UNIVERSITY OF KWAZULU-NATAL

TERTIARY STUDENTS' ESTIMATES OF THEIRS AND THEIR RELATIVES' MULTIPLE AND OVERALL INTELLIGENCES: A CROSS-NATIONAL STUDY OF NIGERIAN AND SOUTH AFRICAN STUDENTS.

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A dissertation submitted in partial fulfilment of the requirements for the degree of Master of Social Science (Educational Psychology) in the school of Psychology, University of KwaZulu-Natal, Pietermaritzburg, South Africa.

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DECLARATION

I, Kikelomo Adebukola Adewusi hereby declare that the work is the author's original work and that all sources have been accurately reported and acknowledged, and that this report has not been previously in its entirety or is been submitted at any University in order to obtain an academic qualification.

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K.A. Adewusi

March, 2011

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ABSTRACT

A sample of five hundred and three (503) University of KwaZulu-Natal students participated in this study, which investigated Black Nigerian and South African tertiary students' estimates of theirs and their relatives' multiple and overall intelligences. Participants' ages ranged from 18- 44 years. The sample included both undergraduate and postgraduate students. The aim of the study was to investigate black students' perceptions of theirs and their relatives' multiple intelligences, using the theory of multiple intelligences developed by Gardner (1983). Participants were asked to rate their own overall estimates of intelligence as well as their relatives. Results show significant differences in nationalities with Nigerians rating themselves and their relatives higher on almost all components of multiple intelligences compared to South Africans. A comparison of males and females using only the South African sample showed no noted differences in self ratings, except for bodily-kinaesthetic and intrapersonal intelligences. These results are discussed in relation to the literature.

CHAPTER 1

INTRODUCTION

Background and outline of Research problems

The way people define and measure intelligence varies according to culture, gender and race (Beloff, 1992; Deary, 2001; Eysenck, 1998; Furnham, 2000a, 2000b; Furnham, Clark, & Bailey, 1999; Sternberg, 1990). This has generated controversies among different scholars and theorists. Furnham (2001) argues that in academic settings, there have been lots of popular published reports about intelligence. These include: single entity or general (g) factor - a general factor of intelligence that underlies all individual's adaptive behaviour (Eysenck, 1998); estimation of intelligence quotient (IQ) - a measure of how able an individual is on a particular task (Foxcroft & Roodt, 2003) and lay people's perceptions of intelligence – individuals' personal views on what intelligence is (Furnham, 2000).

The debates and controversies concerning what constitute intelligence are numerous (Eysenck, 1998; Gardner, 1983, 1999; Foxcroft & Roodt, 2003; Furnham, 2000, 2001; Sternberg, 1990, 2000), but the most common are the idea of a general factor of intelligence and that of multiple factors of intelligences which this study aims to analyse. These debates and controversies on what constitute intelligence have also motivated various writers to create more informed knowledge and awareness about the topic (Beloff, 1992; Byrd & Stacey, 1993; Furnham, 2000a, 2000b, 2001; Furnham & Baguma 1999; Furnham & Mkhize, 2003).

Different approaches have been used to define what constitutes intelligence. For example, researchers in this regard have studied and established differences in the estimates of intelligence between different individuals, such as: parents and their children; parents and teachers; and among people from Africa, America, Asia, and Europe (Furnham & Baguma 1999; Furnham, Crawshaw, Rawles & Spencer-Bowdage, 2003; Furnham & Mkhize, 2003; Furnham, Reeves & Budhani 2002; Furnham & Ward 2001). Their findings focus on lay people's definitions of intelligence, as opposed to professional

definitions of the construct – assumptions of psychologists and other researchers based on data collected from people performing tasks that are assumed to measure intellectual functioning (Sternberg, 1990).

Pomerantz and Ruble (1998) analyzed the implications of perceptions in social and educational settings, and found out that perceptions affect individuals' expectations and evaluation which through various processes can affect performance. In addition, Beyer (1999) has indicated that differences in perception of intelligence vary between genders. Beyer's (1999) study shows that gender differences on self perceptions are out of touch with reality and may impede effective self regulation and goal setting in academic, professional and interpersonal situations.

African culture is generally perceived to be collective and it is possible that not only the estimates of intelligence would differ, but African conceptions and understanding of the construct itself. Studies show that lay people's perceptions are very powerful in that they have the potential to direct and shape behaviour that would gear towards social and educational implications (Furnham, 2000; 2001). For example, if an individual or a cultural group believes that he or she is more or less intelligent in comparisons to another individual or group, then it is more likely for that individual to see oneself as inferior or superior to the other group (Furnham, 2000).

Cross cultural studies on perceptions of intelligence show that what constitute intelligence varies across cultures, with significant disparities between different cultural groups, such as western and non- western cultures (Ruzgis & Grigorenko, 1994; Yang & Sternberg, 1997). In non-Western cultures such as African culture, people have been found to favour social competence and interconnection with others as important to what constitutes intelligence, whereas Western cultures tend to see the self as independent and autonomous of other individuals and emphasize on logical competence (Sternberg, 2000). However, it is expected that individuals will define and measure intelligence according to their belief systems across different cultural groups.

This study was conducted using a questionnaire as a measurement instrument on self estimates of IQ ratings; the rationale behind this study is to demonstrate the importance of self-perception in shaping individual's future outcomes on the way intelligences are

perceived and represented among different gender and cultural groups. This study compares two African nationalities within the University of KwaZulu-Natal (UKZN), that is, black Nigerian and black South African students. The study investigates the participants' estimates of their own intelligences, as well as the estimated intelligences of their male and female relatives. Literature reviews have shown that limited studies have been conducted on comparative studies on multiple intelligences among Africans, especially when compared to studies done on Western countries (Furnham & Akande, 2004). For this reason, the researcher felt that it would be worthwhile to analyse self-estimated perceptions of intelligence by first having a sound knowledge of how Nigerians perceive intelligence, and then by comparing these self- estimates with any other African country, such as black South Africans. This study uses the ideas and studies done by Adrian Furnham and his colleagues across the continent on self-estimates of perceptions of intelligence using the approach of the seven factors of multiple intelligences by Gardner (1983).

Gardner (1983) gives a much broader look at the theory of multiple intelligences. Gardner perceived multiple intelligences as what it means to be smart / intelligent. Instead of believing that there is only one way to be intelligent, Gardner believes that intelligence is not just one underlying mental capacity, rather a variety of intelligences, working in combination that are needed to explain how human beings take on such diverse roles in life. For example, a person can be an accountant, can sing well, and may still have passion for creative art.

Gardner (1983) then proposes the seven multiple intelligences, namely:
- Verbal / linguistic intelligence - the ability to use words.
- Logical / mathematical - ability to reason logically and solve number problems.
- Spatial intelligence - ability to find ones' way around the environment, and form mental images.
- Musical intelligence - ability to perceive, create pitch and rhythm patterns.
- Bodily-kinaesthetic intelligence - ability to carry out motor movement e.g. being a surgeon or a dancer.
- Interpersonal intelligence - ability to understand other people.

- Intrapersonal intelligence - ability to understand oneself and develop a sense of one's own identity.
- Gardner (1999) later included the eighth intelligence - Naturalistic intelligence (ability to connect activities to the world around us, bring natural objects to use in craft and tell descriptive stories of nature). However, for the purpose of this study, the first seven factors of multiple intelligences were adopted.

Research aims and objectives

This study seeks to contribute to the debate and controversies on lay people's perceptions of intelligence and how they may be employed as constructs for the understanding of other cultural groups. The study engages this by:

- Examining students' estimates of their multiple intelligences and the multiple intelligences of their male and female family members.
- Determining whether there is a 'gender' effect in self-estimates of multiple intelligences for both South African and Nigerian participants.
- Analyzing if there is a 'cultural' or 'nationality' effect in participants' estimates of their own multiple intelligences.
- And examining if there is any interaction effect/s (Gender of Self, Nationality, Gender of Others) that may exist in the way participants estimate their multiple intelligences and those of their relatives.

Research problems and key questions

It is conceptualized that different individuals, groups, cultures, or genders perceive intelligence differently. It would be worthwhile to confirm this hypothesis through these groups' behaviour and their perceptions in the way the groups respond to questions on the measures and definitions of intelligence. Core questions for this study include the following:

- Do male and female students differ in their estimates of their own multiple and overall intelligences?
- Is there a gender effect (differences or disparities) as far as the students' estimates of the multiple intelligences of their male and female relatives are concerned?

- Do Black South African and Black Nigerian students differ in the way they estimate their multiple intelligences?
- Is there a 'cultural' or 'cross-nation' effect on the perception of multiple intelligences?

Hypotheses

The study investigated the following hypotheses:

Hypothesis 1

H_0: There is a gender effect in the self-ratings of mathematical and spatial intelligence; with male students rating themselves higher, and female students giving themselves lower ratings.

H_1: There is no gender effect in self- ratings of mathematical and spatial intelligence; with male students giving themselves lower ratings.

Hypothesis 2

H_0: There are cultural (nationality) differences in self-estimates of intelligence between Black Nigerian and Black South African students.

H_1: There are no cultural (nationality) differences in self-estimates of intelligence between Black Nigerian and Black South African students.

Rationale

It is an important issue to examine perceptions of intelligence cross-culturally due to the social importance of the concept in different cultures (Furnham & Baguma, 1999; Furnham, Callahan & Akande, 2004; Furnham, Hosoe & Tang 2001). To test the robustness of the findings of perceptions of intelligence across cultures, Adrian Furnham and colleagues have completed various cross-cultural comparative studies of self-estimated multiple intelligences. Data have been collected from the United States, Asia (China, Hong Kong, Japan, and Singapore), Europe (Belgium, Germany, Portugal, Slovakia, and United Kingdom) and the Middle East (Iran). Studies show that fewer studies had been done in the African continent, as far as various cultural groups' conceptions and perceptions of intelligence are concerned (Furnham & Akande, 2003,

2004; Furnham, Callahan & Akande, 2004). This makes a study on the Africa continent a relevant research endeavour.

This study examines Nigerian and South African students' self-estimates (perceptions) of theirs and their relatives' multiple intelligences. This study is unique in the sense that there has been few or no emphasis with respect to self-estimated intelligence between West Africans and South Africans within a tertiary institution. This makes the focus of this study relevant, as many comparative studies have not studied different populations within the same community settings and possibly similar cultural backgrounds. For example, Furnham, Callahan and Akande (2003; 2004) studied self- estimates of intelligence in three different African counties (Zambia, Namibia and Zimbabwe). Furnham and Akande (2004) also compared self-estimates/perceptions of multiple intelligences among students from University of Ibadan in Nigeria and among white and black South African students in South Africa.

Other studies that have also looked at self estimates of multiple intelligences compare and analyse intelligence within the same population, but within different cultural backgrounds. For example, Furnham, Mkhize and Mnadaweni (2004) investigated black South African and Indian South African parents' estimates of their own and children's intelligences.

Furnham (2001) argues that studying self estimates/perceptions of intelligence and that of relatives is considered interesting due to the drastic increase in actual intelligence from different generations in the past 50 years. Thus, it is concluded that the increase in intelligence across different generations may be heightened by education in many countries, due to each generation becoming better and more educated than the previous generation.

Studies (such as Beloff, 1992; Furnham, 2000; Furnham, Hosoe & Tang, 2002), have also shown that when asking males and females to estimate the intelligence of their parents, it is possible to investigate whether the 'male hubris and female humility' findings -cultural or societal demand or expectations for dominance and modesty among male and female in their mental or cognitive ratings (Beloff, 1992), on self-estimates extend to others of the same gender as well as those of different gender or whether self-estimates are

somehow different. In this regard, it is perceived that if men believe their fathers are brighter than their mothers, this may be seen as good evidence for gender stereotypes (Beloff, 1992) and it may be worthwhile to explore the perceptions of females to discover if their noted self-deprecation and humility - the societal representations on the way females think, behave and see themselves in comparison to their male counterpart (Beloff, 1992)- holds across different cultural settings.

On this note, research on IQ estimates have suggested that the male-favouring difference extends to estimates of relatives, with fathers and sons being perceived as more intelligent than mothers and daughters respectively (Beloff, 1992; Furnham, 2000, 2001; Furnham, Hosoe &, 2002). This study looks at self-estimates of the participants and their relatives; it does not look at participants' definitions of intelligence per se. Its main focus is on people's estimates of their multiple intelligences and the multiple intelligences of their male and female family members.

Whilst ability assessment across cultures is difficult to measure without running into controversial validity issues amongst others (Greenfield, 1997), Sternberg and Berg's (1992) studies on laypeople's perceptions of intelligence show that the degree at which an intelligent person is represented differs across different backgrounds and cultural groups. It may be interesting to research on self estimates using factors of multiple intelligences among two African student groups in order to analyze if any cultural and gender differences occur in the way these groups perceive intelligence and intelligent individuals as was previously reported in Adrian Furnham and colleagues' studies.

There is no major rationale for choosing participants from black Nigerian and South African students, but the motive behind this decision is mainly because studies have shown that there are gaps in estimates/perceptions of intelligence within the African continent (Furnham & Akande, 2004). Therefore the researcher felt that it may be worthwhile to research within her own cultural background in other to gain a broader insight into how students from her own cultural group perceive intelligence to be.
 The researcher is a student from the University of KwaZulu- Natal and a member of Nigerians in Diaspora (a union of Nigerians living and studying abroad), hence accessibility of both the participants from Nigeria and South Africa is convenient and this study is also within the researcher's reach. The possible limitation of this study thus lies

in the fact that it does not have a qualitative dimension looking at cultural constructions of intelligence.

OUTLINE OF THESIS

Chapter 1 (Background and the outline of the research): This chapter discusses the background information on the concept of intelligence, different controversies surrounding the construct, research aims and objectives, research problems and the rationale of the study.

Chapter 2 (Literature review): This chapter reviews different literatures on the meaning and different approaches used to define intelligence by lay people and professionals. Studies show that there are different approaches to intelligence (Furnham, 1999; Gardner, 1983). This chapter also discusses different theories of intelligence; the general (g) factor of intelligence, Thurstones' multiple factors, Stenberg triarchic theory of intelligence and Gardner's multiple intelligences. Studies show that among these theories of intelligence, there are two commonly used theories, such as: the general (g) factor theory and the theory of multiple intelligences (Furnham, 1999; Owen, 1998). This chapter also looks at previous studies on how gender and gender stereotypes have been constructed on multiple intelligences, and the different cross-cultural perceptions on estimates of multiple intelligences.

Chapter 3 (Methodology): This chapter discusses the research approach adopted by the researcher. This study used a quantitative approach and participants had to rate themselves and their families on a scale of seven multiple intelligences designed by Gardner (1983). This rating scale allowed the participants to give an estimate of theirs and their family members' overall intelligence. This chapter also discusses some methodological issues relating to this study, such as the research design, the validity and reliability of the instrument used, the issue of ethical consideration and the challenges faced.

Chapter 4 (Data Analysis): This chapter presents the result derived from the analysis of the questionnaires filled in by the participants. This is achieved by grouping the data obtained using statistical analysis to analyse participants' self-estimates of the multiple intelligences, followed by an analysis of their family members estimates on gender and nationality effects. The results of these analyses are presented in Data analysis section.

Chapter 5 (Discussions on findings and Conclusion): This chapter discusses the likely explanations of the results obtained. The nationality significant differences obtained between black South African and black Nigerian male participants may be as a result of the Nigerian participants building confidence on their intelligences due to their longer independent periods and exposure to Western education longer than their South African counterparts, as well as the effect of Bantu education during the Apartheid regime on South African students may impact on the way they respond to the questions of intelligence. This chapter also tackles the implications of this study for future research, implications for the theory and the limitations of this study.

CHAPTER 2

LITERATURE REVIEW

The construct of intelligence remains controversial for lay people, professionals and researchers alike. Gardner (1999) argues that there is no single agreed definition of intelligence, especially when lay people are asked to estimate perceptions of their intelligences as well as their relatives'. Thus, definitions of intelligence largely depend upon whom one asks. Studies have shown that intelligence is rather a complex construct that is defined differently by different people for different purposes (Ruzgis & Grigorenko, 1994; Sternberg & Gardner, 1982). Hence, intelligence as a construct has been investigated throughout the years, the search into what constitutes intelligence dates back to the 18th century, and today there has been little consensus reached on the definition (Foxcroft & Roodt, 2003).

This chapter begins by highlighting different approaches used to define intelligence from different schools of thought (the traditional meaning of intelligence, general and specific factors of intelligence, multiple factors of intelligence, triarchic theory of intelligence and multiple intelligences). Although, this study's main focus is on people's estimates of their multiple intelligences and the multiple intelligences of their male and female family members, analyzing the diverse approaches to intelligence, will give a broader meaning on the construct of intelligence and highlight the controversies surrounding the construct.

This chapter further looks at lay people' perception of intelligence from different studies, it also looks at gender in relation to multiple intelligences from a host of different literatures on gender differences in relations to their estimated abilities. This will facilitate the findings regarding the topic.

This chapter also touches on gender stereotypes - generalization about an individual or a group of people on how intelligent male and female are been constructed across different cultures (Franzoi, 1996). Lastly, this chapter looks at the conceptualizations of intelligence both in Western and non- Western cultures. For example, this study explores the concept of intelligence across African cultures. This chapter also analyses the cross-cultural perceptive using multiple intelligences across different cultural groups. Overall,

this chapter aims to highlight the gap that currently exists in the field of intelligence perceptions across different culture.

Traditional meaning / approaches to intelligence

Since intelligence has been defined in many ways and by different authors (Foxcroft & Roodt, 2003; Gardner, 1983, 1999; Gardner, Kornhaber & Wake, 1996; Shaffer, 2002; Sternberg, 1985; 1990), major approaches have emerged with regards to the definitions of intelligence. These approaches are largely seen as where individual's perception of intelligence stemmed from. They include: *biological approaches* (Gardner, 1999; Gardner, Kornhaber & Wake, 1996; Shaffer, 2002; Foxcroft & Roodt, 2003), *integrated approaches* (Gardner, Kornhaber & Wake, 1996; Sternberg, 2000) *psychometric approaches* (Foxcroft & Roodt, 2003) and *ecological* approaches (Stenberg, 1985, 1990). These approaches' assumptions and critiques are explained below:

Biological approach

Biological perceptions of intelligence focus on the physical aspect and functioning of the brain, which can be measured objectively (Foxcroft & Roodt, 2003). For example, the measurement of reaction times to physical stimuli. This approach to intelligence was one of the first recorded approaches from Darwin's Evolutionary theory. Darwin's approach focuses on a physical structure and functioning of the brain, which can be measured objectively. This involves a much more sophisticated method than those used in the early measurement laboratories; it assumes that people have innate tendencies that enable them to adapt to their environment for survival (Foxcroft & Roodt, 2003; Shaffer, 2002).

Gardner (1983; 1999) criticised the biological approach to intelligence on the basis of its assumption that intelligence is hereditary and that the environment and the individual do not have a shared relationship. Gardner argued that environmental aspects such as one's socio- economic status, the educational background, societal values and norms are perceived as not playing a role in the individual's cognitive development. In this case, other studies have shown that one's intelligence is taken as a true reflection of one's maximum level of mental functioning which cannot change over time (Gardner, Kornhaber & Wake, 1996; Sternberg & Gardner, 1982). The main difference that exists

between different races and genders in terms of their intellectual abilities is believed to hail from the biological inadequacy in one's race and gender (Shaffer, 2002).

Although research shows that there is a strong biological component to intelligence (Foxcroft & Roodt, 2003; Gardner, Kornhaber & Wake, 1996; Shaffer, 2002; Sternberg, 1990), questions still remain whether the high correlations in intelligence between first-degree relations is a result of a high genetic influence, or as a result of the same environmental factors that close relations share (Aiken, 1994). For example, monozygotic twins and adoption studies show that there is an innate component of intelligence which indicates that there is a high concordance rate in intellectual ability between the first-degree relatives as compared to the general population. Researchers have also perceived the biological approach as creating room for the abuse of psychometric testing instruments (Foxcroft & Roodt, 2003; Gardner, 1999; Gardner, Kornhaber & Wake, 1996).

