information because they provide the most authentic evidence of whether one can muster whatever it takes to succeed. Success builds a robust belief in one's personal efficacy. Failures undermine it, especially if failures occur before a sense of efficacy is firmly established (Bandura, 1997). Secondly, people can develop high or low self-efficacy vicariously through other people's performances (vicarious experiences). A person can watch someone in a similar position perform, and then compare his own competence with the other individual's competence (Bandura, 1977). If a person sees someone similar to them succeed, it can increase their self-efficacy. However, the opposite is also true; seeing someone similar fail can lower self-efficacy. Thirdly, verbal persuasion generally manifests as direct encouragement or discouragement from another person. Discouragement is generally more effective at decreasing a person's self-efficacy than encouragement is at increasing it. Similarly, the level of credibility directly influences the effectiveness of verbal persuasion; where there is more credibility, there will be a greater influence. Thus, a pep talk by a manager who has an established, respectable position would have a stronger influence than that of a newly hired manager. Although verbal persuasion is also likely to be a weaker source of self-efficacy beliefs than performance outcomes, it is widely used because of its ease and ready availability. Finally, people's experiences of sensations from their body and how they perceive this emotional arousal influences their beliefs of efficacy (Bandura, 1977). In stressful situations, people commonly exhibit signs of distress such as shakes, aches and pains, fatigue, fear, nausea, sweaty palms, racing heart, butterflies in the stomach and the like. Perceptions of these responses in oneself can

markedly alter self-efficacy. Getting 'butterflies in the stomach' before public speaking or having 'sweaty palms', and/or a 'racing heart' before performing a high situation criticality task such as the penalty kick will be interpreted by someone with low self-efficacy as a sign of inability, thus decreasing self-efficacy further. However, high self-efficacy would lead to interpreting such physiological signs as normal and unrelated to ability. It is one's belief in the implications of physiological response that alters self-efficacy, rather than the physiological response itself. Although this source is the least influential of the four, it is important to note that if one is more at ease with the task at hand they will feel more capable and have higher beliefs of self-efficacy.

Self-efficacy can enhance human accomplishment and well-being in countless ways (Pajares, 1997). They influence the choices people make and the courses of action they pursue. Individuals tend to select tasks and activities in which they feel competent and confident and avoid those in which they do not. Unless people believe that their actions will have the desired consequences, they have little incentive to engage in those actions. Whatever factors operate to influence behavior, they are rooted in the core belief that one has the capability to accomplish that behavior. Self-efficacy also help determine how much effort people will expend on an activity, how long they will persevere when confronting obstacles, and how resilient they will be in the face of adverse situations. The higher the sense of efficacy, the greater the effort, persistence and resilience. People with a strong sense of personal competence approach difficult tasks as challenges to be mastered rather than as threats to be avoided. They have greater intrinsic interest and deep engrossment in activities, set themselves challenging goals and maintain strong commitment to them, and heighten and sustain their efforts in the face

of failure. Moreover, they are more quickly to recover their sense of efficacy after failures or setbacks, and attribute failure to insufficient effort or deficient knowledge and skills that are acquirable. Self-efficacy also influence an individual's thought patterns and emotional reactions. High self-efficacy helps create feelings of serenity in approaching difficult tasks and activities. Conversely, people with low self-efficacy may believe that things are tougher than they really are, a belief that fosters anxiety, stress, depression, and a narrow vision of how best to solve a problem. As a consequence, self-efficacy can powerfully influence the level of accomplishment that one ultimately achieves. This function of self-beliefs can also create the type of self-fulfilling prophecy in which one accomplishes what one believes one can accomplish. That is, the perseverance associated with high self-efficacy is likely to lead to increased performance, which, in turn, raises one's sense of efficacy and spirit, whereas the giving-in associated with low self-efficacy helps ensure the very failure that further lowers confidence and morale.

Weinberg, Gould, and Jackson (1979) manipulated subjects' efficacy expectations about competing on a muscular endurance task by having them observe their competitor (a confederate), who either performed poorly on a related strength task and was said to have a knee injury (high self-efficacy) or who performed well and was said to be a varsity track athlete (low self-efficacy). Results indicated that the higher the induced self-efficacy, the greater the muscular endurance. Subjects who competed against an injured competitor endured longer than those who competed against a varsity athlete. Feltz (1982) conducted a study that compared the influence of self-efficacy as a common cognitive mechanism with an alternative anxiety-based model (Eysenck, 1978) in the approach/avoidance behaviour of college females

attempting a modified back dive. The self-efficacy model in this study showed that self-efficacy was the major predictor of performance, and that a reciprocal relationship existed between self-efficacy and back-diving performance. The anxiety-based model included related performance experience, self-reported anxiety, and physiological arousal as causal influences on back-diving performance. Self-efficacy was hypothesized as merely an effect.

Self-efficacy theory has been criticized for being so heavily based on self-report measures because of the demand and suggestion problems that may occur (Borkovec, 1978; Kazdin, 1978). However, Bandura (1986) has presented evidence that in situations where individuals have no reason to distort their reports, self-reports can be quite representative of cognitions. Thus, efficacy judgments are best made when recorded privately. Weinberg, Gould, and Jackson (1979) compared public with private efficacy-expectation groups and found no differences between the two in terms of expectations or performance. Critics have suggested, however, that just making an efficacy statement, even privately, creates a demand or goal to match the performance with the efficacy judgment (Biglan, 1989; Borkovec, 1978). Contrary to this presumption, (Telch, Bandura, Vinciguerra, Agras, & Stout, 1983) have shown that variation in social demand has little or no effect on congruence between self-efficacy and performance. If anything, social demand may encourage conservation and thus reduce the congruence between self-efficacy and performance.

Kazdin (1978) has also criticized Bandura's measure of self-efficacy for being so closely related to the actual performance task that it ensured high correlations. But one can also be assured of finding low correlations if there is little similarity between the efficacy measure and what people are asked to

perform (Bandura, 1978). Moreover, Kazdin was concerned about the possible reactivity occurring when the self-efficacy measure and the behaviour test are administered so closely in time. Again, Bandura (1978) points out that if the interval between efficacy judgments and performance is too great, efficacy expectations may be changed in the interim. Self-efficacy, as a construct, has even been questioned as to its necessity in explaining behaviour by those with strong behavioristic views (Biglan, 1987; Borkovec, 1978; Eysenck, 1978; Wolpe, 1978). These theorists have argued that environmental events such as anxiety response "habit" were the direct cause of both self-efficacy expectations and behavioural change.

In summary, while some criticisms have focused on the methods by which self-efficacy ratings are made (Feltz, 1982; Kazdin, 1978; Kirsch, 1980; Kirsch, 1985), research on self-efficacy in numerous sport and physical activity settings has shown a consistent significant relationship between self-efficacy and performance. The studies that have been conducted to investigate the causal relationships in Bandura's theory of athletic activities (Feltz, 1982; McAuley, 1985) have been consistent in showing that performance factors and perceived self-efficacy are both needed to explain performance.

Perceived competence

Perceived competence and perceived ability are terms that have been limited in use to the achievement and mastery motivation literature and indicate the sense that one has the ability to master a task resulting from cumulative interactions with the environment (Harter, 1978; Nicholls, 1984). Harter (1978) and Nicholls (1984) have developed theories of achievement motivation incorporating the construct of perceived competence (or ability). Although both theoretical models are very similar in their predictions of

perceived competence in achievement contexts, Nicholls uses attribution theory (a theory of causal judgment) to explain the cognitions involved in developing a sense of competence, whereas Harter bases her model on socialization and affective processes within a drive theory to explain the development of a child's sense of competence and subsequent behaviour.

These theories are not as well tested within the sport and physical activity areas as is self-efficacy theory, and where they have been employed, they have been used to explain participation motivation rather than specific task performance. According to Harter's (1978) model, children's mastery attempts in specific domains result in successes or failures and are evaluated by significant others. If the successes are optimally challenging, this leads to perceived competence and intrinsic pleasure. Approval by significant others also leads to perceived competence, but the need for this approval diminishes with age. Perceived competence and intrinsic pleasure, lead to increased motivation to be competent. A history of failure results in perceived lack of competence and anxiety in mastery situations, and decreases children's motivation to continue mastery attempts. In addition, the need for external approval persists developmentally, rather than diminishing.

Harter (1978) suggested that perception of control, as well as significant others' approval or disapproval of mastery attempts, influences a child's perceived competence. Children who feel responsible for the outcome of their mastery attempts have a positive sense of competence. When children either do not know who is in control or view powerful others as responsible for their performance, they have a negative or lower sense of competence. Harter's model is intuitively appealing to the study of motivation in youth sports. From this model, one would predict that young athletes who perceive

themselves to be highly competent in a sport, who are oriented toward mastery in sport, and who identify themselves as primarily responsible for their performance persist longer at the sport and maintain interest in mastering the skills. In contrast, those who perceive themselves to have low competence in sport, who are oriented toward extrinsic mastery, and who believe that others are responsible for their performance do not maintain task performance and interest.

Nicholls' (1984) theoretical model also relates perceived competence (ability) to effectance motivation. Like Bandura (1977) and Harter (1974), Nicholls believes that perceived competence is the critical mediator of performance and persistence. In addition, the basic assumption of Nicholls' theory is that people are motivated by a desire to demonstrate and/or develop high ability and avoid demonstrating low ability.

In sport, an athlete's goal would be to maximize the subjective probability of attributing high ability to the self and minimize the subjective probability of attributing low ability to the self. As long as the athlete is able to make high ability attributions to the self in a sport situation, participation will continue. In contrast, the athlete who makes low ability attributions will discontinue participation in that sport to avoid the unpleasant affect associated with feelings of failure. Both Harter's (1974) and Nicholls' (1984) models provide the same explanation for children's discontinuation of an activity such as a sport. Nicholls proposes that athletes who realize that they do not possess enough ability to be successful will drop out. Harter also proposes that when athletes have a low perceived physical competence they will withdraw because this perception produces feelings of failure, anxiety, and sadness.

As with self-efficacy assessments, perceived competence is based on self-report and thus could suffer from demand and suggestion problems. The trait nature of the measurement reduces its predictive accuracy in relation to performance (Bandura, 1986; 1986). Sport researchers have used sport-specific measures to try to increase the predictive power of their tests (Brustad, & Weiss, 1987; Hom, & Hasbrook, 1986; Weiss, Bredemeier, & Shewchuk, 1986) but some have still found this type of modification not to be specific enough (Brustad, & Weiss, 1987). The measurement of perceived competence has also been criticized for not taking the contextual factors of performance situations into account (Bandura, 1986; Duda, 1987). For instance, children's perceived competence in a sport may change depending on the environmental pressure to compete, the competitiveness of the sport organization, or the peers with which children are comparing themselves (Kirsch, 1985; Klint, 1985). Bandura (1986) has also criticized competence motivation conceptually as being difficult to verify because the motive is inferred from the mastery behaviour it supposedly causes. One cannot tell, as Bandura points out, whether individuals engage in mastery behaviour because of a competence motive to do so or for any number of other reasons without an independent measure of motive strength.

In summary, Harter's theory is developmentally oriented and thus well suited for studying children's competence motivation in sport. It is also trait oriented in its conception, even though the perceived competence construct is viewed as a multidimensional motive rather than as a global trait or unitary construct. Unfortunately, because perceived competence has been measured as a trait, the contextual factors of performance situations have not been

considered and the research on perceived competence in youth sports has not been as consistent as the research on self-efficacy.

Sport confidence

Vealey (1986) was dissatisfied with the way self-efficacy and self-confidence had been operationalized in countless ways for every sport situation studied and noted that Harter's model of perceived competence was limited to children. Therefore, she developed a model and instrumentation for sport confidence (the belief in one's ability to be successful in sport) in an attempt to provide a parsimonious operationalization of self-confidence in sport situations. According to Vealey, this model and instrumentation allow for more consistent predictions of behaviours across different sport situations. Borrowing heavily from Nicholls' and Bandura's theories, she developed an interactional, sport-specific model of self-confidence in which sport confidence is conceptualized into trait (SC-trait) and state (SC-state) components, and also includes a competitive orientation construct to account for individual differences in defining success in sport. SC-trait represents the perceptions that individuals usually possess about their ability to be successful in sport; SC-state represents the perceptions individuals have at a particular moment about their ability to be successful in sport. However, based on Nicholls' belief that success means different things to different individuals, Vealey recognized a need to include in her model a construct, competitive orientation, as a way to operationalize success.

Although competitive orientation is not considered a primary construct in the model, both SC-trait and competitive orientation are predicted to influence how athletes perceive factors within an objective sport situation and how they respond with certain SC-state levels. Specifically, SC-state is

hypothesized to be positively related to SC-trait and performance orientation and negatively related to outcome orientation.

SC-state, in turn, is predicted to be the most important mediator of behaviour. SC-trait and competitive orientation are predicted to influence and be influenced by subjective outcomes. Vealey (1986) has used causal attributions for performance, perceived past success, perceived performance rating, and performance satisfaction as measures of subjective outcomes. Performance satisfaction would be what Bandura (1986) considers an outcome expectation. SC-trait and performance orientation are hypothesized to be positively related to internal attributions for performance, performance rating, performance satisfaction, and perceived success.

Vealey's measurement of confidence represents an improvement over the physical self-efficacy scale (Ryckman, Robbins, Thornton, & Cantrel, 1982) and Harter's physical subscale in that it assesses the generative capabilities necessary for successful performance in most sport situations. However, it does not consider specific sport contexts or assessments of those contexts in the microanalytic approach that will produce the most predictive power. For instance, in ice hockey, an important area of self-confidence is one's perceived ability in making power plays (scoring when the opponents are short-handed). Power play behaviour can be assessed directly, which provides a measure that is especially relevant to the behaviour being analyzed. As stated previously, measures that are tailored to the domain of functioning being studied have greater predictive power than general trait measures.

Also, in regard to the measurement of sport confidence, Vealey does not provide a rationale for instructing respondents to compare their self-confidence to that of the most self-confident athlete they know. Since people

differ in terms of the athletes they know, such a rating procedure can create considerable unsystematic variance. Subjects could appear high or low in confidence, depending on whom they happen to select for comparison. Should the comparison athlete be one the respondent knows personally or a professional that the respondent reads about in the newspaper? Perhaps less variable results would occur if respondents were instructed to make comparisons to an age- and gender- appropriate athlete in terms of sport confidence.

The necessity for including SC-trait in the sport confidence model could be questioned, since the only variable it predicts is SC-state and is therefore redundant. Determining the important sources of SC-state may be more fruitful than assessing athletes' dispositional self-confidence. In addition, inclusion of the concept of competitive orientation could be called into question. Vealey included the construct of competitive orientation in the model as a way to operationalize individual perceptions of success. However, how one perceives success in one situation may be different from how one perceives it in another. The definition of success may be situationally specific. In using the self-efficacy measurement approach, the questions can be structured to assess comparative confidence (how confident are you that you can beat your opponent?) and/or individual performance-oriented confidence (how confident are you that you can improve your last performance?). A dispositional competitive orientation is not needed.

To test fully the network of relationships hypothesized in the sport confidence model, a path analysis or causal modelling should have been conducted. However, this would have necessitated a larger sample. This type of analysis would better test the necessity for including SC-trait and

competitive orientation in the model. In addition, even without a path analysis, a larger sample size is needed for any multivariate analysis.

Movement confidence

Another model specific to sport and motor performance, one concerning movement confidence, was developed by Griffin and Keogh (1982) to describe the feeling of adequacy in a movement situation as both a personal consequence and a mediator in that situation. This model is similar to the models previously reviewed. Griffin and Keogh claim, however, that their model expands these models to include evaluations that an individual makes of sensory experiences directly related to moving. Movement confidence is viewed as a consequence of this evaluation process, which then in turn mediates participation in a movement situation.

