

**SELF-EFFICACY AND MENTAL TOUGHNESS AS PREDICTORS OF PERCEIVED
SPORTING PERFORMANCE AMONG FEMALE UNDERGRADUATES**

BY

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DEDICATION

This research project is dedicated to God Almighty for grace and mercy towards the completion of this project

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ABSTRACT

Modern athletes are motivated daily to produce consistent and solid sporting performances. As such, the mental construct of the athletes and perseverance of the athletes seem to combine to produce this required consistent sporting performances to remain relevant in the field of sport. However, it seems that female athletes are mentally tougher than male athletes and show beliefs in their ability which interactively influences their sporting performances. This study aims to study causal and actual relationship between of mental toughness, self-efficacy and sporting performance of female undergraduate athletes in LadokeAkintola University of Technology, Ogbomoso, Oyo State. Using Ex-post faccto research design where by data were collected through the use of general self-efficacy scale by RalfSchwazzer and Matthias Jerusalem, Mental toughness questionnaire developed by Heather Cherry and the perceived personal performance scale developed by Gershgoren where Convenience sampling was used to select 300 participants of which 283 was fit for data analysis. Three hypotheses was tested using the multiple regression analysis and the Pearson Correlation coefficient. The study discovered that Self-Efficacy and Mental toughness jointly predicted sporting performance among female undergraduates in Lautech $F(2, 280) = 272.89; p < .05$ with $R = 0.81$ $R^2 = 0.66$; there is a significant positive relationship between mental toughness and sporting performance of female undergraduate athletes ($R = .80$ $p < .05$). However, there is a significant positive relationship between self-efficacy and sporting performance ($R = .47$ $p < .01$). It was concluded that self-efficacy and mental toughness interactively predicted the sporting performance of female athletes and there is a relationship between mental toughness and sporting performance of athletes. It was therefore suggested that athletes should observe their sporting performance and aim to perform even better.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Emotion related research in sport psychology has been associated with a number of factors beyond the physiology of athletes, which have been found to be paramount in the performance and mental well-being of athletes. The current study based on several researches holds that self-efficacy, athletic identity and mental toughness are some of the emotional factors which can significantly affect the performance and general life of an athlete. Sports psychology in many ways is a fortunate scientific field of inquiry as it provides an arena for the study of human performance and emotions spanning the “thrill of victory to the agony of defeat” as well as group dynamics, organizational behaviour and individual personality characteristics.

The main focus of sports psychology is the sporting performance of athletes. Capranica, Piacentin, Halson, Myburgh, Ogasawara & Millard-Stafford (2013) asserted that Athletic performance is multifactorial and is most likely influenced by inherent biological and anatomical differences to include a number of environmental forces that shape the culture, affecting sport participation, athlete development, and training.

Overall literature supports, the idea that mental preparation strategies coupled with perceived faith in the ability of the athlete have a positive effect on the performance as it is assumed that physical ability of an individual are related to his psychological structure because the environment in which the physical abilities are displayed constitute an ideal setting for the development of psychological characteristics as well. Sport is an ever expanding avenue of human life. From earliest time to the modern age sport in its various forms has played a vital role in the life of mankind. Sport activities provide a means of emancipation from daily routine and pressures. Sport is recognized as playing a relevant

societal role to promote education, health, intercultural dialogue, and individual development, regardless of an individual's gender, race, age, ability, religion, political affiliation, sexual orientation, or socioeconomic background (International Olympic Committee 2012). In modern competitive world every sportsman is in a race of excelling better than others. Everyone desires to see himself/herself successful and for which personality plays a major role personality is the set of psychological traits and mechanisms within the individual that are organized and relatively enduring and that influence his or her interactions with and adaptation to the intra-psychic physical and social environments. This research therefore focuses on the influence of the belief in one's capacity pertaining to athletes and the perceived or actual mental dexterity of athletes prior to and after sporting events in sporting activities of females. Self-efficacy is people's belief in their capabilities to perform in ways that give them control over events that affect their lives. Bandura (1977) used self-efficacy to denote a situational specific variable which influences performance and determines how much efforts individual will expand and how long they will persist in the face of obstacles and difficult experiences. Therefore, the higher the self-efficacy the more the intensive effort. While the lower the self-efficacy the less the effort and difficult tasks will be viewed as threat. Research suggests that mentally tough athletes may be better able to maintain an optimal mind-set throughout competition (Cashmore, 2002), handle criticism, losses, and poor performances (Clough et al., 2002), overcome or rebound from setbacks (Jones et al., 2002), take personal responsibility for performance (Fourie & Potgieter, 2001), and remain calm and relaxed in high pressure situations (Clough et al., 2002).

During the past decade, there has been a resurgence of interest in the self that has focused on the study of individual differences as well as developmental change. Much of this work can be subsumed under the heading of the "self-concept," where there has been a proliferation of theoretical and methodological activity, leading to a growing body of

empirical evidence on the self (Harter, 1990). The degree of interest has been stimulated by the important role of self-concept in the explanation of human well-being, and its initiator and mediator role in human behaviour (Fox, 1990; Marsh, 1993). Research has shown that self-concept is associated with many positive achievements and social behaviours including leadership ability, satisfaction, decreased anxiety, and improved academic and physical performance (Fox, 1992).

Self-concept is also widely presumed to make a causal difference in addressing some of the key social issues of our time. Attesting to this pervasive significance of the self-construct and the outcomes that are mediated by it, Nathaniel Branden (1994) contends: I cannot think of a single psychological problem from anxiety to depression, to underachievement at school or at work, to fear of intimacy, happiness or success, to alcohol or drug abuse, to spouse battering or child molestation, to co-dependency and sexual disorders, to passivity and chronic aimlessness, to suicide and crimes of violence that is not traceable, at least in part, to the problem of deficient self-esteem (Branden, 1994). Hence positive self-belief is valued as a hot variable that makes good things happen, facilitating the realization of full human potential in a range of settings. A theme emphasized here is that the most powerful effects of self-concept are based on specific components of self-concept most logically related to specific outcomes considered in a particular study (a multidimensional perspective) rather than the global component of self-concept represented in global measures of self-esteem (a unidimensional perspective). Clark and Herbert (2003) indicated that, the elite swimmer is expected to perform at a level commensurate to their status of "elite". As their swimming times decrease and performances improve the athlete often accepts accompanying pressure that may coincide with these improvements. A moderating variable in the perception of this pressure is one's self-concept.

The work of Shavelson and Marsh in particular has demonstrated the link between self-concept and performance in a sporting as well as academic setting. Coaches and school administrators alike have struggled to explain poor performance in their charges, when many objective and subjective signs indicate a higher level potential. In the sporting example, one possible explanation is that the athlete's opinion of themselves, influenced by internal and external comparative influences, may hinder their ability to perform up to their physical, mental and technical potential.

Several qualitative inquiries have found mental toughness changes throughout the course of human development and is influenced by various individuals (e.g., coach, peers), experiences (e.g., critical events, both positive and negative), and personal factors (e.g., curiosity) (Connaughton Hanton & Jones 2010). Mirroring this, Anthony, Gucciardi, and Gordon's (2016) synthesis of the qualitative literature delineated four sources of mental toughness development which includes personal attributes, interactions with the environment, opportunities for progressive development, and continued and diverse critical incident experiences. Qualitative investigations have been supplemented by initial research involving targeted interventions, a number of which have provided support for the modification of mental toughness (Gucciardi, Gordon & Dimmock 2009; Bell, Hardy & Beattie 2013). Similar gains have also been found over longer intervals. In Bell, Hardy, and Beattie's (2013) longitudinal intervention involving adolescent cricketers, the experimental group was found to have significantly greater post-test coach-rated mental toughness scores (i.e., 12-month post-intervention), as compared to (a) the group's pre-test scores and (b) the control group's post-test scores. Taken together, these studies offer emerging support for the amenability of mental toughness, both over time and through intervention efforts.

The second (and perhaps strongest) factor underpinning the prominent attention that mental toughness has been given is based on the implicit associations it has with success and

superior performance outcomes. The mental toughness performance link has roots in early studies that retrospectively sampled elite and super-elite performers, such as past Olympic champions and athletes labelled as “mentally toughest” during their tenure as international performers (Jones, Hanton & Connaughton, 2002; Bull, Shambrook, James & Brook 2005). A common critique of such studies is that athletes should not be presumed to be knowledgeable or archetypical of what embodies mental toughness on the basis of the experiences they recollect or their past sporting achievements (Crust 2008). More recently, researchers have not only broadened conceptualizations and applications of mental toughness to non-elite athletes (Crust 2008; Mahoney, Gucciardi, Ntoumanis & Mallett 2014), but begun to quantifiably examine whether mental toughness is able to predict or differentiate athletes according to competitive (race times) (Gucciardi, Ntoumanis & Mallett 2014) and non-competitive performance indicators (e.g., 20 meter shuttle run test) (Gucciardi, Peeling, Ducker & Dawson 2016). However, in many studies, the reporting of performance-related MT computations form part of subsidiary results, which are not typically discussed in much detail (Crust & Azadi 2010; Meggs, Ditzfeld, & Golby). Considering mental toughness holds such a strong conceptual association with athletic performance (Crust & Keegan 2010), an empirical vagueness presently exists in this area (Crust 2008). Specifically, it is still uncertain whether mental toughness contains or is manifested in better performance, achievement, or success outcomes, or whether mental toughness is more likely reflected in non-performance factors (e.g., increasing the likelihood of positive psycho-behavioural responses to certain conditions). Therefore, it appears a prudent moment in the progression of mental toughness to reflect on the mental toughness performance relationship by synthesizing the literature in this area.

