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COLLECTIVE INTELLIGENCE AND SOCIAL SENSITIVITY AMONGST STUDENTS AT THE UNIVERSITY OF THE WITWATERSRAND

BY

JASON VAN STADEN
Student No. 528443

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Research Supervisor: Professor Christian W. Callaghan (University of Witwatersrand)

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- The participants in this research - thank you

DECLARATION

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Date: 29/03/2019

ABSTRACT

The study of groups and their ability to solve problems is referred to as collective intelligence. Woolley, Chabris, Pentland, Hashmi and Malone (2010) demonstrated that measuring a group's intelligence is similar to the way an individual's intelligence is measured. This is done by establishing the emergence of a factor referred to as 'c', like the factor 'g' that emerges at an individual level. This factor predicts the performance of a group in future tasks. It appears from literature that social sensitivity is the most predictive variable of the collective intelligence factor. However, little is known about what determines a person's social sensitivity. This research investigates social sensitivity to guide and inform academia and practitioners on how to improve collective intelligence.

The most popular measure used in current research for measuring social sensitivity in adults is the 'Reading the Mind in the Eyes' test (RMET). This is a test that requires respondents to choose the correct mental state of a person by viewing static stimuli of their eye region. Previous research, however, shows lower scores for cultures that are not Caucasian. It has been suggested that this is due to the stimuli being exclusively Caucasian in the current RMET. This research creates and tests two new RMET instruments, one containing African stimuli, the other, diverse Asian stimuli. Along with culture, gender has shown variations in performance on the RMET. Women tend to score higher than men on the RMET. This research extends literature by assessing gender RMET differences across cultures and different cultural instruments. This serves as Study 1 in the present research. A by-product of Study 1 is valid mental state items that is used to create a shortened multicultural RMET instrument. The new multicultural instrument avoids cultural biases and allows for the efficient measurement of social sensitivity.

Study 2 investigates determinants of social sensitivity by using the multicultural instrument developed in Study 1. The determinants are trait emotional intelligence, personality and individual contextual factors such as culture, gender and family background. Along with direct relationships, mediation and moderation relationships are also tested.

A post-hoc investigation, Study 3, assesses social sensitivity's importance to collective intelligence in an African context. This is also the first attempt in an African context to validate

the emergence of the collective intelligence factor when applied to an African sample. Together, these three studies further academic knowledge of social sensitivity and collective intelligence.

Using a quantitative methodology, the research consists of two designs. The first uses a questionnaire survey administered in person. The first research design was used to create and test new social sensitivity instruments (Study 1) and investigate the predictors of social sensitivity (Study 2). The second research design implements a quasi-experimental method which is used to test for the emergence of the collective intelligence factor in groups. Study 1 tested a sample of 1 306 responses of University of the Witwatersrand students. Study 2 tested 427 responses, while Study 3 tested a sample of 36 students – which were dived into 13 groups. Study 1 follows precedent in literature to create the new RMET instruments and then applies analysis of variance (ANOVA) techniques to assess variance across cultures and genders. Studies 2 and 3 use factor analysis, bivariate and multivariate statistical techniques to assess variables and their relationships with each other. Moderation and mediation techniques are also applied.

Study 1 results produce a contextually valid 21-item African RMET, and a contextually valid 26-item diverse Asian RMET. Assessment of these new instruments plus 30 context-validated items from the original Caucasian RMET show significant cultural differences. Those self-reporting with an African culture score significantly lower on social sensitivity as measured by the RMET, regardless of the culture of the stimuli presented to them. Therefore, there appears to be no advantage in performance on the RMET tests when assessing the stimuli of an individual's own culture, an assumption which is suggested in literature. A gender advantage, whereby women score higher on social sensitivity, is also present across all cultural instruments. Study 2 results investigate the antecedents of social sensitivity.

The individual contextual factors gender and home language significantly predict social sensitivity in Study 2. Personality and trait emotional intelligence prove to be non-significant predictors of social sensitivity. Interestingly, the relationship between trait emotional intelligence and social sensitivity is moderated by home language. Those who speak an African home language display a significant negative relationship between trait emotional intelligence and social sensitivity. In contrast, those who speak English as their home language show a significant positive relationship. This finding provides insight into the cultural differences observed in the RMET.

Findings suggest that those of an African culture self-report that they are more emotionally intelligent if they perform lower on the RMET. This suggests high performance in mind-reading by identifying facial cues is, potentially, not an important indicator of high emotional intelligence in African cultures. In support of this, literature suggests that less emphasis is placed on facial cues in African cultures, thus cultural norms need to be considered. For instance, in certain African cultures direct eye contact is seen as a sign of disrespect in certain situations. These norms appear to influence African cultures' performance on the RMET. This finding challenges assumptions in academic literature, particularly views on the differences between cultures' RMET scores. This study provides culturally important information on different cultural views on assessing mental states.

Study 3 results provide limited evidence that the collective intelligence factor emerges in an African context. However, results show that social sensitivity is correlated with the identified collective intelligence factor in the study. This research provides three new tested RMET instruments to academia (African, diverse Asian and a shortened multicultural instrument). This investigation also shows that African cultures and men perform lower on social sensitivity instruments. In addition, the research also shows African cultures who are performing higher on trait emotional intelligence have lower RMET scores, an opposite effect to English cultures, suggesting differing perspectives on the importance of this particular ability to each culture's emotional intelligence. Such findings provide interesting implications for both academia and practitioners.

Education and training of both African and other cultures will potentially allow an understanding of each culture's social interaction norms, and what is seen as the emotionally correct response in different situations. This adjustment may help social interactions between cultures by governing the individual's use of different emotional skills in a way that promotes cultural inclusiveness and cooperation. This research, therefore, provides resources and knowledge to help academics and practitioners hypothetically improve cross-cultural social interactions. This understanding will potentially improve collective intelligence in teams and groups.

KEYWORDS: Collective intelligence, Social sensitivity, Theory of Mind, Groups, South Africa, Teams

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LIST OF ACRONYMS

ToM	Theory of the Mind
RMET	Reading the Mind in the Eyes Test
RME	Reading the Mind in the Eyes
EI	Emotional Intelligence
BFI	Big Five Inventory (Personality Measure)
TEIQue	Trait Emotional Intelligence Questionnaire
TEIQue-SF	Trait Emotional Intelligence Questionnaire- Short Form
RAPM	Raven's Advance Programming Matrices
IQ	intelligence quotient
R&D	Research & Development

CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE RESEARCH

1 INTRODUCTION

This chapter explains the need for this research by providing a brief background to relevant literature. The research significance is highlighted, followed by the establishing of the research aims and objectives. This chapter presents the research questions and hypotheses, which guide the deriving of theoretical models to be tested in the research. The chapter also describes the sequencing and contents of each chapter in the thesis. The chapter conclusion will summarise the key concepts of the research.

1.1 BACKGROUND

In the modern world, society is faced with a series of 'wicked' or extremely complex societal problems, in domains that include the environment (for example, climate change), health-care (for example, disease outbreaks), poverty (for example, famine) and crime (for example, terrorism) (Introne, Laubacher, Olson & Malone, 2013). It is necessary to ask the question: Who is going to solve these problems?