Movement confidence, as a consequence, involves the evaluation of a two-factor personal assessment: movement competence (MOVCOMP) and movement sense (MOVSENSE). Movement competence is an individual's perception of personal skill in relation to task demands, and movement sense is an individual's personal expectations of sensory experiences related to moving. These sensory experiences can include muscle aches, breathing hard, sensing of speed, pain of injury, etc. Griffin and Keogh categorize these sensory experiences into two components: personal enjoyment of expected moving sensations and perceived potential for physical harm. Thus, perceived movement competence and perceived movement sense interact to produce a sense or state of movement confidence.

Movement confidence as a mediator functions to influence participation choice, participation performance, and participation persistence in a fashion similar to that proposed by Bandura (1977). Participation, in turn,

provides information that is added to an individual's experiences for future use in the personal evaluation process.

On conceptual grounds, Feltz (1988) see no need for this model in studying self-confidence in movement situations that could not be studied within Bandura's (1977) theoretical framework of self-efficacy. Griffin and Keogh (1982) believe that movement sense is the unique component that differentiates their model from other conceptions of self-confidence. However, in Bandura's model, expected sensory experiences are implied as a source of confidence information via physiological states. The personal enjoyment of such sensations appears to have more to do with having the incentive to perform the task than it does with having confidence. An increase in enjoyment may increase approach behaviour and persistence, but not confidence in one's ability to perform the task more proficiently. In addition, perceived potential for physical harm may be viewed as part of the perceived task demands or task difficulty within Bandura's framework.

Measuring Self-confidence in Sport

Several instruments have been used to measure athlete's perceived confidence to determine how confident athletes feel prior to performance. These measures are used to determine how confident an athlete is and its relationship to facilitative or debilitative performance (Bandura, 1977; Harter, 1978; Vealey, 1986; Griffin, & Keogh, 1982). Some of these scales used in measuring self-confidence in sport include physical self-efficacy scale, perceived competence scale, the trait sport-confidence inventory (TSCI), the state sport-confidence inventory (SSCI), the competitive orientation inventory (COI) and the competitive state anxiety inventory-2 (SCAI-2R) and movement confidence inventory.

Physical self-efficacy scale

Self-efficacy instruments are typically constructed by listing a series of tasks, usually varying in difficulty, complexity, or stressfulness. People are asked to designate the tasks they believe they can perform (efficacy level). For each task designated, they rate their degree of certainty (efficacy strength) that they can execute it on a 100-point probability scale ranging from high uncertainty to complete certainty. According to Bandura (1977), this method permits a micro-analysis of the degree of congruence between self-efficacy and action at the level of individual tasks. However, this method also requires that one conduct a conceptual analysis of the subskills needed to perform a task and a contextual analysis of the level of situational demands. In the sport literature, self-efficacy researchers have typically correlated aggregate self-efficacy scores with aggregate performance scores due to the nature of the tasks used in sport. In most sports studies, subjects' efficacy expectations and performance have not been assessed in terms of the approach/avoidance to a series of tasks that increase in difficulty. Rather, subjects are asked about their confidence beliefs concerning a single task in terms of how long or at what height they can perform and then are asked to attempt that task in two or more trials.

Ryckman, Robbins, Thornton, and Cantrell (1982) developed the Physical Self-Efficacy Scale to provide an omnibus measure of perceived physical self-efficacy. The scale has two factors: a perceived physical ability factor and a physical self-presentation confidence factor that reflects confidence in the display of physical skills. The authors found significant correlations between total physical self-efficacy scores, perceived physical ability scores, and performance on a reaction-time task and a motor

coordination task. Gayton, Matthews, and Burchstead (1986) also found predictive validity for the scale with competitive marathon running performance. However, McAuley and Gill (1983) found a task-specific measure of self-efficacy that measured expectations in the areas of vault, beam, bars, and floor exercise to be a much better predictor of gymnastics performance than the global measure of physical self-efficacy. This supports a growing body of evidence that particularized measures of self-efficacy have greater explanatory and predictive power than global measures (Bandura, 1986).

Perceived competence scale

Harter (1978) developed the Perceived Competence Scale for Children to measure perceived competence in children from grades three through nine. Harter and Pike (1983) later extended this scale to pictorial versions appropriate for pre-school-kindergarten and first-second grades. The original scale consists of 28 items, seven in each of the three specific domains (cognitive, social, physical) and seven that assess a child's general sense of self-worth. The structured alternative questionnaire format involves first asking the child to choose between one of two statements that was most descriptive of him or her as compared to other children of the same age. For instance, the child must choose between "Some kids do very well at all kinds of sports, BUT others don't feel that they are very good when it comes to sports." After choosing one of the two statements, the child is asked whether the statement is "sort of' or "really" true for him or her. This questionnaire format was designed to reduce social desirability effects. Both responses are worded so that they are perceived as socially legitimate. Each item is scored on a four-point scale, with 4 indicating the highest degree of perceived

competence and 1 indicating the lowest. The scores are typically summed and then averaged for each subscale. Harter (1981) found that girls consistently rated themselves as less competent than boys in the sports domain. However, if subjects are instructed to use same-sex children as their comparison peer group, these differences are eliminated (Weiss, Bredemeier, & Shewchuk, 1986). Based on the above, Harter (1985) has moved on to develop the Self Perception Profile for Children, which is a revision of the Perceived Competence Scale for Children. The revised scale contains two additional subscales: physical appearance and behavioural conduct. These new subscales assess self-adequacy rather than perceived competence in the form of actual skills. Several items from the original subscales also underwent revision.

The trait sport-confidence inventory (TSCI), the state sport-confidence inventory (SSCI), the competitive orientation inventory (COI) and the competitive state anxiety inventory-2 (SCAI-2R)

Vealey (1986) developed three instruments to test the relationships represented in her conceptual model: (a) the Trait Sport-Confidence Inventory (TSCI), (b) the State Sport-Confidence Inventory (SSCI), and (c) the Competitive Orientation Inventory (COI). Both the TSCI and SSCI use a five-point Likert scale for respondents to compare their own self-confidence with the most self-confident athlete they know. Similarly to Bandura (1986), Vealey considered the conceptual areas of competence deemed important to sport performance in developing the TSCI and SSCI instruments. Besides physical ability, Vealey (1986) noted that abilities such as performing under pressure and being able to make critical decisions were also necessary competencies for success in sport. However, unlike Bandura's measurement of self-efficacy, Vealey considered the competency areas of sport in general in

measuring sport confidence rather than conducting a conceptual analysis of each sport under investigation.

Researchers interested in sport confidence have also used the Competitive State Anxiety Inventory-2 (CSAI-2) (Martens, Burton, Vealey, Bump, & Smith, 1982) to measure self-confidence in sport situations. In the CSAI-2, self-confidence is viewed as a separate subcomponent of anxiety in addition to cognitive and perceived somatic anxiety. Specifically, self-confidence is thought of as the conceptual opposite of cognitive anxiety. This is in opposition to Bandura's (1984) view of self-efficacy, which does not include anxiety in either the definition or the measuring devices. Just because three factors were found in a factor analysis does not mean that confidence is a sub- component of anxiety or that anxiety is a subcomponent of confidence.

Movement confidence inventory

Griffin and Keogh (1982) recognized that the difficulty of measuring movement confidence would be in measuring perceived movement competence, personal enjoyment of expected moving sensations, and perceived potential for physical harm as entities separate from each other and separate from movement confidence. They developed a Movement Confidence Inventory (Griffin, Keogh, & Maybee, 1984) in an attempt to identify these components as separate entities and as varying in their contribution to perceived levels of movement confidence. The inventory requires three different ratings to be made for any movement task: level of experience, level of confidence in performing the task and extent to which each of 22 paired descriptor words (e.g., "safe/dangerous") contributes to one's perceived level of movement confidence. The descriptor words were

organized into the three confidence components of competence, enjoyment, and physical harm.

Unfortunately, factor analysis of the descriptor words did not reveal three factors organized around the three confidence components, rather, there were simply items loading on one factor, with the partner or opposite word loading on the second factor (e.g., "difficult/easy") (Griffin, Keogh, & Maybee, 1984). The Movement Confidence Inventory does not provide an external criterion of movement confidence, which Griffin and Keogh (1982) indicate is a difficult matter to resolve. One possibility they suggested is to identify observable behavioural manifestations of movement confidence. However, using behaviour to measure self-beliefs would entangle one in hopeless circularity.

Research Perspectives on Self-confidence and Sport Performance

Sport confidence is viewed as critical to human functioning and sport performance. It has been consistently associated with positive affect, whereas a lack of confidence has been associated with anxiety, depression, and dissatisfaction (Martens, Vealey, & Burton, 1990; Vealey, 1986; Vealey, & Campbell, 1988; Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). A great deal of research in sport psychology has examined the influence of self-confidence on athletes' performance. This section reviews this research, including (a) studies in which athletes and coaches identify self-confidence as critical to performance, (b) studies that examine the relationships between confidence and athlete performance in natural competitive settings, and (c) studies that examine the effects of self-confidence on physical performance in controlled experimental settings.

Athletes and coaches have generally identified self-confidence as important for success in sport. Overall research supports the view that athletes and coaches perceive self-confidence to be a crucial psychological requisite for success in sport. International level athletes identified self-confidence as the most critical mental skill in defining mental toughness (Bull, Shamrock, James, & Brooks, 2005; Jones, Bray, Mace, MacRae, & Stockbridge, 2002). Over half of a sample of elite, university and club athletes ranked self-confidence as the most important mental skill related to their performance (Durand-Bush, Salmena, & Green-Demers, 2001). In interviews, US Olympic champions, their coaches, parents or significant others identified self-confidence as a key mental skill in successful performance at the elite level (Gould, Dieffenbach, & Moffet, 2002). U.S Olympic coaches identified self-confidence as an important influence on their athletes' performance at the 1996 and the 1998 Olympic Games (Gould, Guinan, Chung, & Greenleaf, 2002), and junior tennis coaches rated self-confidence as an important mental skill for young tennis players (Gould, Medbery, Damarijan, & Lauer, 1999).

Confident individuals tend to be more skilled and effective in using cognitive resources necessary for sporting success. For example, although not directly tested in the sport literature, Bandura and Wood (1989) showed that confident individuals remain task-diagnostic by focusing on process solutions to problems in the face of obstacles, whereas less confident individuals are more likely to become self-diagnostic and focus on their perceived inadequacies. Furthermore, confidence has been found to influence the coping processes of athletes. More specifically, athletes who possess a strong belief in their ability reported being able to peak under pressure and cope successfully with adverse situations during competition (Cresswell, & Hodge, 2004).

Self-confidence means individuals' belief in ability to control environment and themselves (Burton, 1998; Martens, Burton, Vealey, Bump, & Smith, 1990; Woodman, & Hardy, 2001). It reinforces athlete's perceived ability to manage stress and anxiety during sport competition and leads athlete to be less under the effect of competitive anxiety. In addition to control and reduce negative emotions, this sense of capability helps athlete to do his/her sport tasks with more success and has a better performance. This explanation is consistent with evidence that has confirmed the association of self-confidence with perceived ability in athletes (Martens et al., 1990; Robazza, & Bortoli, 2007). Craft, Magyar, Becker and Feltz (2003) have also shown that self-confidence before and during the match determine low competitive anxiety and often correlate with better performance.

Research findings have revealed that self-confidence activates coping resources in order to encounter competitive anxiety (Hanton, & Connaughton, 2002; Jones, & Hanton, 2001; Robazza, & Bortoli, 2007). Based on this, one can explain that self-confidence helps athlete with appropriate usage of coping strategies to manage and control competitive anxiety and through this improve his/her sport performance. Based on Carver and Scheier's (1988) control process theory on stress and coping, and consistent with findings related to facilitative and debilitative anxiety (Jones, 1995) it is possible that self-confidence through positive appraisal and interpretation of symptoms related to player's experienced anxiety, helps athlete to perceive this anxiety as facilitative and cope with it in a better way (Hanton, & Connaughton, 2002; Hanton, O'Brien, & Mellalieu, 2003; Ntoumanis, & Jones, 1998; Jones, 1995; Jones, & Hanton, 2001). This explanation is consistent with the idea of "positive coping expectancy" in the cognitive activation theory of stress.

Ursine and Eriksen (2004) believe that athlete's positive coping expectancy means the feeling of ability to control situation with existing coping resources, reduce the likelihood of sport anxiety.

Research findings have also revealed that athlete's self-confidence moderates negative experienced emotions in sport competition and helps continuity of managing and controlling situation during the match (Hanton, & Connaughton, 2002; Robazza, & Bortoli, 2007). The ability to moderate negative emotions and control situation during the match helps athlete to rule over the game with more relaxation and effective management, puts into action his/her sport skills, and gains more desirable consequences. This is also in line with the butterfly catastrophe model (Hardy, 1996; Hardy, Woodman, & Carrington, 2004).

Research by Mahoney and Avener (1977) and Burton (1988) have indicated that self-confidence is an important predictor of performance that is at least partially independent of cognitive anxiety (Burrows, Cox, & Simpson, 1977; Thayer, 1978; Hardy, & Whitehead, 1984; Martens, Burton, Vealey, Bump, & Smith 1990). The original exploratory factor analysis of the CSAI-2 (Martens et al., 1990) revealed cognitive anxiety and self-confidence factors, which they argued should therefore be regarded as being relatively independent of each other. Studies have revealed that self-confidence plays some role in determining the interpretation that performers place upon their anxiety symptoms, and therefore the effect of anxiety upon performance (Hardy, 1990; Hardy, & Jones, 1990; Jones, 1995). Jones, Swain and Hardy (1993) found that self-confidence intensity correlated more strongly with performers' directional interpretations of their cognitive and somatic anxiety symptoms than with the intensity of these symptoms. Edwards and Hardy

(1996) reported that athletes perceived their anxiety more facilitative to performance as self-confidence increased. Self-confidence is suggested to be a powerful construct in sport that has the ability to influence performance over and above the effect exerted by cognitive anxiety and physiological arousal (Hardy, Jones, & Gould, 1996) and to discriminate between anxiety interpretations (Jones, Hanton, & Swain 1994; Jones, & Hanton, 2001; Hanton & Connaughton, 2002). Hardy (1990) suggested that self-confidence might protect against the potential debilitative effects of anxiety. Self-confidence has been reported to be facilitative to performance in several studies (Lane, Terry, & Karageorghis, 1995; Wiggins, 1998; Thomas, Lane, & Kingston, 2004). Moreover, self-confidence is more facilitative compared to cognitive and somatic anxiety.

Hays, Maynard, Thomas and Bawden (2007) were the first to investigate sport confidence in successful world-class sports performers. They identified sources and types of confidence used by athletes competing on the world stage and demonstrated that demographic and organizational factors influence the development of confidence in such athletes. For example, women athletes derived confidence from a perceived competitive advantage, such as seeing their competitors perform badly, or crack under the pressure of competition. In contrast, men just believed they were better than their competitors. These findings suggest that in accordance with previous research (Lirgg, George, Chase, & Ferguson, 1996), female world-class athletes tend to be situationally dependent on external information in establishing performance expectations.

Hays et al. (2009) again examined the role of confidence in relation to the cognitive, affective, and behavioural responses it elicits, and identified the

factors responsible for debilitating confidence within the organizational subculture of world-class sport. Using Vealey's (2001) integrative model of sport confidence as a broad conceptual base, 14 athletes (7 males, 7 females) were interviewed in response to the research aims. Analysis indicated that high sport confidence facilitated performance through its positive effect on athletes' thoughts, feelings, and behaviours. However, the athletes participating in this study were susceptible to factors that served to debilitate their confidence. These factors appeared to be associated with the sources from which they derived their confidence and influenced to some extent by gender. Thus, the focus of interventions designed to enhance sport confidence must reflect the individual needs of the athlete, and might involve identifying an athlete's sources and types of confidence, and ensuring that these are intact during competition preparation phases.