Approximately 88% of relevant studies found athletes with higher levels of MT tend to achieve more or perform better. The strength of many of these studies is the use of sport-

specific measures to objectively evaluate performance, which, compared to competitive standard, provide more direct evidence supporting the influence of mental toughness on athletic performance. However, given mental toughness applies primarily to the most critical, pressurized, or adversarial competitive situations (Cook, Crust, Littlewood, Nesti & Allen-Collinson 2014), it is surprising that only two studies have measured competitive performance indices of this kind (Cowden 2016). In both studies, there was limited support for the superior performance of mentally tougher athletes during such conditions. For example, Cowden (2016) found that mental toughness predicted one out of six performance indices during critical moments in tennis competition. Identifying the most important competitive situations that warrant mental toughness is likely more challenging in selected sports (e.g., long distance running), but if mental toughness represents the psychological attribute that differentiates the 'good' from the 'great' (Coulter, Mallett, Gucciard 2010), then scholarly attention should be directed towards identifying sport specific mental toughness moments and evaluating the performance of athletes during these moments. This includes determining the type/s of mental toughness that specific situations require.

Additionally, the mental toughness components which includes confidence, anxiety management, and concentration have all been found to positively relate to athletic performance (Durand-Bush, Salmela, & Green-Demers, 2001; Meyers, LeUnes, & Bourgeois, 1996; Smith & Christensen, 1995; Smith, Schutz, Smoll, & Ptacek, 1995). For example, Smith and Christensen (1995) assessed the psychological attributes of minor league baseball players and found that confidence and peaking under pressure were significant predictors of a pitcher's earned run average and that confidence and achievement motivation were significant predictors of a player's batting average. Mental toughness is a term often used by coaches, the media, and even athletes themselves to describe a team or athlete who overcomes a deficit or setback, performs at the peak of their abilities, shows grit and

determination, or has the personal and athletic qualities that set them apart from their competition. Indeed, mental toughness is often mentioned as one of, if not the, determining factor in any record-setting or even just winning performance.

In fact, Gould and colleagues found that 82% and 73%, respectively, of their participants (athletes, coaches, and parents) cited mental toughness as one of the most important factors for successful performance (Gould, Dieffenbach, & Moffett, 2002; Gould, Hodge, Peterson & Petlichkoff, 1987). Not surprisingly, a recent search for “mental toughness” on a sporting news website (www.yahoosports.com) revealed thousands of articles referencing it. One article explained Tiger Wood’s recent lack of success on the golf course as being due to a lack of mental toughness and not a decline in ability (Wetzel, 2010). Another article attributed a professional hockey team’s playoff victories to mental toughness (Canadian Press, 2011). Although most scholars recognize that boys and men generally exhibit greater sports interest than girls and women, some dispute this or argue that differences in observed sports behaviour do not represent differences in underlying interest (Brake, 2010; Hogshead-Makar & Zimbalist, 2007). Historical reviews of sports demonstrate that many societies had substantial female participation. For instance, in ancient Sparta, girls trained and competed in several sports, including running and wrestling (Golden, 2008; Guttman, 1991). Also, it is perceived that in Olympic sports, men and women compete in different competitive classifications, presumably because the “weaker sex” could not compete without a disadvantage compared with men (Capranica et al 2013).

Nevertheless, it appears that males have been generally more involved than females in all historical societies (Craig, 2002; Guttman, 1991, 2004; Potter, 2012). Guttman’s (1991) monograph, *Women’s Sports: A History*, is telling. It is the most comprehensive review of this topic, and the first sentence of the book states, “There has never been a time, from the dawn of our civilization to the present, when women have been as involved in sports, as

participants or spectators, as men have.” Of course, on logical grounds, we cannot be completely confident that there have not been some historical societies that showed a different pattern, but no evidence for this has turned up so far. Cross-cultural ethnographic studies of sports in small-scale societies have also documented unambiguous evidence of female sports participation. For example, in studies of North American Native Americans, there are many accounts of girls and women avidly playing double ball and shiny, both of which involve direct competition and coordinated team play (Craig, 2002; Oxendine, 1988). Nonetheless, ethnographers and anthropologists have ubiquitously focused on male sports participation, and this is apparently because of the greater frequency and societal significance of male sports (Chick, Loy, & Miracle, 1997; Roberts et al., 1959; Sipes, 1973). Many studies outside the domain of sports have reported sex differences in motivation, including competitiveness, responses to competition, and risk-taking, a correlate of competitiveness (Croson & Gneezy, 2009; Wilson & Daly, 1985). It is not surprising, therefore, that researchers have also tested for such sex differences within sports settings. Apparently, however, there has been no previous attempt to summarize this research. The current research is therefore not interested in the differences in the mental strength and sport participation of the male and female sexes rather is interested in the influence of core psychological variables on the sporting performance of female college students who can be seen to be active sport participants.

1.2 STATEMENT OF PROBLEM

Almost every athlete is interested in performing at the highest standard at the most suited competition or sporting event. This is one reason why athletes look up to sporting role models for motivation. The motivation of these athletes is thus a build-up process that begins with their perceived performances right from the training sessions to the performances during subtle and very important competitions. A gap in other researches is the focus on male

athletes without considering the gender factor in the build up to sporting performances. Although major sporting events are gender categorised, the attention given to male sporting events have led to demotivation of several female athletes such that there seem to be a decline in the general performance of female athletes. An important observation in this situation is focused to the self-perception of these athletes to include their beliefs and attitudes directed to the enactment of their personal abilities. This decline in female sporting performance could also be as a result of the inability of female participants to come through difficult challenges in their sports careers. These challenges vary from financial challenges, social support, and sexism among other barricades female athletes experience. Financial challenges of these athletes include the not having enough funds to train and enter for important competitions, it could also extend to not having enough to purchase important sporting kits such as spikes, costumes among others. Another challenge experienced by these female athletes include the lack of social support from family, friend and the social world at large. More people are pessimistic of the chance of a female athlete irrespective of the athletes' exhibition of promising features to convince them of their support. This is highly unlikely for male athletes. Lack of social supports often lead to sexist disposition from friends alike who feel the place of a female is not where a male should be. It would take a very tough female athlete to overcome these challenges. Provision of female athletes with adequate psychological boost such as reorientation of the self and provision of adequate social support will therefore improve the sporting athletes. In line with the aforementioned problems, the research therefore purports to answer the following research questions.

RESEARCH QUESTIONS

- Will there be a significant relationship between mental toughness and perceived sporting performance?

- Will there be a significant relationship between self-efficacy and perceived sporting performance?
- Does self-efficacy and mental toughness jointly or independently predict perceived sporting performance of female undergraduates?

1.3 RESEARCH OBJECTIVES

The major objective of this research is to examine the independent and joint prediction of self-efficacy and mental toughness on sporting performances of female undergraduates in Ladoke Akintola University of technology, Ogbomosho, Oyo State.

SPECIFIC OBJECTIVES

- To examine the relationship between the mental toughness and perceived sporting performance.
- To test the relationship between the self-efficacy and perceived sporting performance.
- To investigate the joint prediction of self-efficacy and mental toughness on perceived sporting performances of female undergraduates

1.4 SIGNIFICANCE OF STUDY

This research is relatively important to the field of sport psychology in provision of adequate information as to how to improve female sports performances. Sport psychologist will be able to link perceived ability of athletes and their mental strength to athletes' sport performance. The study is also relevant to professionals in the field of sport sciences to, include physiologist, trainer, scout, promoter, coach, etc. and particularly those in direct contact with female athletes through the enhancement of their knowledge on how to improve the perceived self-belief of their athletes and how to sharpen athletes mental toughness.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Bandura Self-Efficacy Theory

The theory was first postulated by Albert Bandura in 1976 and was reviewed in 1994. According to the theory, Perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave. Such beliefs produce these diverse effects through four major processes. They include cognitive, motivational, affective and selection processes. A strong sense of efficacy enhances human accomplishment and personal well-being in many ways. People with high assurance in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided. Such an efficacious outlook fosters intrinsic interest and deep engrossment in activities. They set themselves challenging goals and maintain strong commitment to them. They heighten and sustain their efforts in the face of failure. They quickly recover their sense of efficacy after failures or setbacks. They attribute failure to insufficient effort or deficient knowledge and skills which are acquirable.