Integrated approach to intelligence

In this case, intelligent behaviour is defined in the context where we find it (Gardner, Kornhaber & Wake, 1996). In addition, Foxcroft and Roodt (2003) define integrated approach to intelligence as the ability to adapt and function within one's social environment. Studies show that this type of approach occurs in relation to the social environment, it is perceived in terms of what each society sees as important for its own situation (Sternberg, 1985). Individuals' perceptions of intelligence and their relevant practices vary widely across societies, which are influenced by different cultural histories of those societies in their social circumstances (Gardner, Kornhaber & Wake, 1996; Sternberg, 1990; 2000). Furthermore, Sternberg and Kaufman (2001) perceive the integrated approach in terms of individual assessment on intelligence as well as in the assessment used to select individuals based on personal attributes, their placement in programs or interventions that are led by social or economic agencies e.g. industries, hospitals, schools, government services and different vocational training centre.

Sternberg and Gardner (1982) argued that this approach does not differ entirely from the biological approach to intelligence but it can result in maximising the growth and use of manpower by the formal economic sector. However, Gardner (1999) also argued that this

approach is complex to interpret in relation to its multiple factors namely: different social context and their various practices across societies.

Psychometric approach to intelligence

Aiken (1994) defines traditional psychometric view of intelligence in terms of what intelligence tests measure, that is, it can be perceived as testing how well one scores on a psychological test. Foxcroft and Roodt (2003) elaborate more on the usefulness of the psychometric approach which has been seen to lead to the development of objective tests that are used to assess one's intellectual abilities, using standardized intelligence tests which are used for educational, occupational, diagnostic and screening purposes. Shaffer (2002) also added to the usefulness of this approach in that intelligence tests and the statistical analyses of the results of those intelligence tests may assist with the organization or structure of intellect, and which have been reported to improve people's lives.

Researchers were critical of the construct validity of psychometric tests in that such test do not measure intelligence but rather only a narrow aspect of some characteristics of human abilities (Sternberg, 1990; Sternberg & Berg, 1992). In addition, Gardner (1983) argued that intelligence tests do not necessarily measure the experience, knowledge and other matters that enable people to function well and solve problems in their daily lives, but can cause harmful educational practices such as rote learning and separate tracked classes.

The Ecological approach

Intelligence is placed in the context where one lives; the individual is perceived as having a mutual interaction with the environment and the people he/she lives and interacts with (Foxcroft & Roodt, 2003). Studies have shown that ecological approaches bring to the researchers' and practitioners' attention the need to be more cautious in interpreting and applying their own culture's conception of intelligence (Furnham, 2000; Greenfield, 1997), hence, it emphasizes that external factors need to be taken into account before intelligence can be fully understood (Sternberg, 2000).

Studies show that ecological approaches to intelligence are based on a large amount of empirical support demonstrating the effects of background on performance and their scientific findings which have implications for individuals' perceptions and assessments of intelligence beyond a static intelligence based approach (Gardner, Kornhaber & Wake, 1996; Greenfield, 1997; Sternberg & Kaufman, 2001). Other studies have also criticized ecological approach in that it does not specify mechanism to account for how and why some individuals acquire particular types of knowledge or select certain strategies, when other individuals within the same context do not require these particular types of knowledge (Gardner, 1999; Furnham, 2000; Sternberg, 1990; Thurstone, 1983). This assumption on ability is seen to be based on the final scores on a limited sample of behaviour of individuals assessed.

In conclusion, looking at the literature on different traditional approaches used to define and underpin the construct of intelligence, it shows that how to define intelligence or explain how it functions and how it should be measured remains controversial. Foxcroft and Roodt (2003) point out that these approaches to intelligence complicate efforts to understand the concept and actually make it difficult to build theories or construct on intelligence.

Other approaches and theories used in interpreting intelligence

Different approaches to intelligence have been developed over the decades, including the theories used to the measure the estimate perceptions of intelligence (Armstrong, 1994; Furnham, Clark & Bailey, 1999). For the purpose of this study, the main two schools of thought are discussed and highlighted with respect to their origin. These two main schools of thought, namely, the general (g) factor and multiple intelligences are then analyzed. However, each of these theories has contributed to the general understanding of intelligence in its own way, but each has their supporters and critics which have highlighted the controversial nature of dealing with human cognitive functioning (Gardner, Kornhaber & Wake, 1996; Foxcroft & Roodt, 2003).

The general factor (g) theory supporters, such as: (Cattell, 1971; Thorndike, 1987; Eysenck, 1998 and Spearman, 1904), support the notion that a single general (g) factor theory could be used to explain differences between individuals. These researchers' views are based on the fact that different measures of cognitive ability correlate

positively with each other and that they measure some shared ability or construct. On the other hand, (Gardner, 1983; Sternberg; 1985 and Thurstone, 1983) are the great supporters of the theory of multiple factors of intelligence. These researchers believe that there is more than one general factor to ones' ability; they identified several mental abilities to intelligence.

Interestingly, between supporters of general (g) factor and the supporters of multiple factors of intelligence, Eysenck (1998) pointed out that the proponents of these two opposing theories of intelligence finally came to agree on a similar view on the construct of intelligence.

General (g) factor of intelligence

In general (g) factor of intelligence, Spearman (1904) was the first person to suggest the general factor / ability (g) to intelligence. Spearman indicates that this factor (g) could be used to analyze and interpret intelligence tests. Intelligence is regarded as comprising of only one general factor of intelligence hence, intelligence is seen as a single and collective ability of an individual to act and react in an ever challenging environment (Cattell, 1971). It is assumed that one's ability to learn and do various things stems from a unified cognitive ability known as (g) or general factor of intelligence which originates partially from the implementation of general components used in processing information of human behaviour (Owen, 1998).

In view of this, studies have shown that general (g) factor has been tested to measure different cognitive functioning perfectively; it also shows that (g) measures some shared construct/ ability on different individuals (Eysenck, 1998; Foxcroft & Roodt, 2003; Kalat, 2005). Kalat (2005) pointed out that general (g) factor determines the intelligence of individuals and stems from biological aspect of intelligence; for example, general (g) factor is seen as genetically inherited which is used in varying degrees during each reaction to a stimuli.

Thorndike (1987) pointed out that when Spearman saw that this underlying factor of intelligence could not contain all the information required to do mental tasks, Spearman believed that there could be an additional factor which could be observed even when multiple factors are identified. In addition, Cattell (1971) mentioned that Spearman's (g)

factors of intelligence are especially specified to a particular activity, which Spearman named as specific (s) factors. As a result, we then have the well-known two factor theory of intelligence which allows for both a general (g) factor and specific (s) factor.

Foxcroft and Roodt (2003) later maintained that Spearman's (g) could be divided into two distinct 'gs', which he called (gf) - fluid intelligence and (gc) - crystallized intelligence, these two distinct factors are beyond the scope of this study.

Critiques of (g)

Studies have indicated that many psychologists remain sceptical that any one ability accounts for all of (g) (Gardner, Kornhaber & Wake, 1996; Owen 1998). Kalat (2005) argued that people do have several intelligent abilities that correlate because they grow in the same ways, that is, something that contributes to all forms of intelligence, which are perceived to all, and which depend on good health, good nutrition, education, and most probably genetics. For example, Gardner (1983) argued that most people who have good support for developing one intellectual skill also may have good support for developing others.

Gould (1996) also pointed out that Spearman's factors of intelligence still exist despite many more recent attempts to repeat his studies; it is believed that these attempts have not yielded such a conclusive result. However, positive correlations have been shown to exist, but these correlations tend to be lower than those originally found by Spearman (Foxcroft & Roodt, 2003).

Regardless of these general (g)'s factor criticisms stated above, studies show that Spearman's feature of the two factors of intelligence: general (g) and specific (s) factors have shown to be present in all individuals' cognitive abilities, which also underlie all human thinking (Eysenck, 1998).

Thurstone Multiple factors

Thurstone (1983) was the main proponent of the multiple factors theory. He identifies seven primary mental abilities, namely: verbal comprehension, general reasoning, word fluency, memory, number, spatial and perceptual speed abilities. This theory has inspired Robert Sternberg and Howard Gardner in their theories of intelligence. For the purpose of

this study, Thurstone's theory would not be further analyzed. Thurstone however, has laid good foundation for multiple factors of intelligence which are still in use today (Sternberg, 2000).

Sternberg's triarchic theory of intelligence

Sternberg (1985) tried to accommodate what were previously considered as conflicting views of intelligence. He was able to integrate the different views from different schools of thought on intelligence into an integrated and clearer understanding of intelligence. His understanding of intelligence has necessitated concern towards initiating theories of intelligence that take into account Thurstone's multiple factors, which he named 'triarchic theory of intelligence' and which runs across human life in various contexts.

Gardner (1999) pointed out that Sternberg's theory has been adopted as evidence that intelligence is comprised of a number of abilities, such as the intellectual abilities, which is also a foundation for the development of multiple intelligence theories adopted by Howard Gardner. Study shows that Sternberg's theory of multiple intelligences somehow comprises of general factor (g), specific factor (s) and largely on multiple factor of intelligence (Sternberg & Berg, 1992).

 Sternberg (1985) proposed a triarchic theory that deals with three aspects of intelligence; his theory is one of the few theories that are comprehensive. He distinguishes three types of intelligence that give a full description of intelligence such as: componential, experiential and contextual intelligence.

Componential intelligence: Sternberg (1985) describes this type of intelligence as intelligence that focus on internal aspect of intelligence which processes the underlying information responsible for problem solving. Sternberg further divides this type of intelligence into three components which are: Meta, performance and knowledge acquisition components.

- Meta-component: the intelligent individuals use this intelligence to guide their problem- solving situations such as, in planning, monitoring and the evaluation of solution (Sternberg & Berg, 1992).

- Performance component: Sternberg (1985) explains that this type of intelligence is often specific to the type of problem being solved; this type of intelligence is mainly useful in computation ability such as encoding the elements of a problem and justifying one's response.

- Knowledge acquisition component – This type of intelligence allows intelligent individuals to learn how to acquire the necessary knowledge needed for learning problem solving in: *Selective encoding*- which determines the relevant information needed for one's purposes; *Selective combination* - information used to form integrated whole and *Selective comparison* – the relationship between new and already stored information in one's memory (Sternberg & Berg, 1992).

Sternberg and Kaufman (2001) also pointed out that the meta, performance and knowledge acquisition components occur and are valued in all cultures, thus, what is considered as intelligent using these components may differ across cultures because of the conception that problems and values often vary across cultures.

Experiential intelligence: This type of intelligence involves the practical application of Meta, performance and knowledge acquisition components to the real world contexts (Sternberg, 1985). Sternberg's assumption on this type of intelligence is that experience with a certain task will increase one's competency in that particular area.

Sternberg believes that an individual is born with biological primitive abilities that depend on environmental influences for development. However, intelligent individual often knows when and how to adapt to a particular environment, if adaptation does not work, an intelligent individual will know when and how to change to fit his/ her needs and abilities (Sternberg & Berg, 1992). For example, Wagner and Sternberg (1986) found out that, a business person may excel well on a test of tacit knowledge about business, but may not score well on a standardized test of intelligence, however, this business person may have learnt how to allocate his/her time and energy in a business setting and may have not exerted the same amount of time and energy in a standardized test situation.

Contextual intelligence: Sternberg (1985) sees the intelligent individual in this regard, to have the ability to use his/her experiences to solve problems and quickly device alternate measures in such a situation. Sternberg sees the intelligent individual as skilful and

insightful in processing of new information. This may be achieved by using the knowledge-acquisition components to extract and apply relevant information that is less obvious in a new situation. For example, Gregory (1996) argued that these aspects of intelligence have shown that intellectually gifted children easily apply intellectual abilities when solving problems, however, children with average intellectual abilities need to be told what information to encode, how to combine the information and what information to compare.

Critique of Sternberg's theory

Firstly, Gardner (1999) criticized Sternberg's theory for its complexity in integrating the three components of intelligence. It is argued that these three components do not precisely fit together; and that Sternberg does not provide a theoretical framework on how these different components of intelligence function; whether in a particular task or in a certain context. Secondly, other researchers like: Gardner, Kornhaber and Wake (1996) and Li (1996) criticize Sternberg for down-playing the role played by biological processes such as the genetic makeup in shaping intelligence.

In spite of these critics above, Gardner (1999) agreed that, although this theory is complex especially when used to emphasize intelligent behaviour, but it can also be seen as highlighting advances in the field of intelligence beyond a narrow, static conception of intelligence.

Theory of multiple intelligences

Sternberg's triarchic theory of intelligence influenced Gardner (1983) who identifies several mental skills, talents, or abilities of individuals' intelligence called multiple intelligences theory. Gardner (1999) pointed out that multiple intelligence theory appreciates intelligence as a concept and not as a fixed entity, that is; it can have a number of components that are not well defined. These types of intelligences are reported to be captured in Sternberg's three components of intelligence. Gardner (1983) lists these seven intelligences as follows: Linguistic / Verbal, Logical / Mathematical, Musical, Bodily- kinaesthetic, Spatial, Inter-personal and Intra-personal intelligences.

<u>Diverse sources of Gardner's evidence</u>

Gardner (1983) acknowledges the source of multiple intelligence theory to stem from the empirical evidence, which can be revised on the basis of new empirical findings. Gardner says that many studies were reviewed from previous understanding of intelligence in the development of his theory and the actual intelligences were identified and outlined on the basis of his empirical findings from neuroscience, psychology, anthropology and other relevant disciplines.

Armstrong (1994) also acknowledges that Gardner gives a much broader look at multiple intelligences in form of the meaning in the way we perceive intelligent individual. This is perceived as what it means to be smart / intelligent. Instead of believing that there is only one way to be intelligent; Gardner (1983) believes that multiple intelligence is not just one underlying mental capacity, rather a variety of intelligences, working in combination that are needed to explain how human beings take on such diverse roles in life, For example, a person can be a psychologist, manages his/her own farm, and may still have a special skill in dancing.

Gardner (1983) argues that an individual may have all the seven intelligences, but may not have the same levels of skill in each of this intelligence. He further extends his argument to the notion that no intelligence is more important than the other and therefore over time, through experience or practice, an individual can grow and improve in a particular ability or intelligence.

Li (1996) recognizes Gardner's source of multiple intelligence theory to come from the studies of people that were once normal and healthy and then became brain-damaged through stroke or traumatic experiences in life. It was argued that Gardner finds evidence for a discrete intelligence in the sparing of a capacity following the brain damage of these individuals. For example, it was argued that some stroke patients may not have impaired speech yet are unable to find their way around the hospital or their homes, others may exhibit the opposite pattern of strengths and weaknesses. These two separate abilities have helped Gardner to separate intelligences into verbal / language and spatial thinking (Armstrong, 1999).

Gardner (1983) believes that environmental factors are significant in the development of intelligence. He explains further that people who are gifted in a particular ability will accomplish little if they are not exposed to materials that engage that particular intelligence. According to Gardner, Kornhaber and Wake (1996, p 204) "the more powerful the environmental interventions and available resources, the more capable people will become and the less important will be their particular genetic inheritance". For example, individuals who come from families that are genetically good in doing some acrobat dancing, if by any circumstances, these individuals do not have the opportunity that will exercise the talent in them, they might actually do poorly than individuals who have no trait but the environment has provided enough resources to build the act of dancing.

Gardner (1983; 1999) describes human intelligence as 'a neural mechanism or computation system' which is seen as genetically designed to be activated by some sort of internally or externally existing information. Gardner (1983) looks for origins of human intelligences in the intelligences of the species similar to humans, hence he finds his evidences in the notion of a separate human musical intelligence and that there are strong continuities in the spatial abilities of human and other primates.

Armstrong (1999) reveals that Gardner questions the issue of measuring intelligence with intelligence test; it is reported that Gardner sees intelligence tests as not reflecting the individual's true abilities. However, Gardner's assumption is perceived to be based on the initial focus of intelligence as a capacity for logical reasoning, which was demonstrated by scientists and logicians (Gardner, Kornhaber & Wake, 1996).

Gardner (1983) claims that his notion of intelligence is in accord with Spearman's general (g) factor, but his views were challenged long before he proposes his theory. Furthermore, Gardner sees multiple intelligences as not in accordance with explaining and presenting patterns of scores such as psychometric tests, but as accounting for the diversity in individual's roles that occurs across different cultures (Armstrong 1994; Gardner, Kornhaber and Wake, 1996). In addition, Gardner's ideas have been seen as popular among laypeople who like the idea of intelligence as being the ability to do something that other people value within one's culture (Armstrong, 1994; 1999).

Gardner's seven multiple intelligences are then analysed below:

- **Linguistic/Verbal Intelligence**: Gardner (1983) analyses the origin of this intelligence to come from developmental psychology, which reveals a universal and rapidly developing capacity for speech among various individuals. Gardner defines this type of intelligence as the mechanisms dedicated to speech or verbal sounds, grammar construction, meaning and uses of language in various settings. For example, Morgan (1996) points out that those individuals who are talented in this ability may like to work with language and can use it appropriately in writing, speaking and abstract thinking. They may like to read books, write stories or non-fiction articles, they may also like to tell stories or give speeches; for example, these individuals may be found in professions such as Law, Journalism, and Advertising (Armstrong, 1994).

- **Logical/Mathematical Intelligence**: Gardner (1983) defines this intelligence as the ability to use and appreciate abstract relations in solving number problems. Mathematical ability increases over time starting from exploring and ordering objects, advancing to manipulation of objects and appreciating actions that can be performed on objects (Gardner, 1999). Intelligent individuals in this regard should have the capacity to assign a numerical corresponding to an object in a series of objects (Gardner, Kornhaber & Wake, 1996). For example, intelligent individuals may like to use logic and math to solve problems and to arrange geometric shapes such as puzzles. These intelligent individuals may be interested in sciences, computers, or engineering (Armstrong, 1994).

- **Spatial Intelligence**: Gardner (1983) sees this intelligence as the ability to perceive visual, transform and modify information to recreate visual images even without references to an original physical stimulus.
  Visual images may require individual to be able to find his or her way around the environment, and form mental images (Armstrong, 1994). For example, intelligent individuals may learn better by looking at pictures, graphs, maps, and real objects. They can visualize things clearly and often use that visual element to help them remember and understand the topic that they are learning about. Intelligent individuals may include professionals like Navigators, Artists, Engineers and Architects.

- **Musical Intelligence**: Gardner (1983) believes that this type of intelligence will allow people to create, communicate and understand meanings made out of sound.

  Gardner et al. (1996) points out that those intelligent individuals may display high musical ability which may require more intensive exposure. For example, neurological and brain studies show that music and language are located in different areas of the brain (Li, 1996). The intelligent individuals in this category may also have the ability to perceive and create pitch and rhythm patterns. For example, intelligent individuals may love to listen to music, they may be able to play instruments, hear rhythms, and notice what is in tune and what is out of tune. Intelligent individuals may also have the ability to criticize music and its different styles. Profession associated with this type of intelligence include Music conductors, Audio engineers, Music composers and Instrumentalists (Armstrong, 1994).

- **Body–kinaesthetic Intelligence**: Gardner (1983) describes this as the ability of the individual to use all parts of one's body to solve problems or fashion products. Gardner sees this type of intelligence as the individuals' ability to carry out fine and gross motor movement. For example, intelligent individuals may have a well-developed connection between their brain and their body; they may learn better when they are active and able to move. Intelligent individuals are often coordinated and can do precise physical movements. For example, professional in this category may be dancers, athletes, sculptors, or doctors using their hands to perform intricate surgeries (Armstrong, 1994).

- **Interpersonal Intelligence**: Gardner (1983) sees this type of intelligence as the ability to make use of core capacities to recognise and make distinction among others' feelings, beliefs, and intentions. Gardner reveals that in early development, this type of intelligence is seen as the ability of young children to discriminate among the individuals in their environment and to discern others' moods. Gardner calls this type of intelligence the ability to understand other people (Gardner et al., 1996).