Multiple authors argue that distributed problem solving is the answer (Brabham, 2008; Callaghan, 2015; Introne et al., 2013; Diggle, 2013; Malone & Klein, 2007; Mau & Leonard, 2004). The core of distributed problem solving is probabilistic innovation theory (Callaghan, 2015). Probabilistic innovation theory describes the way in which the probability of solving problems can be exponentially increased by increasing problem solving inputs (Callaghan, 2017a). Callaghan (2016a) argues that problem solving is constrained in current market and academic systems by their ability to aggregate and synthesise external inputs. However, the rise of new technologies provides new opportunities for the improvement of problem-solving systems that harnesses probabilistic innovation to solve both societal and market problems (Callaghan, 2018a, 2018b). The above arguments suggest that to solve complex problems, many individuals should be contributing to the solution, and the use of technology makes this possible. This is contrary to past norms, which have largely relied on individuals and experts to solve societal problems (Brabham, 2008; Mau & Leonard, 2004; Torr-Brown, 2013; Wuchty, Jones & Uzzi, 2007).

The tension between using individuals or the collective to solve problems is the grounding for this research. The pattern towards group problem solving is increasingly evident in organisations.

Companies are adopting organisational structures that rely on a ‘network of teams’ to solve business problems and execute solutions (Bersin, McDowell, Rahnema & Van Durme, 2017; McDowell, Agarwal, Miller, Okamoto & Page, 2016). More than 92% of executives identified the transition from traditional organisational structures to team-based structures as their priority (McDowell et al., 2016).

Abundant literature exists on individual intelligence but less on collective intelligence (Mulgan, 2014). Collective intelligence is the basis for distributed intelligence (Lévy, 1997), which is an important component to distributed problem solving. This disparity in knowledge between collective intelligence and individual intelligence is vital. To resolve the tension between using individuals or the collective (teams or groups) to solve problems, and to verify distributed problem solving as a more powerful tool of problem-solving to both society and organisations, it is necessary to understand collective intelligence and its predictors in more detail as to make a fair comparison with individual intelligence. This research aims to extend the knowledge of collective intelligence and its antecedents.

1.1.1 Collective Intelligence

Collective intelligence is not a new concept and is applied in diverse fields of enquiry (Leimeister, 2010). Lévy (1997) defines collective intelligence as a universal and distributed intelligence which is the product of collaboration and competition amongst multiple individuals. Collective intelligence has been related to many different concepts, the most popular being ‘wisdom of crowds’ (Surowiecki, 2004), ‘crowdsourcing’ (Howe, 2006), ‘swarm intelligence’ (Krause, Ruxton & Krause, 2010), ‘open source’ (Lakhani & Panetta, 2007) and ‘open innovation’ (Chesbrough, Vanhaverbeke & West, 2006).

Wisdom of the crowds describes the phenomenon where groups of ordinary people can outperform any individual of that same group in problem solving. An example of this is the ‘ask the audience’ wild card from the popular TV game show ‘Who Wants to be a Millionaire?’. This wild card allows contestants to view the votes from the audience showing which answer they believe is the most correct. This wildcard leads to the correct answer 91% of the time. In comparison, another wild card ‘phone a friend’, which is largely based on individual knowledge, only leads to the correct answer 65% of the time (Surowiecki, 2004).

Crowdsourcing, which is likened to a form of outsourcing, describes accessing skills, talent, and resources at a fraction of the cost by using technology, such as the Internet. An example of this is iStockphoto, a website that was able to undercut the price of a professional photographer by 99% by providing a marketplace for 'crowds' of amateur photographers to sell their photos (Howe, 2006).

Swarm intelligence traditionally describes animal group living that allows for the solving of problems that otherwise would be difficult to solve individually (Krause et al., 2010). An example of swarm intelligence is how a community of ants plots the shortest route from their food source to their nest. As individual ants travel down a certain path, they leave pheromones which fellow ants then follow. The shorter the route, the more frequent the foot traffic of ants going back and forth on that path. The increased foot traffic means that more pheromones are left on that path. The greater the pheromones, the more attractive the path is to follow. Longer paths mean ants will take longer to emit pheromones on that path, reducing the attractiveness to follow that path (Dorigo, Maniezzo & Colorni, 1996).

Open source is a description of complex software systems used to run critical applications. It is created, maintained and improved for free by volunteer computer programmers (Lakhani & Panetta, 2007). One of the most popular examples of the success of open source software is the rise of Linux operating systems. The adoption of Linux since 1991 has been impressive and robust. In 2009, 48% of companies surveyed by technology research group Forrester indicated that they were using Linux operating systems (Kerner, 2010). The benefits of lower cost, greater flexibility, speed and innovation were reasons cited for the adoption of the open source software as opposed to proprietary alternatives such as Microsoft (Kerner, 2010).

Open innovation depicts a model where companies purposefully use both internal and external ideas and paths to market to further research and development (R&D) (Chesbrough et al., 2006). An example of open innovation is companies who make use of platforms such as Top Coder. Top Coder is an online platform that breaks down large client software projects into smaller modules which is then designed, developed, tested and integrated by a community of over 500 000 members. The U.S. Department of Health and Human Services and the state of Minnesota made use of Top Coder to help build a new health-care provider portal and fraud detection system (King & Lakhani, 2013).

All these concepts contain, to some degree, a reflection of collective intelligence. The differences exist in the application. For example, swarm intelligence is used to describe the collective intelligence phenomenon in animals, open source is used to describe the production and distribution of free editable software and crowdsourcing is linked to using the Internet to share resources and skills. These applications apply to the overriding mechanism at work identified as collective intelligence. This link to multiple areas of interest underlines the importance of collective intelligence to understanding different concepts in literature.

Recently, there has been renewed interest in collective intelligence as new forms of collaboration have been made possible by the Internet (Salminen, 2012). Companies such as Google, Wikipedia, Threadless (Malone, Laubacher & Dellarocas, 2009, 2010) and Innocentive (Brabham, 2008) have successfully utilised these collaboration opportunities to build organisations that rely on collective intelligence. There are many examples of collective intelligence on the Internet; the ones mentioned are the most popular and individual descriptions of each follows below.

Google's success relies on aggregating the judgements of many individuals who create web links to websites and using the results to create a search engine with indexed websites and hosted files as results.

Wikipedia is an encyclopaedia rivalling the quality of Encyclopaedia Britannica (Giles, 2005). It allows individuals to contribute to the encyclopaedia online and freely make changes to all entries (Malone et al., 2010).

The success of Threadless is the result of an ongoing T-shirt design competition. People with a valid email address can submit their T-shirt designs online (Brabham, 2008). A website community votes for the best design and a winner is chosen based on the number of votes each design receives. The winning T-shirt design is produced and then sold online.

Innocentive is a platform for companies or organisations to access a variety of qualified individuals to solve difficult R&D problems in exchange for a monetary reward (Lakhani & Panetta, 2007). These examples utilise the benefits of collective intelligence at a macro-level, which describes collective intelligence as a statistical phenomenon (Lorenz, Rauhut, Schweitzer & Helbing, 2011; Salminen, 2012).

This statistical phenomenon relies on the averaging of the outputs of large groups of individuals to produce a result better than each individual output. An often-cited example of this statistical phenomena was that described by the British scientist Francis Galton. He found that in a competition to guess the weight of an ox, that weighed 1 198 pounds, the average of 778 contestants' guesses equated to 1 197 pounds, a mere one pound less than the actual weight (Surowiecki, 2004). This example highlights how averaging large outputs creates a statistical phenomenon that promotes more accurate results. However, this study will not focus on the macro-level of collective intelligence but acknowledges its statistical power as demonstrated by the above examples. Salminen (2012) identifies two other levels of collective intelligence in literature.