Vealey (1986) examined the possible relationships between attachment styles, competitive anxiety, self-confidence and performance among competitive swimmers aged 17-20. The participants were 44 swimmers from all over Sweden (24 elite and 20 sub-elite). The results indicated that swimmers with high levels of self-confidence experienced less competitive anxiety than swimmers with low levels of self-confidence, but this relation did not affect significantly their performance results. Again, self-confidence showed a strong negative relationship to competitive anxiety and a positive relationship to performance (although not statistically significant).

Rokka, Mavridis, Bebetsos, and Mavridis (2009) used the competitive State Anxiety Inventory-II (CSAI-II, Martens, Burton, Vealey, Bump & Smith, 1982; Martens et al., 1990; Jones, & Swain, 1992) to evaluate the levels of intensity and direction of the competitive state anxiety in junior

handball players prior to a competition and to investigate any possible differences between male and female players, as well as in relation to their athletic experience among 115 handball players, members of eight handball teams (four male and four female), which participated in the Greek Junior Handball Championships finals held in Athens in 2008. Results showed that junior male handball players displayed higher self-confidence, with positive effects on their performance, while female handball players stated lower self-confidence, which was neither facilitative nor debilitative to performance. In relation to years of experience, the results revealed that players with four to six years of experience showed higher self-confidence with facilitating direction, while players with less years of experience displayed lower self-confidence, with neither facilitative nor debilitative effects on their performance.

Besharat and Pourbohlool (2011) used the multidimensional competitive anxiety questionnaire and sport self-efficacy scale to examine moderating effects of self-confidence and sport self-efficacy on the relationship between competitive anxiety and sport performance in a sample of 246 (149 males, 97 females) Iranian athletes. The results revealed that self-confidence and sport self-efficacy moderated the relationship between competitive anxiety and sport performance. Analysis of the data revealed that moderating effects of self-confidence for the association of cognitive and somatic dimensions of competitive anxiety with sport performance were partial. On the other hand, the moderating effects of sport self-efficacy for the association of cognitive and somatic dimensions of competitive anxiety with sport performance were full.

Otten (2009) examined basketball free throw sport performance under pressure among undergraduate psychology students from California State

University, Northridge. Participants performed two sets of 15 free throws; after the first set of 15 free throws, participants in the control group were told they would be videotaped and that the tape would be shown to a sport psychology class. The video-tape was used as a "pressure" component of the experiment. The study found that participants who felt greater control and confidence were more likely to perform better under pressure situations. Levy, Nicholls, and Polman (2010) investigated the relationship between confidence and subjective performance in addition to exploring whether coping mediated this relationship. A sample of 414 athletes completed a measure of confidence before performance. Athletes also completed a measure of coping and subjective performance after competing. Correlational findings revealed that confidence was positively and significantly associated with subjective performance. Furthermore, mediational analysis found that coping partly mediated this relationship. In particular, task-oriented coping (i.e., mental imagery) and disengagement-oriented coping (i.e., resignation) had positive and negative mediational effects, respectively. Additionally, athletes who employed mental imagery generally coped more effectively than those using resignation. These findings imply mental imagery has the potential not only to improve confidence, but also subsequent performance, while resignation coping may have the opposite effect. Overall, these results lend some credence to Vealey's integrated sports confidence model.

Mahoney and Avener (1977) used a standard questionnaire and interview on thirteen male gymnasts during the final trials for the U.S. Olympic team. Particular attention was given to psychological factors and cognitive strategies in their training and competition. Using their final competitive grouping as the primary dependent variable, correlations were

performed to assess the relationship between these factors and superior athletic performance. Data from this exploratory study suggested that varying patterns of cognition may be strongly correlated with successful and superior gymnastic performance. Specifically, dream frequency, self-verbalizations, and certain forms of mental imagery seemed to differentiate the best gymnasts from those who failed to make the Olympic team. These two groups also appeared to show different anxiety patterns and different methods of coping with competitive stress with Olympics gymnastics qualifiers having higher self- confidence than non qualifiers. The results showed that self- confidence is a key factor in discriminating between successful and less successful athletes.

Gould, Weiss, and Weinberg (1981) asked 49 college wrestlers competing in the 1980 Big Ten championship tournament to complete a psychological skills inventory assessing psychological factors used in training and competition. The relationships between 22 cognitive variables and 2 performance measures (tournament placement and seasonal win–loss record) were examined. Findings revealed that self-confidence, maximum potential, and use of attentional focusing were the most important variables separating the groups. Specifically, successful wrestlers as compared to less successful wrestlers were more self-confident, indicated that they were closer to achieving their maximum wrestling potential, and more frequently focused their attention only on wrestling-related thoughts prior to competition. Similarly, data from 39 aspirants for three different 1977 Canadian Wrestling Teams were obtained using a version of previously "published" set of psychology-focused questions for gymnasts that was "adapted" for wrestling to examine psychological factors that separated team qualifiers from non-

qualifiers (Highlen, & Bennett, 1979). Seventeen factors were developed from the question set. Team qualifiers were compared to non-qualifiers. Results found self-confidence to be the factor that most effectively discriminated qualifiers from non-qualifiers in international competitions; the qualifiers of course possessed greater confidence and less self-doubt. Other major factors such as belief that the performer was reaching maximum potential, the use of distractions, hours spent training, more positive and fewer negative thoughts, deliberate blocking of anxiety-provoking thoughts, better concentration and attentional focus and less anxiety contributed to group discrimination. Imagery and factors affecting performance did not contribute to the function that distinguished the groups.

Cohn (1991) investigated the psychological characteristics of peak performance in golf. Collegiate golfers as well as touring and teaching professionals were interviewed regarding their peak performance experiences. Results showed that during peak performance, the golfers were highly focused and immersed in the task at hand, performed effortlessly and automatically, felt physically relaxed and mentally calm, and felt in control of themselves and their performance. In addition, these golfers had no fear of negative consequences, maintained high self-confidence, and experienced fun and enjoyment whilst experiencing peak performance. Beauchamp (1999) conducted in-depth interviews about successful putting with five U.S. PGA Tour golfers who had a combined total of 28 U.S. PGA Tour victories. The players indicated that the psychological skills of mental imagery, confidence, and task focus played an important role in their competitive putting success. Deeper investigation into the preshot routine of putting indicated that European female tour players had lower brain activity (particularly in the

parietal area) as measured by an electronencephalography (EEG) prior to putts that they reported being confident that the ball was going to go in the hole prior to striking the ball (Crews, Lutz, Nilsson, & Marriott, 1999).

Concept of Penalty Shootout

Soccer penalty shootout or kicks from the penalty mark (the official term for the ''penalty shootout''; FIFA, 2004) is one of the most highly pressurised situations in the sport. It is one of the most dramatic events in the knock-out phase of major international soccer tournaments. Since its first introduction on 27 June 1970 (Miller, 1998), the penalty kick has had an increasing influence in the outcome of high profile matches, particularly in the tie-break shootout scenario. For example, the finals of the most prestigious international tournaments (that is, World Cup, European Championships, and Copa America for national teams, and UEFA Champions League for club teams) have each been decided at least once by a penalty shootout. The outcome of these kicks is typically attributed to factors such as psychology (e.g. coping with stress), skill (e.g. kicking technique), physiology (e.g. overcoming the fatigue of 120 min play), and chance (e.g. in what direction the goalkeeper moves).

Penalty kicks are perceived to be important because their outcome determines if a team advances or is eliminated from a tournament, or alternatively, they determine a team's final rank (such as winning a tournament or being placed third). In major tournaments, the importance of each kick is further underscored by the widespread public interest and the vast numbers of people who watch the games live on television. Viewing numbers are particularly high for the World Cup, with one-fifth of the world's

population, or 1.1 billion people, reported to have seen the live coverage of the 2002 World Cup final on television (FIFA Marketing, & TV, 2002).

A kick from the penalty mark is a task that requires the player to take a free shot at goal from a distance of 11 metres. The goal area measures 24ft (7.32m) wide by 8ft (2.44m) high. Furthermore, a shot struck with typical speed ($20m.s^{-1}$) to distal areas of the goal should reach the goal in around 600ms and be physically impossible for the goalkeeper to save due to constraints on their reaction time (Frank, & Hanvey, 1997). Despite these positive statistics, a surprisingly large number of penalty kicks are not converted (~25%; McGarry, & Franks, 2000) and more are hit within two metres either side of the goalkeeper (~70%; Bar-Eli, & Friedman, 1988). A further study has shown that shots directed toward the upper third of the goal have a save rate of 0%, yet only 13% of shots are hit to these areas (Bar-Eli, & Azar, 2009). Similarly, Miller (1996) examined the penalty kicks taken during the 1994 World Cup finals and concluded that 59% of penalty kicks landed relatively centrally and resulted in 26% being saved by the goalkeeper. Conversely only 41% of shots landed 6ft (1.78m) inside each post and of these only one was saved (8%). This evidence emphasises the point that the skill level of the penalty taker to hit the optimal areas of the goal positively influences outcome success.

McGarry and Franks (2000) corroborated these findings when they assumed that kick ability is important for the outcome of a kick. Although there is some evidence to indicate that the skill of the goalkeeper is positively related to effective anticipation, and consequently penalty kick save performance (Savelsbergh, Williams, van de Kemp, & Ward, 2002), the question of how goal-scoring skill is related to penalty kick from performance

remains to be answered empirically. Conceptually, goal-scoring skill from the penalty mark is probably constituted by both tactical and technical components. Tactically, shooters can decide to shoot the ball left, right or towards the middle of the goal; shoot high or low; and pick a corner early or wait and react to the movements of the goalkeeper. Technically, it is about executing the tactical decision in the most efficient way, which often means producing a kick with optimal power and accuracy.

The Brain on Penalties

The prefrontal cortex (PFC) is the area of the brain that regulates decision making and makes a player aware of the consequences of his actions. It is extensively connected to other areas of the brain which regulate emotion and as such, it is very easy for a player to foresee the potential jubilation of a successful penalty kick or the utter despair of a miss (Korb, 2010). The area of the brain directly responsible for the actual kicking of the ball is the primary motor cortex (PMC) as it instructs the muscles on where and how to move. The PMC receives input from the supplementary motor area (SMA) which plans specific movements. The SMA, in turn, receives input from the PFC. In a nutshell, the PFC decides what to do, and then delegates the responsibility of doing that action to the SMA and the PMC. The SMA, the PMC and all the unconscious motor areas of the brain are perfectly able to carry out the assigned duty, as kicking the ball into the corner of the goal is a skill that footballers have practiced countless times in the past. The only thing the PFC has to do is decide where to kick the ball and how hard. No further intervention from the PFC is necessary. However, as mentioned earlier, the PFC can see the consequences of making a bad decision in the heat of the moment. This can lead to second guessing, which ultimately leaves the SMA

and the PMC without clear instructions on what to. It is thus well documented based on this that great players are able to silence their PFCs under pressure, and just live in the moment (Korb, 2010).

Explaining the Penalty Kick from an Information-Based Approach

From an ecological dynamics perspective, decision-making behaviour in the penalty kick emerges from the dynamical interactions of performer-performer (environment) towards specific goals (i.e. to score or to save a goal), influenced by task constraints over time (e.g., players' strategies, task inherent stress, prior experiences) (Lopes, Araújo, Peres, Davids, & Barreiros, 2008). When a player continuously interacts with a structured environment (e.g., teammates, opponents, spectators, light or wind conditions, surface type), functional patterns of behaviour emerge. The theory of direct perception promoted by Gibson (1979), consider the individual-environment relationship as being grounded on contextual information that affords what is possible to do at a certain moment. In this view, relevant information is the cornerstone of penalty kicks interpersonal dynamics, because it expresses players' intentions. For example, if a penalty taker aims to direct the ball to a certain place, her/his kinematics must reflect the genuine action (i.e., the one that fits their intention) about the direction of the ball (Runeson, & Frykholm, 1983). Nevertheless, although the information that allows goalkeepers to anticipate the direction of the ball should be present on penalty takers' movement, it is common to observe deceived goalkeepers (i.e., goalkeepers that dive to the opposite side of ball direction). The success of penalty taker's deceptive action is more related with incapacity of goalkeepers to detect and use relevant information than with an effective ability of the first to dissimulate that information. The perception of information from performance environment

does not automatically entail a use of that information for action guidance (Huys, Cañal-Bruland, Hagemann, Beek, Smeeton, & Williams, 2009).

Format of a Soccer Penalty Shootout

The rules of soccer state that when a winner has to be declared and two teams are tired after extra time in a tournament, the "penalty shootout" or (kick from the penalty mark) is used to decide the winner (FIFA, 2017). Five players from each team perform one kick each. If the score is still equal after 10 kicks, one player from each team takes a kick (''sudden death'') until one team has scored a goal more than the other from the same number of kicks. The penalty shootout has been used to decide almost one fourth of games in the knock out stages of major tournaments (Jordet, Hartman, Visscher, & Lemmink, 2007), including several finals (e.g. the 2006 World Cup final). Thus, the event has become a normal feature of top level international football.

Penalty Kicking Strategies

Penalty kickers employ different aiming strategies during penalty shootouts. One of the first examinations of penalty kicking strategies was conducted by Kuhn (1988), who analysed 66 professional kicks from top-level German football. Kuhn observed two distinct kicking strategies, which he termed 'keeper-dependent (KD) and 'keeper-independent (KI). The KD strategy involves the kicker focusing on the goalkeeper and waiting for his anticipatory movements before shooting to the opposite side from which he dives. The KI strategy involves the kicker totally ignoring the goalkeeper, and instead preferring to focus where he is aiming. Vickers (2007) indicated that KI strategy provides the best approximation of coordinated visuo-motor control and aiming. However, it may be difficult for penalty kickers to completely ignore the goalkeeper. That is, previous research has suggested

that penalty kickers can be influenced unwillingly by the actions (and possibly mere presence) of a goalkeeper with performance suffering as consequence. Masters, van de Kamp and Jackson (2007) demonstrated that if goalkeepers simply stand marginally off-center, even if the penalty kicker is not consciously aware of this, there may be an influence on the kicker's shot direction. Furthermore, van de Kamp and Masters (2008) demonstrated that a goalkeeper's posture influences the perception of size resulting in subtle influences on the location to which the penalty kicker shoots the ball. Finally, Wood and Wilson (2010b) showed that if a goalkeeper waves his arms, this attracts visual attention of the penalty kicker, leading to sub-optimal gaze patterns and impaired shot accuracy.

Similarly, Kuhn (1988) suggested that approximately 70% of all shots utilise the KD strategy. Probably the main reason for using the KD strategy is that by waiting until the goalkeeper dives in one direction before shooting to the other, the degree of accuracy needed is less (i.e., it is no longer necessary to hit the optimal scoring zone just inside the post). However, this strategy relies on the 'keeper making these anticipatory movements early enough to give the penalty taker time to extract the necessary information required to formulate an accurate response and adjust his/her kicking action accordingly. van der Kamp (2006) examined the temporal implications of shooting utilising a KD strategy and found that penalty takers found it difficult to modify their kicking action if a 'keeper waited until at least 400ms prior to ball contact.

It is evident therefore that the KD strategy relies on aspects of the task that are not within the control of the taker, and may be manipulated by the 'keeper to create an advantage. A KD strategy may therefore be counterproductive from a psychological preparation viewpoint, where a focus

on 'controlling the controllables' is recommended (Hardy, Jones, & Gould, 1996). Rather than wait to see what the 'keeper is going to do, the KI strategy would appear to maintain control by focusing on where the ball should be placed to beat the goalkeeper.