  For example, Morgan (1996) points out that those intelligent individuals may like to be around other people. They can read people and discover what their needs are. Gardner (1983) appends that intelligent individuals may be involved in organizations, / group-works and may tend to be good communicators. Professions associated with this type of

intelligence include Psychology, Education / teaching, Social work and Human resources management (Armstrong, 1994).

- **Intrapersonal Intelligence**: Gardner (1983) sees this type of intelligence as the ability to know one's own feelings and perceive how best to use the ability. This allows the intelligent individual to understand his / her own feeling and develop a sense of own identity. This type of intelligence also allows the intelligent individual to distinguish pleasure from pain and act upon discrimination. For example, intelligent individuals here understand their own strengths and weaknesses; they know themselves well and often spend time in self-reflection (Armstrong, 1994).

Critiques of Gardner's theory

Researchers and other practitioners believe that Gardner's ideas are based more on reasoning and intuition rather than on the results of empirical research studies he claims to base his theory on (Herrnstein & Murray 1994; Scarr, 1985). These researchers have criticized multiple intelligence theory for lacking scientific justification, but rather stand more on social claims.

Gardner is criticized for equating talents with intelligence (Sternberg, 2000). Sternberg believes that Gardner's theory does not represent new thinking on multiple constructs of intelligence. Sternberg sees Gardner's approach as more or less describing the nature of intelligence with the terms such as 'abilities'/ talents.

Herrnstein and Murray (1994) argued that all the seven forms of intelligence are not of equal importance and value in educational settings. However, similar to Herrnstein and Murray, is Sternberg (1990) who also criticized that all the seven types of multiple intelligence are not of equal value in the manner they measure intelligence.

It was also argued that Gardner has proposed that there are seven independent and equally important forms of intelligence, but research has shown that different cultures assign varying levels of importance to intelligence. For example, linguistic/verbal and logical /mathematical intelligences are valued most in Western cultures, while bodily kinaesthetic intelligence is more highly valued in cultures that depend on hunting for survival, e.g. African culture (Armstrong, 1994).

Sternberg (2000)'s argument on multiple intelligence questioned whether an adult who is tone deaf and has no sense of rhythm can be considered mentally challenged in the same

way as one that has never developed any verbal skills? To this effect, Sternberg believes that Gardner's seven intelligences might be better referred to as cognitive approach rather than using separate constructs of intelligence.

In addition, Herrnstein and Murray (1994) argue that Gardner's theory of multiple intelligences is not legitimate because there are no specific tests to measure the seven intelligences. Gardner believes that a psychometric approach to measuring intelligence based on paper and pencil tests is too limiting. Gardner recommends that any intelligence be assessed by a number of complementary approaches that consider the several core components of intelligence. For example, spatial intelligence might be assessed by asking people to find their way around an unfamiliar territory, to solve an abstract puzzle, and to construct a three-dimensional model of their home.

 Morgan (1996) also argues that Gardner's theory is incompatible with general (g) factor. The concept of (g) is an important part of a widely accepted theory developed by Charles Spearman, and that intelligence is composed of a general ability or (g) factor which underlies all intellectual functions. Although, Gardner agrees that (g) has a scientific place in intelligence theory, but he is interested in understanding intellectual processes that are not explained by (g).

<u>Multiple intelligences become popular, in spite of the criticisms</u>

Gardner's theory has been complimented for being the most comprehensive intelligence theory; this is due to the fact that Gardner's theory encompasses the biological, nurture and contextual perspectives (Lazear, 1991). It is reported that Gardner's theory permits a division of various abilities that make up intelligence; for example, the important role different cultural groups placed on particular abilities for males and females in their cultural groups (Sternberg & Kaufman, 2001).

Gardner's theory has been used to promote lay people's perception of intelligence and among different cultural groups, because it provides a broader definition of intelligence and promotes gender and cultural fairness in testing (Furnham & Baguma, 1999).

Research has also shown that within few years of the publication of Gardner's theory, several schools were formed around the notion of multiple intelligences (Armstrong,

1999; Lazear, 1991). Teachers of the gifted learners, interested in boosting their educational program in which they worked, sought to maximize their number of learners. Since there are only a limited number of individuals with IQ- intelligence quotient of 130 or greater (the usual gifted cut-off level), pressure developed from teachers, parents and individuals cross cultures to expand the gifted definition and the use of this theory in defining different perceptions of intelligence (Armstrong, 1994). Gardner's concepts of intelligence have also been widely used in self-estimates of perceptions of multiple intelligences among lay people and across cultures (Furnham & Baguma, 1999; Furnham & Fong, 2000; Furnham, Shahidi & Baluch, 2002).

Looking at different approaches / theories of intelligence mentioned in this section among others: the general (g) factor, Sternberg's triarchic theory and multiple intelligences, the most popular are the general (g) factor and multiple intelligences. The general (g) factor elucidates the biological foundations of intelligence. It gives an account that general (g) factor stems from neural processing of speed as its source of intelligence. The general (g) factor explains that intelligence can be measured with a single factor of intelligence to explain differences between individuals' cognitive abilities; it is believed that general (g) factor underlies all intellectual functions of all individuals (Owen, 1998). In spite of (g)'s function and usefulness, it has been criticised for not covering all forms of individual's ability due to its heavy dependent on psychometric test (Gardner, 1983).

On the other hand, Sternberg's triarchic theory of intelligence is comprehensive, his theory was able to integrate different views of intelligence into an integrated and contextual conception of intelligence. Sternberg's theory provides the foundation for Gardner's multiple intelligences, which has been used as evidence that intelligence is comprised of a number of abilities and not as a single ability as in general (g) factor of intelligence (Sternberg, 1985). However, Sternberg's theory has been criticised for not providing a biological foundation of intelligence, and for this reason, it down plays its validity, because his theory does not focus on the human brain and individuals' social differences. Although Sternberg's theory provides a comprehensive understanding of intelligence, it was criticised for its complexity in the integration of the three types of intelligence proposed (Gardner, 1999). Sternberg's theory was also criticised for not providing sufficient information on how these three types of intelligences fit together (Gardner, 1996).

In contrary to general (g) factor and Sternberg's theory, Gardner's theory of multiple intelligences has been complimented for being the most comprehensive intelligence theory. This is due to its biological, nurture and contextual perspectives in providing a broader understanding of the construct of intelligence. His theory gives room for a division of various abilities that make up ones intelligence; such as the important role different cultural groups placed on particular abilities (Gardner, 1983).

In spite of Gardner's compliments on his theory, he was also criticised for placing his evidence more on reasoning and intuition than on the results of empirical research studies. His theory was criticized for equating talents with intelligence and that all his seven forms of intelligence are not of equal importance and value in educational settings as he proposed these intelligences to be (Herrnstein & Murray 1994; Stenberg, 1990). Therefore, the debates and controversies on what constitute intelligence and the notion that no intelligence theory is more important than the others will continue. As we go deeper into the meaning of intelligence, evidences keep manifesting that there is no general theory accepted by all on the construct of intelligence.

Lay people's perception of intelligence

Studies have shown that when people engage in intelligent activities, their thoughts and actions are guided by their personal definitions of these constructs (Kaufman, 1990). Research has also shown that lay people's beliefs about how to foster and evaluate intelligence may be very different from the theories developed by experts (Lim, Plucker & Im, 2002). A number of studies have also investigated lay people's perception of intelligence (Furnham, 2000, 2001; Rammstadt & Rammsayer, 2000, 2001). However, there are many studies from different countries that show slight, but also fundamental differences in what young people consider as intelligence and intelligent behaviour (Rushton & Skuy, 2000; Yang & Sternberg, 1997).
Studies show that different people across different cultures define intelligence differently (Furnham, 2000, 2001; Sternberg, 1992, 2000; Furnham & Akande 2003; Furnham, Callahan, & Akande, 2004). For these reasons, what constitutes intelligence among Western culture would differ from the African culture and vice-versa.

Similar to Lim et al., (2002), Yang and Sternberg (1997) also believe that lay people have much wider interpretation of the concept of intelligence than do professionals. Since

there is no universal or generally accepted definition of intelligence, this concept of intelligence is believed to be defined according to who is been asked and what that layperson's perception is. To this effect, previous studies have shown that laypeople's theories and beliefs about intelligence have created significant social and educational consequences (Furnham 2001), especially when laypeople have erroneous beliefs about superior or inferior intelligences which may lead to arrogance or low confidence.

More so, researchers have attempted to investigate lay beliefs about intelligence by examining self-estimated scores on the bell curve (Beloff, 1992; Bennett, 1997, 2000; Rammstadt & Rammsayer, 2000, 2001; Furnham, 2001). Overall, studies have shown that people's understanding of intelligence to be determined by their self-estimations of their own Intelligence quotient (IQ) (Furnham, Baluch & Shahidi, 2002a).

Some research have been particularly concerned with the correlation between psychometric intelligence and self-estimated intelligence in establishing the meaning or definition of the construct, result appears to be around (r = .30) with evidence of numerous outliers (Furnham & Fong, 2000; Furnham & Rawles, 1999).

Studies also show that people tend to believe there are generational differences in IQ, with each generation being more intelligent than the last. For example, people think they are less intelligent than their children, but more intelligent than their parents (Furnham, Neto & Paz, 2007).

People also believe mathematical, spatial, and verbal intelligence to be the major predictors of overall intelligence (Furnham, 2000; 2001). In addition, research has shown that there is evidence that people estimate others' intelligence similarly to their own. That is, if people give high self estimates to themselves, they do the same for their relations (Furnham, 2001; Furnham, Neto & Paz, 2007). However, it is expected that individuals will define and measure intelligence according to their belief systems. This study aims to investigate self perceptions of students' estimates of their own and their relatives and the important role that these self perceptions played in shaping individual's future outcomes using the seven factors of multiple intelligences by Gardner (1983; 1999).

Gender and gender stereotypes in relation to intelligence perceptions

Over the recent decades, the issue of gender differences in various domains of life has been investigated by different researchers globally (Beloff, 1992; Bennett, 1992; Beyer, 1999; Bowd & Brady, 2003, Lynn, 1994). Research shows that there has been a body of studies on gender differences in estimated ability that shows a consistent self-enhancing bias in men and a consistent self-degrading bias in women (Beyer, 1999).The first study probably recorded on gender differences is that of Hogan (1978), he researches on American male and female differences in perceptions of intelligence. Hogan (1978) hypothesizes that a woman's tendency to perceive herself as less intelligent than do men was due to women's denial of their intellectual equality and that this denial is socially rewarded and promotes better relations with men. Beloff (1992) also presented a similar interpretation of her findings in a sample on Scottish students. Beloff (1992) reported that women underestimate their intelligence whereas men overestimate it. Hence, this shows that men and women do hold different perceptions of intelligence.

Looking at the effects of theories on male and female perceptions of intelligence, such as the effect of general (g) factor on perception of intelligence, researchers have consequently examined gender differences in the overall estimate of one's own intelligence using general (g) factor. Except for a few exceptions, the results confirm that men overestimate their own general intelligence more than do women (Byrd & Stacey, 1993; Furnham & Rawles, 1995).

Using the effect of multiple intelligences to examine gender perceptions of intelligence, Adrian Furnham and colleagues have also extended their research on gender differences using the concept of multiple intelligences theory illustrated by Howard Gardner. They found out that differences mainly occurred on individual's estimate of spatial and logical/ mathematical intelligences.

Since the main focus of this study is on individuals' estimates of theirs and their relatives' intelligences using the concept of multiple intelligences, more attention would be directed to gender in relation to multiple intelligences than on the effect of general (g) factor.

Many researchers such as Bennett (1996), Furnham, Clark and Bailey (1999), Furnham and Fong (2000) and Furnham, Hosoe and Tang (2001) report that males tend to estimate their intelligences higher that female did. However, Beloff (1992) proposes that in women's upbringing, there is an emphasis on humility and that they receive modesty training, resulting in poor intellectual self-image relative to men, she termed this the 'male hubris-female humility effect'. Similar to Beloff's (1992) study, Furnham, Clark and Bailey (1999) in their study ask male and female participants to rate each of the seven multiple intelligences proposed by Howard Gardner. Result shows that male participants rated themselves higher than the female participants especially in logical / mathematical and spatial intelligence. Their study also confirms Beloff's (1992) report on male hubris- female humility effect, that is, women have less confidence in their intelligence than men do.

Other researchers have looked at estimates of parental, grandparental, and siblings intelligences, results show that laypeople believe that their fathers are more intelligent than their mothers (Byrd & Stacey, 1993), their grandfathers are more intelligent than their grandmothers (Furnham & Rawles, 1995), and their brothers are more intelligent than their sisters (Furnham & Fong, 2000).

More recently, studies on gender differences in estimates of one's own and parental intelligence, such as, Furnham and Wu (2008), show that ratings of overall individual intelligence has declined by about half a standard deviation for each generation back that was estimated. Furnham (2001) also suggests that this generational increase may be as a result of men formerly attained higher educational qualifications than women. Another reason suggested for the belief that intelligence rises with each generation and that people are now becoming more aware of their own intelligence and others (Flynn, 1999).

In addition, Furnham (2000) studies British parents' estimates of their own and their children's multiple intelligence, and found out that British fathers gave higher estimates than mothers on their own logical/mathematical and spatial intelligences. British parents rated their male children as having higher logical/mathematical, spatial, and intrapersonal intelligences than their female children. Furnham's (2000) study shows that it was British parents' first male children that were rated higher on all the seven multiple intelligences than their second male children. Furnham's (2000) study also shows that male and female differences mainly lie on linguistic/verbal and logical/mathematical intelligences. He then concluded that this pattern of estimates on intelligences could be as a result of some

cultural influences attached to first male children, that is, males are linked to some societal and family influences that have led to the belief that males are more intelligent than female.

In another study on South African's parents' perception of intelligence, using Gardner's seven multiple intelligence by Cohen (2001), results were similar to Beloff (1992) and Furnham (2000). Cohen found out that sons were perceived as more intelligence than daughters especially in mathematics, spatial intelligence and intrapersonal intelligence. Girls on the other hand, were perceived as being more intelligent in interpersonal and musical intelligence. On Cohen's (2001) overall study, he found out that South Africans' parents perceived their children as having higher mental ability than they have.

More recently, Furnham and Mkhize (2003) looked at Zulu mothers' beliefs about the intelligence of their own children. In contrast with previous study results, Zulu mothers rated their spatial, inter- and intrapersonal intelligence nearly two standard deviations above the norm. Zulu mothers also believed that, overall, their children were about 6 IQ points more intelligent than themselves, this could be as a result of the South African past history on socio-political factors.

In another study performed cross-culturally on how British and Iranian people estimated their own intelligences and that of their relatives, Furnham, Shahidi and Baluch's (2002) study show similar findings to British parents' (Furnham 2000) and South African parents' (Cohen, 2001) estimates on multiple intelligence of their own and their children. On their overall study, it shows that men rated their own mathematical/ logical and spatial intelligence higher than women did.

The notion that males are more intelligent on logical and spatial intelligence than females, have been analyzed by different studies as gender stereotypes. It is believed that much of our gender knowledge or perception is based on stereotypes. A number of studies have analyzed gender stereotypes on the basis that people are social beings who depend on the process of socialization for learning socially accepted behaviours (Eagly & Kite 1987; Eagly & Steffen, 1986; Franzoi, 1996; Popenoe, Cunningham & Boult, 1998). Franzoi (1996, p. 131) defines gender stereotypes as 'society's expectations about the characteristics of female as a group and males a as a group'. Franzoi (1996) believes that

this type of categorization involves fixed ways of thinking about people that puts them into categories and does not allow for individual variations. In addition to gender stereotypes, Eagly and Kite (1987) also pointed out that people have different personal attributes that are categorised as male and female attributes; these are known as general traits of masculinity and femininity. Masculinity is related to tasks completion and goal achievements in the public world of work, while femininity are considered to deal with expressive personality traits related to caretaking and nurturance in private world of the home. Men are particularly characterized as silent, courageous, strong, adventurous / spatial and aggressive while women are linked to be fearful, vocal, soft-hearted and affectionate (been able to relate more to children and women in their society).

For these reasons, men are seen to excel more on cognitive abilities such as problem-solving/logical, spatial and intrapersonal intelligence, while women excel more on verbal, musical and interpersonal intelligences (Furnham, 2000; Silverman & Philips, 1998).

Gender stereotypes are understood to vary across different people and cultures, which are perceived as a potential for shaping behaviour (Popenoe, Cunningham & Boult, 1998). Eagly and Kite (1987) believe that people are taught to learn these behaviours from a very early age in order to function and become integrated members of the society. Hence, people's judgments are based on physical characteristics in males and females.

Eagly and Kite (1986) also believe that judgment for men and women tended to be strongest in physical characteristics and weaker in personality traits. For example, people are more confident about labelling someone as a man or a woman based on the information about their physical traits than personality traits.

For this reason, Eagle and Kite (1987) conducted a study on American college students in rating people from 28 counties that these people possess certain instrumental and expressive personality traits. It shows that the resulting stereotypes of different nationalities where gender was not specified tended to resemble the stereotypes of their men more than their women; women were consistently rated low when gender was specified and high when gender was not specified. Their findings suggest that women from different nationalities tend to be judged more by gender stereotypes than the stereotypes of their nationality, but the exact opposite were observed to appear for men.

Other study also shows that different components of gender stereotypes are not highly correlated, for example, Deaux and Lewis (1984) reported that although people believe

that certain traits, behaviour and physical characteristics are more closely associated with masculinity or femininity, but they do not believe that merely because a person possesses a particular gender traits that he / she will definitely posses the other as well. This was examined from a point where people will probably judge a family member as either gender in displaying a given trait such as - independent and strong, to role behaviour - financial provider and cooks meal. These gender traits have been tested to correlate with Americans, it was reported that a woman could be a bread-winner and still maintains her other roles as a woman.

However, the manners in which perceptions of intelligence are constructed by various people have been reported to favour male and female associated behaviours and abilities (Revitch & Sizer, 1991). This then puts women at a disadvantage; it also affects the way school children perceive themselves in relation to their cognitive abilities. For example, societies raise children that resemble their cultural societal norms and values. These are evident in many institutions for learning where a large proportion of males are compared to females, to do technical subjects such as mathematics, sciences and technical drawing. Girls are perceived to dominate the home economics classes while boys tend to be allocated to science and technical classes (Honigsfield & Dunn, 2003).

Using these gender stereotypes in the perceptions of multiple intelligences, Furnham (2001) proposes that logical/mathematical and spatial intelligence which are perceived as dominant on males lie at the minds of most lay people's perceptions of intelligence. Furnham's result shows that the average lay people's perception of intelligence is male normative, which is, because male rated higher on logical/ mathematical and spatial intelligences, male are then considered superior, compared to female. Bowd and Brady (2003) also suggested that school settings have added to the male normative in that females are more geared towards subjects that are less mental abilities than males, such as mathematics (males are seen to dominate logical/mathematical abilities) and female are more geared towards subjects involving verbal/ linguistic abilities.

Findings have also show some biological effects of gender difference on male and female cognitive abilities. Social scientists believe that biological differences between males and female probably do play a role in certain gender differences. It is believed that social scientists often make the issue of biology when biology consequently influence

behavioural differences in the way man and woman think, learn and behave. Hence, men and women are labelled in relation to their sexes as gender differences (Franzoi, 1996). Hampson (2002) found out that women's performances at certain cognitive abilities were altered when having their menstrual cycles, that is , their level of estrogens (female hormones) have been observed to be high during this period. This high level of estrogens has been linked to women's low performance on spatial intelligence, but high on speech as compared to men. On the other hand, men have been observed to perform better, especially when their levels of testosterone (male hormones) are higher. These sex hormonal differences or sex differences (biological status of being male or female) have also been linked to everyday jobs that male and female do (Silverman & Philips, 1998).

There have been recent studies investigating whether perceptions of intelligence are changing with the increased awareness and resources on intelligence, to both male and female (Popenoe, Cunningham & Boult, 1998). South African government initiates a programme called 'take a girl to work'; this is done by way of encouraging young girls to break the gender stereotypes. South African government is an example of integrating male and female in the public sectors especially on formerly male dominated careers and jobs. This merge has been encouraged to dismantle the traditional stereotypes that puts female at a disadvantage. A growing number of South African women have been appointed to a high government cabinet positions and businesses that were previously held and dominated by men. This merger will serve as role models to young generations (Popenoe, Cunningham & Boult 1998).