Another level that this study will not focus on is the emergent level. This level describes how the interaction of individuals (micro-level) 'emerges' to produce a statistical phenomenon (macro-level) (Salminen, 2012). Simply, emergence is when the whole becomes more than the sum of its parts (Damper, 2000). Salminen (2012) identifies complex adaptive systems as the focus at this level. Complex adaptive systems describe concepts such as additivity, self-organisation and emergence (Ottino, 2004). Another concept at this level is the shared memory of humankind. This type of memory acts as a short-term memory for the individuals of a complex adaptive system (Salminen, 2012). The Internet has been described as a shared memory of humankind that helps collective intelligence emerge (Heylighen, 1999; Lévy, 2010; Luo, Xia, Yoshida & Wang, 2009). These concepts (complex adaptive systems and shared memory of humankind) explain how collective intelligence emerges from the micro-level.

The micro-level is an important level of collective intelligence because it is at this level one can truly unpack what drives collective intelligence, the foundation for all other levels of collective intelligence. The micro-level describes the psychological, cognitive and behavioural aspects of the individual's interactions and how these contribute to collective intelligence (Salminen, 2012). It is also at this level that an influential finding emerged regarding collective intelligence.

In 2010, Woolley and her co-authors identified the emergence of a collective intelligence factor in groups (Woolley, Chabris, Pentland, Hashmi & Malone, 2010). This factor, termed 'c', is analogous to the factor 'g' which measures the general intelligence of individuals in psychology literature. However, the factor 'c' measures the intelligence of the group as opposed to the

individuals within the team. This factor essentially measures how 'smart' a group is at a range of different tasks. Other studies later replicated the results (Engel et al., 2015; D. Engel, Woolley, Jing, Chabris & Malone, 2014a; Kim et al., 2015). This pertinent contribution to literature and practitioners means that there is now the potential to measure how 'smart' a group is and what drives this intelligence. This is important, as an increasing amount of work is done in groups in diverse fields of enquiry (Gowers & Nielsen, 2009; Hackman, 2002; Wuchty et al., 2007).

Now that measuring collective intelligence appears possible, the next big question to ask is: when a group attains a higher collective intelligence, what makes this group smarter?

Woolley et al. (2010) found that the average intelligence of individuals and the highest intelligence in the group are only moderately correlated with collective intelligence. They did, however, find that conversational turn-taking, the proportion of female group members, and social sensitivity to be significantly correlated with collective intelligence. Upon further data analysis, it was found that social sensitivity was the most predictive of a group's collective intelligence. This result regarding the importance of social sensitivity to a group's intellect has been further emphasised in later studies (Engel et al., 2014a ; Engel, Woolley, Jing, Chabris & Malone, 2014b; Engel et al., 2015).

1.1.2 Social Sensitivity

There is a growing body of literature regarding the ability to infer the mental states of yourself or of another person and how this will in turn predict individual behaviour (Apperly, 2012; Baron-Cohen, Leslie & Frith, 1985; Flavell, 1999; Premack & Woodruff, 1978; Saxe & Powell, 2006). In literature this has been referred to as 'Theory of Mind', 'mentalising', 'mind reading', 'social intelligence', 'folk psychology' and 'social sensitivity'.

Theory of Mind (ToM)[1], until recently, has received limited attention in describing how it can help adults to improve the effectiveness of their social interactions. High social sensitivity is seen as a skill that allows individuals in a group to cultivate a harmonious interpersonal atmosphere that will lead to improved group performance (Curşeu, Pluut, Boroş & Meslec, 2015). Individuals achieve this by having a more accurate understanding of group members' emotional

[1] This term is the most popular in psychology literature. As such it will be used interchangeably with social sensitivity, the most popular term in management literature, throughout this research

states and can adapt their own actions and behaviour to improve group harmony. It is, therefore, desirable for individuals in a group to have higher social sensitivity.

Currently, a few instruments exist to measure social sensitivity. Notable ones include the false-belief task (Wimmer & Perner, 1983), Strange Stories (Happé, 1994), Faux Pas Recognition test (Stone, Baron-Cohen & Knight, 1998) and the Reading the Mind in the Voice Test (Rutherford, Baron-Cohen & Wheelwright, 2002). These instruments rely heavily on verbal communication and language ability and these tests are also easily passed by adults (Prevost et al., 2013). Consequently, research has focused on ToM development in children. In response, Baron-Cohen, Jolliffe, Mortimore and Robertson (1997) created the 'Reading the Mind in the Eyes' test (RMET) to measure subtle differences in ToM in adults.

The RMET requires a person to look at facial stimuli and select the correct corresponding mental state from a set of words. The test was later improved, creating an instrument that is widely used in literature (Baron-Cohen, Wheelwright, Hill, Raste & Plumb, 2001). It is this ability to detect subtle differences in adult social sensitivity that has garnered the RMET wide-spread popularity. Research has since focused on identifying social cognitive differences in different clinical populations such as those affected by autism (Baron-Cohen et al., 2001), schizophrenia (Irani et al., 2006; Kettle, O'Brien-Simpson & Allen, 2008), anorexia (Harrison, Tchanturia & Treasure, 2010) and Parkinson's disease (Tsuruya, Kobayakawa & Kawamura, 2011).

In contrast, assessment and identifying of differences in normal populations has received relatively little attention. Two areas where normal populations have shown difference are culture and gender. Studies show that differences seem to exist between different cultures (Dehning et al., 2012; Lazarus, 2009; Loftus & Noordien, 2011; Monique et al., 2013; Prevost et al., 2013). These differences are particularly evident for non-English speakers who score lower on social sensitivity scores. Gender difference are also evident in social sensitivity literature (Vellante et al., 2013). These differences seem to appear in the male population who score lower on social sensitivity. It appears that underlying individual factors dictate social sensitivity levels in the normal population.

Discovering and understanding social sensitivity influences will potentially lead to knowledge of how to improve social sensitivity in diverse contexts. In organisations, this is important as the

modern workforce is extremely diverse, consisting of individuals from multiple generations, disperse global teams and having many heterogeneous factors such as gender, race, culture and sexual orientations (McDowell et al., 2016). This diversity in workforce often leads to conflict and communication challenges amongst team members due to different individual backgrounds (Bouncken, Brem & Kraus, 2016; Srikanth, Harvey & Peterson, 2016). Such challenges ultimately hinder the creativity and innovation benefits that diverse teams can offer organisations (Bouncken et al., 2016). Improving social sensitivity of team members will potentially help reduce conflict and improve communication in diverse teams by allowing members to more quickly and accurately identify each other's mental states and adapt their behaviour to avoid conflict and meet team goals. Therefore, new knowledge on social sensitivity and what is determining its variances can indirectly improve collective intelligence and social interactions.

Social sensitivity or ToM is an ability concerned with the human brain. Having a deeper understanding of this ability has potential benefits to the science and practice of management (Becker, Cropanzano, & Sanfey, 2011; Butler & Senior, 2007; Senior, Lee, & Butler, 2011). ToM promotes more unselfish social interactions which is important to organisational settings that require collaboration, trust, communication and coordination (Frith & Frith, 2008). Previously, the concept of ToM has been investigated in management science to help explain how certain personality traits such as Machiavellianism might affect an organisation (see Bagozzi et al. 2013). However, it appears that ToM or social sensitivity may have an even more important role to play in organisation performance through its ability to improve the collective intelligence of groups. This consideration links this research to management science but also has broader implications for society.