Dohmen (2008) suggested that an accurately hit shot, hit with average speed, would leave insufficient time for a goalkeeper to react and make a save. This finding would suggest that a KI strategy might be superior, if a penalty taker is sufficiently skilled to achieve this level of accuracy. Additionally, as research suggests that goalkeepers do not use the kicker's line of gaze to anticipate shot direction (Bakker, Oudejans, Binsch, & van der Kamp, 2006), employing a target-focused strategy should not prime the goalkeeper as to the ensuing kick direction. To maximise the chance of hitting this optimal scoring area, the perception-action research suggests that performers should fixate on the target location prior to shooting, in order to guide aiming and execution. In short, performers have to look where they intend to shoot (Bakker, Oudejans, Binsch, & van der Kamp, 2006).

Kuhn's (1988) categorisation of these two kicking strategies was formulated via video analysis of games, and as no indices of gaze were obtained, the aiming strategies had to be estimated. Despite this limitation, studies examining penalty kicking techniques have used Kuhn's definitions to test the potential benefits of each strategy (Morya, Ranvaud, & Pinheiro, 2003; van der Kamp, 2006). For example, Bakker, Oudejans, Binsch and van der Kamp (2006) examined the gaze behaviours of penalty takers when they asked participants to kick a sponge ball to a projected goal under time constraints. While this study did not seek to examine Kuhn's categories, it was found that

participants tended to look where they aimed with centrally focused fixations inducing more central ball placements.

Theories of Sport Performance under Pressure

Several theories have been postulated to explain how pressure creates anxiety in high criticality situations which results in under performance or performance failure. These theories (explicit monitoring theory, distraction theory and attentional control theory) explain how pressure creates anxiety in athletes leading to loss of attention and poor performance (Wang, Merchant, & Morris, 2004; Beilock, & Carr, 2001; Baumeister, 1984).

Explicit monitoring and distraction theories

One of the factors that may affect the time to make or alter motor decisions is high pressure. In sport tournaments with high degree of perceived importance, it is common that the desire to perform well as possible creates pressure (Hardy, Jones, & Gould, 1996). It is commonly assumed that this pressure to perform at an optimal level provokes an increase in situational stress and state anxiety which leads to decrements in performance (Beilock, & Carr, 2001; Lewis, & Linda, 1997; Masters, 1992; Wang, Merchant, & Morris, 2004). High level of anxiety is considered an aversive emotional state that occurs in threatening circumstances. Infact, state anxiety is determined interactively by trait anxiety and situational stress. Given the importance of scoring on each of the shot in the penalty shootout for the outcome of the entire game, the pressure on the players to perform well will arguably be very high.

Two theories that have been proposed to explain performance failure under pressure are explicit monitoring theory and distraction theory (Beilock, & Carr, 2001; Wine, 1971). Beilock and Carr (2001) proposed explicit

monitoring theory to explain performance failure under pressure. According to the explicit monitoring theory, a rise in anxiety due to pressure may increase attention to the skill processes of performing correctly. Athletes who focus on the explicit process of a skill are more likely to choke, not succeed, under pressure (Beilock & Carr, 2001). Baumeister (1984) proposed that pressure causes increased attention to skill-focused processes, which disrupts task performance. Focusing on the specifics of a task will result in a breakdown of automated movements, which then will affect the athlete's ability to perform (Weinberg, & Gould, 2011). This will result in choking under pressure. On the other hand, distraction theory posits that distraction occurs due to the increase of pressure (Wine, 1971). The influence of pressure on the performer will then cause a decrease in performance, due to this distraction. It is worth noting both theories, since they give two different perspectives of why pressure can influence performance, and why choking might occur. DeCaro, Thomas, Albert and Beilock (2011) used both explicit monitoring and distraction theories to explain poor performance under high-pressure situations. The authors proposed that pressure situations may lead to either distraction or explicit monitoring. DeCaro et al. investigated working memory and attentional control, which are proposed as skills that can be influenced by high-pressure situations. The study analyzed categorization tasks and reaction times within different pressure conditions. The authors concluded that pressure can influence performance, and that both distraction and explicit monitoring theories may explain choking under pressure.

Attentional control theory (ACT)

Researchers have proposed that the unfavourable effects of anxiety result from narrowed processing capabilities after excessive arousal

(MacLeod, 1996; Wilson, Vine, & Wood, 2009). As such, one reason why anxiety is more harmful when a task is difficult is because complex tasks require more information intake, which is limited by anxiety (MacLeod, 1996). Attentional control theory (ACT) proposed by Eysenck, Derakshan, Santos, and Calvo (2007), states that anxiety decreases the influence of one's goal-directed attention system; instead, the focus under stress becomes the step-by-step process of the task. Similar to Easterbrook (1959), this suggests that there might be a relationship between anxiety and performance; increases in anxiety may result in diminished performance, due to a shift in attention. Thus, it seems that staying focused and appropriately directing attention in sport may, ultimately, impact the outcome of the game.

Research Perspectives on Performance Success and Failure in Penalty Kicks and other Sport

Anxiety is the most significant contributing factor to performance failure in football penalty shootouts (Jordet, Hartman, Visscher, & Lemmink, 2007). Indeed, the penalty is one of very few occasions in this predominantly fast-moving, team sport when players are under individual scrutiny and have sufficient time to think about the consequences of failure (Jordet, & Elferink-Gemser, 2012). Furthermore, unlike most other skills that are susceptible to choking effects (e.g., golf putting), the opposing team's goalkeeper increases uncertainty and has a direct influence on performance success.

A penalty kick is fundamentally an aiming skill requiring the shooter to shoot the ball past the goalkeeper, who stands centrally striving to prevent the player from scoring. It stands to reason that a ball placed further from the goalkeeper's reach stands a better chance of beating the goalkeeper, resulting

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in a successful shot. It is a well-known premise among coaches that the optimal place to kick a penalty is on the ground, as close as possible to the goalpost. This intuitive assumption is believed to be true because the reaction time that the goalkeeper has is very short, and therefore it should be almost impossible for him or her to save a well-placed ball directed to that location (Dohmen, 2008).

Bar-Eli and Azar (2009) analysed 286 penalty kicks in an attempt to identify the optimal area of the goal that offers the highest probability of scoring. The analysis revealed that no kick towards the upper third of the goal was stopped, while 12.6% of the kicks to the middle third and 19.8% to the lower third were stopped by the goalkeeper. These results suggest that the common practice of directing penalty kicks to the lower part of the goal (56.6% of the kicks reached this zone) is the least successful kicking strategy in penalty kicks. In contrast, the least used strategy of targeting the ball to the upper third of the goal produced more successful shots. They concluded that penalty takers should aim to the upper area of the goal, and in particular to the top two corners of the goal.

Interestingly, despite the relative simplicity of this seemingly rudimentary aiming task, a large proportion of penalty kicks are missed. A study that examined the penalty kicks in the 1986 FIFA World Cup observed that about 70% of the 42 kicks taken landed two metres either side of the centralised goalkeeper (Bar-Eli, & Friedman, 1988). In other words, most of the penalty kicks did not land in the presumed optimal place. Miller (1996) also examined the penalty kicks taken during the 1994 World Cup finals and concluded that 59% of penalty kicks landed relatively centrally (within 6ft

either side of the goalkeeper) and only 41% landing to an optimal zone defined as within 6ft (1.78m) inside each post.

Indeed, despite the relatively large target area, and the fact that players frequently hit smaller targets over much longer distances (e.g. passes to players within game situations) a surprisingly large number of penalty kicks are missed. Many studies have attempted to establish the success rate of penalty takers in major competitions worldwide and there is a general consensus that this lies between 75% and 86% for top male professionals (McGarry, & Franks, 2000). Therefore despite the relative simplicity of this seemingly rudimentary aiming task, a large proportion of penalty kicks are missed. There are a few notable examples of performance failure from the world of football that may further emphasise this point. For example, three previous European Champions League finals were decided by penalty shootouts (that is, FC Bayern München-Valencia CF in 2001, AC Milan–Juventus FC in 2003, and Liverpool FC–AC Milan in 2005), with a relatively high percentage of kicks being missed: 4 out of 11 (36.36%) in 2001, 5 out of 10 (50%) in 2003, and 5 out of 10 (50%) in 2005, which means that a total of 14 out of 31 shots (45.16%) were missed in those three top games, including penalties shot during the games themselves (McGarry, & Franks). Such performance failure has caught the attention of sport psychologists, who have explored many variables which may affect performance in this task.

A number of observational studies using video analysis of elite football penalty takers, qualitative studies that have interviewed elite penalty takers and lab-based experimental studies have all shown that there are certain behaviours and psychological variables that are linked to, and predict, performance success in football penalty shootouts. McGarry and Franks

(2000) performed a computerized probability simulation of how the order of the shooters would affect the outcome. The empirical basis for their simulation was data on kicks from the penalty mark in the World Cup from 1982 through 1998 and the European Championship in 1996. The simulation was based on a few assumptions. First, it was argued that later kicks are more important than early kicks. If each kick were to be performed independently of the others, all kicks would be of equal importance. However, in reality, each kick is performed in awareness of both the outcome of the previous kicks and the current standing between the teams. Thus, the researchers expected anxiety to increase with greater kick importance, thereby supposing that fewer goals would be scored from more important or later kicks. Their data partially supported this hypothesis, with scoring percentages of 77.8%, 80.6%, 86.1%, 65.7%, 72.0%, and 50.0% for kicks #1 through #6, respectively. As the authors point out, however, these data may be confounded by the selected line-up order, with coaches picking the best player to take the first kick. Unfortunately, the European Championships before 1996, as well as other major international tournaments that could have provided a stronger statistical foundation and additional empirical support for these findings, were not examined in this study.

Jordet, Hartman, Visscher, and Lemmink (2007) explored whether poor performance in penalty shootouts was attributable to stress, skill level, physical fatigue or chance. Data were collected from 41 penalty shootouts comprising of 409 penalty kicks from major international competitions. Results indicated that the importance of the kicks (indicative of stress) was negatively related to the outcome, whereas skill and fatigue had little or no relation to outcome. Jordet et al. have since gone on to explore exactly how

this increase in anxiety affects the behaviours of penalty takers and what affect these behaviours have on subsequent shooting performance.

Jordet, Hartman, Visscher, and Lemmink (2007) examined almost 400 kicks from penalty shootouts held during major tournaments. They found that players score on fewer than 60% of their attempts when a miss will instantly result in a loss for the team compared to 92% of their attempts when a goal will win the game. Jordet et al. suggested that penalty takers' perceptions of control may explain why some 'choke' under the pressure of the shootout and some players succeed. Players' perceptions of control are influenced by both beliefs about the role of skill or luck (contingency), and their beliefs about their penalty taking ability (competence). Players with low perceived competence and contingency (who believe the outcome is dependent on luck or the goalkeeper's actions rather than skill) experienced more cognitive anxiety symptoms than those who perceived their competence and contingency level as high (Jordet, Elferink-Gemser, Lemmink, & Visscher, 2006).

A study by Jordet and Hartman (2008) examined soccer penalty shootouts under pressure. Shots whereby a miss would result in a team's loss were considered as high-pressure situations. Video analyses of penalty shootouts from the World Cup, European Championship and UEFA Champions League during 1997-2006 were examined for the purposes of the study. Shot valences were assessed from penalty shots. Positive shots were shots that (if made) would result in a win, while negative shots were those (that if missed) would lead to a loss. Results found that shooters were worse in negative-shot situations, implying that those in high-pressure situations performed worse than those in low-pressure situations.

A study that examined soccer penalty shootouts under pressure by Jordet and Hartman (2008), as stated earlier, found that players took more time before shots that might result in a loss. The more time spent prior to taking the shot, it may be argued, the less automatic it is. Jordet and Hartman suggested that spending more time prior to executing a skill may lead to over-thinking and focusing on the task rather than just performing the task. Thus, for a more difficult (Jackson, & Baker, 2001) or pressure-filled (Jordet, & Hartman, 2008) task, length of preparation time may increase and consistency may decrease, both leading to performance problems.

Jordet, Hartman and Sigmundstad (2009) investigated how anxiety disrupted the timing of the penalty and also negatively influenced players' non-verbal behaviour. Video analysis of 366 penalty kicks explored the effects of different time periods typical in penalty shooting (walking to the penalty spot, ball placement, back-up, waiting for the referee's whistle, responding to the whistle, and run-up duration) on subsequent performance. Results indicated that longer times to respond to the referee's whistle were related to more goals and shorter times were related to fewer goals. Specifically, players who took less than one second to place the ball on the penalty spot score on about 58% of their penalties whereas those who took longer score on about 80% of their penalties. Similarly, taking about a second or more to respond to the referee's whistle to initiate the shot is associated with a higher probability of scoring than rushing to take the shot. The authors concluded that extreme levels of pressure cause performers to exhibit escapist thoughts where they strive to get the situation 'over and done with' as quickly as possible. Interestingly such behaviour can make goalkeepers form negative impressions of the penalty taker and in turn, increase their confidence in saving the

subsequent shot (Furley, Dicks, Stendtke, & Memmert, 2012). Therefore, players need to take their time as they prepare for the shot, rather than rushing to get the penalty over and done with.

Jordet (2009a) examined video analysis of all shots ever taken in penalty shootouts in the World cup, European championship and Champions league between 1976 and 2006 to determine the relationship between player status and penalty kick performance. Results showed that the most esteemed players (i.e. those who took a shot after they had received one or more prestigious international award such as 'FIFA Player of the Year' or 'Ballon d'Or) performed worse than players at the same level of performance, but with no awards. In another study with the same data base, players from the national teams with the highest status performed worse than players from the teams with lower status (Jordet, 2009b). This suggests that having a high status or position in one's sport which will lead to high expectations to perform can sometimes turn around to be a liability in extreme pressure situations.

Moll, Jordet and Pepping (2012) investigated whether post-goal celebrative behaviours influence team success in a penalty shootout. Interestingly, 82% of those players who substantially celebrated their successful penalty ended up on the winning team. The authors concluded that such positive displays of emotion are contagious and are likely to 'infect' a positive attitude on team-mates taking subsequent kicks. Conversely, such behaviours also seem to have a negative effect on the opposition. Specifically, when players displayed substantial celebratory behaviours, the opposing team was more than twice as likely to miss their next shot.

McGarry and Franks (2000) employed computer simulation, probability theory and mathematical modelling to explore the effectiveness of

different penalty shoot-out strategies. Their analyses suggests that there is an advantage in placing the team's fifth best penalty taker on the first kick, the fourth best on the second kick, the third best on the third, the second best on the fourth, and the team's best penalty taker on the fifth kick. If the competition goes to sudden death, the sixth best penalty taker should take the sixth kick and so on. These results highlight the increasing pressure as the competition progresses and may also highlight the 'best player should go first' fallacy. The idea of 'getting off to a good start' by putting the best penalty taker first appears wrong as there is least pressure on this kick. The researchers also state that the ability of the team's goalkeepers to save penalties should also be known and, if possible, substitutions should be made to place the best penalty stopper goalkeeper on the pitch at the end of the game. The researchers also recommend the use of substitutions to put better penalty takers on pitch if possible.

Jordet, Elferink-Gemser, Lemmink, and Visscher (2006) interviewed ten international football players regarding their perceptions of contingency (the belief that the outcome was attributable to luck or skill) competence (their perceived ability at penalty taking) and control (their perceived ability to cope with the anxiety experienced) whilst watching video footage of an international penalty shootout in which they had previously competed. Results indicated that participants with low perceived competence and contingency (who attributed outcome to be determined by luck rather than skill) before the penalty shootout experienced significantly more cognitive anxiety symptoms than those who perceived their competence and contingency to be high.