They approach threatening situations with assurance that they can exercise control over them. Such an efficacious outlook produces personal accomplishments, reduces stress and lowers vulnerability to depression. In contrast, people who doubt their capabilities shy away from difficult tasks which they view as personal threats. They have low aspirations and weak commitment to the goals they choose to pursue. When faced with difficult tasks, they dwell on their personal deficiencies, on the obstacles they will encounter, and all kinds of adverse outcomes rather than concentrate on how to perform successfully. They slacken their efforts and give up quickly in the face of difficulties. They are slow to recover their sense of

efficacy following failure or setbacks. Because they view insufficient performance as deficient aptitude it does not require much failure for them to lose faith in their capabilities. They fall easy victim to stress and depression. People's beliefs about their efficacy can be developed by four main sources of influence. The most effective way of creating a strong sense of efficacy is through mastery experiences. Successes build a robust belief in one's personal efficacy. Failures undermine it, especially if failures occur before a sense of efficacy is firmly established. If people experience only easy successes they come to expect quick results and are easily discouraged by failure. A resilient sense of efficacy requires experience in overcoming obstacles through perseverant effort. Some setbacks and difficulties in human pursuits serve a useful purpose in teaching that success usually requires sustained effort.

The second way of creating and strengthening self-beliefs of efficacy is through the vicarious experiences provided by social models. Seeing people similar to oneself succeed by sustained effort raises observers' beliefs that they too possess the capabilities master comparable activities to succeed. By the same token, observing others' fail despite high effort lowers observers' judgments of their own efficacy and undermines their efforts. The impact of modelling on perceived self-efficacy is strongly influenced by perceived similarity to the models. The greater the assumed similarities the more persuasive are the models' successes and failures. If people see the models as very different from themselves their perceived self-efficacy is not much influenced by the models' behaviour and the results its produces. Modelling influences do more than provide a social standard against which to judge one's own capabilities. People seek proficient models that possess the competencies to which they aspire. Through their behaviour and expressed ways of thinking, competent models transmit knowledge and teach observers effective skills and strategies for managing environmental demands. Acquisition of better means raises perceived self-efficacy.

Social persuasion is a third way of strengthening people's beliefs that they have what it takes to succeed. People who are persuaded verbally that they possess the capabilities to master given activities are likely to mobilize greater effort and sustain it than if they harbour self-doubts and dwell on personal deficiencies when problems arise. To the extent that persuasive boosts in perceived self-efficacy lead people to try hard enough to succeed, they promote development of skills and a sense of personal efficacy.

2.1.2 Self-Determination Theory

The self-determination theory was developed by Edward Deci and Richard Ryan in 2002. Although there are quite a number of theories focused on the athletes' mental toughness, this research wishes to discuss mental toughness from the self-determination perspective. Self-determination theory is comprised of five sub-theories, one of which is particularly apt for the current study, namely basic psychological needs theory, BPNT (Deci & Ryan, 2002). In line with BPNT, the optimization of human functioning is contingent on the degree to which individuals perceive the satisfaction of three fundamental psychological needs: autonomy (the belief that one's actions are self-chosen), competence (the belief that one can bring about desired outcomes), and relatedness (the belief that one is meaningfully connected with a wider social network). This research propose that mental toughness is connected to notions that underscore BPNT as it too concerns the optimization of human functioning in performance contexts. In addition, researchers have shown that BPNT variables are predictive of behaviours or characteristics consistent with the definitional and conceptual properties of mental toughness. For example, there is evidence to support associations between psychological needs satisfaction and persistence (Pelletier, Fortier, Vallerand, & Brière, 2001), effort (Boiché, Sarrazin, Grouzet, Pelletier, & Chanal, 2008), concentration (Standage, Duda, & Ntoumanis, 2003), adaptive coping (Smith, Ntoumanis, Duda, & Vansteenkiste, 2011), and challenging-seeking (Standage et al., 2003).

Other principles detailed in BPNT are also useful for interpreting mental toughness. In particular, within BPNT, psychological needs satisfaction is dependent on the degree to which autonomy, competence, and relatedness are supported by social environments. Social environments that nurture all three psychological needs are termed autonomy-supportive (despite the title, autonomy supportive environments support all three psychological needs), whereas those that thwart psychological needs are termed controlling (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009; Deci & Ryan, 2000). Su and Reeve (2011), in their meta-analysis of the extant literature, identified autonomy-supportive environments as being characterized by the offering of choice (within boundaries), the acknowledgment of feelings or perspectives, the use of non-controlling actions and feedback, the provision of meaningful rationales, and the nurturing of individuals' inner motivational resources (curiosity, enjoyment, belonging). In comparison, controlling environments are characterized by the manipulative use of rewards, negative conditional regard, intimidation, and excessive personal control (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010). In line with previous findings (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011) and recent speculations in the literature (Gucciardi & Mallett, 2010), we propose that the provision of autonomy supportive environments may lead to the facilitation of mental toughness, whereas controlling environments may lead to the forestalment of mental toughness. Elucidating these suggestions further, previous findings show that factors believed to be responsible for the development of mental toughness share the characteristics of autonomy supportive environments. In particular, researchers (Connaughton, Wadey, Hanton, & Jones, 2008; Gucciardi, Gordon, Dimmock, & Mallett, 2009) have suggested that mental toughness development is contingent on athletes being afforded opportunities to explore and engage in tasks volitionally (e.g., self-directed learning), perceiving themselves as competent and feeling challenged during learning (e.g., being able to demonstrate skill mastery, engage

in competitive challenges), and feeling respected, cared for, and needed by those around them (e.g., positive social support, a sense of belonging). In line with BPNT, autonomy-supportive environments are key to the optimization of human functioning because of how they nurture psychological needs satisfaction, suggesting an indirect association between social environments and functioning through psychological needs satisfaction. As architects of athletes' experiences, coaches are pivotal in the provision of the social environments that may either foster (i.e., autonomy-supportive) or forestall (i.e., controlling) mental toughness. Although not explicitly focused on BPNT principles, Gucciardi et al. (2009) proposed that coaches who exhibit behaviours consistent with the notion of autonomy-supportive environments (e.g., encourage athlete input, challenge learning, promote mastery, create non-hostile social environments) were more likely to facilitate mental toughness. Gucciardi et al. (2009) also found that coaches who engage in behaviours consistent with notions of controlling environments (e.g., emphasize ego involvement) are likely to thwart mental toughness development. As articulated above, it is likely that coaching environments are associated with mental toughness indirectly, depending on the degree to which such environments nurture individuals' psychological needs. Researchers have shown that athletic performance (Gillet, Vallerand, Amoura, & Baldes, 2010), as well as positive and negative affect (Adie, Duda, & Ntoumanis, 2008) are contingent on the satisfaction of psychological needs that result from the provision of autonomy-supportive environments. Findings from related fields of psychological inquiry provides evidence demonstrating that better athletic performances, higher levels of positive affect, and lower levels of negative affect are associated with the personal characteristics consistent with mental toughness conceptualizations especially self-belief, (Caprara, Steca, Gerbino, Paciello, & Vecchio, 2006; success mindset, Elliot & McGregor, 2001; emotional awareness and regulation, Salami, 2011). Further, preliminary research has supported theoretically expected relations

between mental toughness and performance (Bell, Hardy, & Beattie, 2013; Gucciardi et al., in press), positive affect, and negative affect (Gucciardi et al., in press). Given the plausible links and preliminary evidence of relations between mental toughness and BPNT variables, performance, and both positive and negative affect, we contest a nomological network of relations that details the antecedents and outcomes of mental toughness. In particular, we propose that BPNT variables facilitate mental toughness that, in turn, results in adaptive athlete outcomes.

2.1.3 Grand Unified Theory of Sports Performance

This theory was proposed by Paul Glazier in 2015. Glazier introduced the theory by admitting that it is generally accepted that sports performance is governed by a complex interaction of variables, such as physiological fitness, psychological preparedness, physical development, biomechanical proficiency, and tactical awareness, amongst others (e.g., nutrition, genetics, general health and wellbeing, sociocultural factors, etc.). Despite sports performance being multi-factorial, however, the overwhelming trend historically has been for sports performance research to be mono disciplinary in nature that is, it has tended to be conducted within the confines of one of the sub disciplines of sports science, usually either sports physiology, sports biomechanics, or sports psychology (Abernethy et al., 2013; Burwitz, Moore, & Wilkinson, 1994).