The improvement of collective intelligence and social interactions has many societal benefits, from solving complex global problems to improving individual relationships. Thus, this research, through its investigation into social sensitivity and collective intelligence is important on many levels.

1.2 SIGNIFICANCE OF RESEARCH

This research can be broken down into three separate contributions to literature: a methodological, knowledge and contextual contribution. The first contributions take place in Study 1, where new social sensitivity instruments are developed and tested. Study 2 then uses a newly developed instrument from Study 1 and tests new social sensitivity relationships, thereby creating new knowledge relating to the examined variables. Lastly, Study 3 is mainly a contextual contribution as it looks to extend research relating to the collective intelligence factor in a South African context. The significance of each study is detailed below.

Study 1

As highlighted earlier, cultural differences are present when using the current RMET instrument. Certain cultures, such as African cultures, score lower on the current RMET instrument, a measure of social sensitivity. No clear evidence exists explaining why this is the case. One reason proposed in literature is that the current instrument only consists of Caucasian stimuli (Adams Jr et al., 2010; Dehning et al., 2012; Franklin, Stevenson, Ambady & Adams, 2015; Hallerback, Lugnegård, Hjärthag & Gillberg, 2009; Lazarus, 2009; Loftus & Noordien, 2011; Prevost et al., 2013; Vellante et al., 2013). This is seen as a relevant observation because there seems to be an intra-cultural advantage on the RMET (Adams Jr et al., 2010; Franklin et al., 2015). An intra-cultural advantage refers to cultures performing better on instruments where stimuli reflects their own culture. This advantage was shown using the original Caucasian RMET (Baron-Cohen et al., 2001) instrument and newly developed 'Asian' RMET consisting of Japanese stimuli (Adams Jr et al., 2010) on a sample including American and Japanese participants.

This result, although informative, needs to extend to represent other cultures such as African and other Asian ethnic groups such as Indian, Middle eastern and Indonesian. This extension will allow a more complete assessment of ToM across all cultures. Therefore, there is a need for an African and 'Other culture' RMET instrument. 'Other culture' in this research refers to a collection of different cultures from Asia such as Indian, Indonesian, Korean and Chinese.

The call for more ToM instruments is one echoed in literature (Hallerback et al., 2009; Monique et al., 2013; Tahiroglu et al., 2014). Shortened ToM instruments are also desirable (Olderbak et

al., 2015; Redondo & Herrero-Fernández, 2018). This study is important because it addresses all the issues presented above. Study 1 creates three new ToM instruments that are culturally linked. The first an African RMET, the second an 'Other culture' RMET, and the last a shortened multicultural RMET. In addition, the Caucasian RMET is also tested and validated in the current context. A by-product of creating and testing these instruments is a significant narrative on the influences of culture on ToM performance.

Another issue raised in the background section is the apparent gender differences in ToM. Few studies report ToM scores by gender (Vellante et al., 2013). The culture-gender interaction has been proposed as a possible explanation for these observed differences in gender (Franklin et al., 2015; Monique et al., 2013), more specifically, suggesting that women are outperforming men on social sensitivity due to a culturally dependent norm or social role governing such an advantage. This study provides a useful contribution to this commentary. The assessment of multiple cultural instruments on a relatively diverse sample as well as the gender differences across each instrument allows for the assessment of the culture-gender interaction. Thus, this first study has multiple contributions to literature. The priority contributions are the creation of new instruments; however, the testing of the instruments provides further important knowledge contributions. Table 1 summarises how this study extends current literature.

Table 1. Study 1 contributions

Contribution type	Primary literature authors	Primary Literature contribution	Study extension
Methodological	Baron-Cohen et al. (2001)	36-item Caucasian RMET (freely accessible).	New 36-item African RMET.
Methodological	Adams Jr et al. (2010)	36-item Japanese RMET (not freely accessible).	New 36-item 'Other-culture' RMET.
Methodological	Baron-Cohen et al. (2001), Adams Jr et al. (2010)	Single culture 36-item RMET instruments.	New 21-item multicultural instrument.
Knowledge	Dehning et al. (2012), Monique et al. (2013)	Cultural differences observed in Caucasian RMET.	Testing of cultural differences across multiple cultural RMET instruments.
Knowledge	Adams Jr et al. (2010), Franklin et al. (2015)	Intra-cultural advantage observed for the Japanese and Caucasian RMET instruments with a Japanese and Caucasian sample.	Testing of an Intra-cultural advantage for the African, 'Other culture' and Caucasian RMET instruments with a diverse sample.
Knowledge	Kirkland, Peterson, Baker, Miller and Pulos (2013)	Meta-analysis showing female advantage in ToM across primarily Caucasian cultures.	Testing of a female advantage in ToM consisting of diverse cultures.
Knowledge	Franklin et al. (2015)	Investigation between gender differences between the Japanese (Asian) RMET and Caucasian RMET based on culture.	Investigation between gender differences between the African RMET, 'Other culture' RMET and Caucasian RMET based on culture.

Study 2

Engel et al. (2014a) call for contributions to literature to understand the factors that improve collective intelligence. Social sensitivity is one of these important factors.

This study therefore aims to further understand the concept of social sensitivity by testing for potential antecedents. These prospective predictors include emotional intelligence (EI), personality and individual contextual factors. This enquiry seeks to provide a theoretical contribution to literature as well as certain practical applications.

Currently, there is little theoretical research that has investigated what predicts a higher social sensitivity. Research related to this query has found that engaging with works of fiction leads to higher levels of social sensitivity (Kidd & Castano, 2013; Mar, Oatley, Hirsh, dela Paz & Peterson, 2006; Mar, Oatley & Peterson, 2009). It has demonstrated that practicing brief

mindfulness mediation activities enhances ToM (Tan, Lo & Macrae, 2014). In line with this result, it has also shown that compassion meditation training increases ToM abilities (Mascaro, Rilling, Tenzin Negi & Raison, 2012). Another suggestion to improve ToM is to administer oxytocin, a hormone associated with childbirth and care (Guastella et al., 2010). Although all the above studies provide insight into how to improve ToM, they appear to only offer temporary improvement of ToM.

There is also no clear indication of why low levels of ToM exist in the first place. Low levels of social sensitivity have been explained by clinical conditions such as autism, schizophrenia and Parkinson's disease for example, but not in a normal population. It is at this juncture that Study 2 assesses the individual factors in a normal population that are determining ToM. Research in this area is sparse and disjointed, mainly owing to the general focus of research on ToM development in children and, recently, differences in clinical populations. In the limited attempts to assess normal population variations, factors such as culture (Prevost et al., 2013), gender (Kirkland et al., 2013), empathy (Lawrence, Shaw, Baker, Baron-Cohen & David, 2004), cooperation (Paal & Bereczkei, 2007), emotional intelligence (Ferguson & Austin, 2010) and personality traits (Nettle & Liddle, 2008) show promise in explaining variations in social sensitivity. However, these studies have limitations in methodology, instrument, sample, analysis and the variables examined. Therefore, this study extends literature by using a multicultural social sensitivity instrument, a diverse sample (linked to the context of the study) and the assessing of moderation and mediation effects.