More recently Jordet and Elferink-Gemser (2012) interviewed eight elite professional football players who had taken penalty kicks in a UEFA

European Championship penalty shootout. Players were interviewed regarding their experiences of stress, coping and emotions during each of four temporal phases of the penalty shootout (the break after extra-time prior to the shootout beginning; standing in the centre circle during the shootout waiting for their turn to shoot; the walk to the penalty mark; and the shot itself). Results indicated the dynamic nature of stress, coping and emotions during each of these phases. The most stressful phases reported were the break after extra time that preceded the start of the shootout and the time interval between the shootout beginning and the player's turn to shoot. During these periods players experienced higher levels of anxiety due to (a) contingency beliefs about penalty shootouts being a lottery, (b) lack of control regarding penalty taker selection and shooting order, and (c) lack of control experienced by having to passively wait and watch teammates perform. During the walk to the penalty spot to take their kick, players reported feelings of loneliness and concentration disruption. Finally at the penalty mark players reported relatively few stressors in comparison to earlier phases of the shootout, but common stressors reported were the fear of failure and worry about the goalkeeper's performance or behaviour.

In a study by Wilson, Wood and Vine (2009), players took kicks under high and low threat conditions in an effort to explore how anxiety would alter their aiming behaviour. When anxious, players were quicker to focus on the centralised goalkeeper and spent significantly longer looking in this location compared to the low threat condition. Furthermore, this disruption is increased if the goalkeeper actively attempts to attract the kicker's attention by using distracting behaviours (waving the arms; Wood, & Wilson, 2010b). This centralisation of aiming behaviour caused a corresponding tendency to shoot

centrally at the goalkeeper - an affect that resonates with the findings discussed earlier from penalty shootouts (Bar-Eli, & Azar, 2009; Miller, 1996). The authors summarised that if players hit optimal areas of the goal, their chances of success increase dramatically and that in order to shoot with such accuracy they need to aim effectively. Anxiety has a negative impact on the aiming behaviour of the player creating an attentional bias towards looking at the goalkeeper. Therefore there may be utility in training players to optimise their aiming behaviour to perform well under pressure.

Two recent studies by Wood and Wilson, (2011, 2012) taught players to focus on optimal target areas of the goal (top-corners) for a sufficient amount of time in order to process the aiming information needed for accurate shooting (Quiet-eye training; Vickers, 2007). Compared to a practice group who just received uninstructed practice time, the quiet-eye trained players hit more accurate shots during training and maintained this performance advantage under the pressure of a 'live' penalty shootout (Wood, & Wilson, 2011). Wood and Wilson (2012) also explored the impact this training regime had on the control beliefs of the penalty takers. Quiet eye trained participants significantly reduced their perceptions of outcome uncertainty (contingency) and increased their perceptions of shooting ability (competence) and ability to score and cope with the pressure (control), compared to players who received uninstructed practice. Furthermore, there was an overall and significant relationship between high perceptions of control beliefs and aiming behaviour. Specifically, those participants with high control beliefs were more likely to aim optimally and further from the goalkeeper, whereas participants with low control beliefs experienced suboptimal and more centralized aiming behavior.

Morya, Ranvaud, and Pinheirom (2003) conducted a laboratory experiment to look at reaction times so that they could assess whether or not penalty takers should ignore the actions of the goalkeeper or take them into account. They found that penalty takers reached perfect performance only if the goalkeeper moved at least 400ms before the ball was kicked. Goalkeepers are therefore advised not to move this amount of time before the ball is struck. van der Kamp (2006) conducted an experiment in which 'intermediate level' players were asked to do one of two things; either to take a penalty ignoring the goalkeeper completely, or to take account of goalkeeper during the run up to the kick (that is, to anticipate what the goalkeeper will do and respond accordingly). The results showed that the success of players who tried to anticipate the goalkeeper's actions was weaker than in the other situation, which the researcher puts down to the reduction in time to shape the attempt. Although the researcher does not state it, another explanation might be the increased complexity of the task in stressful conditions.

Wilson, Vine and Wood (2009) conducted a study to examine the effects of ACT on anxiety during basketball free throw performance. The "quiet eye" period, or the final fixation point before movement of the task, was proposed by Vickers (1996) and implemented by the authors to explain where attention was set during performance. Vickers (2007) proposed four characteristics of a quiet eye: gaze location, gaze onset, gaze offset and gaze duration. Wilson et al. used an eye tracker to determine the exact point of attention for a sample of free throw shooters selected from college basketball teams. Participants wore the eye tracker device while shooting free throws. The experimental group was told that their performance would be compared to those of their teammates, as a manipulation of pressure. Participants in the

control group were simply told to do their best. Results found that experimental group participants shot worse and had a reduction in the quiet eye period. This finding suggests that attention during performance can easily be influenced by anxiety, which also supports the predictions of ACT.

In order to evaluate the impact of pressure on performance, Hickman and Metz (2015) used PGA TOUR ShotLink Data from 2004-2014 that records the exact location of players' golf balls before and after each shot, down to the inch. The ShotLink Data, combined with tournament earnings data, allowed the researchers to create a unique dataset of putting on the last hole of a tournament which contains information on the shot, the player taking it, and the tournament in which it is taken. The results of their analysis provide evidence that pressure can indeed lead to significantly reduced performance in a real-world setting. That is, as the amount of money riding on a shot increase, the likelihood that shot is made is significantly reduced. They also found that less experienced players tend to be more affected by pressure than their more experienced counterparts, and that the difficulty of the shot (based on distance) factors into the magnitude of the impact caused by high stakes. Genakos and Pagliero (2012) examined the impact of interim rank in a weightlifting competition on the probability of a successful lift. Controlling for weight (the difficulty of the task), they find that higher ranked competitors, those arguably under more psychological pressure than lower ranked competitors, are less likely to complete a successful lift. Their study is similar in thought to this study, but instead of using monetary reward as a measure of pressure, they used rank in a tournament. Williams, Singer and Frehlich (2002) in a study examining billiards performance, also found that performers took longer and

displayed longer final fixations for more difficult, as opposed to easier billiards shots.

Conceptual Framework

Age, experience, position, anxiety and self-confidence provide a general framework for examining the success and failure in penalty kicks and suggest a possible relationship among these variables. The figure below shows that age, position and experience influences penalty kicks outcome. Again, age, position and experience affects anxiety which influences penalty kicks outcome. Similarly, age, position and experience affects self-confidence which influences penalty kicks outcome. Also, self-confidence and anxiety independently influences penalty kicks outcome. Furthermore, self-confidence affects anxiety which influences penalty kicks outcome. In addition, anxiety affects self-confidence which influences penalty kicks outcome. Finally, age, position and experience affect self-confidence which goes on to affect anxiety and the resultant kicks and vice versa. All these may be due to the cognitive interpretations that a player gives to the penalty kick execution which can have either a positive or negative effect on the outcome (success or failure) of the kick (Jordet, Hartman, Visscher, & Lemmink, 2007). Given the importance of scoring on each of the shot in the penalty shootout for the outcome of the entire game, the pressure on the players to perform well will arguably be very high. High level of anxiety is considered an aversive emotional state that occurs in threatening circumstances such as the penalty kick (Beilock, & Carr, 2001; Wine, 1971). A rise in anxiety due to pressure may increase attention to the skill processes of performing correctly. Penalty takers who focus on the explicit process of a skill are more likely to choke, not succeed, under pressure (Beilock, & Carr, 2001). Similarly, increase in pressure due to distraction will

have an influence on the player which will then cause a decrease in performance, due to this distraction (Wine, 1971).

Several investigations have been conducted to test the proposed relationships between anxiety and performance, self-confidence and performance, and between age, experience, position and performance. For example, Burton (1988) found a negative linear trend between cognitive anxiety and swimming performance and a positive linear trend between self-confidence and performance. In the two samples investigated by Burton, cognitive anxiety accounted for up to 46% of swimming performance variance and self-confidence accounted for up to 21%. Gould, Petlichkoff and Weinberg (1984) also found a significant negative linear relationship between cognitive anxiety and performance, but no significant trend between self-confidence and performance (See figure 1).

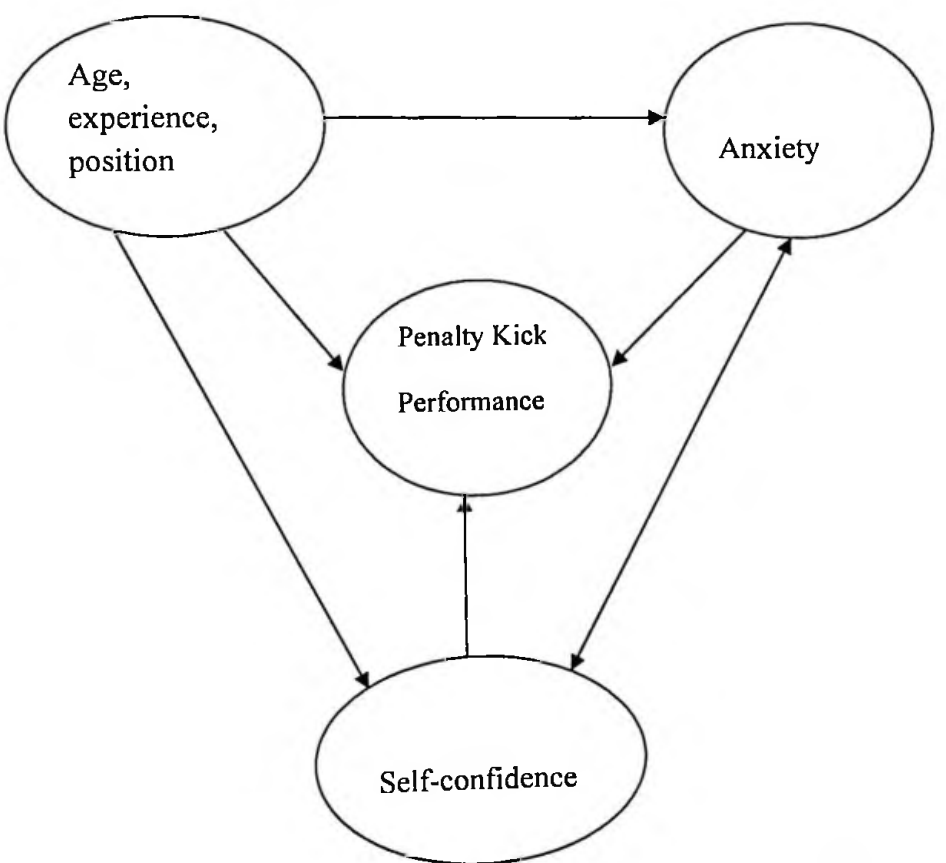

Figure 1 - Conceptual framework of the influence of demographic factors, anxiety and self-confidence on penalty kick performance

Conversely, Martin and Gill (1991) found self-confidence to be significantly and positively related to distance running performance, but found no significant relationship between cognitive anxiety and running performance. Similarly, in their study of pistol shooters, Gould, Petlichkoff, Simons and Vevera (1987) found no significant relationship between cognitive anxiety and performance. However, in that study, a significant negative relationship between self-confidence and performance was revealed.

Otten (2009) examined basketball free throw sport performance under pressure among undergraduate psychology students from California State University, Northridge. The results of the study showed that participants who felt greater control and confidence were more likely to perform better under pressure situations. Mahoney and Avener (1977) used a standard questionnaire and interview on thirteen male gymnasts during the final trials for the U.S. Olympic team. The results showed that self- confidence is a key factor in discriminating between successful and less successful athletes. Gould, Weiss, and Weinberg (1981) asked 49 college wrestlers competing in the 1980 Big Ten championship tournament to complete a psychological skills inventory assessing psychological factors used in training and competition. Findings revealed that self-confidence, maximum potential, and use of attentional focusing were the most important variables separating the groups. Specifically, successful wrestlers as compared to less successful wrestlers were more self-confident, indicated that they were closer to achieving their maximum wrestling potential, and more frequently focused their attention only on wrestling-related thoughts prior to competition.

Jordet, Hartman, Visscher, and Lemmink (2007) explored whether poor performance in penalty shootouts was attributable to stress, skill level, physical fatigue or chance. Data were collected from 41 penalty shootouts comprising of 409 penalty kicks from major international competitions. Results indicated that the importance of the kicks (indicative of stress) was negatively related to the outcome, whereas skill and fatigue had little or no relation to outcome. Wilson, Wood and Vine (2009) explored how anxiety would alter the aiming behavior of players who took kicks under high and low threat conditions. Results indicated that when anxious, players were quicker to focus on the centralised goalkeeper and spent significantly longer looking in this location compared to the low threat condition. Hickman and Metz (2015) used PGA TOUR ShotLink Data from 2004-2014 that records the exact location of players' golf balls before and after each shot, down to the inch to evaluate the impact of pressure on performance. The authors found that less experienced players tend to be more affected by pressure (anxiety) than their more experienced counterparts, and that the difficulty of the shot (based on distance) factors into the magnitude of the impact caused by high stakes.

Researchers have also examined the effects of age on anxiety. George (1994) found that college athletes experienced significantly less somatic anxiety and more self-efficacy than did high school athletes, although differences in performance quality were not significant. Perhaps, then, college athletes benefited from having more experience within their given sport than high school athletes, or increased in confidence as a result of their experience. Modroño and Guillén (2012) similarly found in a sample of windsurfers that age was inversely related to cognitive anxiety, that is, older athletes experienced less cognitive anxiety and high self-confidence than younger

athletes. The researchers proposed that this effect likely came as a result of differences in the level of experience between older and younger athletes. Golfers tend to peak later than athletes in most aerobically based sports (Schulz, & Curnow, 1988). Berry and Larkey (1999) reported that most players peak between 30 and 35 years of age in their ability to score in majors such as British Open and U.S. Open. These studies provide evidence of the ability of players to continue playing high level golf despite increasing age, giving further impetus to explore psychological skills and their influence on golf performance. These results indicate that age and experience are related to both cognitive and somatic anxiety and self-confidence.

Dohmen (2008) indicates that performance improves with experience, but comments that this results may be due to selection bias. Players are chosen to take penalty kicks and players who often miss are frequently removed from taking future penalty kicks. Cao, Price and Stone (2011) found that experience has no effect on free throw performance in pressure situations. Hickman and Metz (2015) showed that pressure affects less experienced players more than those that have earned more money throughout their careers, and that the impact of pressure on performance varies based on how well the player has been putting in the tournament up to that point.

Performance executed by different players in different position is also influenced by psychological factors. According to the Eysenck's study (1982), the playing position in the team and the level of sports should be considered in research study to identify the factors influence on sports performance. Sanjay (2017) compared competition anxiety between offensive and defensive positions of handball players. The result revealed that anxiety level was higher for defensive position than that of offensive position for handball players.

The findings of the studies above clearly give credence that there is a relationship between psychological factors (anxiety, self-confidence) and demographic factors (age, experience, position) on sport performance in general and penalty kick success or failure in particular.

Summary

When the result of an activity matters most, psychological pressure may adversely affect performance. Prior research has indicated that anxiety, self-confidence, age, experience and position can have either positive or negative effects on competitive performance. The psychological demands experienced by elite players in shootout scenarios highlight the anxiety that these players experience during penalty kicks. Research has shown that the processes through which the increased kick importance negatively affects the outcome are related to negative emotional processes such as anxiety caused by the added stress.