In conclusion, there have been a number of factors that have been used to explain gender and gender stereotypes in relation to perceptions of intelligence. Evidences have shown that the meaning ascribed to intelligence on gender basis lies at the minds of most people defining the construct (Furnham, 2000; Gardner, 1999). Hence, perception of intelligence which categories male or female as better in some aspects of intelligence than others are termed male/female normative, for example, male are perceived to do better on mental abilities such as logical/mathematical, spatial and intrapersonal intelligences while female are perceived to do better on verbal/linguistic, music and interpersonal intelligences. This study aims to investigate whether male and female students differ in their estimates of their own multiple and overall intelligences. It will be interesting also to investigate if

there are any gender effects as far as the students' estimates of the multiple intelligences of their male and female relatives are concerned.

Cross cultural perceptions of intelligence

Another area that has received consideration in the lay people's perception of intelligence is individual perceptions that run across different cultural groups. This is more evident when comparing perceptions of intelligence between different continents, nationalities and among different cultural groups. Although, different studies have examined differences among different groups across different countries; studies still show that there are few direct cross cultural differences in that areas of intelligence (Furnham & Baguma, 1999).

Numerous studies have used Gardner's theory of multiple intelligences on how lay people from different cultures perceive intelligence, this is apparent when comparing perceptions of intelligence between west and non-western cultures (Furnham, 2000; Furnham & Baguma, 1999; Furnham, Clark & Bailey 1999; Furnham & Fong, 2000; Furnham, Hosoe & Tang, 2001). Research has shown that little studies have focused on how people from different cultures perceive intelligence (Furnham, Callaham & Akande, 2004). Furthermore, studies show that there is a gap on the estimates of perception of lay people in Africa. Furnham and Akande (2004) argue that despite the fact that self-estimate of intelligence studies have been done in many countries including America, Belgium, Britain, China, Hong Kong, Iran, and Japan, only three have come out of Africa: Furnham and Baguma (1999) compared American, British, and Ugandan university students; Furnham and Mkhize (2003) look at Zulu mothers beliefs about their intelligence and that of their children; and Furnham, Akande, and Callahan (2004) look at black and white South Africans and Nigerians estimations of their own and their relatives (parents and siblings) intelligence.

In a different study, Furnham and Mottabu (2004) look at sex and cultural differences in the estimates of general and multiple intelligences by comparing British and Egyptian students. Although this adds to the number of studies in Africa, there is still a limited corpus of literature in this area. In Furnham and Baguma's (1999) studies on self estimates of intelligence from three continents, their result shows that there are still few direct cross-cultural differences in the areas of intelligence. Some researchers have also

made cross-cultural comparisons showing how the concept of intelligence is much more inclusive in some societies compared to others (Furnham, 20001b; Furnham, Fong & Martin, 1999; Furnham, Hosoe, & Tang, 2002).

Different studies on cross cultural differences on intelligence show that in self-estimates of perception of intelligence, lay people are likely to have a much broader understanding of intelligence when compared to experts (Yang & Sternberg, 1990) and that there are important differences cross culturally (Furnham & Baguma, 1999; Sternberg, 2000; Furnham & Mottabu, 2004; Furnham, Neto & Paz, 2007). In addition, studies have shown that the more educated the participants, the better the knowledge of intelligent Quotient (IQ) was, and thus the less culturally specific in their ideas of intelligence (Furnham, 2001 b; Furnham & Akande 2003; Furnham, Hosoe & Tang, 2002).

Studies have also shown that Western and non Western (African) culture perceives intelligence differently due to their different value systems (Furnham, 2001). Western countries place values in a sense of individualism, self-esteem and self-actualization; while African countries place values on collectiveness, unity and humility (Sternberg & Berg, 1992). Western definition of intelligence has mainly been centred on academic achievement such as mathematical/logical intelligence and the types of intelligence that relate more on spatial intelligence. African definitions of intelligence on the other hand are mainly on spatial and bodily kinaesthetic intelligence (Furnham & Baguma, 1999; Furnham & Mottabu, 2004).

Dasen (1984) also found differences in the perceptions of intelligence between white and black population. He characterized that the black groups emphasize on non-verbal communication skills more and the white population place more emphasis on spoken words or one's ability to communicate well. Furthermore, most studies that have speculated about cross-cultural differences point out that the meaning of intelligence may be different for different groups. Furnham and Baguma (1999) revealed that the differences in perception within a particular setting promote social stratification between people of those different groups and culture. For example, when comparing perception of intelligence between Western and African countries, these two populations are perceived to have different values systems.

Sternberg and colleagues analyze factors of laypeople's perceptions in rating intelligent individuals using samples from across the continents (Western and non Western cultures such as, Africans). Sternberg and Berg (1992) believe that Western culture put more emphasis on the speed of mental processing of an individual intelligence. However, some western theorists have pointed out the importance of depth of mental processing for full learning and the understanding of what one learns. For example, Yang and Sternberg (1997) have viewed western perceptions of one's intelligence as the amount of time spent and the effort contributed in learning, how the individual enjoys learning, and how the individual persists in life-long learning with enthusiasm. Thus, silence is perceived as lack of knowledge in western culture. Sternberg (2000) also perceives that Western schooling appreciate going beyond any particular information given to them, and the intelligent person is seen as creative in thinking.

In contrast to Western views on perception of intelligence, non-Western culture, such as African culture, are perceived as having strong social gears, which facilitate and sustain stable inter-group associations (Dasen, 1984). In addition to social gears, Ruzgis and Grigorenko (1994) believe that in Africa, conception of intelligence is seen largely around skills that help them to facilitate and maintain harmony, stable interpersonal and intrapersonal relationships. Serpell (1996) observes that most African societies emphasize on social responsibilities, cooperatives and obedience as important to intelligence. These social components to intelligence are perceived to facilitate qualities that are pleasant and stable to inter-group associations. For example, intelligent children are expected to be respectful towards adults, there are some words of respect that African adults expect their children to use when in social gathering as a sign of social responsibilities. For example, in Nigerian, the Yoruba word for intelligence is *ogbon* (meaning, to be polite and guarded in social situations). Similar social responsibilities are also found across most African cultures. Emphases are also laid on reasonable participations in family and social life as important aspects of intelligence (Putman & Kilbride, 1980).

Using investigation on aspect of intelligence among different sub-groups, Sternberg and colleagues found differences in concepts of intelligence within and between tribes in Africa. Some cultures tend to associate intelligence with mental order whereas others associate it with some degree of mental disorder (Sternberg & Berg, 1992).

Harkness and Super (1983) analyze the perceptions of intelligence amongst the Kokwet of western Kenya in Africa. They found out that children perceived intelligence differently from adults. Their findings show that children used phrases like being responsible, highly articulation of speech, ability to comprehend difficult matters quickly and good management in interpersonal relationships with others. Adults use phrases like smart or knowledgeable, individuals with wisdom, ability to invent new ideas and sometimes unselfishness. Dasen (1984) analyses the Africans' views on intelligent individuals as having higher social class and distinction as speaking less as compared to the West.

In western Nigeria, Durojaiye (1993) reported that the Yoruba's emphasis on individuals' ability to listen as intelligence ability rather than that individual being able to see all aspects of a problem and to place the problem in its actual situation.

Nevertheless, these differences in perception between the Western and African populations suggest the significance of looking at Africans perception of intelligence and their expression through their behaviour, as possible contrast to Western notions. However, these conceptions of intelligence among Africans have been reported to emphasize on social skills much more than Western conceptions of intelligence do, Africans do recognize the importance of cognitive aspects of intelligence but in a different notion to the Western context (Sternberg, 2000).

Studies from various African countries have found that intelligence is thought of quite differently in the African culture as compared to the West (Dasen, 1984; Durojaiye, 1993). However, some studies from the West suggest that females have higher social intelligence than males such as the interpersonal, intrapersonal and musical intelligences (Furnham & Petrides 2000). Western intelligence has been reported to be male normative, unlike the traditional African societies, the concept of intelligence is perceived as female normative.

Furnham and Baguma (1999) compared American, British, and Ugandan university students and found that the Ugandans gave themselves the highest estimates though they were in fact the least likely to have actually taken a test. Ugandans were found to have more faith in the validity than the other groups and took a much strong hereditarianism view.

Possible explanations for these findings were reported to lie in the subjects' experience of western intelligence tests. Furnham and Baguma (1999) show that about 83.5% of Africans claimed that they have never taken a test; while almost exactly three quarters (74.6%) said they did not believe that IQ tests measure intelligence well. Further two-thirds (64.5%) said that they did not believe tests were useful in educational settings. It was proposed that African participants were both ignorant of, and deeply sceptical about, western tests, that in their view, did not measure real intelligence. Other explanations suggested lie on changes in African societies due to education and the importation of many western television programmes. Their studies also show that younger women in particular seem eager to assert their rights possibly deliberately reversing the female humility or male hubris effect. It was suggested that other factors may have influenced self-estimates which have led to the significant differences. On the overall result, it was concluded that there may have been an experimenter effect that benefited females; though there is no direct evidence to proof this (Furnham & Akande, 2004).

Furnham (2000) shows that the role of socio-economic status may have caused the differences in cross countries perceptions of intelligences (Western and African), it was reported that western parents would have been exposed to these types of intelligence which also put them at an advantage. Other reasons proposed were that the research instrument was developed in the west such as Europe and North America and this would have created issues around cultural biases in analysing these perceptions of intelligence in different countries; the test items reflect the Western notion of what is perceived to be intelligent and it was also proposed that the research findings were clouded by variations in the definitions of intelligence between different cultures (Furnham & Baguma, 1999).

This study is about perception of intelligence among two different nationalities within the university setting that is, black South African and black Nigerian students, it aims to explore the way these two nationalities estimate their multiple intelligences and investigate if there is any 'cultural' or 'cross nation' effect. These two nations both hail from Africa with similar history of colonialism- both Nigerians and South Africans were colonised by the Western world.

Statistics South Africa (2010) show the mid-year South African population estimates around 49,991,300 with 39, 682 600 (blacks), 4,424,100 (coloured), 1,299,900 and 4,584,700 (whites).

Cooper, Nicholas, Seedat and Statman (1990) show that South Africans have gone through the process of apartheid in the last 50 years. Under the Apartheid regime, South Africans' education was segregated according to races: white and non-white (African, coloured an Asians). Under this system, white South African children received quality schooling virtually for free, while their non-white counterparts especially, blacks, had "Bantu education". The Bantu education widened the gaps in educational opportunities for different racial groups. The concept of racial segregations in particular, provides a rationalization for keeping black education inferior, which allows blacks to be educated for their opportunities in life (Moodley & Adam, 2000). Education was viewed as a part of the overall apartheid system, which allowed blacks to take on the role of labourers and servants, illiteracy rates was high at around 24% of adults over 15 years old, teachers in township schools for blacks were poorly trained, and the matriculation pass rate still remains low (Ballard, 2002).

In early 1990, Adam and Moodley (2000) reported that 65% of whites over 20 years old and 16% of Indians have a high school or higher qualification, this figure is only 6% among blacks and 13% among the coloured population. Although South African government is working to rectify the imbalances in education, but the apartheid legacy still remains (Adam and Moodley, 2000). The greatest challenges in education still lie among the poorer and rural provinces; schools are generally better resourced in urban provinces throughout the country (Roefs, 2006).

On the other hand, Nigeria is the most populous country in Africa; the country is listed as the eighth most populous country in the world with the majority of the population being black (Fasuyi, 1985). The recent Nigerian population is approximately 149,229,090 with the age structure of 0-14 years covering about 41% population (male: 31,624,000 and female 30,242,637); 15-64 years covers 55.5% population (male- 42,240,641 and female-40,566,672); 65years and over 3.1% population (male: 2,211,840 and female: 2,343,250) and in terms of the level of literacy in Nigeria, it shows that 68% are literacy (Dept. of Economics & Social Affairs Population, 2010).

Fasuyi (1985) reported that Nigeria education has evolved through a number of phases, the education system in Nigeria has been formed by a number of influences: the colonial influence, the influence of the military regime, the impact of the independence and a new constitution. The progress of education in the southern part of Nigeria reveals the involvement of the Christian missionaries towards the education system in Nigeria during the colonial period. Nigerian education was slowly but soundly developing during the colonial time until the conclusion of World War II. Christian missionaries introduced the Western education system in Nigeria in the mid 19th century. There are three fundamentally distinct educational systems in Nigeria; the indigenous system, the Quranic schools and the formal European style of education (Ogunlade, 1988).

The three largest and influential ethnic groups in Nigeria are the Hausa, Igbo and Yoruba. In terms of religion, Nigeria is roughly split into 50% Muslims, 40% Christians and 10% minority who practice traditional religion (Fasuyi, 1985).

In comparing perceptions of intelligence from different cultural groups, Furnham and Akande (2004) investigate self-estimated intelligence in three African countries (Namibia, Zambia, and Zimbabwe), and found both gender and national differences. Unlike in the West, women from all the three countries gave higher self-estimates across all multiple intelligences, especially on inter- and intrapersonal intelligences than men did. Furnham and Akande argued that a difference in African populations compared with Western (American or European) studies was a function of the definition of intelligence. Other reasons suggested were found in participants' educational backgrounds, and limited exposure of African participants to intelligence tests.

Other studies like Furnham, Callahan, and Akande (2004) also look at gender and race differences in Nigeria and South Africa. They first focus on gender and race differences within South Africa and then compared black and white South Africans. The result was that Whites gave higher estimates for self, parents, and brothers. Overall estimates for self and all relatives were reported to be around the mean. South African blacks and Nigerians' reports show there were both sex and nationality differences on self-estimates with males giving higher self-estimates than females and Nigerians higher self-estimates than South Africans. There were also sex and nationality differences in the answers the two nationalities gave about IQ. These differences were explained in terms of their socio-political, historical and educational differences between these countries.

In another cross cultural study, Furnham and Mottabu (2004) show the differences in sex and culture between Egyptian and British university students in self- and parental estimations of IQ using Cattell's list of twenty multiple intelligences- instead of the commonly used Gardner multiple intelligence. Their result reveals that males tended to estimate their overall intelligence and various multiple intelligences (verbal, numerical, originality and mechanical abilities) higher than females. Egyptians tended to estimate their overall IQ lower than the British but not significantly so, when it came to the multiple intelligences. The Egyptian students gave significantly higher self-estimate on verbal abilities, auditory abilities, spelling, word fluency and perceptual speed and accuracy. On the other hand, British students appeared more modest, and were only significantly higher in mechanical ability and idea production. Egyptian students tended to rate their parents' intelligence higher than did British students. Egyptian more than British students believed in sex and race differences in intelligence.

In rating the overall intelligence, a number of researchers have looked at estimates of specific types of intelligence; such as integrated, ecological and multiple intelligences (Furnham, Fong & Martin, 1999; Furnham, 2000; Furnham, Rakow, Sarmany-Schiller, & de Fruyt, 1999; Furnham & Petrides, 2000). For example, Furnham, Hosoe, and Tang (2002) found that in comparable groups of American, British, and Japanese students, the Americans gave themselves the highest on all ratings, particularly on overall and verbal intelligence, followed by the British, and the Japanese. There are essentially two opposing sites with respect to the consistent gender differences. Similarly, Furnham, Shahidi, and Baluch (2002) compare self-estimates of British and Iranian students and found that the Iranians thought they had lower mathematical but higher spatial, musical, and intrapersonal intelligence than the former. Lastly, intercontinental comparisons have previously demonstrated many significant differences (Furnham, Rakow, Sarmany-Schiller & de Fruyt, 1999; Paulhus, Lysy & Yik, 1998).

From the previous studies one could conclude that there is a question of generalization of research findings across different cultures as to what constitute intelligence. What is perceived as intelligent in one culture cannot be perceived as intelligent in another culture; hence findings from different cultures from previous studies cannot hold the facts for another culture of similar studies. However, more investigation and clarifications of

ideas can assist to solve this quest for study in many psychological researches (Furnham, 2001).

In summary, this chapter has looked at different theories of intelligence, but the two commonly used are the general (g) factor and multiple intelligences; researchers have not been able to prove that one theory is better than the other. But it was proposed that over time, and through experience or practice, an individual can grow and improve in a particular ability or intelligence (Gardner, 1983).

The general (g) factor theory of intelligence agrees that cognitive functioning of individual is only governed by a single factor of intelligence, while multiple intelligences disagree and believe that there are multiple factors of intelligence governing ones' cognitive ability. Hence, between the supporters of one factor of intelligence (g) and the supporters of multiple factors of intelligence, Eysenck (1998) pointed out that these two opposing factors of intelligence eventually were forced to agree on a similar view on the structure of intelligence.

This chapter reviews different lay people's perceptions of intelligence from different literatures, this is important because it will lighten the concept of intelligence especially on how different individuals have perceived intelligence. It is believed that laypeople measure and define intelligence according to their belief systems (Sternberg, 1990). Laypeople's theories and beliefs about intelligence have been reported to create significant social and educational consequences (Furnham, 2001). If people believe that they are more or less intelligent than others, this may lead to inferiority or superiority.

The notion that male are more intelligent on logical and spatial intelligence than female, have been analyzed by different studies as gender stereotypes (Franzoi, 1996; Furnham, 2000, 2001). It is believed that much of our gender knowledge or perception is based on stereotypes. Therefore, male and female are perceived to have varying differences in their perceptions of intelligence (Furnham, Callahan & Akande, 2004). This chapter looks at a number of studies examining gender differences in ratings of overall IQ; nearly all have shown gender differences (Beyer, 1990, 1998, 1999; Bowd & Brady, 2003; Furnham, Clark & Bailey, 1999; Furnham, Hosoe & Tang, 2001). It was reported that men rated themselves higher (superior) to females in mathematical and spatial intelligence. Studies have also shown that participants seemed to believe that intelligence was male normative

and that it was specifically those types of intelligence mentioned above, such as mathematical and spatial- the most differentiated between the sexes that were more predictive of the general overall intelligence (Furnham, Callahan & Akande, 2004; Furnham, Clark & Bailey, 1999; Furnham, Hosoe & Tang, 2001).

This chapter also looks at gender differences in the ratings of relatives, specifically grandparents, parents, siblings, and children (Furnham, 2001). It was argued that lay people's beliefs and perceptions of intelligence have created more consistent generational effects with parents believing they are less intelligent that their children and that their sons are more intelligent that their daughters (Furnham, 2000a; 2000b).

Lastly, this chapter reviewed cross-cultural perceptions of intelligence across continents. Studies have shown that Western and non-Western (African) cultures perceive intelligence differently due to their different value systems (Furnham & Baguma, 1999). Western countries place values in a sense of individualism, self esteem and self actualization; while African countries place values on collectiveness, unity and humility (Sternberg & Grigorenko, 1992).

However, what constitutes intelligence among various lay people, researchers, academicians and professionals still remains controversial (Gardner, 1999). There seems to be no consensus in this regard. Hence, intelligence can be perceived as a personal definition of one's' own interpretation (Gardner, 1999). Studies also show that different cultures assign varying level of importance to intelligence (Sternberg & Berg, 1992; Furnham & Baguma, 1999). This study's participants are black Africans from different cultural backgrounds; it may be prudent to predict that these two nationalities will estimate their perceptions of intelligence and their families' differently. In general, the literature reviewed has enlightened the researcher's understanding on lay people's 'perceptions of intelligence from her own culture and across different cultural groups, using Gardner's theory of multiple intelligences.

CHAPTER 3

RESEARCH METHODOLOGY AND METHODS

This chapter discusses the research approach adopted by the researcher. This study used a quantitative approach, whereby participants filled in a questionnaire in which they rated themselves and their families on a scale of seven multiple intelligences designed by Howard Gardner (1981). This rating allows the participants to give an estimate of theirs and their family members' general and overall intelligence. This chapter also discusses some common issues related to this study, namely, the research design, the validity and reliability of the instrument used, and the issue of ethical consideration as well as the challenges faced.