Practically, since many organisations rely on teams and groups to drive the company's success, it is imperative they have 'intelligent teams'. To do this they need to understand what makes an individual have a higher ToM in different contexts. Acquiring the knowledge of what fosters higher levels of social sensitivity can then help an organisation improve employees' ToM abilities. This information helps organisations to adapt their recruiting strategies and training programmes to hire or train more 'socially sensitive' employees. These applications will then in turn create more 'intelligent teams' in the organisation. Study 2 contributions are summarised in Table 2.

Table 2. Study 2 contributions

Contribution type	Related primary literature authors	Primary Literature contributions	Study extension
Knowledge	Cutting and Dunn (1999), Kirkland et al. (2013), Prevost et al. (2013)	Demonstrating individual contextual factors such as family background (child sample), culture and gender play a role in ToM variations.	Further testing of individual contextual factors in a diverse adult population with a new multicultural social sensitivity instrument. Regression analysis with all individual contextual variables is also run to see each one's relative strength.
Knowledge	Ferguson and Austin (2010)	Demonstrates that trait EI is not correlated with the RMET but with another ToM measure, the faux pas test in an adult sample.	Tests trait EI with the new multicultural RMET and tests potential moderators and mediators.
Knowledge	Ewing, Zeigler-Hill, and Vonk (2016), Ferguson and Austin (2010), Nettle and Liddle (2008)	Demonstrates mixed results on the importance of personality to ToM in an adult sample.	Further testing of personality traits importance to variations in ToM. Potential moderators are also tested as an extension.

Study 3

Study 3 is a post-hoc experiment. The purpose of this study is to confirm the continued importance of social sensitivity to collective intelligence literature in the current context. With this confirmation, Studies 1 and 2 contributions are further magnified as important to improving collective intelligence.

The current work on the collective intelligence factor almost solely relies on a sample from the United States of America (Engel et al., 2015). This is not enough for building a robust and reliable variable. Engel et al. (2015) realised this and completed a study on an American, German and Japanese sample. As this has only extended to a European and Asian sample, it is important that the emergence of the collective intelligence factor be tested in an African context.

This contextual extension is informative as cultures influence how individuals react with others in a group setting (Probst, Carnevale & Triandis, 1999; Wagner & Moch, 1986). Although it is acknowledged that not every member of a certain culture will act or have similar beliefs in groups, there is still consensus about the importance of cultures in group dynamics (Hinds &

Reinecke, 2014; Scissors, Shami, Ishihara, Rohall & Saito, 2011). Engel et al. (2015) express concern about whether the collective intelligence factor will generalise to a collectivist and high-context setting. Collectivism describes a culture that puts the interests of the group before that of individuals (Hofstede, 1984). A high-context setting is one in which people are extremely involved in one another's lives (Hall, 1976). Africa is seen as a collectivist culture and a high context setting. Cultural differences in social sensitivity also raise concerns on whether such a skill is still relevant to collective intelligence in the current context. This undeniably points towards a contextual gap which can be filled by future research. This study will begin to explore this gap by determining whether a collective intelligence factor emerges in an African locale and whether social sensitivity is an important predictor of collective intelligence in the current context. Study 3 contributions are summarised in Table 3.

Table 3. Study 3 contributions

Contribution type	Related primary literature authors	Primary Literature contributions	Study extension
Contextual	Engel et al. (2015), Woolley et al. (2010)	Demonstrates the emergence of a collective intelligence factor in the United States of America (USA), Europe and Asia.	Demonstrate the emergence of a collective intelligence factor in Africa.
Knowledge	Engel et al. (2014a), Engel et al. (2014b), Woolley et al. (2010), Meslec, Aggarwal and Curseu (2016)	Demonstrates that social sensitivity is a significant predictor of collective intelligence. Also tests other variables such as personality, intelligence, percentage of female group members etc.	Demonstrate that social sensitivity is a significant predictor of collective intelligence. Tests trait EI as a new potential predictor of collective intelligence.

Link between studies

Although the individual aims of the above three studies are different, they are linked, and provide a 'feeder'-like effect. Study 1 creates and tests culturally valid and inclusive RMET instruments. Study 1 further extends this by creating a shortened multicultural instrument which is more practical for use when testing antecedents of social sensitivity in a diverse sample. Study 2 then uses this shortened multicultural instrument to understand further social sensitivity and its antecedents. This is important to Study 3 as past literature reveals social sensitivity to be the most significant predictor of collective intelligence (Engel et al., 2014a; Engel et al., 2015; Engel

et al., 2014b; Woolley et al., 2010). Study 3 attempts to verify this importance, but regardless of the outcome, Studies 1 and 2 provide unique contributions to understanding social sensitivity. Separately the three studies are noteworthy, but together they provide a greater understanding of what makes an 'intelligent team' in a culturally diverse world. This knowledge can then be applied in multiple fields requiring intelligent groups, making this research relevant to practice as well as academia.

1.3 AIMS AND OBJECTIVES OF THE RESEARCH

The following section first describes the aims and then the objectives of this research.

1.3.1 Aims

An aim describes what one wishes to achieve and understand upon completion of the research (Oliver, 2013).

The aim of the overall research is to add knowledge to social sensitivity literature to further understand the concept of collective intelligence in humans.

To do this, three separate sub aims are derived. The first aim is to develop, test and compare culturally valid and inclusive social sensitivity instruments. The second aim tests potential predictors of social sensitivity as previous literature indicates a significant relationship between social sensitivity and collective intelligence. The third aim is to extend the research on the collective intelligence factor by Woolley et al. (2010) to an African setting, focusing on its potential emergence and its relationship with social sensitivity.

These sub-aims address the core research problem that there is a lack of knowledge surrounding the predictors of collective intelligence. Social sensitivity, in particular, requires further investigation to extend what is currently known about it. The previous two sections highlighted this problem. As such, the purpose of this research is to further understand social sensitivity as an important predictor of collective intelligence in an African locale.

1.3.2 Objectives

Objectives are specific statements demonstrating the activities the researcher wishes to complete (Oliver, 2013).

To achieve the aims of this research, a few objectives are set and are listed below:

- Collect and test relevant stimuli to create new cultural instruments.
- Validate the new cultural instruments and original Caucasian instrument on a large sample.
- Create an objective shortened multicultural social sensitivity instrument.
- Conduct a relevant literature review on social sensitivity and its potential antecedents which include trait emotional intelligence, personality and individual contextual factors.
- Using the literature review and the study's theoretical model as a guide, create a scientific and ethically guided questionnaire to test the proposed explanatory variables of social sensitivity.
- Test the questionnaire on a representative sample of University of the Witwatersrand students.
- Build on the experiment of Woolley et al. (2010) to determine whether the collective intelligence factor emerges in South Africa and whether social sensitivity is a significant predictor in the current context.
- Analyse the results of the instruments, questionnaire, and experiment to provide implications for both theory and practice.

1.4 RESEARCH QUESTIONS AND HYPOTHESES

This research addresses four research questions and, where applicable, each has sub-questions and hypotheses and are detailed below.

In identifying and fulfilling the need in literature to develop new cultural instruments for measuring ToM, one can now begin to answer questions related to the relationships between culture, gender and social sensitivity. Research questions 1 and 2 are key questions that arise from a review of literature which is presented in the next chapter.