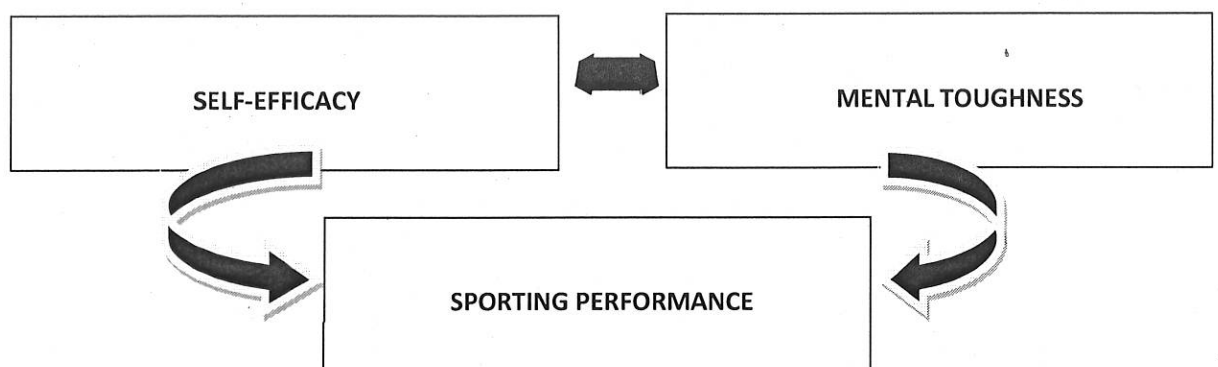
In his theory, Glazier emphasized on constraint. The concept of constraints has rich tradition in theoretical physics, evolutionary and theoretical biology, and mathematics. In movement science, constraints have emerged as a central construct in the dynamical systems theoretical approach to motor control and learning, which has evolved over the past three decades in response to perceived inadequacies with the traditional information processing theoretical approach derived from cognitive psychology and computational neuroscience (see Abernethy & Sparrow, 1992; Schmidt & Fitzpatrick, 1996; Summers, 2004). Broadly

defined, constraints are internal or external boundaries, limitations, or design features that restrict the number of possible configurations that the many DOF of a complex system can adopt (Sparrow & Newell, 1998). Constraints can have spatial or temporal components or both, they reside at all levels of analysis from microscopic to macroscopic (e.g., biochemical, neurological, behavioural, morphological, etc.), and they operate over a multitude of different timescales, from milliseconds to years (Newell, Liu, & Mayer-Kress, 2009; Newell, Mayer-Kress, & Liu, 2001). The physiological constraint that perhaps impacts directly on sports performance more than any other is fatigue. Fatigue develops when the substrates from which energy is derived for muscle contraction become depleted or when the by-products of metabolism accumulate in the active muscle. Many definitions of fatigue can be found in the extant literature (see Williams & Ratel, 2009, for a review) but one of the most widely-cited was provided by Bigland-Ritchie and Woods (1984) who defined it as "... any reduction in the force generating capacity of the total neuromuscular system regardless of the force required in any given situation" (p. 691). Most empirical investigations examining the effects of fatigue on sports performance have typically reported that it leads to decreases in the magnitude, and increases in the variability, of various indices of control (e.g., force, amplitude, velocity, acceleration, power, range of motion, etc.), which, in turn, lead to reductions in the speed, accuracy, and consistency of performance outcomes (Apriantono, Nunome, Ikegami, & Sano, 2006; Davey, Thorpe, & Williams, 2002; Higham, Pyne, Anson, & Eddy, 2012; Kellis, Katis, & Vrabas, 2006; Murray, Cook, Werner, Schlegel, & Hawkins, 2001; Rampinini, Impellizzeri, Castagna, Coutts, & Wisløff, 2009; Rota, Morel, Saboul, Rogowski, & Hautier, 2014; Russell, Benton, & Kingsley, 2011).

The psychological constraint that perhaps impacts directly on sports performance more than any other is anxiety. At any level of sports competition, anxiety can often have a profound sometimes catastrophic effect on performance. A commonly-identified antecedent

of anxiety is performance pressure created from the desire to perform at the highest possible level in situations that are perceived to be very important by the individual or team (Baumeister, 1984). Moderate to severe pressure-induced anxiety can lead to acute and dramatic declines in performance which is a phenomenon colloquially known as ‘choking’ (Hill, Hanton, Fleming, & Matthews, 2009). A variety of theories have been proposed to explain how sports performance can, and often is, affected by anxiety (see Beilock & Gray 2007) but, given most of these hypotheses (e.g., reinvestment theory by Masters, 1992; processing efficiency theory by Eysenck & Calvo, 1992) have origins in information processing theory, the focus of most research has predominantly been on establishing cognitive mechanisms (e.g., attentional processes, memory structures, etc.) with relatively little consideration given to how anxiety physically manifests in terms of its impact on the processes of coordination and control that ultimately determine sports performance (Weinberg, 1990).

2.2 CONCEPTUAL FRAMEWORK



The diagram above shows that although there is a relationship between self-efficacy and mental toughness, these two variables independently predict sporting performance of athletes.

2.3 Related Empirical Studies

2.3.1 Self- Efficacy and Sport Performance

Moritz et al (2000) examined the relationship between self-efficacy and performance in sport. Based on 45 studies (102 correlations), the average correlation between self-efficacy and sport performance was observed to be 0.38. Given the heterogeneity of findings, follow-up univariate and multivariate moderator analyses were conducted by them. Results indicated that the most important moderator was concordance, thereby highlighting the importance of matching the self-efficacy and performance measures. Additional moderators examined by them included the types of self-efficacy measures, the types of performance measures, the nature of the task, and the time of assessments. These variables accounted for approximately 44% of the variance in the self-efficacy-performance relationship.

Weinberg and Yukelson, Jackson (1980) have conducted a series of experiments testing self-efficacy prediction in a competition and found that high self-efficacy subjects persist significantly longer in an aversive muscular endurance task than low self-efficacy subjects, McAuley (1993) reported the role played by exercise self-efficacy in the maintenance of exercise participation of previously sedentary middle-aged adults 4 months after the termination of a formal exercise program. He examined the influence of self-efficacy, physiological (aerobic capacity, sex, body composition), and behavioural (past exercise frequency and intensity) parameters in the maintenance of exercise participation through correlational and multiple regression analyses. He observed that self-efficacy significantly predicted exercise behaviour at follow-up when controlling for biological and behavioural influences. Aerobic capacity, exercise efficacy, and exercise behaviour in combination were significantly related to current energy expenditure in aerobic physical activity.

Similarly McAuley and Courneys (1992) also found that more efficacious sedentary older adults reported greater positive affect during graded exercise testing than did individuals with low self-efficacy.

2.3.2 Mental Toughness and Sport Performance

Norris (1999) has emphasized the importance of mental toughness in developing champion athletes. Mental toughness is having the natural or developed psychological edge that enables you to; Generally cope better than your opponents with the many demands (e.g., competition, training, lifestyle) that are placed on you as a performer; Specifically, to be more consistent and better than your opponents in remaining determined, focused, confident, resilient, and in control under pressure (Jones et al, 2002). Mental toughness refers to a player's psychological skills that are advantageous to performance. However, what are these skills? One way to begin thinking about psychological skills is to think of a player that you admire for their on-field ability. Mental toughness is considered as one of the main characteristics contributing to athletic success (Jones et al., 2007).

Mental toughness has been defined in different ways. For example, Jones and colleagues (2002) defined mental toughness as 'Having the natural or developed psychological edge that enables you to, generally, cope better than your opponents with the many demands (competition, training, lifestyle) that sport places on a performer and, specifically, be more consistent and better than your opponents in remaining determined, focused, confident, and in control under pressure'. The important point in this definition is the epithets 'natural or developed' suggesting that mental toughness is partly influenced by genetics though it may also develop out of experience and learning (Crust & Clough, 2011). A review of the literature on mental skills reveals that mental toughness is an important psychological characteristic in sports.

The literature shows that mental toughness is necessary for achieving peak athletic performance. For example, William (1998) and Gould, Dieffenbach and Moffett (2002) reported that mental toughness was an important psychological trait in athletic performance. Several studies have addressed the relationship between mental toughness and other variables. There is evidence that mental toughness is associated with gender, age, and sporting experience (Nicholls et al, 2009), higher levels of sporting achievement (Sheard, 2010), more effective coping in testing circumstances (Kaiseler et al., 2009) and more resistance to pain (Crust & Clough, 2005).

Crust and Azadi (2010) found significant positive correlations between mental toughness and using various psychological approaches such as mental imagery and goal setting. Their findings suggest that mentally tough athletes are committed to use alternative ways beyond physical training to improve their performance.

Mattie and Munroe Chandler (2012) investigated the relationship between mental toughness and mental imagery. The results showed that mental imagery could significantly predict mental toughness in the individuals. Specifically, sophisticated motivational imagery proved to be the strongest predictor of all aspects of mental toughness. Thus, mental imagery is one of the key approaches to improve mental toughness. Several studies have investigated the relationship between mental toughness and athletic performance. Crust and Clough (2005) studied the relationship between mental toughness and physical endurance in undergraduate students. The results showed a significant positive correlation between mental toughness and the suspension time of a weight.

Kuan and Roy (2007) found that elite Wushu players had higher levels of mental toughness comparing with their non-elite counterparts. Newland and colleagues (2013) studied the relationship between mental toughness and basketball task performance. They reported that mental toughness was typically observed in hard situations. Therefore, athletes

needed higher mental toughness in competitive, pressing settings comparing with common games and daily training. Their findings suggested that there was a complicated interplay between mental toughness and performance in basketball; however, the complexity varied based on athletes' sex. In this regard, there was a poor correlation between mental toughness and basketball task performance in women but a strong relationship between the two variables in men. The researchers recommended that further studies be conducted on the relationship between mental toughness and athletic performance. We assume that mental toughness contributes to athletic performance; still, there is scarcity of research on the issue. Newland et al. (2013) contended that there was a complicated association between mental toughness and athletic performance so that there should be further studies to measure the variables more objectively.