Ethical Considerations

Upon the approval of the research proposal by the Faculty Research Ethics Committee, all participants were approached to participate in the study. Participants were asked to sign informed consent forms after the purposes, possible harms and benefits of the study had been explained (Appendix 1). The researcher explained that their participation was voluntary; they were made aware of their right to withdraw at any stage without suffering any negative consequences. Participants' anonymity, beneficence, non- maleficience as well as confidentiality were maintained. Questionnaires did not indicate the names of the participants; hence their identities were unknown. The completed questionnaires were kept secure and locked away during the data collection and analysis processes, and they would be destroyed immediately once the processes of analysis and reporting are completed. It was also discussed with the participants that should they require feedback about this study's research findings, verbal feedback would be arranged with them, hence the researcher's and supervisor's telephone numbers were indicated on the consent form signed by each participant.

As far as the benefits of the study are concerned, it was discussed with the participants that there were no direct benefits, but the results of the study will contribute towards the general body of knowledge on people's estimates of multiple intelligences and implications for education will be drawn, especially if gender effects emerged. Research

report would be made available to UKZN and educators which may benefit teaching methods to avoid the self-fulfilling prophecy on schooling.

Participants

Convenient and purposive sampling methods were used in selecting the participants, especially participants from Nigeria. The Nigerian students were asked to participate from all the four campuses of UKZN (Edgewood, Howard College, Pietermartizburg and Westville campus). 503 (Five hundred and three) participants participated in this study, of which 167 were South African male, 172 were South African female, 165 were Nigerian male. The initial intended 47 Nigerian female students data collected were discarded due to fewer Nigerian female students on campus. These Nigerian female participants' data were relatively lower than the entire data collected in each category; that is, South African male, female and Nigerian male. It is believed that Nigerian female students in general, do not travel abroad alone (unlike their male counterparts). These Nigerian female students are either with their parents or are married; very few Nigerian female students travel alone abroad. Hence most Nigerian students found on campus are male.

The researcher then tested data collected between South African male and female and Nigerian male which are represented in Tables 1 and 2 below.

Table 1: *Frequencies of the Participants*

	Nationality	Gender	Age
N	503	503	503
Missing	0	0	0

Note. N= Total no of participants participated (in terms of gender, age and nationality).

Table 2 gives the total number of study participants. One hundred and sixty five (165) Nigerian males took part in the study (32.8 % cumulative frequency), while three hundred and thirty three (338) South African males and females participated, thus totalling five hundred and three (503) participants in the study.

Table 2: *Distribution by Nationality*

		Frequency	%	Valid %	Cumulative %
Valid	Nigerian	165	32.8	32.8	32.8
	SA	338	67.2	67.2	100.00
	Total	503	100.0	100.00	

Note. SA = South African

Figure 1: *Bar-Chart Distribution for Nationality*
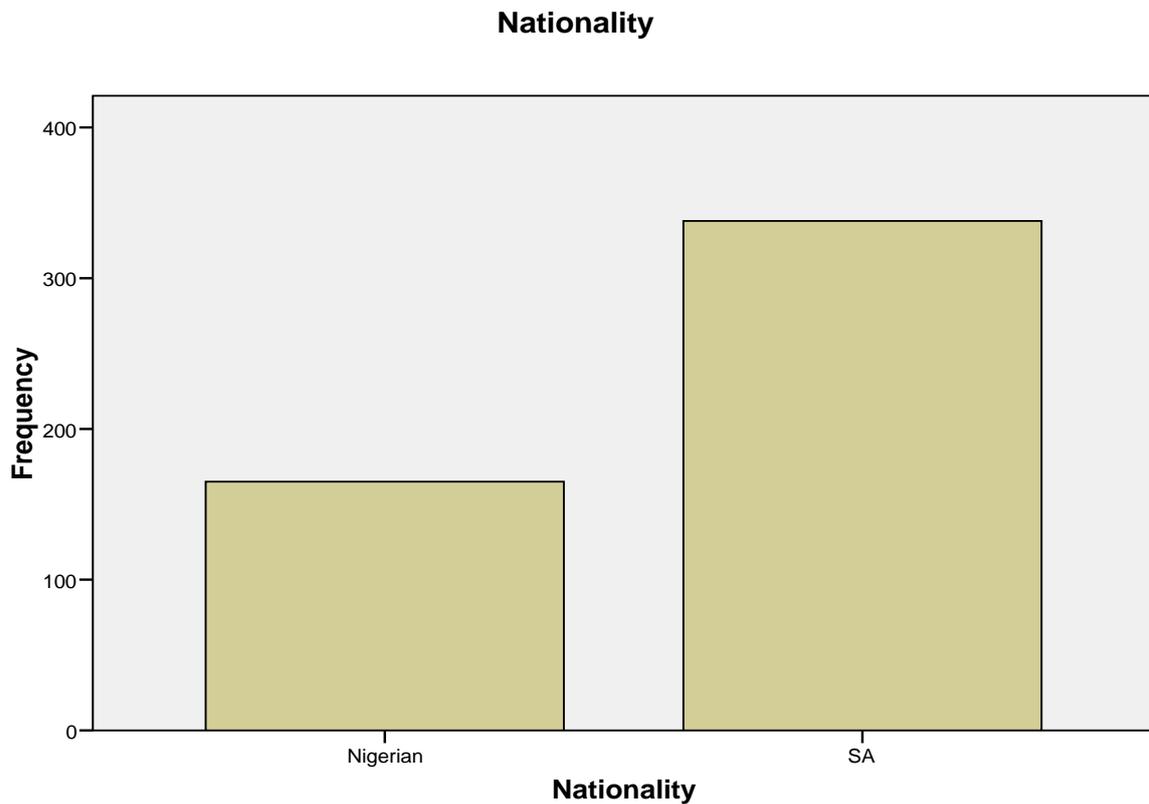
Note. SA = South African

Figure 1 shows the Bar Chart distribution for both Nigerian and South African participants, with South African having a larger percentage of participants of male and female representation. Only Nigerian males participated in the study due to lower number of Nigerian female available on campus. Hence South African has the larger frequency

distribution of 338 while Nigerian has the lower frequency of 165 respectively. This needs to be borne in mind in the interpretation of findings.

Table 3: *Gender Distribution*

	Frequency	Percent %	Valid Percent	Cumulative Percent
Male	331	65.8	65.8	65.8
Female	172	34.2	34.2	100.0
Total	503	100.00	100.0	

Note.   % = Percentages which range from 0-100

Table 3 shows the total gender frequencies of participants from Nigeria and South Africa. There were three hundred and thirty one (331) male (Nigerian and South African participants) and 172 female (South African participants only).

Figure 2: *Bar-Chart Distributions by Gender*
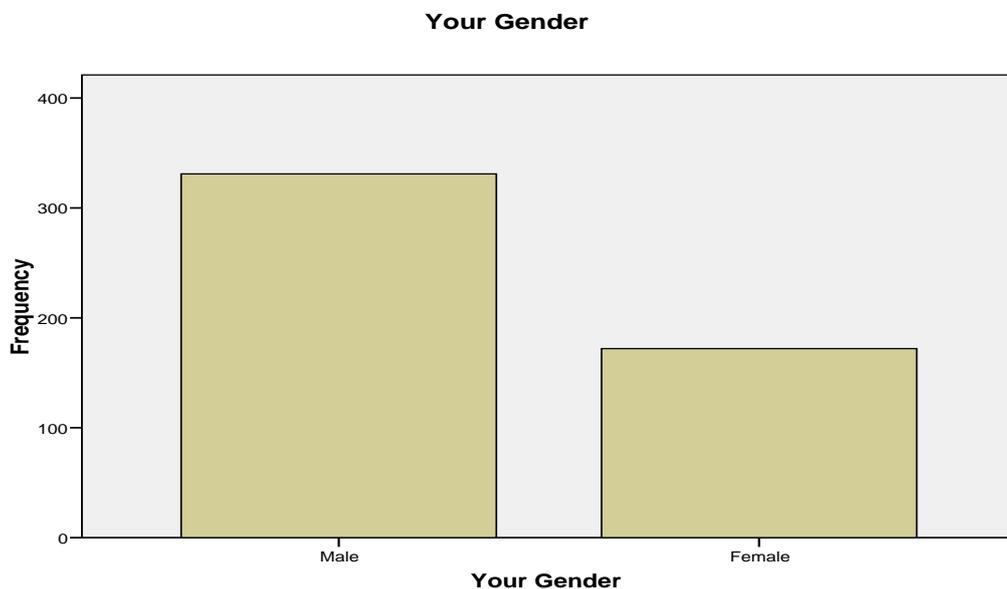
Note.   Your Gender = Gender distributions for all the participants (South African male and female and Nigerian male).

Figure 2 shows that Bar-Chart distributions for gender with the males obviously having the highest frequency distribution of 331 due to both male Nigerians and South Africans'

participation in the study, while female frequencies amounted to 172, due to non participation of Nigerian females.

Table 4: *Age Distribution*

	Frequency	Percent %	Valid percent	Cumulative percent
18	25	5.0	5.0	5.0
19	62	12.3	12.3	17.3
20	78	15.5	15.5	32.8
21	84	16.7	16.7	49.5
22	49	9.7	9.7	59.2
23	11	2.2	2.2	61.4
24	26	5.2	5.2	66.6
27	4	0.8	0.8	76.3
28	25	5.0	5.0	81.3
29	9	1.8	1.8	83.1
30	33	6.6	6.6	89.7
31	13	2.6	2.6	92.2
32	2	0.4	0.4	92.6
33	4	0.8	0.8	93.4
34	11	2.2	2.2	95.6
38	1	0.2	0.2	95.8
40	4	0.8	0.8	96.6
41	4	0.8	0.8	97.4
43	4	0.8	0.8	98.2
44	9	1.8	1.8	100.0
Total	503	100.0	100.0	-----

Note.   ---- Adds up to 100 in the line above, %= Percentages which range from
           0 - 100

Table 4 and Figure 3 show the age and Bar-chart distributions of the participants. The age for these participants ranged from 18 - 44 years. Although convenient sampling was used,

the amount of participants that participated in this study have compared favourably with the number of participants in similar studies. However, the highest age frequencies (84 participants) were 21years with the percentage distribution of 16.7% while 38 year olds had the lowest age frequency (1 participant).

Figure 3: *Bar-Chart for the Age Distribution*
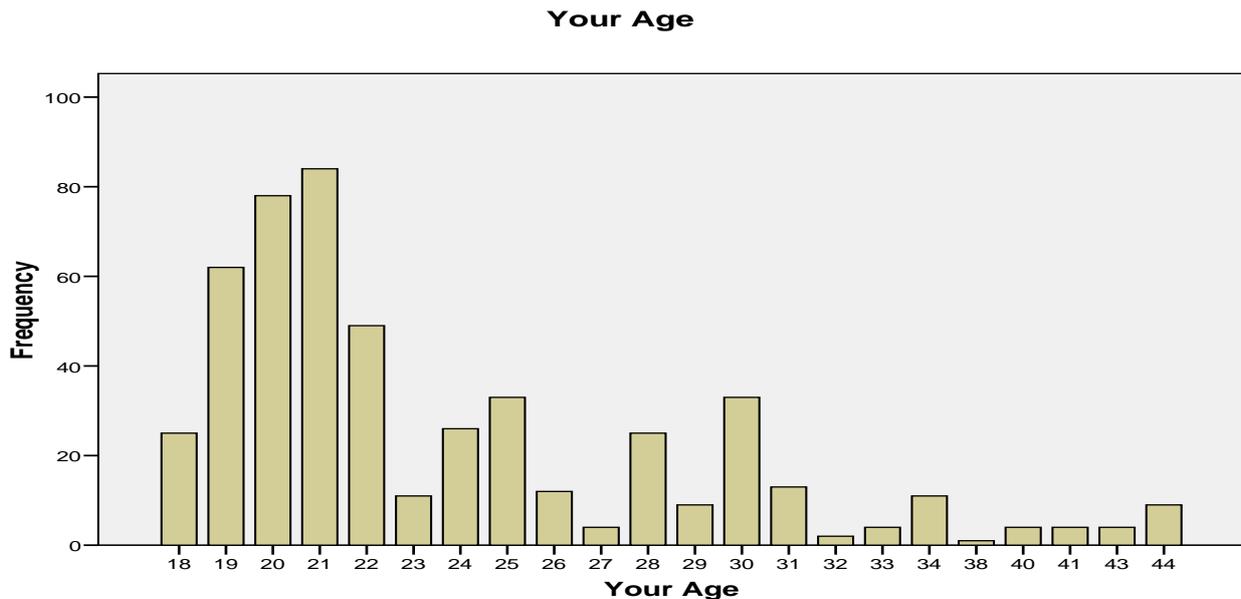
Your Age

Note. Your Age = Age distributions for all the participants (South African male and female and Nigerian male).

Questionnaire

The study used a single page questionnaire. The items for the questionnaire were taken from Furnham's one page self administered standardized questionnaire (see Appendix 2). Participants from these two nationalities within UKZN, i.e. (black Nigerians and black South Africans) were asked to indicate their age, gender, and highest educational qualification. The questionnaire shows a normal distribution of IQ scores with the mean, standard deviation and descriptive labels on each of the scores. The questionnaire also displayed the population score ranging from 55 (mild retardation) to 145 (gifted). The questionnaire has grid Tables with the seven intelligence types labelled and described in seven rows and columns. The columns show self estimates and their family members. Participants were asked to give the estimate of theirs, their relatives' as well as theirs and family overall intelligences using the ranges displayed on columns. Participants were also

required to state their age, their family members as well as their sex and educational qualifications. On the grid Table there is a brief description of each component of intelligence. Lastly, the questionnaire also asked the participants a 'Yes' or 'No' question on a general issue relating to intelligence test.

Procedure

Firstly, questionnaire was administered to individual Nigerian student with the help of research assistants at the various venues where all UKZN Nigerians students in Durban, Westville, Pinetown and Pietermaritzburg usually meet. The large amount of these questionnaires were collected at Nigerians in Diaspora (a union of Nigerians abroad) which comprises of students and non- students, but only the students from UKZN were asked to read, signed the consent form after discussing the issues of ethics and their right in this study . The participants then filled in the questionnaires; efforts were made to see that the retuned questionnaires were correctly answered. Access to the participants was convenient because the head researcher and co- researchers are not only students from UKZN, but are also members of Nigerians in Diaspora. Therefore, the head researcher and co − researchers were able to reach most of the Nigerian students from UKZN at different designated meeting time.

Secondly, the head and co- researchers were able to administer questionnaires to only black South African students in similar manner to Nigerian students. Upon the availability of the black South African students on campus, at the time of data collection, all black South African students at all levels were selected and invited individually to participate in the study. The aims as well as the benefits of the study- autonomy, confidentiality, non-maleficence, and beneficence were explained to the participants before the consent forms were signed, which showed their interest in this study. The questionnaires were administered and collected individually at the student theatre lecture rooms during their regular class sessions and at various computer rooms. This is to ensure that all questionnaires given out to students were returned and answered correctly. The approximate time to answer the questions on the questionnaire was 20 minutes for each participant from Nigerian and South Africa.

Study Design

The study utilizes a quantitative, cross-sectional and factorial design. The independent variables are Nationality (Nigerian or South Africa), Gender (Self), and Gender (of the person whose intelligence is being estimated). The dependent variables are the seven multiple intelligences and overall intelligence estimates as outlined in Gardner's theory of intelligence (verbal, logical, spatial, musical, bodily-kinaesthetic, interpersonal and intrapersonal intelligences). The overall intelligence of self was tested in relation to mother, father, first brother, second brother, first sister and second sister. Participants' ages, sexes, as well as educational qualifications were taken into consideration as covariate.

Reliability and Validity of the Questionnaire and Problems Encountered

The questionnaire is considered reliable and valid because it has been used in a number of similar studies across the continents which have yielded positive and consistent responses (such as, Furnham, Hosoe & Tang, 2007; Furnham, Rakow, Sarmany-Schiller & De-Fruyt, 1999; Furnham, 2000; 2001a). Challenges in the use of the questionnaire may however stem from class and educational differences. The questionnaire does assume familiarity with the concept of IQ and the idea of the normal distribution. This was not envisaged to pose a major threat to this study which deals with a student population. Although the questionnaire is originally developed in a western context, the research questionnaire has proven flexible and simple enough to cater for different cultural groups. The questionnaire has been used among Nigerian and South African populations and there were no major challenges (Furnham & Mkhize, 2003; Furnham, Callahan & Akande, 2004).

The fact that only those Nigerian students currently studying in South Africa in one academic institution, as well as sampling only one aspect of gender (Nigerian male) poses some threats to the generalization of the findings to the Nigerian student population. For example, it is plausible that Nigerian students studying in South Africa (University of KwaZulu-Natal) differ from Nigerian university students in general (that is, in terms of access to resources, socio-economic status and ability). Furthermore, due to smaller sample size collected for Nigerian female participants, their perceptions on

multiple intelligences could not be tested, which may also pose some threats to the generalization of the overall findings. Nevertheless, the study will provide some preliminary data for future studies to build on.

In conclusion, this chapter has looked at how the study sample was obtained; it also provided detailed demographic information on the sample. Purposeful and convenient sampling methods were used to select the sample. The participants' ages ranged between 18 to 44 years. Female Nigerian participants initially captured for this study were later discarded due to limited Nigerian female students on campus. This then resulted in investigating between male Nigerian and South African participants, followed by investigating gender effect on South African male and female participants. In this study, participants gave a written consent after they had been briefed about the aims and objectives of the study. The research instrument used was derived from previous studies conducted by Adrian Furnham and his colleagues on seven factors of multiple intelligences. MANOVA was used in the analysing the data collected.

CHAPTER 4

DATA ANALYSIS

This chapter presents the results of the analysis of the questionnaires that were filled in by the participants. This was achieved by using Statistical Packages for Social Science Programmes - SPSS version 15.0 (SPSS Incorporation Chicago, Illinois, USA) to analyze the data. The results indicate that, firstly, the main effect for gender is statistically significant. South African male students rated higher on Bodily-kinaesthetic intelligence, while South African female students rated higher on intra- personal intelligence. On overall, IQ as well as on the other intelligences, there were no statistically significant differences between South African male and female students' estimates.

Secondly, Nigerian male students gave higher self rating scores for five multiple intelligences out of the seven multiple intelligence analysed than their South African male counterparts. These have shown on the overall IQ, verbal, mathematics, spatial, musical, and bodily-kinaesthetic intelligences. Lastly, the remaining two multiple intelligences with regards to nationality effect, such as, inter and intra-personal intelligences indicate no statistically significant differences. This section should however be interpreted cautiously as both samples excluded females. The findings are therefore not generalisable to Nigerian or South African students in general.

This chapter begins by analysing the multivariate tests for gender (South African sample) on self- estimates of multiple intelligences. It then looks at the multivariate tests for gender and country interaction effects.

Self-estimates of Multiple Intelligence –Gender effect (South African sample)

This section looks at the gender effect in the self-ratings of multiple intelligences for the South African sample (Table 5).

Gender Effect: South African Male and Female Students

Here are the hypotheses tested in this study which is analysed below:

H_0: There is a gender effect in the self-ratings of mathematical and spatial intelligence; with male students rating themselves higher, and female students giving themselves lower ratings.

H_1: There is no gender effect in the self-ratings of mathematical and spatial intelligence; with male students rating themselves higher, and female students giving themselves lower ratings.

The results (see Table 5) show self estimates of intelligence between South African male and female students and their family members, on self ratings, using MANOVA. With the omnibus bus of the null hypothesis showing a statistically significant effect for the MANOVA, it was important to establish the sources of these differences by examining the univariate F tests as indicated in Table 5.