Research Question 1 ***(Study 1)***: *What differences exist between cultures' ToM ability when they are presented with eye regions that are from either the same ethnic group or an alternative ethnic group?*

Research Question 2 ***(Study 1)***: *What gender differences exist in one's ToM performance across different cultures and instruments?*

What also becomes apparent from literature is the undercurrent of other individual factors that could potentially drive variance in social sensitivity. Therefore, a third research question is derived from the literature presented in chapter 2.

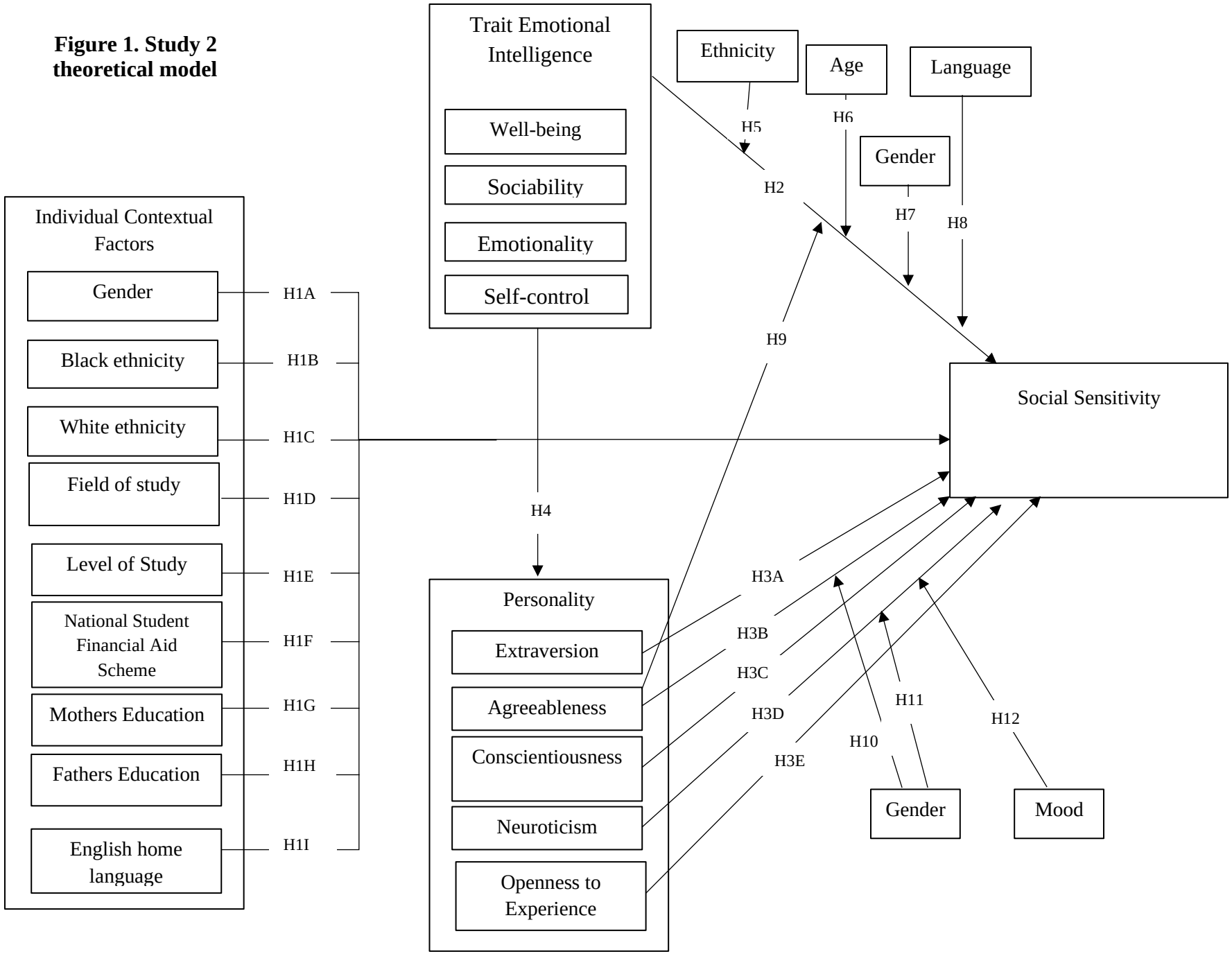
Research Question 3 ***(Study 2)***: *What is the relationship between individual contextual factors, trait EI, personality and social sensitivity?*

Individual contextual factors, personality and trait EI emerged from the literature review as potential antecedents to social sensitivity (see chapter 2) providing sub-questions as listed below.

- What is the relationship between individual contextual factors and social sensitivity?
- What is the relationship between trait EI and social sensitivity?
- What is the relationship between personality and social sensitivity?
- What are the significant mediating relationships between personality, trait EI and social sensitivity?
- What are the significant moderating relationships between individual contextual factors, personality, trait EI and social sensitivity?

From the preceding research questions and literature, the following theoretical model was derived:

Figure 1. Study 2 theoretical model



As highlighted in the theoretical model labelled Figure 1, the following direct relationships were derived from literature in the chapter 2 literature review.

Direct relationships

Hypothesis 1: Individual contextual factors are significantly associated with social sensitivity.

Hypothesis 1_A: There is a significant positive association between being a women and social sensitivity.

Hypothesis 1_B: There is a significant negative association between Black ethnicity and social sensitivity.

Hypothesis 1_C: There is a significant positive association between White ethnicity and social sensitivity.

Hypothesis 1_D: There is a significant negative association between a field of study and social sensitivity.

Hypothesis 1_E: There is a significant positive association between level of study and social sensitivity.

Hypothesis 1_F: There is a significant negative association between an individual's National Student Financial Aid Scheme (NSFAS) status and social sensitivity.

Hypothesis 1_G: There is a significant positive association between mother's level of education and social sensitivity.

Hypothesis 1_H: There is a significant positive association between father's level of education and social sensitivity.

Hypothesis 1_I: There is a significant positive association between English home language and social sensitivity.

Hypothesis 1 tests if certain demographic information and an individual's personal background will affect his or her ability to be socially sensitive. Individual contextual factors such as gender, ethnicity, education, study area, funding requirements, home language and parents' education are measured to make up this variable.

Hypothesis 2: There is a significant positive association between trait EI and social sensitivity.

Hypothesis 2_A: There is a significant positive association between well-being and social sensitivity.

Hypothesis 2_B: There is a significant positive association between sociability and social sensitivity.

Hypothesis 2_C: There is a significant positive association between emotionality and social sensitivity.

Hypothesis 2_D: There is a significant positive association between self-control and social sensitivity.

Hypothesis 2 tests if trait EI affects a person's ability to be socially sensitive. Trait EI is a self-report measure of EI and will be measured through a questionnaire with items developed by Petrides and Furnham (2006). Although the instrument does divide into the four facets of trait EI (represented by the sub-hypothesis), the lack of items for each facet in the chosen instrument compromises its reliability and validity. Thus, the testing of facets of trait EI is done as an exploratory extension. The main objective of this hypothesis is to test the overall variable that is trait EI (H2).

Hypothesis 3: Personality is significantly associated with social sensitivity.

Hypothesis 3_A: There is a significant positive association between extraversion and social sensitivity.

Hypothesis 3_B: There is a significant positive association between agreeableness and social sensitivity.

Hypothesis 3_C: There is a significant positive association between conscientiousness and social sensitivity.