Gucciardi et al. (2009) suggested that, although self-report measurements are important, further studies need to be conducted with objective data. The literature shows that mental toughness is a key factor in athletic success. Nevertheless, there has been scarcity of research on the effect of mental toughness on learning and performing sports tasks. Clough et al. (2002) reported that mentally tough subjects performed better on a planned cognitive task. Their interesting finding was that mentally tough subjects had consistent performance regardless of the type of feedback (positive or negative) while the subjects with low mental toughness showed deteriorated performance after receiving negative feedback. Considering the available evidence on the association between mental toughness and performance (Newland et al., 2013) and the role of mental toughness in successful athletic performance (Sheard, 2010), it is likely that mental toughness serves an important role in learning motor skills.

2.3.3 Gender Difference in Mental Toughness and Coping Capacities

Gender differences in mental toughness and coping have been found in previous studies with regard to performance (Chroni, Perkos, & Theodorakis 2007). One study found that males scored significantly higher than females on total mental toughness (Cohen's $d=0.33$), challenge, control emotions, control life and confidence ability (Chroni 2007). Research using the sports mental toughness questionnaire, found that male athletes scored significantly higher than female athletes on total mental toughness, confidence and control (Cutton & Landin 2007). In exploring the relationship between mental toughness and coping they found low to moderate correlations in 8/10 subscales of the CICS. It could be reasoned that these coping processes utilized by males may lead to differences in coping with injury compared to females.

Recent studies have found that athletes from a range of team and individual sports perceive sports injury to be a stressor (Clough et al 2002; Gould et al 2002) that requires additional coping resources. Coping has been defined as "a constantly changing cognitive and behavioural effort to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Gucciardi et al 2008). At the macro level coping strategies have been separated into two higher order dimensions. Task orientated coping refers to actions that are employed in order to change or master some aspects of an event that is perceived as stressful. This dimension includes specific coping strategies to manage a stressor such as planning and logical analysis. The second dimension, avoidance orientated coping, includes behaviour to disengage oneself from the task or social diversion onto task-irrelevant cues. It has been suggested that this coping orientation may lead to an individual suppressing some warnings of possible injury or reporting fewer injuries (Horsburgh, Schermer, Veselka, & Verno 2009). These findings suggest that higher levels of mental toughness may lead to athletes under reporting and under estimating their injuries. As

males are consistently shown to have higher mental toughness than females it could be reasoned that they employ different coping strategies. No research to date has investigated the specific coping strategies that may underlie any differences between genders in response to injury. Some studies examining gender differences in coping have implications for dealing with injury.

Research has found that female cross-country runners used less task orientated coping strategies than did their male counterparts (Johnson, Ostrow, Perna, & Etzel 1997). More recent work examining gender differences in the appraisal and coping process also used endurance athletes. Data was collected the day before and on a competitive race day for all participants. Results indicated females perceived less control and more venting of emotions on the day of the race and males reported higher usage of suppression of competing activities and lower use of instrumental social support compared to female runners. As females may have less perceived control than males, this may lead to avoidance coping being an adaptive short term strategy during injury, as this type of coping may be preferred when the individual has limited control (Jones, Hanton, & Connaughton 2002). However, no research to date has examined how the stress of time off training and competition due to injury relates to potentially different coping responses of males and females.

2.3.4 Mental Toughness and Psychological Well Being

In a longitudinal study, Gerber et al. (2013a) explored the relationships between mental toughness, perceived stress, depressive symptoms, and life satisfaction. Levels of perceived stress were assessed to provide an estimate of adverse life experiences; depressive symptoms and life satisfaction were assessed to estimate overall levels of adjustment (representing maladaptive and adaptive emotional development, respectively). In a sample of 865 students at vocational schools, both perceived stress and depressive symptoms correlated negatively with the scores on the mental toughness. Moreover, mental toughness was

positively associated with life satisfaction. The researchers also found that well-adjusted individuals (low levels of stress, few depressive symptoms, and high life satisfaction) scored high on mental toughness, whereas maladjusted individuals (high levels of stress, depressive symptoms, and little life satisfaction) tended to have lower levels of mental toughness. Resilient (moderate levels of stress at baseline, decreased depressive symptoms and increased life satisfaction at follow-up) and deteriorated (increasing levels of stress, increasing depressive symptoms, and decreasing life satisfaction) individuals did not differ at baseline but showed an increase/decline of mental toughness over time (resilient and deteriorating individuals, respectively).

In line with these findings, Gerber et al. (2013b) showed that mental toughness was associated with lower perceived stress and fewer depressive symptoms in a sample of 284 high school students and in a sample of 140 undergraduate students. They also showed that mental toughness moderated the relationship between high stress and depressive symptoms. More specifically, high levels of mental toughness were associated with lower depressive symptoms when stress levels were high. Since high levels of stress increase the risk for maladjustment and psychopathology (Grant et al., 2006), the influence of mental toughness in promoting positive adaptation is of practical relevance. The authors suggested that training mental toughness might be particularly relevant for those individuals who are typically difficult to be reached with more traditional health interventions (Gerber et al., 2013b).

Gucciardi and Jones (2012) showed small to moderate negative correlations between mental toughness and stress, anxiety, and depression in a sample of 226 cricketers. This finding was replicated by Jin and Wang (2016) in a sample of 217 international students: higher levels of mental toughness were associated with lower levels of stress, anxiety, and depression. The latter study also showed that mental toughness was associated with better life satisfaction as well as less attachment anxiety and avoidance. A statistical mediation model

that examined whether individual differences in mental toughness mediate the relationship between adult attachment and psychological distress was only partially supported: mental toughness mediated the relationship between attachment anxiety, but not attachment avoidance, and psychological distress and life satisfaction. The authors suggested that targeting mental toughness rather than attachment styles to improve well-being might be more fruitful.

To further elucidate the relationship between mental toughness and depressive symptoms, mutz et al. (2017) showed that mental toughness correlated negatively with the habitual use of expressive suppression (i.e., inhibiting emotion-expressive behaviour) in a sample of 364 adults. Furthermore, they observed a positive correlation with the habitual use of cognitive reappraisal (i.e., reinterpreting the subjective meaning of emotion-eliciting stimuli to alter the emotional response). Individual differences in cognitive reappraisal and mental toughness were negatively associated with depressive symptoms, whereas expressive suppression showed a positive correlation with depressive symptoms. A statistical mediation model provided tentative support for the hypothesis that the relationship between mental toughness and depressive symptoms is mediated by individual differences in expressive suppression. However, no evidence could be obtained that individual differences in cognitive reappraisal mediated the association between mental toughness and depressive symptoms (Mutz et al., 2017). Psychological well-being is critical for achievement and for desirable life outcomes in domains including, but not limited to, work (Daniels and Harris, 2000), education (Chow, 2007), and interpersonal relationships (Pickett-Schenk et al., 2006). On the flip side, mental health problems are associated with poor academic performance, attrition, less days devoted to study, suicidal thoughts, and disordered eating (Duane et al., 2003; Kugu et al., 2006). In a sample of 168 undergraduate students, all components of the mental toughnessq48 were found to be moderate to strong predictors of greater psychological well-

being, which encompassed six distinct factors: (1) self-acceptance, (2) personal growth, (3) purpose in life, (4) positive relations with others, (5) environmental mastery, and (6) autonomy (Stamp et al., 2015).

2.4 Hypothesis

- Self-efficacy and mental toughness will jointly predict perceived sporting performance among female undergraduates.
- There will be a positive relationship between mental toughness and perceived sporting performance.
- There will be a positive relationship between self-Efficacy and perceived sporting performance.

2.5 Operational Definition of Terms

Self-Efficacy

According to Bandura 1994, perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave. Such beliefs produce these diverse effects through four major processes. They include cognitive, motivational, affective and selection processes.

Self-efficacy in this research framework focuses on the level of belief an athlete assumes for herself to perform as the level required of her. It is a self-concept of an individual pertaining to the perception of that individual to enact his or her abilities in doing something. This will be measured using the general self-efficacy scale constructed by Ralf Schwarzer & Matthias Jerusalem. 35 and below indicated low scores on the self-efficacy scale while 50 and above indicate high scores on the self-efficacy scale. High scores in the general self-efficacy scale indicates high level of self-efficacy.

Mental Toughness

Mental toughness is the ability to perform at the upper range of one's ability regardless of the circumstances (Loehr, 1986), and may influence how that athlete responds behaviourally, emotionally, and cognitively to stressors (Fletcher, 2005).

Mental toughness in the current study is defined as the level of focus, determination and competitiveness of an athlete in the face of distractions. This will be measured using the mental toughness questionnaire designed by Heather Cherry in 2002. Score of 19 and below indicate low scores on the mental toughness questionnaire while score of 25 and above indicate high score on the mental toughness questionnaire. High scores on the mental toughness scale indicates high level of mental toughness.