Table 5: *Self-estimates of Gender Effect for South African Students*

Gender	Female		Male			
Self	Mean	S.D.	Mean	S.D.	F-Value	p-Value
Ov IQ	105.23	15.75	104.97	16.30	0.02	0.88
Verbal	104.80	24.08	103.80	18.07	0.19	0.667
Math	94.04	23.08	103.37	24.27	2.83	0.093
Spatial	109.24	20.54	109.13	24.20	0.00	0.962
Musical	99.30	24.38	98.64	28.74	0.05	0.820
Body K	96.42	21.56	103.07	21.31	8.12	0.005*
Inter	112.56	23.38	117.82	18.97	0.95	0.331
Intra	119.62	22.90	111.02	24.89	10.93	0.001*

Note. **Ov** IQ = Overall intelligence, Verb = Verbal intelligence, Math = Mathematical intelligence, Spatial = Spatial intelligence, Music = Musical intelligence, Body K= Bodily kinaesthetic, Inter = Inter-personal intelligence, Intra = Intra-personal intelligence.

Estimates of overall intelligence between South African male and female students were found not to be statistically significant ($F= 0.02$, $p>0.05$). The mean score for female is 105.23 whilst the mean score for male is 104.97.

Verbal intelligence was also not found to be statistically significant for gender on self ratings ($F=0.19$, $p>0.05$). Hence, this means that male and female South African students do not differ in the way they estimate their verbal intelligence.

Mathematics intelligence was not found to be statistically significant for gender ($F=2.83$, $p>0.05$). The mean score for South African female students is 94.04 and male students 103.37.

Spatial intelligence for gender was found not to be statistically significant for male and female South African students ($F= 0.00$, $p<0.962$). The female students scored 109.24, while male students scored 109.13 respectively. *Musical intelligence* is not statistically significant for gender ($F=0.05$, $p = 0.05$). The mean score for female is 99.30 and for male 98.64 respectively.

Body kinaesthetic was found to be statistically significant for gender ($F=8.12$, $p<0.05$). Mean scores for both female and male students are 96.42 and 103.07 respectively. With a follow up test, testing the main significant gender effect between South African male and female students, result also shows that there are statistically significant differences between these two categories of students. This result on bodily kinaesthetic intelligence may show that male and female South African students do differ in their estimates of this intelligence.

On *Interpersonal intelligence,* scores were not found to be statistically significant for gender ($F=0.95$, $p<0.331$). The mean score for female student is 112.56 and for male students 114.82. Furthermore, *Intrapersonal intelligence* is also statistically significant for gender ($F=10.93$, $p<0.001$), with the mean score of 119.62 for female and 111.02 for male respectively. This result also shows that female students rated higher on intra-personal intelligence than their male student counterparts.

In summary, using the seven multiple intelligences to rate gender for South African male and female students, result shows that only bodily kinaesthetic and intrapersonal intelligences were found to be statistically between the two genders. Males rated higher

on Bodily-kinaesthetic intelligence, while females rated higher on intrapersonal intelligence.

Table 6: *Self-estimates of Intelligence- Gender Effect for South African Students' Mothers*

Gender	Female		Male			
Mothers	Mean	S.D.	Mean	S.D.	F-value	p-value
Mothers'						
Ov IQ	99.91	19.57	102.98	13.68	2.66	0.104
Verb	100.61	22.03	103.85	17.78	2.12	0.147
Math	92.33	23.70	92.60	22.83	0.01	0.916
Spatial	104.04	20.21	106.54	18.37	1.36	0.244
Music	95.90	24.66	95.48	24.89	0.02	0.878
Body K	91.28	24.44	96.63	22.32	4.27	0.040
Inter	107.06	21.61	114.52	20.62	10.17	0.002*
Intra	115.44	21.05	112.88	19.83	1.27	0.261

Note. Ov IQ = Overall intelligence, Verb =Verbal intelligence, Math = Mathematical intelligence, Spatial = Spatial intelligence, Music = Musical intelligence, Body K= Bodily kinaesthetic, Inter = Inter-personal Intelligence and Intra = Intra-personal intelligence.

With the overall MANOVA test showing statistically significant differences overall, univariate F tests were conducted to establish the variables that contributed to this overall difference. Mothers' estimates of *overall intelligence* for South African students were not found to be statistically significant (F=2.66, p>0.05) (see Table 6). The mean score for female students' mothers is 99.91, while 102.98 is for their male student counterparts. This shows that there are no main significant differences in the way South African male and female students rated their mothers' intelligence.

Verbal intelligence for self ratings on mothers' intelligence was not found to be statistically significant (F=2.12, p>0.05). Female students rated their mothers' IQ with the mean score of 100.61 whilst male students rated their mothers' IQ with the mean score of 103.85 respectively. This also shows that there are no main significant differences in the way these students rated their mothers' IQ.

Mothers' *mathematical* score was also not found to be statistically significant on gender (F=0.01, p>0.05). Female students rated their mothers on a mean score of 92.33 and male

students rated their mothers a mean score of 92.6 respectively. This shows that South African male and female students' estimates of intelligence do not differ in the way they rate their mothers' IQ.

Spatial scores for mothers' IQ was not found to be statistically significant (F=1.36, p>0.05). The mean score on self estimates of IQ for female students' mothers intelligence is 104.04 and male students 106.54 respectively.

Mother's *music intelligence* was not found to be statistically significant (F=0.02, p>0.878). The mean score for male rating is 95.48 and for female students rating, 95.90. This shows that South African male and female students do not differ in the way they rate their mothers' intelligence.

On the other hand, mothers' *bodily kinaesthetic* score was found to be statistically significant (F= 4.27, p>0.040). South African male students rated their mothers' intelligence higher than their female students' mothers. The female students' mothers' scores is 91.28, while 96.63 is for their male students' mothers.

Mother's i*nter-personal* intelligence was found to be statistically significant (F=10.17, p<0.05). The mean score for female students' mothers is lower (107.06) than their male students mean score of (114.52). This shows that male students consider their mothers more intelligent on interpersonal intelligence than their female students 'mothers.

On *intra-personal intelligence,* there were no statistically significant differences in the South African students' rating of their mothers' intelligence (F= 1.26, p>0.261). The mean score for male students' mothers is 112.88 while female students' mothers rated on 115.44.

Hence, out of the seven multiple intelligences, South African students only show statistically significant differences for their mothers' rating of intelligence on interpersonal and bodily kinaesthetic intelligences, with male students rating their mothers higher than their female students' counterparts. The remaining five multiple intelligences (mathematical, verbal, musical, spatial and intrapersonal intelligences) were not found to be statistically significant.

Table 7: *Self-estimates of Intelligence- Gender Effect for South African Students' Fathers*

Gender	Female		Male			
Fathers	Mean	S.D.	Mean	S.D.	F-Value	p-Value
Fathers'						
Ov IQ	99.77	17.69	105.85	17.53	7.89	0.005
Verb	101.40	19.53	110.48	19.86	14.08	0.000
Math	90.58	20.80	96.80	23.12	5.28	0.022
Spatial	106.78	19.59	105.96	23.19	0.10	0.755
Music	97.21	21.69	86.21	21.06	17.53	0.000
Body K	99.03	26.83	100.22	25.17	0.14	0.710
Inter	98.37	24.61	114.01	19.34	33.25	0.000
Intra	111.05	24.20	111.89	16.62	0.11	0.740

Note. Ov IQ = Overall intelligence, Verb =Verbal intelligence, Math = Mathematical intelligence, Spatial = Spatial intelligence, Music = Musical intelligence, Body K= Bodily kinaesthetic, Inter = Inter-personal intelligence, and Intra = Intra-personal intelligence.

The same procedure was followed; after the significance of the overall MANOVA test was established, univariate F tests were examined to establish the variables contributing to this significant overall MANOVA effect. The estimates of *overall intelligence* on gender effect for fathers' IQ was found to be statistically significant (F=7.89, p<0.05), as shown in the Table 7. The mean score for female students' fathers is 99.77 and male students' fathers, 105.85. This shows that male students rated their fathers higher on the overall intelligence than their female students.

Fathers' *verbal score* is also statistically significant (F=14.08, p<0.05), with the male students rating their fathers' verbal intelligence higher than the female students' fathers. However, the mean score for male students' fathers is 110.48 and female students mean score is 101.40 respectively.

Fathers' *mathematics intelligence* was also found to be statistically significant for gender (F=5.28, p<0.05). Female students gave their fathers an average of 90.58 and male students gave their fathers an average of 96.80 respectively. This also shows that the male

students rated their fathers' intelligence higher on mathematical intelligence than their female students' fathers.

On fathers' *musical intelligence,* there were statistically significant differences in self estimates of intelligence (F=17.53, p<0.05). The average score for female students of their fathers' IQ is 97.21, while male students' fathers rated on 86.21.

Fathers' *inter-personal intelligence* were also found to be statistically significant (F=33.25, p<0.05). Male students rated their fathers' interpersonal intelligence higher than their female students' fathers. Mean scores for male students is relatively higher (114.01) than their female students' fathers (98.37).

On *bodily kinaesthetic intelligence,* there were no statistically significant differences between the ratings of both male and female students' fathers (F=0.14, p>0.71). Male students rated on a mean score of 100.22 while their female students rated on a mean score of 99.03 respectively.

Spatial intelligence scores for fathers were also found not to be statistically significant (F=0.10, p>0.05). The mean scores for male students' fathers are 105.96 and female students 106.78 respectively. This shows that South African students' estimates do not differ in their ratings of their fathers' spatial intelligence.

More so, fathers' *intra-personal intelligence* was not found to be statistically significant (F=0.11, p>0.05). Male and female students show no difference in their fathers' intrapersonal intelligence ratings. The mean score for female students is 111.05 and male students, 111.89 respectively.

In summary, self-estimates of fathers' intelligence show, four out of the seven multiple intelligences to be statistically significant, with South African male students rating their fathers higher on verbal and mathematical intelligences than their female students' counterparts. On the other hand, South African female students rated their fathers' intelligences higher on musical and inter personal intelligences. Estimates of overall intelligence also show that, South African male students rated their fathers higher than their female students' counterparts.

Table 8: *Self-estimates of Intelligence- Gender Effect for South African Students' First Brothers*

Gender	Female		Male			
					F-	p-
Brothers	Mean	S.D.	Mean	S.D.	Value	Value
1st Bro.						
Ov IQ	101.88	19.47	100.34	17.13	0.46	0.500
Verb	105.04	21.15	100.57	19.82	3.09	0.080
Math	99.88	21.00	99.32	27.36	0.03	0.852
Spatial	104.65	19.64	105.11	23.80	0.03	0.864
Music	100.43	24.47	97.84	22.17	0.80	0.372
Body K	100.20	26.62	104.66	20.73	2.28	0.132
Inter	101.64	22.21	100.68	18.52	0.14	0.705
Intra	106.09	23.09	105.80	18.13	0.01	0.908

Note. 1st Bro.Ov.IQ = First Brothers' Overall intelligence, Verb =Verbal intelligence, Math = Mathematical intelligence, Spatial = Spatial intelligence, Music = Musical intelligence, Body K= Bodily, Kinaesthetic, Inter = Inter-personal intelligence, and Intra = Intra-personal intelligence.

The estimates of *overall intelligence* for South African students' first brothers was not found to be statistically significant (F=0.46, p>0.05), (see Table 8). South African male students rated their first brothers on the mean of 100.34 while their female students' counterparts rated 101.88. This shows that South African students' estimates of their first brothers do not differ by gender effect. First brothers verbal intelligence scores are also not statistically significant (F=3.09, p>0.05). Female students rated their first brothers on a mean of 105.04 whilst male students rated on a mean score of 100.57 respectively.

On *mathematical intelligence,* South African students first brothers ratings were not found to be statistically significant for gender (F=0.03, p>0.05). Female students rated their first brothers on an average of 99.88 and male students rated theirs on an average of 99.32. This shows that male and female students on their first brother's ratings do not differ on their self estimates of intelligence. First brothers' *spatial scores* were not found to be statistically significant (F=0.03, p>0.05), with the mean of 104.65 for female students and 105.11 for male students' counterparts.

First brothers' *musical intelligence score* was also not found to be statistically significant (F=0.02, p>0.05) with the mean of 100.43 for female and 97.84 for male students.

South African students' first brothers' *body kinaesthetic intelligence score* is also not statistically significant (F=2.28, p>0.05). The mean scores rated for female students is 101.64 and male students 100.68 respectively.

First brothers' *interpersonal score* was also not found to be statistically significant (F=0.14, p>0.05). The mean scores are 101.64 for female students and 100.68 for male students. First brothers' *intra-personal intelligence score* was also not found to be statistically significant (F=0.01, p>0.05). The mean scores for female students is 106.09 and male students 105.80.

In summary, the results of self estimates of intelligence for gender effect on first brothers' ratings, were found not to be statistically significant for the ratings of male and female students using the seven multiple intelligences.

Table 9: *Self-estimates of Intelligence- Gender Effect for South African Students' First Sisters*

Gender	Female		Male			
Sister	Mean	S.D.	Mean	S.D.	F-Value	p-Value
1st Sis						
Ov.IQ	98.87	18.71	102.60	19.27	1.97	0.162
Verbal	96.04	17.96	101.84	20.24	4.70	0.031
Math	95.90	20.13	97.55	22.14	0.31	0.577
Spatial	105.71	18.37	98.78	17.05	7.77	0.006
Musical	105.66	22.34	100.77	23.83	2.29	0.131
Body K	100.33	17.57	96.02	21.49	2.47	0.117
Inter	104.58	25.39	104.44	22.41	0.00	0.968
Intra	104.25	24.03	107.35	18.81	1.04	0.309

Note. 1st Sis Ov.IQ =First sisters' Overall intelligence, Verb =Verbal intelligence, Math = Mathematical intelligence, Spatial = Spatial intelligence, Music = Musical intelligence, Body K= Bodily kinaesthetic, Inter = Inter-personal intelligence, and Intra = Intra-personal intelligence.

Univariate F tests after a significant overall MANOVA test show that the estimates of *overall intelligence* for first sisters' intelligence was not found to be statistically

significant by gender of the South African participants (F=1.97, p>0.05), see Table 9. This shows that there are no main significant differences between these two groups' ratings of their first sisters, with female students rated on the mean of 98.87 and male students on the mean of 102.60 respectively.

On *mathematical intelligence,* there were no statistically significant differences between gender (F=0.31, p>0.05). Female students rated their first sisters on the average of 95.90 and male students rated first sisters on the average of 97.55.

First sisters' *body kinaesthetic intelligence,* their scores were also not found to be statistically significant for gender (F=2.47, p>0.05). Female students rated their first sisters on the average of 100.33 and male students on the average of 96.02. First sisters' *inter-personal score* was also not found to be statistically significant for gender (F=0.00, p>0.05). Female students gave their first sisters an average of 104.58 and male students with an average of 104.44 respectively.

First sisters' *intra-personal intelligence* score was also not found to be statistically significant for gender (F=1.04, p>0.05). Female students rated their first sisters on an average of 104.25 and male students on an average of 107.35.

On the other hand, first sisters' *verbal intelligence* score was found to be statistically significant (F=4.7, p<0.05). Female students rated their first sisters on a mean of 96.04 whilst male students rated their first sisters a mean score of 101.84.

Spatial intelligence scores for first sisters were found to be statistically significant (F=7.77, p<0.05). This shows that male and female students do differ in their estimates of their first sisters' abilities. Male students rated their first sisters on the mean of 98.78 and female students, 105.71 respectively.

First sisters' *musical intelligence* was found to be statistically significant (F=0.02, p>0.878). The average score for female students is 105.66 and for male students, 100.77.

In summary, male students rated their first-born sisters higher on verbal intelligence while female students rated their first-born sisters higher on spatial intelligence. The remaining intelligences were not found to be statistically significant.

Self-estimates of Intelligence- Nationality Effect

The second hypothesis tested for this study is:

H_0: There are cultural (nationality) differences in self estimates of intelligence between black Nigerian and black South African male students.

H_1: There are no cultural (nationality) differences in self estimates of intelligence between black Nigerian and black South African male students.

As it was difficult to obtain Nigerian female students on campus, only the South African male and Nigerian male participants were used in the analysis of the 'nationality' effect. The overall MANOVA test was shown to be statistically significant, followed by univariate analyses (see Table 10).

Table 10: *Self-estimates of National Effect: Nigerian and South African Male Students*

Nationality	Nigerian		South African			
Self	Mean	S.D.	Mean	S.D.	F-Value	p-Value
Self-Ov IQ	110.90	12.44	104.97	16.30	13.63	0.000*
Verb	115.84	20.07	103.80	18.07	32.56	0.000*
Math	111.74	15.07	98.37	24.27	35.54	0.000*
Spatial	113.88	21.77	109.13	24.20	3.48	0.063
Music	112.11	21.58	98.64	28.74	22.86	0.000*
Body K	110.43	20.54	103.07	21.31	10.11	0.002*
Inter	113.88	19.60	114.82	18.97	0.19	0.661
Intra	114.35	17.93	111.02	24.89	1.91	0.168

Note.   Self-Ov.IQ = Self Overall intelligence, Verb =Verbal intelligence, Math = Mathematical intelligence,

Spatial = Spatial intelligence, Music = Musical intelligence, Body K= Bodily kinaesthetic,

Inter = Inter-personal intelligence, and Intra = Intra-personal intelligence.

Estimates of overall intelligence between South African and Nigerian male students were found to be statistically significant (F=13.63, p<0.05). The mean score for Nigerian male students was 110.90 and South African male students, 104.97. Nigerian male students rated their overall intelligence higher than their South African male students' counterparts.

Verbal intelligence was also found to be statistically significant for nationality (F=32.56, p<0.05). The mean score for Nigerian male students is 115.84 and South African male students with a mean score of 103.80. This shows that Nigerian male students rated their verbal intelligence higher than their South African male students' counterparts.

Mathematics intelligence was found to be statistically significant for nationality (F=35.54, p<0.05). The mean score for Nigerian male students is 111.74 and for South African male students is lower with a mean score of 98.37.

Musical intelligence score was found to be statistically significant for nationality (F=22.86, p< 0.05). The mean score for Nigerian male students is 112.11 and South African male students lower with a mean of 98.64.

Bodily kinaesthetic intelligence was also found to be statistically significant for nationality (F=10.11, p<0.05). Mean scores for both Nigerians and South African male students were 110.43 and 103.07 respectively.

However, the following estimates are not statistically significant: *spatial intelligence* (F=3.48, p>0.05) with the mean of 113.88 for Nigerian male students and 109.13 for South African male students; *Inter-personal intelligence* (F=.19, p>0.05) with a mean of 113.88 for Nigerian male students and 114.82 for South African male students; and *Intra personal intelligence* (F=1.91, p>0.05) with a mean of 114 for Nigerian male students and 111.02 for South African male students.

In summary, Nigerian male students rated higher on self estimates of their own intelligence, which is evidence on the estimates of overall IQ, verbal, mathematics, musical, and bodily kinaesthetic intelligences than their South African male students' counterparts. However, scores were not found to be statistically significant in the ratings of spatial, inter-personal and intrapersonal intelligences.

Nigerian and South African male students were also asked to estimate their family members' IQ on the seven multiple intelligences as well as rated their family members on

their overall intelligence. The results of the MANOVA and follow up univariate F tests are shown in Table 11). Results show that, out of the seven multiple intelligences, five multiple intelligences were found to be statistically significant for participants' mothers. Nigerian male participants rated their mothers higher on verbal, mathematical, musical and bodily kinaesthetic intelligences while South African participants rated their mothers higher on spatial intelligence.

Table 11: *Self-estimates of National Effect: Nigerian and South African Male Students' Mothers*

Nationality	Nigerian		South African			
Mothers'	Mean	S.D.	Mean	S.D.	F-Value	p-Value
Ov.IQ	106.31	16.74	102.98	13.68	3.70	0.055
Verb	110.22	20.03	103.85	17.78	8.87	0.003*
Math	101.82	18.86	92.60	22.83	15.18	0.000*
Spatial	101.15	24.11	108.54	18.37	4.95	0.027*
Musical	103.63	23.56	95.48	24.89	8.85	0.003*
Body K	102.87	20.81	96.63	22.32	6.53	0.011*
Inter	113.18	21.51	114.52	20.62	0.31	0.576
Intra	112.52	17.96	112.88	19.83	0.03	0.863

Note. Ov.IQ = Overall intelligence, Verb =Verbal intelligence, Math = Mathematical intelligence, Spatial =Spatial intelligence, Music = Musical intelligence, Body K= Bodily kinaesthetic, Inter = Interpersonal intelligence, and Intra = Intra-personal intelligence.