Confidence has been consistently associated with positive affect whereas a lack of confidence has been associated with anxiety, depression, and dissatisfaction. Elite athletes have revealed that confidence affects their performance through their thoughts, behaviours, and feelings. Research has shown a direct correlation with confidence to success with athletes through the following: successful athletes exhibit higher self-confidence than unsuccessful athletes, athletes who have higher self-confidence during competitions are more likely to be successful, confident athletes believe in their ability to perform well, and personal self-confidence strongly contributes to success or failure. Thus, lacking self-confidence in sports can be detrimental to an athlete's performance.

Executing the penalty kick increases the amount of anxiety in a player due to the influence of the final score on the outcome of the game. Theories of sport performance under pressure suggests that an increase in anxiety due to pressure will cause an increase in attention to skill processes and the goalkeeper resulting in shots that are hit significantly closer to the goalkeeper and therefore more 'saveable'.

CHAPTER THREE

RESEARCH METHODS

The purpose of this study was to investigate the influence of demographic factors (age, experience, position), anxiety and self-confidence on penalty kick performance among Ebusua Dwarfs players in the Ghana Premier League. This chapter presents the research design, population, sample and sampling procedure, research instrument, data collection and data analysis procedures that were used in the study.

Research Design

A quantitative descriptive survey design was employed in this study. This design was used to obtain information to represent a picture or snapshot of the current status of penalty kick phenomena among Ebusua Dwarfs players in the Ghanaian Premier League (Ary, Jacobs, & Razavieh, 1990; Best, & Kahn, 1993; Denscombe, 2003; Ogah, 2013).

Population

The population for the study consisted of 30 soccer players of Ebusua Dwarfs in the 2016 Ghana Premier League. These participants were selected for the study because of the great deal of pressure under which they perform which either facilitates success or debilitate failure during penalty kick performance (Jones, & Hardy, 1990; Jones & Hanton, 2001; Manzo, Mondin, Clark, & Schneider, 2005; Martens, Vealey, & Burton, 1990; Vealey, & Chase, 2008).

Sampling Procedure

The sample for this study consisted of all the 30 registered players of Ebusua Dwarfs, a Cape Coast based professional football club which played in the 2016/2017 Ghana Premier League. This census sampling technique was

chosen because the number was small (Ogah, 2013; Descombe, 2003; Best, & Kahn, 1993). Additionally, it was convenient and easy to get access to the players because the researcher has ever coached the club during the 2015/2016 Ghana Premier League soccer season. Furthermore, the researcher's involvement and experience with the club and players during penalty kicks informed his decision to use them for the study. There were five goalkeepers, nine defenders, 11 midfielders and five forwards. They had all completed senior high school and could therefore read, write and understand.

Data Collection Instruments

The study adopted the Revised Competitive State Anxiety Inventory-2R (CSAI-2R) (Cox, Martens, & Russell, 2003) and the State / Trait Sport Confidence Inventory (S/TSCI) (Vealey, 1986) to examine the influence of anxiety and self-confidence on performance. In addition, I designed a demographic inventory to collect data on participant's age (how old they are), experience (number of years that they have played soccer) and position (where they play on the field of play). This inventory asked participants to write their age, experience and positions in the spaces provided against the demographic variables.

The revised competitive state anxiety inventory-2 (CSAI-2R)

The Revised Competitive State Anxiety Inventory-2 (CSAI-2R) (Cox, Martens, & Russell, 2003) was adopted to examine the multidimensional pre-competitive state anxiety of the soccer players. Three subscales were included in the questionnaire; somatic anxiety, cognitive anxiety and self-confidence. The CSAI-2R comprised 17 items, with 7 items in somatic anxiety subscale and 5 items in each of the subscales of cognitive anxiety and self-confidence. Examples of somatic anxiety items included "I feel jittery" and "My heart is

racing"; Cognitive items included "I am concerned about losing" and "I am concerned about performing poorly"; Self-confidence items included "I feel self-confident" and "I am confident I can meet the challenge". Subjects responded on a 4-point Likert scale where categories varied from not at all (1), somewhat (2), moderately so (3) to (4) very much so. The reliability estimate for the CSAI-2R is .84. The reliability of this instrument for this study was .79.

The state/trait sport confidence inventory (S/TSCI)

The State / Trait Sport Confidence Inventory (S/TSCI) (Vealey, 1986) was used to measure the persistent level of certainty athletes hold regarding their sport ability. This inventory consisted of three items for trait measures and three items for state measures that reflect several aspects of sport performance. Participants were asked to compare their level of confidence in each performance area to that of the most confident athlete they knew, utilizing a 9-point Likert scale anchored 1 (low) to 9 (high). Item samples included, "Compare your confidence in your ability to execute the skills necessary to be successful to the most confident athlete you know" and "compare your confidence in your ability to execute successful strategy to the most confident athlete you know." Both SSCI and TSCI had demonstrated adequate internal consistency and construct validity across a variety of sport samples (Vealey, 1988). The reliability estimate of the TSCI is .89. The reliability of this instrument for this study was .84.

Performance

The players' performance was measured through penalty kicks. Participants were asked to aim at the goal and shoot the ball past the goalkeeper who stood centrally striving to prevent the player from scoring

(Bar-Eli., & Azar, 2009). This stands to reason that a ball placed further from the goalkeeper's reach stands a better chance of beating the goalkeeper, resulting in a successful shot. It is a well-known premise among coaches that the optimal place to kick a penalty is on the ground, as close as possible to the goalpost (Dohmen, 2008). This intuitive assumption is believed to be true because the reaction time that the goalkeeper has is very short, and therefore it should be almost impossible for him or her to save a well-placed ball directed to that location (Dohmen, 2008).

Data Collection Procedure

The research protocol was approved and an ethical clearance (ID: UCCIRB/CES/2017/24) given by UCC Institutional Review Board (See Appendix C). In addition, an introductory letter was obtained from the Head of Department of Health, Physical Education and Recreation (See Appendix B). The choice of this method was influenced by Ogah (2013) that in order not to violate the right of human subjects, there is the need for ethics committee to certify that a research, research instrument and data collection processes are acceptable and respect the right of subjects. Hence, the ethical clearance and introductory letter obtained from UCC and the department of HPER was used to obtain permission for entrance into the club.

The purpose of the study was explained to the players before data collection begun. The players were assured of anonymity and confidentiality of their responses. All the players were asked to sign consent forms before responding to the questions (See Appendix A). Prior to completing the questionnaire, players were informed that there were no right or wrong answers and that they should choose the answer which described how they felt at that moment in relation to the upcoming task (penalty kicks). Again, the

(Bar-Eli., & Azar, 2009). This stands to reason that a ball placed further from the goalkeeper's reach stands a better chance of beating the goalkeeper, resulting in a successful shot. It is a well-known premise among coaches that the optimal place to kick a penalty is on the ground, as close as possible to the goalpost (Dohmen, 2008). This intuitive assumption is believed to be true because the reaction time that the goalkeeper has is very short, and therefore it should be almost impossible for him or her to save a well-placed ball directed to that location (Dohmen, 2008).

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The research protocol was approved and an ethical clearance (ID: UCCIRB/CES/2017/24) given by UCC Institutional Review Board (See Appendix C). In addition, an introductory letter was obtained from the Head of Department of Health, Physical Education and Recreation (See Appendix B). The choice of this method was influenced by Ogah (2013) that in order not to violate the right of human subjects, there is the need for ethics committee to certify that a research, research instrument and data collection processes are acceptable and respect the right of subjects. Hence, the ethical clearance and introductory letter obtained from UCC and the department of HPER was used to obtain permission for entrance into the club.

The purpose of the study was explained to the players before data collection begun. The players were assured of anonymity and confidentiality of their responses. All the players were asked to sign consent forms before responding to the questions (See Appendix A). Prior to completing the questionnaire, players were informed that there were no right or wrong answers and that they should choose the answer which described how they felt at that moment in relation to the upcoming task (penalty kicks). Again, the

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players were informed that the player with the most successful attempts and the goalkeeper with the most saves will each be given a cash prize of one hundred Ghana cedis (GHC 100.00). Similarly, the group with the highest number of successful attempts at the end of the competition will be given a cash prize of three hundred Ghana cedis (GHC 300. 00). This reward was announced to the players so as to elicit the needed anxiety and its correlational self-confidence in them. This is similar in thought to Hickman and Metz (2015) and Wilson, Wood, and Vine (2009) when they directly connected pressure and monetary reward to performance in the final golf putting among golfers and in penalty kicks among soccer players. Again, since salaries and bonuses of these players are not paid regularly, this reward was deemed appropriate to influence the thoughts, feelings and behaviours of these players and thus elicit the needed psychological disposition (anxiety and self-confidence) among these players. Five groups of 6 players were formed. Pieces of papers numbered 1-5 were put in a bowl for the goalkeepers to pick simultaneously. The numbers that they picked represented the groups that they belonged to. This was also done for the defenders, midfielders and attackers to ensure that the groups were equally represented. Players with the same number from each group were all asked at different times to answer the questionnaire just before their kick. This was done for the rest of the players with same numbers till everybody had their kicks. The questionnaires were administered at three different times (1st attempt, 3rd attempt and 5th attempt) to each player of a team comprising 6 players at a time in a group setting just before the start of each attempt because it was assumed to be the period during which their anxiety and self-confidence levels became most evident (Jordet, Hartman,

Visscher, & Lemmink, 2007; Jordet, Hartman, & Sigmundstad, 2009; Jordet, Elferink-Gemser, Lemmink, & Visscher, 2006; Kais, & Raudsepp, 2005).

Each player after completing the questionnaire, was immediately called upon to pick the official ball for the penalty shootout after which he was asked to walk towards the penalty mark or spot where he was instructed by the referee to place the ball and wait for his signal (whistle) before executing the kick against a goalkeeper who stood centrally in the goal. A goal was awarded when the whole circumference of the ball crossed the goal line in-between the two uprights and under the cross bar (FIFA, 2017). The player after taking his kick was asked to join his team mates and wait for his next attempts. This took place during training hours from 2:00pm-5:00pm. To control for the effects of wind, playing boot and experience on the outcome of each kick, the corner flag posts were used to check for the direction of wind. Thus, if the flag post were still, then that meant the wind speed and direction was normal for a kick to be effected. Again, to check for the effect of playing boot on kick outcome, all the players were asked to use boots that they would typically use to play a league game which would make them comfortable and focused. Again, preliminary interactions with the players at the beginning of the exercise revealed that every player within the team have ever taken a penalty kick in a high pressure situation before thus making the group a homogenous one and giving no one an undue advantage over the other.

Data Processing and Analysis

Data was screened for missing values and outliers. This was done to ensure that the data met the assumptions of linearity, normality and sphericity for one-way repeated measures analysis of variance (ANOVA) and multicollinearity for multiple regression. Satisfying the assumptions, research

question one was analyzed using one- way repeated measures analysis of variance whiles research question two was analyzed using multiple regression.

Research Question 1: What is the interaction effect between age, experience, position, anxiety, and self-confidence on penalty kick performance among Ebusua Dwarfs soccer players?

One-Way Repeated Measures Analysis of Variance (ANOVA) was used to analyse research questions one to find out the interaction effects between the independent variables of age, position, experience, anxiety, self-confidence, and the dependent variable (penalty kick performance) among Ebusua Dwarfs soccer players. The choice of one-way repeated measures analysis of variance (ANOVA) was influenced by proposition of Schuyer (2008) that when comparing two or more group means where the participants are the same in each group, the appropriate statistical technique to use One-way repeated measures analysis of variance (ANOVA).

Research Question 2: Which variable (age, experience, position, anxiety and self-confidence) is more likely to predict penalty kick success among Ebusua Dwarfs soccer players?

A multiple regression was used to analyze research question two to find out which of the independent variables (age, position, experience, anxiety and self-confidence) was more likely to predict penalty kick performance. The choice of multiple regression was influenced by proposition of Schuyer (2008) that when predicting the value of a variable (dependent variable) based on the value of two or more other variables (independent variable), the appropriate statistical technique to use is multiple regression.

CHAPTER FOUR

RESULTS AND DISCUSSION

The purpose of this study was to find out the influence of demographic factors (age, experience, and position), anxiety and self-confidence on penalty kick performance among Ebusua Dwarfs players in the Ghana Premier League. This chapter presents the statistical analysis, results of the study and the discussion.

Research Question 1: What is the Interaction Effect between Age, Experience, Position, Anxiety and Self-Confidence on Penalty Kick Performance among Ebusua Dwarfs Soccer Players?

This question sought to find out how the interactions of these variables affect football penalty kick success or failure. To answer this question, series of questions were posed on 12 anxiety and 11 self-confidence related behaviours. One-way mixed repeated measures ANOVA was conducted to examine the effects of age, experience, and position, and changes in anxiety and self-confidence on the rate of success in penalty kick in soccer.

Though, the data met the assumption of normal distribution and has no outliers, Leven's test of homogeneity of error variances were significant ($p < 0.05$). This indicates a violation of the assumption of equality of error variances and that the groups are not near equal. This was expected because the various positions (goalkeeping, defence, midfield, forward) played were not equal. Mauchly's test of sphericity was not significant ($p > 0.05$), and that assumption of sphericity was not violated.

The result of the One-Way Mixed Repeated Measures ANOVA revealed no interaction effect between age, experience, position and changes in anxiety and self-confidence levels on penalty kicks, F (6, 22) = 0.70, p > 0.05, Wilks' Lambda = 0.08, η^2 = 0.72. Simple main effects analysis indicates no significant differences between the levels of independent variables of age, experience and position. Furthermore, anxiety and self-confidence have no significant interaction effect in creating differences in penalty kick across time, F (6, 22) = 0.80, p > 0.05, Wilks' Lambda = 0.43, η^2 = 0.35. Therefore, differences in penalty kick success do not necessarily depend on the interactions of age, position, experience, levels of anxiety and self-confidence (See Table 1 for data).

Table 1 - Summary Results of 3×4×2 Mixed One-Way Repeated Measures ANOVA of Interaction and Main Effect Difference of Age, Experience, Position, Anxiety and Self-Confidence on Success of Soccer Penalty Kick

Sources	*df*	*F*	*sig.*
Age*Position*Exp.	22	.70	.75
Anxiety	11	1.8	.31
Self-confidence	11	.31	.95
Age	4	.56	.70
Anxiety	2	1.5	.33
Self-confidence	2	.03	.99
Position	6	.05	.99
Anxiety	3	.08	.97
Self-confidence	3	.10	.96
Experience	18	.18	.92
Anxiety	9	1.02	.54
Self-confidence	9	.23	.97

N = 30; p > 0.05

The results of this study did not show any statistically significant interaction because the pressure of a penalty shootout in a real match situation is impossible to mimic in a training session. Emotions must be triggered to elicit desired responses. The importance and pressure of an event can trigger emotions which may cause feelings of anxiety to occur. Even though conditions such as the presence of an audience, award of cash prize and the chance to be selected to take the team's penalty kick during regulation time or included in the team's best five penalty kickers were created, they did not represent the state and trait situations that are characterised by extremely high levels of performance pressure in competitive penalty shootout to elicit the desired physiological and psychological (emotional) responses in the players. Thus, the situations that were created under the current study did not induce enough feelings of anxiety to occur as kicking the penalty to win a cash prize and/or earn the opportunity to be in the team's best five penalty kickers cannot be equated to the importance and pressure associated with kicking the penalty to bring a team back to parity, gain qualification to the next stage of a competition and/or win a competition.

Again, since the penalty kicks took place at the team's training grounds, the audience (spectators and fans) were not many to make the situation look threatening to induce the psychological imbalance associated with the penalty kick as compared to when thousands of people are watching in the stadium and millions at home on television. Thus, the audience or crowd effect present did not have a significant influence on the players as compared to if the kicks had taken place under real match situation where a win would keep the team in pole position and probably win the trophy or out of competition and lose the trophy.