Sporting Performance

Sporting performance in the present study is perception of athletes' performance during sport activities. Here emphasis is placed on the agility, energy, mental and physical balance to include physical coordination and other sporting features. This is measured using the perceived sport performance scale by Gershgoren in 2012. Score of 19 and below indicate low scores on the perceived sport performance scale while score of 25 and above indicate high score on the perceived sport performance scale. High scores on the mental toughness scale indicates high level of mental toughness. High scores in the perceived sport performance scale indicates excellent, all round sporting performance.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

This research adopts an ex-post facto research to examine after the fact analysis of the perceived sporting performance of female athletes as influenced by their level of mental toughness and their perceived self-efficacy. The study adopts the ex-post facto because there was no formal manipulation of research variables as well as the data collection procedures. The independent variables includes self-efficacy and mental toughness. While the dependent variable is the sporting performance of female athletes.

3.2 Setting and Participants

The study was carried out among female undergraduate athletes in Ladoke Akintola University of Technology, Ogbomoso in Oyo State. The participants are 283 female undergraduates with the age range of 17-30 years and the mean age of 20.88 years (SD = 2.00). In regards to religious affiliation, 196(69.3%) are Christians, 84(29.7%) are Moslems, 3(1.1%) practice traditional religion. Undergraduates were selected from 100-500 level across various departments. 82(29%) are in 100 level, 107(37.8%) are in 200 level, 77(27.2%) are in 300 level, 15(5.3%) are 400 level while 2(0.7%) are 500 level students.

3.4 Sample and Sampling Technique

Research participants are sampled using the purposive and convenient research sampling technique. The choice of female athletes is a purposive research sampling technique meaning that participants are strictly female participants. The use of convenient sampling technique involves the administration of research instrument to any female athlete found in the university sporting complex irrespective of the affiliation with a sporting event.

3.5 Research Instruments

The instrument used for the measurement of variables in this study were self-report measures pertaining to key demographic variables within the population of study and significant other variables.

3.5.1 Section A

Section A consists of items measuring socio-demographic information of the participants, such as age, religion, level, sporting department and sports role model. Actual age is given; religion was reported as Christianity, Islam and Traditional; Also, the sporting department was reported an open ended question. The athletes was also asked to provide their sports role model.

3.5.1 Section B

General Self-Efficacy (GSE) scale by Ralf Schwarzer & Matthias Jerusalem in 1995. The scale was constructed to measure in-school adolescent's self-efficacy. This scale is created to predict coping with daily hassles as well as adaptation after experiencing various kinds of stressful life events. It is a ten item standardized instrument that requires 10 minutes on average to answer the questions. Responses are made on a 4-point scale. Responses to all 10 items are summed up to yield the final composite score, with a range from 10 to 40. No recoding. In samples from 23 nations, Cronbach's alphas ranged from .76 to .90 while in this present study, the researcher reported a reliability coefficient alpha of 0.81.

3.5.2 SECTION C

Mental toughness questionnaire

The mental toughness questionnaire was developed by Heather Cherry in 2002. The scale was adopted in 2004 and was adopted from the mental toughness questionnaire and Competitive Adjective Profile (CAP) both developed by Loehr et al in 1992. The mtq is a 18 items scale measuring the inherent or developed psychological edge, which allows one to

cope better than one's opponents with the demands of competition and "be more consistent and better than one's opponents in remaining determined, focused, confident, and in control under pressure (Jones et al., 2002, p.209). This definition characterizes mental toughness as a quality that allows athletes to cope better than her/his opponent with the demands of competition, which specifically relates to the notions of resiliency and competitive desire. The definition also speaks to being better at remaining both focused and confident under pressure, which parallels the proposed components of focus and self-confidence. It is a five-point Likert scale was used to allow athletes to indicate how much they agreed or disagreed with the items in the MTQ. The reliability of the questionnaire was obtained for each components of the research instruments which did not all yield acceptable coefficients. However, a general coefficient of .78 was realised for the internal consistency of the instrument while in this present study, the researcher reported a reliably coefficient alpha of 0.91. The subscales of the questionnaire include the resilience subscale, self-confidence subscale and the competitive desire subscales. However, only the competitive desire component reached the desired level of reliability.

3.5.3 SECTION D

Perceived Personal Performance Questionnaire (PPPQ; Gershgoren, 2012). This scale was originally conceptualized as the Perceived Performance in Team Sports Questionnaire. It has been adapted to measure an individual's perception of his or her own performance during the current or previous athletic season. The only changes to the original scale were in the wording of the questions to orient each question towards the individual and not the team. The prompting question to which participants responded was stated as "During this competitive season, my team..." This prompting question was adapted to read "During this competitive season, I..." Due to these changes, the name of the scale was changed to the Perceived Personal Performance Scale, or PPPQ. An almost exact replication of the PPTSQ, the PPPQ

includes 16 items scored on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). An Exploratory Factor Analysis was conducted for the PPTSQ using 271 professional athletes (Gershgoren, 2012). This analysis supported the three separate factors of the PPTSQ. The perceived outcome scale had a .87 Cronbach α . The perceived effort investment scale was found to have a Cronbach α coefficient .85. The perceived skill execution scale constituted a Cronbach α coefficient of .90, and the Cronbach α coefficient for the entire PPTSQ was .93. With an average of 8 days between when the test was given, the test-retest reliability for the whole scale was .67 while in this present study, the researcher reported a reliably coefficient alpha of 0.93.

3.6 PROCEDURE

The research procedure started with collection of letter of introduction of the researcher by the Head of Department, Psychology department, Federal University Oye-Ekiti, Ekiti State. After this, the researcher proceeded to the field to administer the research instruments. Data were collected as the research participants were assured of the level of confidentiality of information about them during the research. Data were then analysed and presented accordingly.

3.7 STATISTICAL METHOD

Statistical information pertaining to the socio-demographics of research participants was analysed using descriptive statistics such as mean, mean deviation, standard deviation among other descriptive statistics. The first hypothesis was tested using the multiple regression statistical technique to measure the joint and independent prediction of self-efficacy and mental toughness. The second and third hypotheses were tested using Pearson Correlation coefficient.

CHAPTER FOUR

RESULTS

Hypothesis one states that Self-Efficacy and Mental toughness will jointly or independently predict perceived sporting performance among female undergraduates in Lautech. The hypothesis was tested using multiple regression analysis. The result is presented in table 4.1

Table 4.1 Multiple Regression Analysis of Sporting Performance among Female undergraduate athletes by self-efficacy and mental toughness

Variables	β	T	P	R	R^2	F	P
Mental Toughness	.157	4.082	<.05	.81	.66	272.89	<.01
Self-Efficacy	.734	19.07	<.05				

From Table 4.1, it can be observed that Self-Efficacy and Mental toughness jointly predicted perceived sporting performance among female undergraduates in Lautech $F(2, 280) = 272.89$; $p < .05$ with $R = 0.81$ $R^2 = 0.66$. This suggests that both variables jointly accounted for 66% variation in perceived sporting performance among female undergraduates in Lautech. However, independent contributions of mental toughness ($\beta = .16$; $t = 4.082$, $p < .05$) and Self-efficacy ($\beta = .734$; $t = 19.07$, $p < .05$) was significant in the joint production. Therefore, the hypothesis was confirmed.

Hypothesis two states that there will be a significant relationship between mental toughness and perceived sporting performance among female undergraduate athletes in Lautech. Hypothesis three states that there will be a significant relationship between self-efficacy and perceived sporting performance among female undergraduate athletes in Lautech. The two hypotheses were tested using the Pearson correlation coefficient. The results is presented in table 4.2 below

Table 4.2: Summary of Pearson Correlation Showing the relationship between Age, Mental toughness, Self-Efficacy and Sporting Performance.

	Age	Mental Toughness	Self-Efficacy	Sporting Performance
	Mean(SD)			
Age	20.88(2.00)	-.11	-.068	-.134
Mental Toughness	61.04(13.19)		.43**	.80*
Self-Efficacy	28.98(5.20)			.47**
Sporting Performance	27.35(7.83)			

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

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

Table 4.2 shows that there is a significant positive relationship between mental toughness and perceived sporting performance of female undergraduate athletes ($R = .80$ $p < .05$). This implies that an increase in the mental toughness of the athlete will lead to an increase in the sporting performance of the athlete. Hypothesis two is therefore accepted.

Moreover, there is a significant positive relationship between self-efficacy and sporting performance ($R = .47$ $p < .01$). This implies an increase in the self-efficacy of the athlete will lead to an increase in the perceived sporting performance of the athlete. Hypothesis three is therefore accepted.

CHAPTER FIVE

5.0 Discussion

The study found out that mental toughness and self-efficacy jointly predicts perceived sporting performance of female undergraduate athletes. The study also shows that there is a positive relationship between mental toughness and the sporting performance of female undergraduate athletes. Some researchers have also correlated mental toughness with sporting performance of athletes. For example, Kuan and Roy (2007) found that elite Wushu players had higher levels of mental toughness comparing with their non-elite counterparts. Also, Newland and colleagues (2013) studied the relationship between mental toughness and basketball task performance. They reported that mental toughness was typically observed in hard situations and therefore conclude that athletes needed higher mental toughness in competitive, pressing settings. Their findings suggested that there was a complicated interplay between mental toughness and performance in the basketball sport.