Nigerian and South African male students' estimates of their mothers' *verbal intelligence* were found to be statistically significant (F=8.87, p<0.05). The estimated mean scores for Nigerian and South African participants' mothers were 110.22 and 103.85 respectively. Nigerian participants rated their mothers' verbal intelligence higher than their South African male participants.

Participants' mothers' ratings on *mathematical intelligence* was found to be statistically significant (F=15.18, p<0.05). The mean score for Nigerian male students' mothers was 101.82 and for South African male students' mothers, 106.54. This shows that Nigerian participants rated their mothers higher on mathematical intelligence than their fellow South African participants' ratings of their mothers.

Participants' mothers' *spatial intelligence* was found to be statistically significant (F= 4.95, p<0.05). The mean score for Nigerian male participants' mothers is 101.15 and 106.54 for South African participants. This shows that South African male participants rated their mothers higher on spatial intelligence than their Nigerian male counterparts.

Mothers *musical intelligence* was also found to be statistically significant (F= 8.85, p<0.05). The mean score for Nigerian male students' mothers is 103.63 and 95.48 for South African male mothers.

Mothers' ratings on bodily *kinaesthetic* intelligence was found to be statistically significant (F= 6.53, p<0.05). The mean scores were 102.87 for Nigerian male mothers and 96.63 for South African male mothers.

There was also a statistically significant difference on spatial intelligence ratings for participants' mothers (F= 4.95, p>0.027) with the mean of 108.15 for South African male ratings of their mothers and Nigerian male students' mothers on the mean rating of 101.15. This means that South African male students rated their mothers' spatial intelligence higher than Nigerian male students.

The following results were not found to be statistically significant for nationality; overall intelligence (F=3.70, p>0.05) with the mean of 106.31 for Nigerian male students' mothers and 102.98 for South African male students' mothers; inter personal intelligence (F=0.31, p>0.576) with a mean of 113.18 for Nigerian participants and 114.52 for South African participants' mothers and intrapersonal intelligence (F=0.03, p>0.863) with a mean of 112.52 for Nigerian male students' mothers and 112.88 for South African male students' mothers respectively.

In summary, Nigerian male students' mothers were rated higher on verbal, mathematical, musical and bodily kinaesthetic intelligences than their South African male students' counterparts; on the other hand, South African male students' mothers rated higher on spatial intelligence than Nigerian male students' counterparts. In general, Nigerian male participants over-estimated their mothers' abilities compared to their South African male counterparts.

Table 12: *Self-estimates of National Effect: Nigerian and South African Male Students'*
Fathers.

Nationality	Nigerian		South African			
Fathers'	Mean	S.D.	Mean	S.D.	F-Value	p-Value
Ov IQ	111.09	13.11	105.85	17.53	7.87	.005
Verbal	117.07	18.59	110.48	19.89	8.04	.005
Math	112.50	15.23	96.80	23.12	44.17	.000
Spatial	111.52	23.72	105.96	23.12	3.86	.051
Music	106.30	22.18	86.21	21.06	59.08	.000
Body-k	105.87	25.34	100.22	25.17	3.43	.065
Inter	109.49	25.09	114.01	19.34	2.78	.097
Intra	111.74	14.36	111.89	16.62	.006	.936

Note. Fathers' Ov.IQ = Fathers' Overall intelligence, Verb =Verbal intelligence, Math =

Mathematical intelligence, Spatial = Spatial intelligence, Music = Musical intelligence,

Body K= Bodily kinaesthetic, Inter= Inter-personal intelligence, and Intra = Intra-personal intelligence.

Self-estimates of fathers' multiple intelligences by the two male samples were also shown to be significant overall on the MANOVA analysis, which necessitated following up using univariate analyses (see Table 12).

Verbal intelligence was found to be statistically significant for nationality on fathers' intelligences (F=8.04, p<0.005). Nigerian male participants rated their fathers' verbal intelligence higher than South African male participants. Nigerian male participants estimated their fathers' abilities on the average of 117.07 and South African male participants on the average of 105.85 respectively.

Mathematical intelligence was also found to be statistically significant (F=44.17, p<0.05) with Nigerian male students rating their fathers' abilities higher than their South African counterparts, with the mean of 112.50 and 96.80 respectively.
On *spatial intelligence*, scores were not found to be statistically significant (F= 3.86, p>0.05).

Musical intelligence scores were also found to be statistically significant, (F= 59.08, p<0.05). Nigerian male participants rated their fathers' intelligence, higher than their South African male counterparts. This shows on their rated mean for each participant,

Nigerian male student with the mean of 106.30 and South African male with the mean of 86.21 respectively.

Bodily kinaesthetic intelligence score was also found to be statistically significant (F=3.43, p> 0.65), hence, Nigerian male students show higher ratings for their fathers' abilities than their South African counterparts, with the mean of 105.87 and 100.22 respectively.

In summary, five out of the seven factors of multiple intelligences were found to be statistically significant for nationality on fathers' IQ ratings. Nigerian male students rated their fathers' abilities higher than their South African male counterparts on verbal, mathematical, spatial, bodily kinaesthetic and intrapersonal intelligences. The remaining two multiple intelligences, that is, interpersonal and musical intelligences are not statistically significant. However, overall intelligence for fathers is also statistically significant. This means that on the overall ratings of intelligence, Nigerian male students rated their fathers' intelligence higher than their South African male students' counterparts. As in the estimation of their mothers' abilities, Nigerian male students tend to overestimate their fathers' multiple intelligences, compared to the South African male sample.

Table 13 shows how the two samples estimated their first-born brothers' multiple intelligences. Upon following up using univariate F tests, the estimates of *overall intelligence* for both South African and Nigerian participants' first brothers was found to be statistically significant (F= 41.01, p<0.05). The mean score for Nigerian male students' first brothers is 111.98 whilst 100.34 it is for South African male students' first brothers. This shows that Nigerian male participants rated their first brothers' abilities higher than their South African counterparts. First brothers' *verbal intelligence* was also found to be statistically significant for nationality (F=18.84, p<0.05). The mean score for Nigerian participants' first brothers were 110.25 and for South African participants' first brothers were 100.57 respectively.

Table 13: *Self-estimates of National Effect between Nigerian and South African Participants' First Brothers*

Nationality	Nigerian		South African			
IQ's	Mean	S.D.	Mean	S.D.	F-Value	p-Value
1st Bro						
Ov.IQ	111.98	12.53	100.34	17.13	41.01	0.000*
Verbal	110.25	16.85	100.57	19.82	18.84	0.000*
Math	115.11	19.74	99.32	27.36	29.91	0.000*
Spatial	112.95	15.13	105.11	23.80	10.57	0.001*
Music	103.88	22.58	97.84	22.17	4.94	0.027*
Body	109.50	23.90	104.66	20.73	3.15	0.077
Inter	110.68	19.80	100.68	18.52	18.39	0.000*
Intra	108.96	21.95	105.80	18.13	1.66	0.198

Note. 1st Bro Ov.IQ =First Brothers' Overall intelligence, Verb =Verbal intelligence,

Math = Mathematical intelligence, Spatial = Spatial intelligence, Music = Musical intelligence,

Body = Bodily kinaesthetic, Inter = Inter-personal intelligence, and Intra = Intra-personal intelligence.

First brothers' *mathematical intelligence* was found to be statistically significant for nationality (F=29.91, p<0.05), with the mean of 115.11 for Nigerian participants first brothers and 100.57 for South African participants' first brothers. This score shows that Nigerian male students rated their first brothers' abilities higher than their South African male counterparts.

First brothers' *spatial intelligence* was also found to be statistically significant for nationality (F=10.57, p<0.05). Mean scores for both Nigerian first brothers and South African first brothers were 112.95 and 105.11 respectively. This shows that Nigerian male students rated their first brothers' spatial intelligence higher than their South African male counterparts.

First brothers' *musical intelligence* was found to be statistically significant for nationality (F = 4.94 p < 0.05). The mean score for Nigerian male students' first brothers is higher with 103.88 and for South African male students' first brothers is lower with a mean of 97.84.

First brothers' *inter-personal intelligence* was found to be statistically significant for nationality (F = 18.39 p < 0.05). The mean score for Nigerian participants' first brothers was 110.68 and 100.68 for South African participants' first brothers. However, intra-personal intelligence was not found to be statistically significant for first brothers'

abilities. (F=1.66, p>0.05), with the mean of 108.96 and 105.80 for both Nigerian and South African participants respectively.

In summary, Nigerian male students rated their first brothers' intelligences on the following abilities than their South African male students' counterparts; verbal, mathematical, spatial, bodily kinaesthetic, musical and inter-personal intelligences. The general trend for Nigerian males to rate their intelligences higher, compared to the ratings by the South African males, is maintained.

The results (Table 14) show self estimates of intelligence for Nigerian and South African male students' first sisters' ratings on IQ.

Table 14: *Self-estimates of National Effect: Nigerian and South African Male Students' First Sisters*

Nationality	Nigerian		South African			
1st Sister	Mean	S.D.	Mean	S.D.	F-Value	p-Value
Ov IQ	106.62	18.28	102.60	19.27	2.71	0.101
Verbal	114.28	18.23	101.84	20.24	24.90	0.000*
Math	106.41	21.70	97.55	22.14	9.59	0.002*
Spatial	109.83	19.23	98.78	17.05	21.13	0.000*
Musical	104.97	22.57	100.77	23.83	1.94	0.165
Body K	106.41	19.82	96.02	21.49	15.02	0.000*
Inter-	107.97	18.12	104.44	22.41	1.83	0.178
Intra	112.21	20.23	107.35	18.81	3.57	0.060

Note. 1st Sister = First sister, Ov IQ = Overall intelligence, Verb =Verbal intelligence, Math = Mathematical intelligence, Spatial = Spatial intelligence, Music = Musical intelligence, Body K= Bodily kinaesthetic, Inter = Inter-personal intelligence, and Intra = Intra-personal intelligence.

First sisters' *verbal intelligence* was found to be statistically significant for nationality (F= 24.90, p <0.05). The mean scores for Nigerian participants' first sisters are 114.28 and for South African participants, 101.84 respectively. This shows that Nigerian male participants rated their first sisters' higher on verbal scores than their South African male participants.

First sisters' *mathematical intelligence* was found to be statistically significant for nationality (F= 9.59, p<0.05).The mean score for Nigerian participants' first sisters is 106.41 and 97.55 for South African participants' first sisters respectively. This score shows that Nigerian participants estimated their first sisters' abilities higher than South African male participants.

First sisters' *spatial intelligence* was also found to be statistically significant for nationality (F= 21.13, p< 0.05), with the mean score of 109.83 for Nigerian male students' first sisters and 98.78 for South African male students' first sisters respectively. On *bodily-kinaesthetic intelligence,* result was found to be statistically significant (F=15.02, p<0.05) between these participants. Their results show a mean score of 106.41 for Nigerian male participants and 96.02 for South African male counterparts.

The following estimates were not found to be statistically significant; first sisters overall IQ (F=2.71, p>0.05) with the mean of 106.62 and 102.60 for Nigerian and South African male participants' first sisters; first sisters' musical score (F=1.94, p>0.05) with the mean of 104.97 and 100.77; and inter-personal intelligence (F=1.83, p>0.05) with the mean score of 107.97 and 104.44 respectively.

In summary, Nigerians male students rated their first sisters' IQ higher on verbal, mathematical, spatial, bodily kinaesthetic and intrapersonal intelligences than South African male counterparts. This continues the trend established with the other family members' ratings above.

Conclusion

This chapter reported the results derived from the responses of both the Nigerian and South African students in their self ratings and that of their family members' intelligences. These were achieved by analysing the hypotheses tested for each category on the seven multiple factors of intelligence. In the first instance MANOVA was employed and follow up analyses conducted using univariate F tests where the omnibus test of the null hypothesis was found to be statistically significant.

The gender analyses relied on the South African sample only, due to the insufficient sample size for the Nigerian female population studying at the University of KwaZulu-Natal. As far as the self ratings were concerned, significant differences were observed for Bodily-kinaesthetic and intrapersonal intelligences. South African male students rated themselves higher on bodily kinaesthetic intelligences, compared to the self-ratings by South African female students. On the other hand, South African female students rated themselves higher on inter and intrapersonal intelligences, compared to the self-ratings by their male student counterparts.

On estimation of multiple intelligences of family members' ratings, South African male students rated their mothers higher on bodily and inter personal intelligences than their South African female students' mothers. The remaining five multiple intelligences such as verbal, mathematical, spatial musical and intrapersonal intelligences show no statistically significant differences between the participants 'mothers' ratings. On the overall intelligence, South African students' mothers' rating, there are no statistical significant differences in gender ratings of intelligence. Fathers' ratings also show statistically significant differences especially on the overall, verbal, mathematical and interpersonal intelligences, that is, male students rated their fathers higher than their female students' fathers' counterpart.

On estimation of first brothers' rating of intelligence, there is no main significant gender effect, except on overall intelligence, where female students rated their first brothers higher than their male students' counterparts. The main effect for gender on first sisters' overall IQ rating is also not statistically significant. However, on components such as spatial intelligence, female students gave a higher rating for their sisters, while the male participants gave a higher rating for their sisters on verbal intelligence.

This chapter also analysed the results by nationality (South African versus Nigerian), using only the male participants. Results show that there are statistically significant differences in the estimates of intelligences between these two nationalities, with the Nigerian students invariably giving higher self-estimates for themselves and their relatives, compared to the estimates by the South Africans. Nigerian male participants rated themselves higher on intelligences such as: the overall, verbal, mathematical, spatial, musical and bodily kinaesthetic intelligences than their South African male

counterparts. There are however, no statistically significant differences on inter- and intrapersonal intelligences.

Participants were also asked to rate their family members on the seven multiple intelligences, result shows a main significant nationality effect on mothers' rating of intelligence, with Nigerian male participants rated their mothers higher on verbal, mathematical, musical and bodily kinaesthetic intelligences than their South African male counterparts. South African male students only rated their mothers' abilities higher on spatial intelligence than Nigerian male students.

As far as the fathers' ratings were concerned, South African male students gave lower estimates of their fathers' abilities on overall IQ as well as verbal, mathematical, and musical intelligences compared to the ratings given by the Nigerian male students. Result also shows statistically significant differences on the ratings of first brothers' abilities, with South African male students giving lower ratings than the Nigerian students on the following dimensions of intelligence: overall IQ, verbal IQ, mathematical IQ, spatial IQ, and interpersonal IQ.

Lastly, on the estimates of first sisters' rating, Nigerian male students gave higher estimates on verbal, mathematical, spatial and bodily kinaesthetic intelligences than their South African male counterparts. Generally, Nigerian male students tended to give themselves and their relatives higher estimates on the components of multiple intelligences, compared to the ratings South African male students gave to themselves and their relatives. The results are discussed in the following chapter.

CHAPTER 5

DISCUSSIONS OF FINDINGS AND CONCLUSION

Discussions on Findings

It is assumed that when people engage in intelligent activities, their beliefs and behaviours are directed by their individual definitions of the construct of intelligence (Kaufman, 1990). Lim, Plucker and Im (2002) have also shown that laypeople's beliefs about how to interpret and evaluate intelligence may be different from the theories developed by professionals/academicians in the field of psychology. This chapter discusses possible explanations of the analysis of results obtained from the self estimates of tertiary students' intelligence among two African nationalities, that is, black South African and black Nigerian students. Their self-rating in terms of gender effect was first analysed, followed by their nationality effect in their self- ratings for male student participants.

This chapter begins firstly, by analysing possible explanations for the gender differences observed in this study. Gender differences observed in this study may be influenced by social and educational settings that male and female students find themselves (Furnham, 2000). The findings in this study are perhaps best explicable in terms of the dominant sex roles associated with each sex in most contemporary societies (Furnham & Akande, 2003). In most societies, there is high agreement about what are considered to be typically ''feminine'' and ''masculine'' characteristics. For men, dominant masculinities typically include notions of independence and intellectual competence, which may result in their self-enhancing bias. By contrast, stereotypes of femininity include emphasis on humility and modesty (Beloff, 1992), which may result in poor intellectual self-image relative to men. Another reason considered for gender differences for this study may be the result of male hubris and humility findings (Beloff, 1992), male favouring differences extending to estimation of intelligence resulting in low confidence in self rating among female participants.

Other reason argued for the gender differences may be as a result of societal gender stereotypes on perceptions of intelligence. The notion that males are more intelligence

on cognitive/mental abilities than females is based on stereotypes (Francois, 1996). A number of studies have analysed gender stereotypes on the basis that people are social beings that depend on the process of socialization for learning socially accepted behaviours (Eagly & Kite, 1987; Eagly & Steffen, 1996).

Secondly, this chapter also discusses the nationality/cultural effect observed, where Nigerian males students rated themselves higher on intelligences than their South African male students' counterparts. The findings are difficult to explain. It may as well be that the individuality and standing out by way of intelligence in valued among Nigerian males, which would lead to participants rating themselves higher on the multiple components of intelligence. On the other hand, it is possibly that, for the South African participants, the humility effect that has been observed with females in general, is also influential on the male participants' self-ratings, relative to the ratings by the Nigerian males. Further studies are needed to confirm and elucidate these findings.

Finally, this chapter then summarizes the aims of investigating the lay people's and professionals' perceptions of intelligences as well as summarizes the different controversies surrounding the construct of intelligence. It also summarizes the different assumptions of the theories of intelligence as well as the critiques of different approaches to intelligence. It summarizes gender and gender stereotypes on multiple intelligences and the different cross cultural perceptions on self-estimates of intelligence. It also tackles the implications of this study for future research, implications for the theory and the limitations of this study.

Self-estimates of Multiple Intelligence

Self- estimates of Multiple Intelligences: Gender Effect.

Most previous studies conducted on the perception of intelligence outside Africa have shown that males often rate themselves higher than females do especially on logical/ mathematical and spatial intelligences (Furnham & Baguma, 1999; Furnham, Callahan & Akande, 2004; Furnham & Fong, 2000). However, in this study, there are no statistically significant differences on the overall estimates of intelligence between male and female South African students. It is not clear as to why there are no significant

differences in the way male and female students rated their overall intelligences in this case, but it could be theorized that recent changes in social policies advocating gender equity might have played a role in sensitising university female students about their intellectual competences, which they do not see as been different to male students' overall intelligence (Francis 2000). However, it may be argued that sensitising most students on gender stereotyping over these issues may have played a role.

The only statistically significant differences observed in this study were seen in participants' intelligences such as in their intrapersonal and bodily kinaesthetic intelligences, with male students rating themselves higher than female students did on bodily kinaesthetic intelligence. Female students also rated higher on interpersonal intelligence. This result is still in line with the results from the previous studies on gender differences on the estimates of intelligence (Bowd & Brady, 2003; Furnham & Baguma, 1999; Furnham, Callahan & Akande, 2004; Furnham, Clark & Bailey, 1999; Furnham & Fong, 2000) which show that males and females differ on their self ratings of intrapersonal intelligence and sometimes bodily kinaesthetic intelligence. Female students are generally reported in the literature to differ from males on the self ratings on interpersonal and music intelligences (Cohen, 2001; Furnham & Baguma, 1999; Furnham, Callahan & Akande, 2004; Furnham & Fong, 2000).