Hypothesis 3_D: There is a significant positive association between neuroticism and social sensitivity.

Hypothesis 3_E: There is a significant positive association between openness to experience and social sensitivity.

Hypothesis 3 tests whether personality will affect a person's ability to be socially sensitive. The sub-hypotheses represent five types of personality. The Big Five Inventory (BFI) questionnaire by Benet-Martinez and John (1998) will test the personality type for an individual.

To complement the above direct relationships, mediation and moderation relationships are tested to assess whether indirect influencers are present.

Mediating relationships

Hypothesis 4: Personality mediates the relationship between trait EI and social sensitivity.
Hypothesis 4_A: Extraversion mediates the relationship between trait EI and social sensitivity.
Hypothesis 4_B: Agreeableness mediates the relationship between trait EI and social sensitivity.
Hypothesis 4_C: Conscientiousness mediates the relationship between trait EI and social sensitivity.
Hypothesis 4_D: Neuroticism mediates the relationship between trait EI and social sensitivity.
Hypothesis 4_E: Openness to experience mediates the relationship between trait EI and social sensitivity.

Moderating relationships

Hypothesis 5: Ethnicity moderates the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for different ethnicities.
Hypothesis 6: Age moderates the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity gets stronger with age.
Hypothesis 7: Gender moderates the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for women.
Hypothesis 8: Home language moderates the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for different languages.
Hypothesis 9: Agreeableness moderates the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for higher levels of agreeableness.

Hypothesis 10: Gender moderates the relationship between agreeableness and social sensitivity such that the relationship between agreeableness and social sensitivity is stronger for women.
Hypothesis 11: Gender moderates the relationship between neuroticism and social sensitivity such that the relationship between neuroticism and social sensitivity is stronger for women.
Hypothesis 12: Mood moderates the relationship between neuroticism and social sensitivity such that the relationship between neuroticism and social sensitivity is stronger for lower moods and weaker for extremely low moods.

The above hypotheses will test the variables for mediation and moderation properties using the tests created by Baron and Kenny (1986). These tests will further clarify the inter-relationships of the variables to see the true extent of their association with social sensitivity.

Research Question 4 ***(Study 3)***: *Is social sensitivity a predictor of collective intelligence in the current context?*

This research question is derived from the literature review which is undertaken in the next chapter. This research question serves to inform on social sensitivity's importance in the current context. Other relationships are tested for exploratory purposes. The sub-questions and hypothesis are guided from the relationships tested in Woolley et al. (2010) and are listed below.

- Does a collective intelligence factor emerge accounting for at least 30% of the variance in task performance?
- What is the relationship between social sensitivity and collective intelligence?
- What is the relationship between average individual intelligence and collective intelligence?
- What is the relationship between maximum individual intelligence and collective intelligence?
- What is the relationship between percentage of female group members and collective intelligence?
- What is the relationship between the trait EI and collective intelligence?
- What is the relationship between personality and collective intelligence?

From the preceding research questions, the following theoretical model is derived:

Figure 2. Study 3 theoretical model

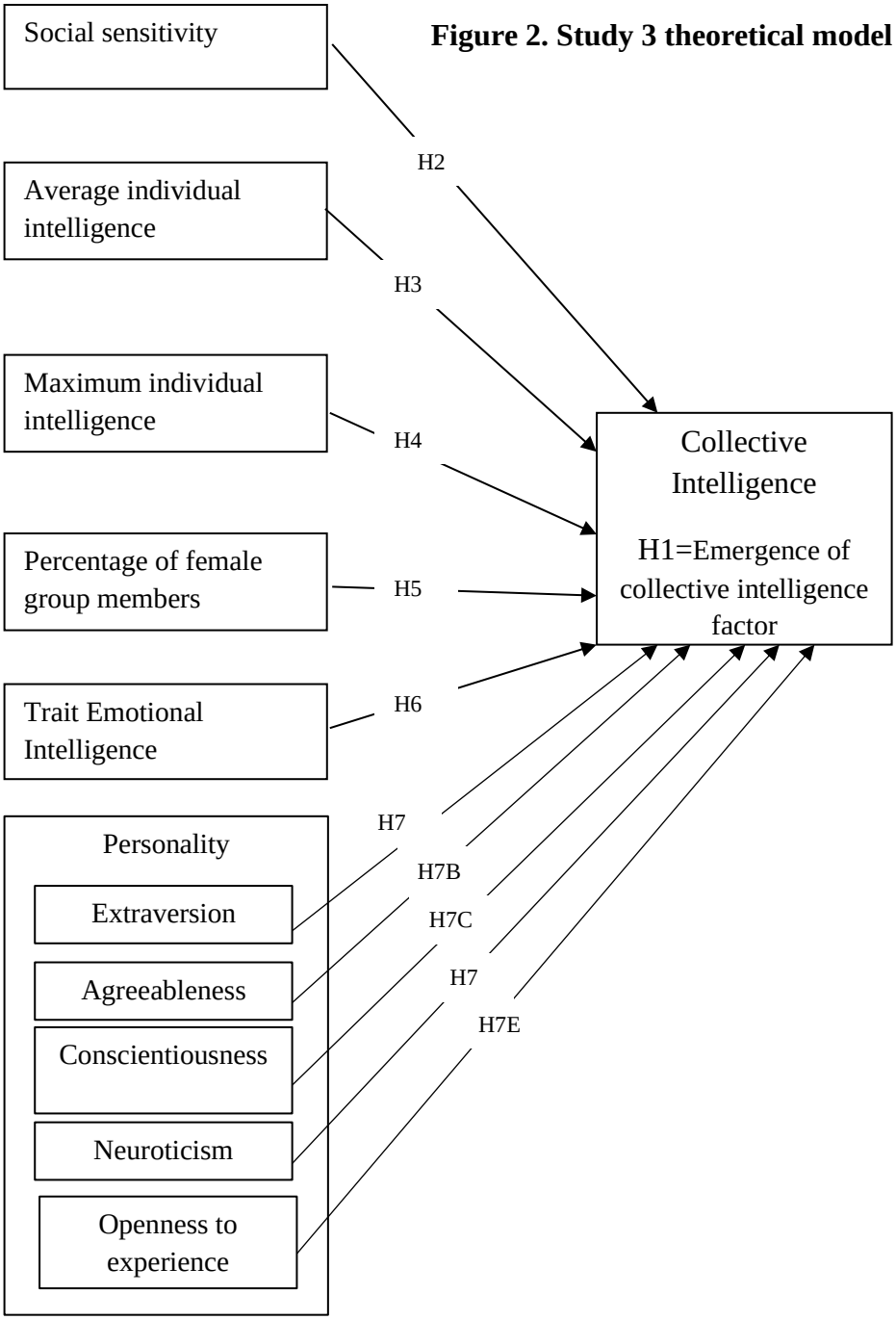


Figure 2 shows the theoretical model for Study 3. Based on this model, derived from literature in chapter 2, the following hypotheses are posited:

Hypothesis 1: A collective intelligence factor emerges accounting for at least 30% of the variance in task performance.

Hypothesis 2: There is a significant positive association between social sensitivity and collective intelligence.

Hypothesis 3: There is a significant positive association between average individual intelligence and collective intelligence.

Hypothesis 4: There is a significant positive association between maximum individual intelligence and collective intelligence.