Other researchers have linked mental toughness to willingness of athletes to improve their performance by focusing on psychological aspects like mental imagery. Mental imagery is an aspect of sport performance. Crust and Azadi (2010) found significant positive correlations between mental toughness and using various psychological approaches such as mental imagery and goal setting. Their findings suggest that mentally tough athletes are committed to use alternative ways beyond physical training to improve their performance. Also, when Mattie and Munroe Chandler (2012) investigated the relationship between mental toughness and mental imagery, results showed that mental imagery could significantly predict mental toughness in the individuals. Specifically, sophisticated motivational imagery proved to be the strongest predictor of all aspects of mental toughness. Thus, mental imagery is one of the key approaches to improve mental toughness. Several studies have investigated the relationship between mental toughness and athletic performance. Crust and Clough (2005) studied the relationship between mental toughness and physical endurance in undergraduate

students and discovered that mental toughness is linked with high level of physical endurance. This is reflected in the performance of athletes in trainings and physical demanding sporting activities.

Another finding from the current study is that there is a positive relationship between self-efficacy and sporting performance of female undergraduate athletes. This assertion is supported by recent researches in the field of sport psychology. For example, Weinberg and Yukelson, Jackson (1980) have conducted a series of experiments testing self-efficacy prediction in a competition and found that high self-efficacy subjects persist significantly longer in an aversive muscular endurance task than low self-efficacy subjects, McAuley (1993) reported the role played by exercise self-efficacy in the maintenance of exercise participation of previously sedentary middle-aged adults 4 months after the termination of a formal exercise program. He examined the influence of self-efficacy, physiological (aerobic capacity, sex, body composition), and behavioural (past exercise frequency and intensity) parameters in the maintenance of exercise participation through correlational and multiple regression analyses. He observed that self-efficacy significantly predicted exercise behaviour at follow-up when controlling for biological and behavioural influences. Aerobic capacity, exercise efficacy, and exercise behaviour in combination were significantly related to current energy expenditure in aerobic physical activity. Similarly McAuley and Courneys (1992) also found that more efficacious sedentary older adults reported greater positive affect during graded exercise testing than did individuals with low self-efficacy. This shows that individuals who were aware of their abilities were able to perform in sporting events while producing significant performance irrespective of their age. While there are few studies linking sporting performance to self-efficacy, other researchers have focused on the role of self-esteem on sporting performance. For example, Ómarsson, (2013) reported results in the research which suggested that athletes who participated in individual sports scored

significantly higher on levels of self-esteem than individuals competing in team sports. Zaccaro, Peterson & Walker, (1987) suggests that the higher levels of self-esteem among individual athletes could be due to the glory being given to them individually after a sporting accomplishment, in contrast to a team sport where the achievement is shared and not quite as personal.

5.2 Conclusion

In conclusion, based on the findings of the study, it is evident that perceived sporting performance of female undergraduate athletes can be predicted from the interaction of mental toughness and self-efficacy. This means that good performances exhibited by female athletes is a result of the active combination of mental toughness and their belief in their personal abilities. Moreover, it is also evident that there are positive relationship between mental toughness of female athletes and perceived sporting performance. This implies that a positive change in the mental toughness of a female athletes leads to proportional positive change in the sporting performance of the athletes. This is similar to the fact that there is a positive relationship between self-efficacy and sporting performance of female athletes, meaning that once a female athletes increase the belief in her personal ability, it should lead to an increase in the perceived sporting performance of the female athletes.

5.3 Recommendation

Based on the findings of the study, it is recommended that female athletes should review their personal abilities and then should be encouraged to believe they can do better. Self-efficacy is functional when athletes are aware of their abilities and believe in themselves to do better. As a result, athletes should keep constant check on their best performance especially in training sessions which could be exhibited in major sporting competitions.

As a matter of fact, each female athletes should have a mental fitness trainer that observes their mental strength before participating and during participation of any sporting

performance of an athletes. This should include training observations. Through this, the mental toughness of athletes is improved upon.

5.4 Limitation of Study

Although the inferences from the research is applicable to both male and female athletes, the research focus is on female athletes which is a limitation to the present study. Moreover, the research did not collect data from professional athletes rather, data was obtained from undergraduate athletes. The research is also limited in making inference especially in terms of research setting.

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FEDERAL UNIVERSITY OYE-EKITI
DEPARTMENT OF PSYCHOLOGY
QUESTIONNAIRE

INFORMED CONSENT FORM

This study is being conducted by Awogbade Busayo an Undergraduate student of Federal University Oye-Ekiti; Ekiti. The study is self-sponsored as part fulfillment of the award of B.Sc. Psychology. I am conducting a research on the field of sports and psychology. Please note your answers will be confidential and will not be made available to anyone else. Result obtained from this result will be made available to authorities for prompt intervention. Your honest answers will be highly appreciated.

Consent: now that the study has been well explained to me and I fully understand the consent of the study process. I will be willing to take part in the study.

.....
 Signature/thumbprint of participant/ date

.....
 signature of interviewer/date

SECTION A

Sex: Male () Female () Age

Level Department:

Religious Affiliations: Christianity () Islam () Traditional ()

What sports do you participate in?

SECTION B:

These are items that relates to how you feel about yourself in various circumstance. Please indicate how true you handle these various situations by choosing from the following options

Not True	Hardly True	Partially True	Exactly True
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		Not true	Hardly true	Partially true	Exactly true
1	I can always manage to solve difficult problems if I try hard enough				
2	If someone opposes me, I can find the means and ways to get what I want.				
3	It is easy for me to stick to my aims and accomplish my goals.				
4	I am confident that I could deal efficiently with unexpected events.				
5	Thanks to my resourcefulness, I know how to handle unforeseen situations.				
6	I can solve most problems if I invest the necessary effort.				
7	I can remain calm when facing difficulties because I can rely on my coping abilities.				
8	When I am confronted with a problem, I can usually find several solutions.				
9	If I am in trouble, I can usually think of a solution				

10	I can usually handle whatever comes my way.				
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SECTION C:

Instructions: The statements below are concerned with how you feel about yourself. Please use the given scale to indicate the extent to which you agree or disagree with each statement. SA= Strongly Agree A= Agree N= neither Disagree nor Agree D= Disagree SD= Strongly Disagree.

		SA	A	N	D	SD
1	I get distracted and lose focus in competition.					
2	I feel positive about my abilities in competition.					
3	I feel in control of my performance.					
4	I really enjoy the thrill of competition.					
5	My mind wanders during competition.					
6	If I compete up to my potential, I believe that I will be successful.					
7	Making mistakes does not get me down.					
8	I am completely concentrated on the task at hand					
9	I always fight to win every minute of competition.					
10	I feel as though I can handle criticism well and use it to my advantage.					
11	I bounce back from setbacks and do not get too discouraged.					
12	Once I lose my cool in competition, it is hard for me to get it back quickly.					
13	I have a strong desire to compete, perform well, and win.					
14	I feel as though my skills as an athlete will allow for success at the collegiate level.					
15	As I perform, I am able to block out my own worries and fears.					
16	Even if I start out with some mistakes, I normally finish strong in the end.					
17	I block out the crowd and all other distractions in competition.					
18	I always give my best effort in competition.					

SECTION D:

Please read the following statements, which pertain to your performance during this or last season, and rank each on a scale ranging from SA= Strongly Agree A= Agree N= neither

Disagree nor Agree D= Disagree SD= Strongly Disagree. Please consider your personal response, independent from the team.

During this competitive season, I... Was

S/N		SA	A	N	D	SD
1	able to overcome obstacles on the field/court/ice					
2	Performed energetically					
3	Coordinated my movements well					
4	Worked as hard as possible on the field/court/ice					
5	Used my abilities to their maximal potential					
6	Fully presented my tactical abilities during competitions					
7	Worked as hard as possible in practice					
8	Competed skilfully to my potential					

Busayo Project Results Frequencies

Statistics

		SEX	LEVEL	DEPARTMENT	RELIGIOUS	SPORT
N	Valid	283	283	283	283	283
	Missing	0	0	0	0	0

Frequency Table

SEX

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	283	100.0	100.0	100.0

LEVEL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	100 Level	82	29.0	29.0	29.0
	200 Level	107	37.8	37.8	66.8
	300 Level	77	27.2	27.2	94.0
	400 Level	15	5.3	5.3	99.3
	500 Level	2	.7	.7	100.0
	Total	283	100.0	100.0	

DEPARTMENT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Macrobiology	17	6.0	6.0	6.0
	Maths	12	4.2	4.2	10.2
	Psychology	25	8.8	8.8	19.1
	Geology	16	5.7	5.7	24.7
	Accounting	10	3.5	3.5	28.3
	English Education	1	.4	.4	28.6
	Sociology	15	5.3	5.3	33.9