Another reason for this result may possibly be the players' familiarity with each other and the environment. Because these players know each other, they are able to predict players' movement features and goal-directed behaviours. This is consistent with findings from ecological dynamic perspective by Lopes *et al.* (2008) when they found that decision-making behaviour in the penalty kick emerges from the dynamical interactions of performer-performer (environment) towards specific goals (i.e. to score or to save a goal), influenced by task constraints over time (e.g., players' strategies, task inherent stress, prior experiences). When a player continuously interacts with a structured environment (e.g., teammates, opponents, spectators, light or wind conditions, surface type), functional patterns of behaviour emerge. These behaviours do really affect their psychology and physiology since they are aware of teammates or opponents expected behaviour. This keeps them calm and relaxed during performance execution minimizing or doing away with the psychological imbalance that often override performance. Gibson (1979) affirmed this when he indicated the individual-environment relationship as being grounded on contextual information that affords what is possible to do at a certain moment. In his view, relevant information is the cornerstone of penalty kick's interpersonal dynamics, because it expresses players' intentions. Specifically, the individual environment relationship under task constraints promotes shifts in perceptual motor behaviours, which are the foundations of decision-making. Such control is possible due to the perception of information to act, which will create new information to be perceived.

But, irrespective of the findings of the present study, few studies have found these same variables (age, experience, position, anxiety and self-confidence) to individually affect penalty kick performance. For example,

anxiety has been found to be the most significant contributing factor to performance failure in football penalty shootouts due to the pressure and importance associated with the kicks (Jordet *et al.*, 2007, 2012; Henry, 2015). Henry (2015) indicated that the pressure on a world stage sometimes gets the better of high quality players because their psychological strength seems to be overridden by the situation when thousands of people are watching in the stadium and millions at home. This makes many footballers with vast amounts of experience, skill and quality succumb to the pressure of taking a penalty. Similarly, Jordet, Hartman, Visscher and Lemmink (2006) showed that the importance of the kicks (indicative of stress) was negatively related to the outcomes of the kicks, whereas skill and fatigue were less, or not, related to outcome.

Another possible reason for the outcomes of these studies may be that these players entertained thoughts such as fear of missing and uncertainty which caused a detrimental impact on their performance. Again, concentration changes such as loss of awareness leading to mental tension or poor selective perception may have resulted in the accumulation of stress in their bodies. These reflect the greater importance and consequent pressure of the world stage. They therefore concluded that psychological components are most influential for the outcome of penalty kicks hence practitioners must work with players to cope with stress to reduce the perceived importance of each kick. Similarly, Jordet *et al.* (2008) also found that anxiety was the only emotion reported by all 10 players who took part in a 2004 European Championship penalty shoot-out. A more detailed analysis of the same players revealed that the ones who reported low perceptions of control also reported higher anxiety symptom intensity and more debilitative symptom direction.

The possible reason may be due to the rise of anxiety that often accompanies such occasions where a miss can lead to losing a competition or where a score can result in winning a competition.

Relatedly, Jordet, Hartman and Sigmundstad (2009) found that several time intervals were linked to performance. For example, longer times to respond to the referee's ready signal were related to more goals and shorter times were related to more misses. Plausible reasons for this result may be the extreme levels of pressure that are induced by major penalty shootouts, causing performers to attempt escaping the emotional distress by getting the situation "over with" as soon as possible. Moll, Jordet, and Pepping (2010) corroborated this when they indicated that due to the penalty kick's role in the final score, individuals cope differently with the emotions related to the penalty kick's pressure. They showed that whilst some players take their time to prepare before taking the penalty which indicates control over the situation, others rush to quickly take the kick due to uncontrolled levels of anxiety. They concluded that fast preparation times reflect the presence of anxiety and the desire to escape the situation by getting their shots over and done with quickly.

Again, the results of this study found that success or failure in penalty kick does not depend on the experience levels (number of years played) of the players even though experience has been generally found to contribute to performance success or failure during competitions. The possible reason may be due to the emotional interpretations that these players of varying playing years gave to the situation. Thus, even though playing a sport for a considerable number of years have been linked to increased competence, and successful skill execution, the pressure associated with penalty kick can sometimes make these players fail due to the responsibility placed on them by

team mates, spectators, fans, and coaches. This affects their perception of control which sometimes leads to choking. This assertion is consistent with Jordet (2009) when he found that current stars (experienced players) scored on average 65% of the time from the penalty spot whereas future stars (inexperienced players) scored 89% of the time from the spot when he examined links between public status and performance in a real-world, high-pressure sport task. The plausible reason for Jordet's result may be that current stars are experienced players who are seen to have acquired a lot of experience as a result of playing over a long period of time. They therefore become more worried about what they think failing would mean to their status and team as compared to younger players who see the penalties as a stage for which they can make a name for themselves, and subsequently perform better. It is therefore believed that experience and high public status acquired over a considerable period of time could negatively affect performance through added performance pressure which can make experience players perform worse than their less experienced counterparts. Furthermore, Wilson *et al.* (2009) found that experienced footballers when anxious fixate faster and longer towards the goalkeeper resulting in significant reductions in shooting accuracy, with shots becoming significantly centralized and within the goalkeeper's reach.

Contrarily, Hickman and Metz (2015) found among golfers putting the last hole to receive a huge cash reward that less experienced players tend to be more affected by pressure than their more experienced counterparts resulting in misses, and that the difficulty of the shot factors into the magnitude of the impact caused by high stakes. The plausible reason for this outcome may be due to the connection between pressure and monetary reward. Larger rewards

equate to facing larger amounts of pressure. The PGA TOUR provides one of the greatest opportunities for a golfer to make huge amounts of money should he/she win. The make or miss on the final hole of a tournament has a final impact on a player's finish position in a tournament and his subsequent monetary reward. These large rewards create a great deal of pressure, potentially leading to underperformance on the part of these less experienced golfers who aspire to become rich and famous overnight.

The position that a player plays in football can also affect the final outcome of a penalty kick. But the result of this current study did not show any significant interaction effect between positional role and penalty kick success. But, Jordet, Visscher, Hartman, and Lemmink (2007) found differences in position played and penalty kick success on positional role and football penalty kick when they looked at the percentage success rate of players of different positions. Jordet *et al.* collected data from soccer statistics internet sites on 41 penalty shootouts and 409 kicks taken in the World cup, European championships and Copa America between 1976 and 2004 to determine percentage success rate of players of different positions. The results showed that attackers successfully convert 83.1% of their penalties, midfield players convert 79.6% and defenders convert 73.6%. This result is not surprising since it is reasonable to assume that players whose most important task or one of their most important tasks is to score goals are better goal scorers than other players. Thus, although there are excellent penalty-taking defensive players, it is likely that the more offensive a player's role, the better his goal scoring skill will be and on kicks from the penalty mark.

The findings of this study did not find any significant interaction effect between age and penalty kick success. However, Jordet, Hartman, Visscher

and Lemmink (2006) found age to be a significant contributor to performance. The researchers analysed the percentage rate of success of penalty shoot-outs of young and older players in the World Cup (WC), European Championships (EC) and the Copa America (CA) and found age to be important with younger players doing better. The results revealed that players aged 22 or younger successfully convert 85.2% of attempts. Those aged between 23 and 28 convert 77.6%, and those aged over 29 years convert 78.1%. The possible reason for the high success rate of these younger players may be due to the low expectations associated with their kick which is indicative of low stress. This makes them stay focused and interpret the situation as facilitative thereby increasing their chances of scoring. Conversely, higher expectations placed on the kicks of older players who are seen as more experienced might have caused them to miss their kicks. Their status and worth of experience puts a lot of pressure on them which makes them miss their kicks. It is recommended that coaches will pay attention to younger and "medium" players when it comes to penalty kicks since the pressure associated with penalty kicks is less evident in them.

Research Question 2: Which Variable (Age, Experience, Position, Anxiety and Self-Confidence) is More Likely to Predict Penalty Kick Performance among Ebusua Dwarfs Players?

A multiple regression analysis was conducted to determine variables that predict penalty kick success among soccer players. Initial correlation analysis showed low to moderate inter-correlations among the variables. The regression analysis indicated VIF of more than one, indicating no collinearity. The analysis revealed that the general model was not significant, $\beta = -.14$, $t = -.06$, $p > .05$. But, the age of the players was significant in predicting the

success or failure in penalty kick, $\beta = .53$, $t = 2.42$, $p<.05$. The sample multiple correlation was .46, indicating that approximately 23% of the variance of penalty kick success can be accounted for by the linear combination of these variables. Linear correlation revealed that age accounted for about 53% of the variance (See Table 2 for data).

Table 2 - Predicting Penalty Kick Success from Age, Experience, Position, Anxiety and Self-Confidence

Variable	*B*	*Beta*	*T*	*R*	R^2	*Sig.*	CS	
							T	VIF
Constant	-.14		-.06	.46	.23	.29		
Anxiety	-.02	-.03	-.18			.86	.96	1.04
SC	.01	.11	.52			.61	.79	1.26
Age	.17	.53	2.42			.02	.68	1.48
Exp.	-.08	-.30	-1.28			.21	.61	1.63
Position	.13	.14	.71			.48	.86	1.16

$N = 30; p > 0.05$

Therefore, as players' age (25 years and above), their penalty kick success increases. The multiple regression model indicated that age as a factor predicted anxiety levels among the players. Specifically, the findings mean that older players (25 years and above) are better penalty kickers than younger players (24 years and below). The plausible reasons may be that anxiety is reduced with increase in players' age and regular exercise and participation in official tournaments. As players age, their skill level increases and become refined through exercise and official tournaments. These help them develop and control their motor skills and ability making them skilled and successful. In a sense, the errors in their kicks become very few and can generally be detected and corrected by them if they do occur. The kicks therefore become automatic and habitual. This reduces both cognitive and state anxiety associated with the kicks thereby increasing their concentration and

confidence. Eventually, these players do not have to attend to the entire production of the kick but perform the kick with minimal thoughts about it. They concentrate on the ball and some of the specific adjustments that they must make in their normal swing of the leg and arm to produce a particular kick to score.

This finding is consistent with previous research findings from Cartoni et al. (2003) and Pears (2007) who concluded that when an athlete's age increases (25 years and above), their anxiety reduces. The probable reason may be that as players age, they learn how to block negative thoughts and concentrate on important cues through practice and participation in official competitions making them confident and successful. They thus relegate all doubts that will create both cognitive and state anxiety in them to the background and focus on the successful performance of the task. This decreases their cognitive and state anxiety levels thereby leading to improved performance. It is therefore not surprising that younger players experience more state anxiety than older players. George (1994) supported this assertion when he found that college athletes (20 years and above) experienced significantly less somatic anxiety and more self-efficacy than did high school athletes (19 years and below), although differences in performance quality were not significant. George concluded that the college athletes who were older benefited from the number of years of practice and participation in competitions within their given sport than their high school counterparts. Similarly, Modroño and Guillén (2012) found in a sample of windsurfers that age was inversely related to cognitive anxiety, that is, older athletes (25 years and above) experienced less cognitive anxiety than younger athletes (24 years and below). The researchers proposed that this effect likely came as a result of

differences in the level of experience between older and younger athletes. Also, Wong and Bridges (1995) found that anxiety plays a role in the attitudes and performance of youth athletes between the ages of nine and thirteen. Their results indicated that as perceived competence increased, anxiety decreased and vice versa.

Though dissimilar but consistent with the findings of this study, Jokl et al. (2004) found that record times across older age categories in swimming have been falling annually as aging athletes adopt more efficient techniques and maintain cross-training regimens designed to promote speed, power, strength, flexibility, endurance, concentration and movement precision. Hirofumi and Douglas (2008) corroborated this finding when they reported similar results from major competitions which showed that peak performance in endurance athlete seems to occur somewhere between 25 to 35 years of age. They concluded that older athletes strive to maintain or even improve upon the performance they achieved at younger ages through training, competition and attentional control. All these results show that there is a relationship between age and anxiety levels of athletes since there is an age "sweet spot," (mid-20's to early 30's) at which the combination of physical, technical, psychological and strategic abilities come together to bring about successful performance (SA Masters Athletics News, 2016). Although there have been numerous examples of Olympians competing, and sometimes winning medals, over the age of 50, the vast majority of these come from sports requiring exceptional skill and less aerobic or anaerobic power, such as the shooting events, sailing, equestrian and fencing. For endurance events, the upper cap for competing at the sport's highest levels appears to be around the age of 40. These results

indicate that age and experience are related to both cognitive and somatic anxiety.

Nevertheless, anxiety as a factor was not found to be a good predictor of penalty kick success among the players in this study. This finding may be due to the cognitive interpretation that the players gave to the situation. A possible reason may be that although penalty kick situation has been reported to be a high situation criticality, these players did not interpret it as such thereby making them have significantly lower levels of anxiety which helped to insulate performance from disruption. Krane and Williams (1994) affirmed this when they found that the cognitive interpretation that each player in a high situation criticality collegiate softball tournament gave to a situation exerted an effect on his performance regardless of the player's skill level. Even though these players performed under high pressure conditions, they did not see these conditions as threatening making them experience low cognitive anxiety which helped to protect and maintain their performance. Adding to this evidence, Burton and Naylor (1997) found competitive anxiety to be ineffective in predicting success in athletic performance and furthermore, not exclusively impairing. According to Burton and Naylor, reasonable levels of pre-competition anxiety may serve to motivate the athlete and regulate focus on the immediate competitive task. This self-awareness, focus, and attentiveness to an individual's performance may therefore motivate the athlete to strive for greater success.

However, previous findings have shown anxiety to negatively impact the aiming behaviour of players who took kicks under high and low threat conditions (Wilson *et al.*, 2009; Bar-Eli and Azar, 2009; Miller, 1996). These studies revealed that players under high threat conditions were quicker to

focus on the centralised goalkeeper and spent significantly longer looking in this location compared to the low threat condition. This disruption was further increased if the goalkeeper actively attempted to attract the kicker's attention by using distracting behaviours such as waving the arms (Wood, & Wilson, 2010b). This centralisation of aiming behaviour caused a corresponding tendency to shoot centrally at the goalkeeper resulting in a miss. Wood and Wilson (2012) corroborated the results of their previous findings when they found among quiet eye trained participants that those participants with high control beliefs (low anxiety symptoms) were more likely to aim optimally and further from the goalkeeper, whereas participants with low control beliefs (high anxiety symptoms) experienced suboptimal and more centralized aiming behaviour. The outcome of these studies imply that players who are able to deal with mediators of anxiety focus on optimal target areas of the goal (top-corners) for a sufficient amount of time in order to process the aiming information needed for accurate shooting whereas players who are engulfed by these mediators become distracted thereby leading to more centralized decisions (kicks) towards the goalkeeper. This clearly indicates that there is relationship between high perceptions of control beliefs and aiming behaviour.

Along similar lines, Jordet *et al.* (2006) found among ten international football players whom he interviewed whilst watching video footage of an international penalty shootout in which they had previously competed that players with low perceived competence and contingency (who attributed outcome to be determined by luck rather than skill) before the penalty shootout experienced significantly more cognitive anxiety symptoms than those who perceived their competence and contingency to be high. Jordet and Elferink-Gemser (2012) supported this finding when they indicated that

players who have taken penalty kicks in a UEFA European Championship penalty shootout experienced higher levels of anxiety due to (a) contingency beliefs about penalty shootouts being a lottery, (b) lack of control regarding penalty taker selection and shooting order, and (c) lack of control experienced by having to passively wait and watch teammates perform. The most stressful phases reported during each of four temporal phases of the penalty shootout were the break after extra time that preceded the start of the shootout and the time interval between the shootout beginning and the player's turn to shoot. During the walk to the penalty spot to take their kick, players reported feelings of loneliness and concentration disruption. Finally at the penalty mark players reported relatively few stressors in comparison to earlier phases of the shootout, but common stressors reported were the fear of failure and worry about the goalkeeper's performance or behaviour.