There is no clear explanation for this gender difference except perhaps when argued in the notion that those tertiary students may be particularly responding to sex-roles assumptions. The notion that male are more intelligent on logical, spatial or bodily kinaesthetic intelligences than female, have been analyzed by different studies as gender stereotypes (Eagly & Kite 1987; Eagly & Steffen, 1986; Franzoi, 1996; Popenoe, Cunningham & Boult, 1998). It is believed that much of our gender knowledge or perception is based on stereotypes. A number of studies have analyzed gender stereotypes on the basis that people are social beings who depend on the process of socialization for learning socially accepted behaviours (Eagly & Kite 1987; Eagly & Steffen, 1986). Gender stereotypes are seen as society's expectations about the characteristics of female as a group and male as another group (Franzoi, 1996). It is believed that this type of categorization involves fixed ways of thinking about people that puts them into categories and does not allow for individual variations. These stereotypes were however not evidently strong in the current sample, as evidenced by

the fact that no significant gender differences were observed in the usual components such as mathematical and spatial intelligence.

In addition to gender stereotypes, Eagly and Kite (1987) also pointed out that people have different personal attributes that are categorised as male and female attributes; these are known as general traits of masculinity and femininity. Masculinity is related to tasks completion and goal achievements in the public world of work, while femininity is considered to deal with expressive personality traits related to caretaking and nurturance at home. Men are particularly characterized as silent/logical thinkers, courageous, strong, adventurous/spatial and aggressive while women are linked to be fearful, vocal, soft-hearted and affectionate.

For these reasons, men are seen to excel more on cognitive and physical abilities such as problem- solving/logical, spatial intelligences or bodily kinaesthetic abilities, while women are expected to excel on social intelligences such as, verbal, musical and interpersonal and intrapersonal intelligences (Silverman & Philips, 1998). Gender stereotypes are understood to vary across different people and cultures, which are perceived as a potential for shaping peoples' behaviour (Popenoe, Cunningham & Boult, 1998). Eagly & Kite (1987) believe that people are taught to have learnt these behaviours from a very early age in order to function and become integrated members of the society. Hence, people's judgments are based on physical characteristics in males and females.

This study's result may also be linked to gender stereotypes, university students in this case may have based their judgment of perception of intelligence on physical characteristics of male and female stereotypes they learn from their societies from their early ages. The fact that this study reveals that South African male students rated bodily kinaesthetic intelligence and female students rated higher on intrapersonal intelligences may be evidences of their level of socialization from their environment resulting in gender stereotypes which are also in line with the previous studies (Francis, 2000; Furnham, Hosoe & Tang, 2001; Furnham, Shahidi & Baluch, 2002).

However, the manners in which perceptions of intelligence are constructed by various people have also been reported to favour male and female associated behaviours and

abilities (Franzoi, 1996). It was reported that male normative perceptions of intelligence also affects the way students perceive themselves in relation to their cognitive abilities (Furnham, 2001). For example, societies raise individuals that resemble their cultural societal norms and values (Franzoi, 1996). These are evident in many institutions for learning where a large proportion of male students are compared to females, to do technical subjects such as mathematics, sciences and technical drawing. Female students are perceived to dominate the home economics classes while male students tend to be allocated to science and technical classes (Honigsfield & Dunn, 2003).

Using these gender stereotypes and male normative effect in the perceptions of multiple intelligences, Furnham (2001) proposes that logical/mathematical and spatial intelligence which are perceived as dominant on males lie at the minds of most lay people's perceptions of intelligence. Furnham revealed that the average lay people's perception of intelligence is male normative. This did not stand out in the current South African sample and this may reflect the dominant discourse on gender equality in that country.

Bowd and Brady (2003) also suggested that school settings have added to the male normative in that females are more geared towards subjects that are less mental abilities than males, such as mathematics (males are seen to dominate cognitive abilities such as; logical/mathematical abilities) and female are more geared towards subjects involving social abilities, such as, interpersonal, intrapersonal, verbal and musical intelligences.

In previous study, Furnham (2000), studied British parents' estimates of theirs and children's multiple intelligences, Furnham found that British fathers–male gave higher estimates than mothers- female on logical/mathematical, spatial and intrapersonal intelligences than their female children. However, this study deals with university students ratings of theirs and relatives multiple intelligence; there are no main significant differences in the overall ratings of intelligence between male and female students on self estimates of intelligence, but there are significant differences on individual abilities such as in mathematical, bodily kinaesthetic, interpersonal and intrapersonal intelligences. Statistically significant differences do not show on main gender effect for relatives' overall intelligence; however differences are noticed on

individual abilities for family ratings. This shows that male and female students rated their family members' differently on individuals' abilities.

It is assumed that the university students' ideas on self ratings may be different from their parents as seen in Furnham (2000)'s study. University students in this case may not be as influenced by some societal demands and family influences about the beliefs that males are more intelligent than female on some aspects of intelligence such as mental and social intelligences as their parents; this may be argued to be the university students' reasons for less significant differences on gender effect on self- estimates of theirs and family members' intelligences observed in this study.

Self-estimates of Multiple Intelligences: Nationality Effect

The results of this study are particularly interesting as far as the male samples from South Africa and Nigeria are concerned. The first difference is the very consistent gender differences in mathematical /logical intelligence in self-rating on the seven multiple intelligences.

Secondly, this study shows that in both Nigerian and South African male students, on nearly every multiple intelligence rating, and for ratings of both self and relatives, the Nigerian male students gave higher ratings than South African male students. This is particularly striking for nearly all the seven multiple intelligences except for interpersonal and intrapersonal intelligence scores which did not show clear differences between these countries. It is not clear precisely why these findings are so, but one could argue this in terms of same sex comparisons that were tested in this study for both Nigerian and South African male students. Other studies that have analysed sex differences on different cultures, for example, have analysed male and female sexes (Bowd & Brady, 2003; Furnham & Baguma, 1999; Furnham, Callahan & Akande, 2004; Furnham, Clark & Bailey, 1999; Furnham & Fong, 2000).

A study by Furnham and Baguma (1999) from Ugandan students analysed both male and females and their cultural differences, their result showed a similar pattern to that found in other African countries' studies. Another study by Furnham, Akande and Callahan (2003) also estimated male and female self estimates, they found only two sex differences with black South African and Nigerian males giving higher self-estimates on

verbal and spatial intelligence than their equivalent females. This study rated estimated intelligence of only male students nationally; this makes the result of this study interesting and also challenging. This may provide further study on the area of research for excellent theoretical and practical area for future study on self estimates of intelligence. It is possibly that the 'male hubris' effect noted by Furnham and his colleagues (such as. Furnham, Clark & Bailey, 1999) is stronger with Nigerian males. Another possibility is that individuality and standing out from others, by way of being intelligent, is more valued and encouraged in Nigerian societies among males, and this would then play out in the self-ratings. Other characteristics of Southern African and Western African cultures as yet unexplored may also account for these differences.

Majority of the previous studies on self-estimates of intelligence have indicated a gender effect on some aspects of intelligence, which this study is also in line with. In most of these previous studies, it was indicated that male rated their intelligence higher than female did, especially on mathematical/ logical and spatial intelligences. But what is really interesting for this study is the bodily kinaesthetic intelligence self-rating for male, which is not commonly reported in most of the previous studies, this may open-up another avenue for further investigation in this regard. However, the fact that male and female students' overall intelligence did not show any statistically significant differences in intelligence might be a consequence of current social policies advocating gender equality, which may have played a role in sensitising female students about their intellectual competence resulting in no clear significant gender effect on the students' overall intelligence for South African participants.

Previous studies on cross cultural self estimates of intelligence especially with Furnham and Akande (2003) have reported a significant cross cultural effect between Nigerian and South African students. Their result from country analysis of self-estimates show that Nigerian students rated their social intelligence (inter- and intra-personal intelligences) much higher than their South African students. But in this study shows that Nigerian students rated higher on all the five, out of the seven multiple intelligences, except in inter and intra personal intelligences which shows no statistically significant differences. However, the result of analysis in this study is still in line with Furnham and Akande's (2003) finding on the overall intelligence of black South African and Nigerian students self estimates of intelligence. It is possible

however that the typically postgraduate nature of the Nigerian sample also accounted for the differences observed.

From the above discussions, it may be argued that the results from this kind of study are both interesting and important. They are important because of their potential consequences. The importance of studies of self-estimated intelligence lies not only in exploring lay theories of intelligence, but also of understanding the possible self-fulfilling nature of self-evaluations of ability (Furnham, 2000), and the interesting part lies in the way theories on perceptions of intelligence and individual self ratings of intelligence manifest.

Beyer (1998, 1999) has demonstrated gender differences in expectations, self-evaluations, and performance on ability-related tasks. Gender differences in self-evaluations affect expectancies of success and failure, and ultimately, performance on those tasks. The results of this study demonstrate relatively few gender differences on individual abilities, but show more evidence of nationality differences. However, the same processes and mechanisms could operate to perpetuate differences in academic performance across gender and cultural groups.

It would have been worthwhile, if this study had compared gender differences nationally, with male and female students from each country, so as to see if Nigerian female students will respond in similar ways as their male counterparts and especially in comparisons to South African female students, but further research may assist in proving possible comparisons in this regard for future studies.

CONCLUSION

This study aimed at investigating the lay people's perception of intelligence using participants from two nationalities, that is, black Nigerian and black South African students from University of KwaZulu-Natal. There is no major motive for choosing participants from Nigerian and South African students per se, but this decision is mainly taking because studies have shown that there are gaps in estimates of perception of intelligence within African continents (Furnham & Akande, 2004), so it may be worthwhile to research within ones' cultural background in other to gain a broader insight into one's culture regarding perceptions of intelligence and then extend the knowledge to the rest of Africa.

Research shows that it is an important issue to examine cross national effect of intelligence due to its social usefulness in different cultures (Furnham & Baguma, 1999; Furnham, Callahan & Akande, 2004; Furnham, Hosoe & Tang, 2001). For this reason, data have been collected from the West (such as Europe), but fewer studies had been done on the African continent, regarding the perceptions of laypeople on intelligence (Furnham & Akande, 2003, 2004; Furnham, Callahan & Akande, 2004). This study is unique in the sense that there has been few or no emphasis with respect to self-estimated intelligence between West Africans and South Africans within a tertiary institution. This makes the focus of this study relevant, as many comparative studies have not studied different populations within the same environment, same sexes, and possibly with similar cultural backgrounds. For example, Furnham, Callahan and Akande
 (2003; 2004) analyse self- estimates of intelligence in three different Southern African counties (Zambia, Namibia and Zimbabwe). Furnham and Akande (2004) also compared self-estimates/perceptions of multiple intelligences among male and female students from University of Ibadan in Nigeria and among white and black South African students in South Africa.

Studies (such as Beloff, 1992; Furnham, 2000; Furnham, Hosoe & Tang, 2002), have also shown that when asking males and females to estimate their intelligence and that of their parents, it is possible to investigate whether the 'hubris humility findings' from self-estimates extends to others of the same gender as well as those of different gender or whether self-estimates are somehow different, and it may be worthwhile to explore

the perceptions of male and female to discover if their 'hubris and humility findings' in previous western studies also apply to Africans.

Conclusion on Research Questions

This study tested two hypotheses, firstly, the gender effect in self-ratings of mathematical and spatial intelligence among South African male and female students; with male students rating themselves higher, and female students giving themselves lower ratings. Secondly, the cultural (nationality) differences in self-estimates of intelligence between black Nigerian and black South African students.

Most previous studies conducted on the perceptions of intelligence have shown that males often overestimate their intelligences while females underestimate. This has been reported more on logical/ mathematical and spatial intelligences (Furnham & Fong, 2000). Although, results from this study show no statistically significant gender differences on the overall estimates of intelligence for male and female students, possible explanation for this may be the level of education of these university students and the recent changes in social policies which permit gender equality may have played a role in sensitising and deflating the gender stereotypes on intellectual abilities that male are more intelligent in some aspects of learning than female (Furnham, 2000).

The result in this study also show a statistically significant gender difference on individual intelligence's rating, where South African male students overestimate their bodily kinaesthetic intelligences, than did South African female students. Possible explanation for these differences may be the effect of 'hubris and humility' reported in many studies for self estimates on gender perception of intelligence (Bellof, 1992; Cohen, 2001; Furnham, 2000).

It may be postulated to argue that those tertiary students may be responding less to sex-roles assumptions. The notion that male are more intelligent on logical, spatial or bodily kinaesthetic intelligences than female, have been categorized in many gender studies as gender stereotypes. It is believed that much of our gender perception is based on stereotypes (Eagly & Kite 1987; Eagly & Steffen, 1986; Franzoi, 1996; Popenoe, Cunningham & Boult, 1998). For these reasons, male are seen to excel more on cognitive and physical abilities such as problem- solving/logical, spatial intelligences or

bodily kinaesthetic, while female excel more on social intelligences such as, verbal, musical, interpersonal and intrapersonal intelligences (Silverman & Philips, 1998). South African university students in this case may have based their judgment less on gender stereotypes compared to the studies reported in the literature.

The results of this study on the male students from Nigeria and South Africa are also particularly interesting; they may provide further questions on why there is a consistent pattern, namely Nigerian students rating themselves and their relatives higher on almost all the dimensions of intelligence.

Implications for Future Research Studies

This study analysed nationality effect between Nigerian male and South African male students which was not the initial plan for this study, due to fewer Nigerian's data for female students collected, the study then settled for the same sex effect. In light of this, it has been noted that most literatures on gender perceptions of intelligence have analysed both sexes (Bowd & Brady, 2003; Furnham & Baguma, 1999; Furnham, Callahan & Akande, 2004; Furnham, Clark & Bailey, 1999; Furnham & Fong, 2000), which may be seen as a gap for same sex effect on perception of intelligence. Hence, the need for same sex perceptions of intelligence may be needed in this regard.

It would have been more interesting to analyse the Nigerian female perceptions of intelligence and to compare this with their South African female counterparts, to see if the same 'nationality effect' observed for male students would also be applicable. More research is also needed on students' perceptions of intelligence from their individual countries which may require qualitative research methods to avoid generalization of assumptions and to allow more opinions on the construct of intelligence. In addition, more research is needed to focus on African's perception of intelligence, to focus on what intelligence means to Africans since African psychology shows a gap in this regard compared to their western counterparts (Furnham & Akande, 2003; Furnham, Callahan & Akande, 2004).

Implications for Theory

In most literatures on theories analysing the perceptions of intelligence, it has been assumed that intelligence has been reported to be tested in the same way for all cultures, especially when intelligence tests designed in the western world are been used to test the perceptions of intelligence across cultures. Hence, western interpretations of intelligence are presumed for other cultures such as, African culture.

What complicates this matter further is that psychologists and professionals alike studying the constructs of intelligence for such a long time have not been able to reach a consensus regarding the constructs of intelligence (Gardner, 1999). In that note, there is still a need for more research into the constructs of intelligence. Researchers may need to research extensively on what Africans consider as their interpretation or perception of intelligence, so as to avoid the idea of unitary perception of intelligence and the idea of linear ranking of people for Western interpretations of intelligence that do not run across all cultures (Furnham & Akande, 2003), especially African cultures.

Limitations of the Study

The participants in this study are derived from a university setting. As such, it cannot be regarded as being representative of the general population for both South African and Nigerian population. However, the study reveals some interesting patterns about the populations of interest. This study also relied on non-probability sampling, which means that its results are not generalisable to the populations of interest. Further, the Nigerian sample was mainly post-graduate and male, reflecting the typical Nigerian students that come to study in South Africa. It would therefore be interesting to collect data in Nigeria, where one would have access to undergraduate students as well. The qualitative dimension of intelligence was not assessed and this means out that participants' unique definitions of the construct were not taken into consideration, something which could have enriched the study.

Conclusive Summary

This study looked at tertiary students' estimates of theirs and their family members multiple and overall intelligence, a cross national study between Nigerian and South African. For the gender effects on self-ratings, relying on the South African sample, the noted gender effect of males rating higher on mathematical and spatial intelligence was not observed. The differences were only on bodily-kinaesthetic (favouring males) and intrapersonal intelligence (favouring females). This result suggests less susceptibility to stereotypes for this particularly South African tertiary sample, at least as far as the self-ratings are concerned. There were statistically significant differences between Nigerian and South African male students, with Nigerian male students rating themselves and their relatives higher on nearly all the aspects of multiple intelligences, including the overall intelligence than their South African male students' counterparts. The reason for these differences are not clear; they may be attributable to the unique perceptions of being intelligence in these two countries, perhaps with individuality and standing out from others being more valued in Nigeria. On the other hand, it is possible that the humility effect evident with females in general was more at play with the South African male sample. Future studies need to examine West African and Southern African cultural characteristics that possibly contribute to this effect.

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APPENDICES

Appendix: 1

CONSENT FORM

Dear Participant,

My name is Kike Adewusi a masters' student in psychology, here at UKZN. I am required to complete a research study in partial fulfilment of my degree. This study is about self-estimates of multiple intelligences, as well as the estimates of the multiple intelligences of relatives. International students (Nigerians only) and South African (Black African) students are being approached to participate in the study. This study requires no administration of IQ tests; it is only the estimates of your multiple intelligences and the intelligences of your relatives that we are interested in.

There is no harm involved in this study. No benefits will accrue to you by virtue of participating in the study. However, the study will contribute towards the literature on intelligence and how it is viewed in different cultural contexts.

Your name is not needed. Your identity will remain unknown and the information you provide will be kept confidential. You may withdraw from this study at any time should you wish to do so and you will not suffer prejudice. A summary of the results of this study will be made available to you desire this.

Please sign below to show your willingness to participate and to indicate that you understand the conditions of this study.

…………………………..   ………………………….
Participant's signature   Date

For further information on this study, you can contact us at:

Student Researcher:	**Supervisor:**
K.A. Adewusi	Professor. N.J. Mkhize (PhD)
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Appendix: 2

HOW INTELLIGENT ARE YOU?

Intelligence tests attempt to measure intelligence. The average or mean score on these tests is 100. Most of the population (about two-thirds of people) score between 85 and 115. Very bright people score around 130 and scores have been known to go over 145. The following graph shows the typical distribution of scores.
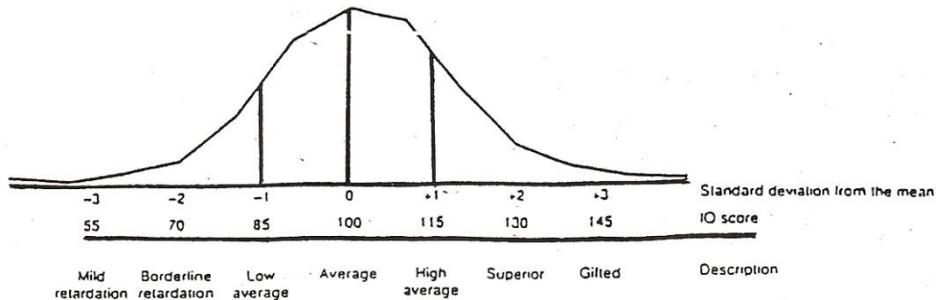
But there are different types of intelligence. We want you to estimate your overall IQ and your score on 7 basic types of intelligence. We then want you to estimate each score for your parents and siblings. Please specify your sex and age.

ESTIMATE							
	YOU	Mother Age:	Father Age:	1st BROTHER Age:	2ND BROTHER Age:	1ST SISTER Age:	2ND SISTER Age:
OVERALL INTELLIGENCE							
1.Verbal or linguistic intelligence (the ability to use words)							
2.Logical or **mathematical** intelligence (the ability to reason logically, solve number problems)							
3. **Spatial** intelligence (the ability to find your way around the environment, and form mental images)							
4, **Musical** intelligence (the ability to perceive and create pitch and rhythm patterns)							
5. **Body-kinetic** intelligence (the ability to carry out motor movement e.g. being a surgeon or a dancer)							
6. **Interpersonal** intelligence (the ability to understand other people)							
7. **Intrapersonal** intelligence (the ability to understand yourself and develop a sense of your own identity)							

	YES	NO
Have you ever taken an intelligence test?	....	....
Do you believe they measure intelligence fairly well?	....	....
Do you believe males are on average more intelligent than females?	....	....
Do you believe intelligence is primarily inherited?	....	....
Do you believe IQ tests are useful in educational settings?	....	....
Do you believe some races are more intelligent than others?	....	....

Please specify details about <u>yourself</u>   Date of Birth.....................   / Age:.................
Sex: Male/Female.....................   Highest Educational Qualifications........................

Nationality: South African / Nigerian:...........................