Biochemistry	19	6.7	6.7	40.6
Geophysics	7	2.5	2.5	43.1
French	6	2.1	2.1	45.2
Mass Com	40	14.1	14.1	59.4
Computer Science	9	3.2	3.2	62.5
English Language	10	3.5	3.5	66.1
Banking and Finance	2	.7	.7	66.8
Chemistry	1	.4	.4	67.1
Political Science	10	3.5	3.5	70.7
Economics	8	2.8	2.8	73.5
Linguistics	6	2.1	2.1	75.6
Criminology	7	2.5	2.5	78.1
Maths Education	2	.7	.7	78.8
Agric Science	2	.7	.7	79.5
TMA	4	1.4	1.4	80.9
Civil Engineering	2	.7	.7	81.6
Plant Science and Technology	2	.7	.7	82.3
Fishery and Agric	1	.4	.4	82.7
Education Management	2	.7	.7	83.4
Crop Science and Horticulture	1	.4	.4	83.7
Peace and Conflict	3	1.1	1.1	84.8
Chemistry Education	4	1.4	1.4	86.2
Public Admin	3	1.1	1.1	87.3
CRS	1	.4	.4	87.6
Industrial Chemistry	7	2.5	2.5	90.1
DSS	6	2.1	2.1	92.2
Buss Education	1	.4	.4	92.6
Buss Admin	5	1.8	1.8	94.3
History and International Relations	3	1.1	1.1	95.4
Food Science and Tech	1	.4	.4	95.8
Soil Science	1	.4	.4	96.1
Agric Education	2	.7	.7	96.8
Bio Education	3	1.1	1.1	97.9
HIS	1	.4	.4	98.2
Physics	3	1.1	1.1	99.3
ICH	2	.7	.7	100.0
Total	283	100.0	100.0	

RELIGIOUS

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Christianity	196	69.3	69.3
	Islam	84	29.7	98.9
	Traditional	3	1.1	100.0
	Total	283	100.0	100.0

SPORT

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Volley	48	17.0	17.0
	Basket	58	20.5	37.5
	Tennis	24	8.5	45.9
	Football	63	22.3	68.2
	Baseball	13	4.6	72.8
	Running	26	9.2	82.0
	Swimming	17	6.0	88.0
	Badminton	9	3.2	91.2
	Short Put	8	2.8	94.0
	Skipping	2	.7	94.7
	Wrestling	2	.7	95.4
	Discuss	2	.7	96.1
	High Jump	5	1.8	97.9
	Javeling	4	1.4	99.3
	Hockey	1	.4	99.6
	16	1	.4	100.0
	Total	283	100.0	100.0

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	283	17	30	20.88	1.995
Valid N (listwise)	283				

Reliability for Self-efficacy Scale

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	282	99.6
	Excluded ^a	1	.4
	Total	283	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.807	10

Item Statistics

	Mean	Std. Deviation	N
SELF1	3.02	.845	282
SELF2	2.90	.769	282
SELF3	2.95	.899	282
SELF4	2.82	.826	282
SELF5	2.69	.873	282
SELF6	2.96	.882	282
SELF7	2.77	.919	282
SELF8	2.87	.885	282
SELF9	3.02	.796	282
SELF10	3.03	.786	282

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SELF1	26.01	21.576	.516	.786
SELF2	26.14	22.354	.468	.792
SELF3	26.09	21.359	.503	.787
SELF4	26.22	22.305	.431	.795
SELF5	26.34	22.070	.429	.796
SELF6	26.07	21.350	.518	.786
SELF7	26.26	22.095	.394	.801
SELF8	26.17	21.200	.535	.784
SELF9	26.01	21.687	.544	.783
SELF10	26.01	22.000	.506	.788

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
29.04	26.347	5.133	10

Reliability for Mental Toughness Scale

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	283	100.0
	Excluded ^a	0	.0
	Total	283	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.913	18

Item Statistics

	Mean	Std. Deviation	N
MENTAL1	3.01	1.281	283
MENTAL2	3.58	1.043	283
MENTAL3	3.55	1.085	283
MENTAL4	3.42	1.147	283
MENTAL5	3.10	1.117	283
MENTAL6	3.61	1.163	283
MENTAL7	3.34	1.153	283
MENTAL8	3.50	1.134	283
MENTAL9	3.37	1.145	283
MENTAL10	3.36	1.103	283
MENTAL11	3.48	1.121	283
MENTAL12	3.09	1.213	283
MENTAL13	3.53	1.177	283
MENTAL14	3.40	1.179	283
MENTAL15	3.37	1.191	283
MENTAL16	3.45	1.143	283
MENTAL17	3.37	1.142	283
MENTAL18	3.53	1.233	283

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
MENTAL1	58.03	173.861	-.044	.926
MENTAL2	57.46	154.753	.700	.905
MENTAL3	57.49	153.435	.722	.904
MENTAL4	57.62	154.853	.625	.907
MENTAL5	57.94	161.206	.407	.912
MENTAL6	57.43	154.225	.638	.906
MENTAL7	57.71	156.953	.544	.909
MENTAL8	57.54	154.526	.645	.906
MENTAL9	57.67	155.993	.584	.908
MENTAL10	57.68	156.246	.600	.907
MENTAL11	57.56	155.822	.605	.907
MENTAL12	57.95	160.363	.396	.913
MENTAL13	57.52	152.314	.699	.905
MENTAL14	57.64	153.691	.648	.906
MENTAL15	57.67	153.000	.665	.906
MENTAL16	57.59	152.846	.703	.905
MENTAL17	57.67	153.675	.672	.905
MENTAL18	57.52	150.456	.729	.904

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
61.04	174.012	13.191	18

**Reliability for Sporting Performance Scale
Scale: ALL VARIABLES**

Case Processing Summary

		N	%
Cases	Valid	283	100.0
	Excluded ^a	0	.0
	Total	283	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.929	8

Item Statistics

	Mean	Std. Deviation	N
SPORT1	3.64	1.047	283
SPORT2	3.47	1.146	283
SPORT3	3.34	1.208	283
SPORT4	3.44	1.229	283
SPORT5	3.36	1.323	283
SPORT6	3.33	1.180	283
SPORT7	3.44	1.179	283
SPORT8	3.34	1.251	283

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SPORT1	23.71	49.687	.711	.923
SPORT2	23.89	47.789	.768	.919
SPORT3	24.01	47.298	.754	.920
SPORT4	23.91	46.974	.760	.919
SPORT5	23.99	46.652	.713	.923
SPORT6	24.02	47.464	.764	.919
SPORT7	23.92	47.177	.785	.917
SPORT8	24.01	46.106	.801	.916

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
27.35	61.279	7.828	8

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
AGE	20.88	1.995	283
LEVEL	2.11	.910	283
SelfEfficacy	28.9823	5.20124	283
MentalToughness	61.0424	13.19138	283
SportingPerformance	27.3534	7.82809	283

Correlations

		AGE	LEVEL	SelfEfficacy	MentalToughness	SportingPerformance
AGE	Pearson Correlation	1	.476**	-.068	-.106	-.134*
	Sig. (2-tailed)		.000	.253	.075	.024
	N	283	283	283	283	283
LEVEL	Pearson Correlation	.476**	1	-.085	-.090	-.163**
	Sig. (2-tailed)	.000		.154	.131	.006
	N	283	283	283	283	283
SelfEfficacy	Pearson Correlation	-.068	-.085	1	.426**	.470**
	Sig. (2-tailed)	.253	.154		.000	.000
	N	283	283	283	283	283
MentalToughness	Pearson Correlation	-.106	-.090	.426**	1	.800**
	Sig. (2-tailed)	.075	.131	.000		.000
	N	283	283	283	283	283
SportingPerformance	Pearson Correlation	-.134*	-.163**	.470**	.800**	1
	Sig. (2-tailed)	.024	.006	.000	.000	
	N	283	283	283	283	283

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

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

Regression for Hypothesis One

Variables Entered/Removed^a

Variables Entered	Variables Removed	Method
MentalToughness, SelfEfficacy ^b		Enter

a. Dependent Variable: SportingPerformance

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.813 ^a	.661	.659	4.57454

a. Predictors: (Constant), MentalToughness, SelfEfficacy

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression 11421.258	2	5710.629	272.890	.000 ^b
	Residual 5859.407	280	20.926		
	Total 17280.664	282			

a. Dependent Variable: SportingPerformance

b. Predictors: (Constant), MentalToughness, SelfEfficacy

Model	Unstandardized Coefficients		Standardized Coefficients ^a		t	Sig.
	B	Std. Error	Beta			
(Constant)	-6.069	1.685			-3.602	.000
SelfEfficacy	.236	.058	.157		4.082	.000
MentalToughness	.435	.023	.734		19.070	.000

a. Dependent Variable: SportingPerformance

T-Test for Hypothesis Two

Group Statistics

AGE	N	Mean	Std. Deviation	Std. Error Mean
Older	153	26.6078	7.93911	.64184

Younger	130	28.2308	7.63259	.66942
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Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means									
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference				
								Lower	Upper			
Spo rtin gPe rfor ma nce	.196	.658	-1.744	281	.082	-1.62293	.93039	-3.45434	.20849			
Equal variances assumed												
Equal variances not assumed			-1.750	276.723	.081	-1.62293	.92741	-3.44859	.20274			