Furthermore, Moll *et al.* (2012) found that post-goal celebrative behaviours influence team success in a penalty shootout. Such positive displays of emotion (indicative of high self-confidence and low levels of anxiety) are contagious and are likely to 'infect' a positive attitude on team-mates taking subsequent kicks. Conversely, such behaviours also seem to have a negative effect on the opposition. Specifically, when players displayed substantial celebratory behaviours, the opposing teams were more than twice as likely to miss their next shot due to lack of focus on the part of the kicker which results in doubt and pressure.

The above synthesised research shows that (a) anxiety influences the non-verbal behaviour of penalty takers and that this negatively affects performance (b) anxiety creates an attentional bias towards the goalkeeper, disrupting aiming behaviour and negatively affecting shooting accuracy (c) the

intensity of anxiety experienced during shootout competition is dynamic in nature and changes as the situation unfolds.

Self-confidence was found not to be a significant predictor of penalty kick success among the soccer players. Although a penalty kick is considered as one of the most highly pressured situations in football, players in this study were able to cope well with the pressure because of their past accomplishments in penalty kicks and knowledge of the qualities and abilities of the performers (opponents) they were involved with. Players who have previously successfully taken penalties and won penalty shoot-outs are more likely to be confident in their ability to take a successful penalty. The reverse of that however is that those who have had bad experiences are less likely to be confident. Jordet (2009) revealed that success rates in penalty shoot-outs are considerably higher for teams who have won their last two penalty shoot-outs compared to those who have lost their last two shoot-outs (89% versus 57%) even if the team membership is changed. Interestingly 'higher status' players, whilst likely having more experience (past accomplishments or successes) to draw on, are sometimes less successful in penalty shoot-out situations perhaps because the pressure of expectation is far greater for them than for players of lower status.

The results of the study showed that experience is not a significant predictor of penalty kick success. This current finding may be due to the fact most of the players have not played for long which have not made them to have the chance of playing in official tournaments where the pressure involved in taking the penalty kick is high. Irrespective of this plausible reason, some researches show opposite findings. For example, results of previous studies have shown that there is a significant reverse relationship between the sports

experience and the athletes' anxiety (Bawa, 2010; Weinburg, & Gould, 2011; Iizuka, 2004 *et al.*; Grossbard *et al.*, 2009). These findings showed that experienced athletes often experience various levels of situations in sports competitions. As such, they are able to avoid psychological problems caused by negative and unrealistic thoughts and ideas making them have less anxiety in comparison to non-athletes or less experienced athletes. In other words, regular exercise and official tournaments help these experienced athletes pay less attention to disturbing stimuli and think more in a way that can be effective in their success. Therefore, practice and experience makes athletes identify the sources of and methods that reduce anxiety. Gill (2000) corroborated these findings when he showed that the less experienced and non elite performers experience a steady increase in anxiety right up to and even during performance, whereas, experienced and elite performers demonstrate a similar steady increase in anxiety, but then a reduction just prior to and during performance. Along similar lines, Gould *et al.* (1984) found higher experience level was associated with low cognitive anxiety levels. They explained that the length of time that an athlete has participated in his sport has a significant influence on his thought processes and subsequent behaviour. Thus athletes who compete for long are better able to mentally cope with factors such as audience or crowd effect and stress. But contrary to these findings, Athanas (2007) found that fencers of any experience level are prone to developing somatic anxiety. No matter how long a fencer has been competing in the sport, the onset of competition may continually create a physiological reaction.

The results of the analysis again showed that the positional role of the players is not a significant predictor of penalty kick success. This result may be due to the players' familiarity with each other. Because the players know

each other, they are able to guess each other's movement behaviour and direction of kick. However, other studies have shown performance executed by different players in different position to be influenced by anxiety. Sanjay (2017) found higher competition anxiety among defenders and lower for attacking players in handball. This might be because defending players are always anxious and worried about the opponent's concealed attacks which they have to devise means to prevent them from scoring. This puts them through a lot of mental stress since they have to keep an eye on the movement of each opposing attacker to make sure that they did not score. They therefore cannot afford to make mistakes and concede a goal since failure on the part of their attacking teammates to equalize can lead to a defeat. The attackers on the other hand experience less anxiety because their responsibility is mostly related with scoring the goal and not to defend it. They can therefore afford to miss especially when they know that their defenders are capable of defending their goal. Cox and Yoo (1995) found among American football players that the offensive player, regardless of whether he played on the line or in the backfield exhibited anxiety control than the backfield player. Because offensive players have very specific team assignments to carry out, it would be to their advantage to be able to control worry and anxiety. Failure to do so could easily result in a fumble or a missed blocking assignment. Cox (1987) further supported this conclusion when he reported that setters in volleyball exhibited the ability to widen their internal attentional focus to a greater degree than middle blockers and strong side hitters. The results of these investigations provide support for sport specific assumption that a relationship exists between playing position in team sports and various psychological variables. More specifically, evidence provided from these studies suggest that

netball players, volleyball players and athletes in American football can be differentiated as a function of psychological skill and the position that they play on the team.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to examine the influence of demographic factors (age, experience, and position), anxiety and self-confidence on penalty kick performance among Ebusua Dwarfs players in the Ghana premier league. This chapter presents the summary of main findings, conclusions and recommendations of the study.

Summary

Players often prepare adequately for the technical aspects of their sport but not the psychological aspects. However, when the result of an activity matters most, psychological pressure may adversely affect performance. This can be the case when scoring the penalty kick to win a major championship. This situation has enormous rewards designed to elicit maximum effort. However, this large reward also creates a great deal of pressure, potentially leading to anxiety and lack of self-confidence and resulting in underperformance.

Anxiety is the most significant psychological construct that influences competitive performance due to its negative emotional state which is characterized by nervousness, worry, and apprehension and associated with activation or arousal of the body. Anxiety is an important facet of personality that can have meaningful effects on competitive performance. It is a construct that has consistently been studied in the field of sport psychology, and has become the most heavily researched psychological variable that influences athletic performance. Similarly, self-confidence is one of the most important variables related to sport performance. It is a construct that is used to explain successful and unsuccessful performances among athletes. Self-confidence

increases perceived ability to emotion management and provides possibility for athlete to control negative emotions more effectively. Empirical research has shown that among athletes, high levels of self-confidence are associated with perceived useful ability.

One of the factors that may affect the time to make or alter motor decisions is high pressure. In sport tournaments with high degree of perceived importance, it is common that the desire to perform well creates pressure. Soccer penalty shootout or kicks from the penalty mark (the official term for the ''penalty shootout'') is one of the most highly pressurized situations in soccer which elicits this pressure in the form of anxiety and lack of self-confidence. It is one of the most dramatic events in the knock-out phase of major international soccer tournaments. Since its first introduction on 27 June 1970, the penalty kick has had an increasing influence in the outcome of high profile matches, particularly in the tie-break shootout scenario. Given the importance of scoring on each of the shot in the penalty shootout for the outcome of the entire game, the pressure on the players to perform well is arguably very high. The outcome of these kicks is typically attributed to psychology due to the anxiety associated with it. Penalty kicks are perceived to be important because their outcome determines if a team advances or is eliminated from a tournament, or alternatively, they determine a team's final rank (such as winning a tournament or being placed third). In major tournaments, the importance of each kick is further underscored by the widespread public interest and the vast numbers of people who watch the games live on television. Due to the high degree of its perceived importance, there is the need to find out which demographic and/or psychological variables

create pressure and provoke an increase in anxiety and a decrease in self-confidence which leads to detrimental performance among soccer players.

To achieve the purpose of this study, two research questions were formulated to guide the study. To find answers to these questions, descriptive quantitative survey design was employed to conduct the study. A census sampling procedure was used to include all the 30 registered players of Ebusua Dwarfs, a professional premier division football club based in Cape Coast in the Central Region of Ghana. The revised competitive state anxiety inventory (SCAI-2R) by Cox, Martens and Russell (2003) and the state/trait sport confidence inventory (S/TSCI) by Vealey (1986) were adopted for data collection. Data collected were analyzed using a one-way mixed repeated measure ANOVA and multiple regression through SPSS (version 16) software. The outcome of the penalty kicks were presented in tables (1 & 2).

Main Findings

The findings of this study revealed no interaction effect between age, experience and position and changes in anxiety and self-confidence levels on penalty kicks. Again, the study found no significant differences between the levels of independent variables of age, experience and position. Furthermore, anxiety and self-confidence have no significant interaction effect in creating differences in penalty kick across time. Therefore, differences in penalty kick success do not necessarily depend on the interactions of age, position, experience, levels of anxiety and self-confidence among soccer players. In addition, the study also revealed that the age of the players was significant in predicting the success or failure in penalty kick with older players (25 years and above) executing their kicks successfully. Therefore, as players' age and

perhaps gain experience, their penalty kicks success increases as they mature in their profession.

Conclusions

It is evident from the findings of this study that differences in penalty kick success does not necessarily depend on the interaction effect of age, position, experience, levels of anxiety and self-confidence among players of Ebusua Dwarfs. Notwithstanding, age is a significant predictor in determining whether players will be good penalty takers since their rate of penalty kick success increases as they mature in their profession. That is, older players (25 years and above) were better penalty kickers than younger players.

Recommendations

Based on the findings of the study, it is recommended that coaches select older players (25 years and above) to execute the penalty kick since they revealed their ability to block negative thoughts and concentrate on important cues which affected their performance through their thoughts, behaviours, and feelings.

Suggestion for Future Research

This study can be exploited as a basis for various surveys on penalty kicks among players of all the premier division clubs in Ghana.

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APPENDICES

APPENDIX A

DATA COLLECTION INSTRUMENT

UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATION STUDIES

FACULTY OF TECHNOLOGY EDUCATION

DEPARTMENT OF HEALTH, PHYSICAL EDUCATION AND RECREATION

QUESTIONNAIRE

Dear Soccer Player,

I am a PhD student at the Department of Health, Physical Education and Recreation of the University of Cape Coast. I am conducting a study on **"Influence of Demographic Factors, Anxiety and Self-Confidence on Penalty Kick Performance: The Case of Ebusua Dwarfs Football Club of Ghana".**

This study is meant to identify the mindsets of soccer players prior to competition and it impact on performance. The information you provide will be treated confidential and there are no right or wrong answers.

Completing this questionnaire will take you about 10 minutes.

If you agree to participate in this study, sign and indicate the date in the columns provided below. Drop the completed questionnaire in the box provided. You may contact me or my supervisors on the numbers below if you have any questions regarding your participation.

Researcher: Prosper Narteh Ogum: 0243514178
Supervisors: Prof. J. K. Mintah: 0202464739
Dr. Charles Domfeh: 0544756528

Signature.....

Date .....

SECTION A

INSTRUCTION: Write your answer against the words in the spaces provided.

1. Age.....
2. Experience.....
3. Position.....

SECTION B

INSTRUCTION: INSTRUCTION: This is a number of statements that players have used to describe their feelings before a competition. Read each statement and circle the appropriate number to your right to indicate **how you feel at this moment**. There are no right or wrong answers. Do not spend too much time on one statement, but choose the answer which describes your feelings right now.

	Not at all	**Somewhat**	**Moderately so**	**Very much so**
1. I feel jittery.	1	2	3	4
2. I am concerned that I may not do as well in this competition as I could.	1	2	3	4
3. I feel self-confident.	1	2	3	4
4. My body feels tense.	1	2	3	4
5. I am concerned about losing.	1	2	3	4
6. I feel tense in my stomach.	1	2	3	4
7. I am confident I can meet the challenge.	1	2	3	4
8. I am concerned about choking under pressure.	1	2	3	4
9. My heart is racing.	1	2	3	4
10. I am confident about performing well.	1	2	3	4
11. I am concerned about performing poorly.	1	2	3	4
12. I feel my stomach is sinking.	1	2	3	4
13. I am confident because I mentally picture myself reaching my goal.	1	2	3	4
14. I am concerned that others will be disappointed with my performance.	1	2	3	4

	Not at all	Somewhat	Moderately so	Very much so
15. My hands are clammy.	1	2	3	4
16. I am confident of coming through under pressure.	1	2	3	4
17. My body feels tight.	1	2	3	4

SECTION C

INSTRUCTION: Think about how self – confident you are when you compete in sport. Answer the questions below based on how confident you generally feel when you compete by circling the number that fits the way you feel to your right. Compare your self - confidence to the most confident player you know. Please answer how you really feel, not how you would like to feel.

	Low			Medium			High		
1. Compare your confidence in your ability to execute the skills necessary to be successful to the most confident player you know.	1	2	3	4	5	6	7	8	9
2. Compare your confidence in your ability to perform under pressure with that of the confident player you know.	1	2	3	4	5	6	7	8	9
3. Compare your confidence in your ability to concentrate well enough to be successful with that of most confident player you know.	1	2	3	4	5	6	7	8	9
4. Compare the confidence you feel right now in your ability to execute the skills necessary to be successful with that of most confident player you know.	1	2	3	4	5	6	7	8	9
5. Compare the confidence you feel right now in your ability to perform under pressure with that of most confident player you know.	1	2	3	4	5	6	7	8	9
6. Compare the confidence you feel right now in your ability to concentrate well enough to be successful with that of most confident player you know.	1	2	3	4	5	6	7	8	9

THANK YOU FOR TAKING PART IN THIS RESEARCH

APPENDIX B

INTRODUCTORY LETTER

UNIVERSITY OF CAPE COAST

CAPE COAST, GHANA
COLLEGE OF EDUCATION STUDIES
FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION
DEPARTMENT OF HEALTH, PHYSICAL EDUCATION & RECREATION

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UNIVERSITY, CAPE COAST

Our Ref: **ED/PED/14/0004/**

25th January, 2017

TO WHOM IT MAY CONCERN

INTRODUCTORY LETTER: MR. PROSPER NARTEH OGUM (ED/PED/14/0004)

The bearer of this letter is a PhD student of the above-named department. In partial fulfilment of the requirements for the programme, he is conducting a research on the topic **"Influence of Demographic Factors, Anxiety and Self-confidence on Penalty Kick Performance: The Case of Cape Coast Ebusua Dwarfs Football Club of Ghana"** and would need permission from you to enable him collect data at your outfit. Be assured that the information collected will be treated with utmost confidentiality.

We would therefore be very grateful if he is given the assistance he needs from your outfit.

We count on your usual co-operation.

Thank you.

Dr. Charles Domfeh
HEAD

APPENDIX C

ETHICAL CLEARANCE

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 03321-33172/3 / 0207355653/ 0244207814
E-MAIL: irb@ucc.edu.gh
C/O Directorate of Research, Innovation and Consultancy

OUR REF: UCC/IRB/A/2016/185
YOUR REF:
OMB NO: 0990-0279
IORG #: IORG0009096

1ST FEBRUARY, 2017

Mr. Prosper Narteh Ogum
Department of Health, Physical Education & Recreation
University of Cape Coast

Dear Mr. Ogum,

ETHICAL CLEARANCE –ID: (UCCIRB/CES/2017/24)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted **Provisional Approval** for the implementation of your research protocol titled ***'Influence of Demographic Factors, Anxiety and Self Confidence on Penalty Kick Performance: The Case of Ebusua Dwarfs Football Club of Ghana.'***. This approval requires that you submit periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

Please note that any modification of the project must be submitted to the UCCIRB for review and approval before its implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithfully,

Samuel Asiedu Owusu (PhD)
Administrator

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST
Date: 01.02.2017