Hypothesis 5: There is a significant positive association between percentage of female group members and collective intelligence.

Hypothesis 6: There is a significant positive association between trait EI and collective intelligence.

Hypothesis 7: Personality is significantly associated with collective intelligence.

Hypothesis 7_A: There is a significant negative association between extraversion and collective intelligence

Hypothesis 7_B: There is a significant positive association between agreeableness and collective intelligence

Hypothesis 7_C: There is a significant positive association between conscientiousness and collective intelligence

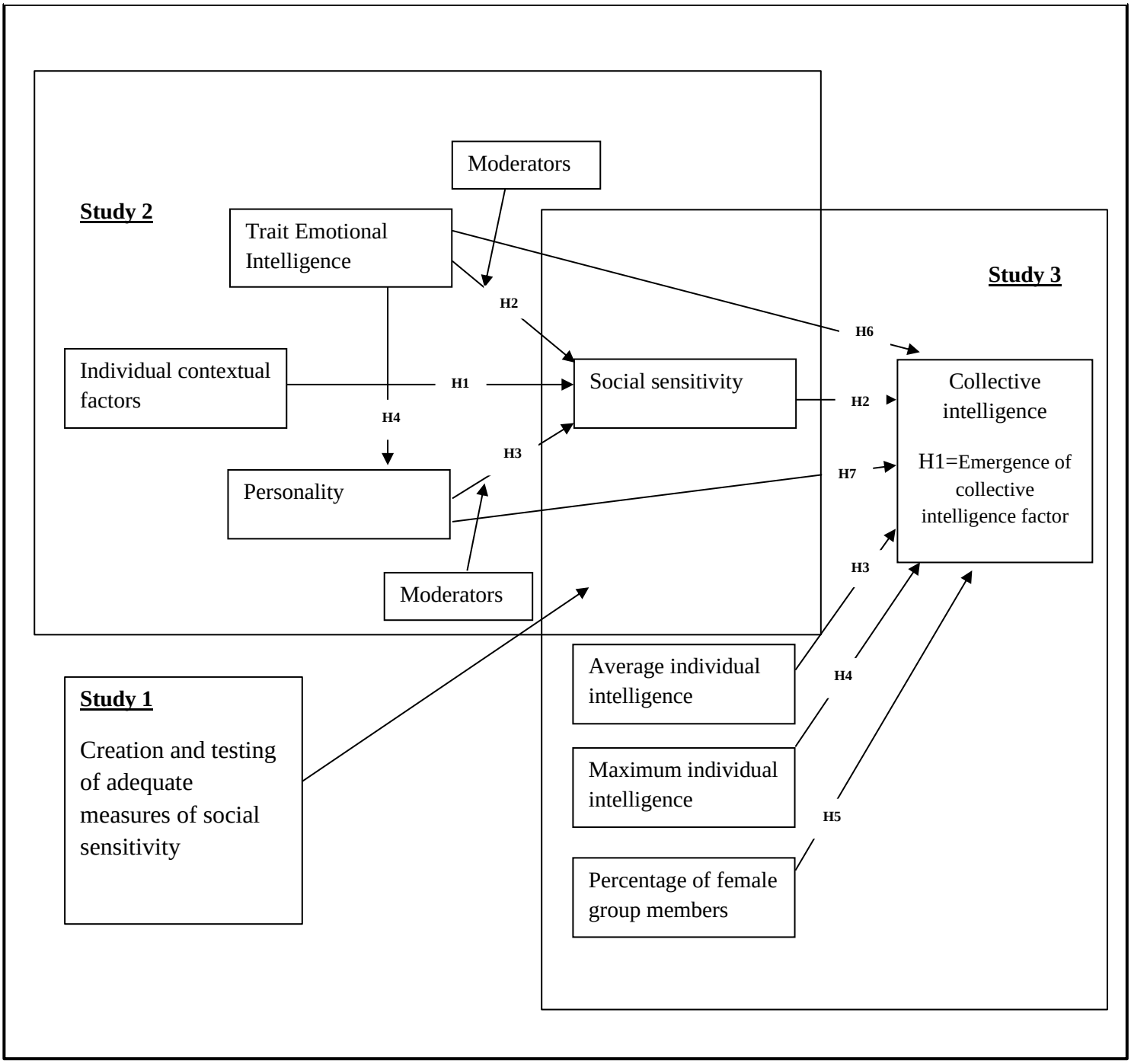
Hypothesis 7_D: There is a significant negative association between neuroticism and collective intelligence

Hypothesis 7_E: There is a significant positive association between openness to experience and collective intelligence

The above hypotheses will be tested by carrying out a similar methodology to that of Woolley et al. (2010) to identify the collective intelligence factor in the current context and extend our knowledge on what predicts such a factor. The next section represents graphically the derived overall theoretical model of this research labelled Figure 3.

1.5 COMBINED THEORETICAL MODEL

Figure 3. Combined theoretical model



1.6 CHAPTER SEQUENCE

The section below presents a brief introduction to each chapter in the thesis and its contents.

1.6.1 Chapter 1: introduction and background to the research

Chapter 1 introduces the research by highlighting the research problem and providing a brief background to the literature. The literature presents the tension between using individuals or the collective to solve both societal and organisational problems. This tension reveals a lack of knowledge surrounding collective intelligence and its predictors. The absent knowledge relates to how collective intelligence emerges in different contexts and what determines its most significant predictor, social sensitivity. A background into social sensitivity literature shows variance in culture and gender performance on the RMET, a measure of social sensitivity, in normal adult populations. In the literature, there is a lack of culturally diverse social sensitivity instruments and knowledge on the antecedents of social sensitivity. The absent knowledge in literature guided the significance of this research which is described in three separate studies. Significant contributions include new social sensitivity instruments, analyses of cultural differences across multicultural ToM instruments (Study 1) and the testing of the predictors of social sensitivity (Study 2). Another significant contribution is the testing of the collective intelligence factor and its predictors in an African context (Study 3). The chapter then presents the aims and objectives of the research followed by the research questions and hypotheses. The research's theoretical models are presented for this research as well. Lastly an overview of the chapters in the thesis is provided.

1.6.2 Chapter 2: literature review

Chapter 2 considers literature for each study and derives the research questions and hypotheses presented in chapter 1. Each studies' importance to management theory is also highlighted. The literature review for Study 1 first considers ToM and how it develops in a person. This development is then considered in the context of culture and gender, which leads to an acknowledgement in the literature of ToM differences based on a person's cultural background and gender. The literature review for Study 2 addresses potential determinants of social sensitivity. The antecedents include emotional intelligence, personality and individual contextual factors. The last literature review section is for Study 3. This review highlights the lack of contextual knowledge about the emergence of the collective intelligence factor in Africa. The review also shows a need to test the collective intelligence predictors. The collective intelligence predictors for Study 3 include average individual intelligence, maximum individual intelligence, social sensitivity, proportion of females, emotional

intelligence and personality. The current research recognises social sensitivity as a particularly important predictor of collective intelligence. After each studies' literature is reviewed the chapter is concluded.

1.6.3 Chapter 3: methodology

Chapter 3 introduces the research methodology used to achieve the aims of each study. This is done by justifying the appropriateness of the research paradigm and approach for the current research. Research design and strategy are discussed by describing how the instruments were constructed. This is followed by discussing the research population and how it was sampled. Research design and strategy is then concluded by considering data collection. The chapter then considers data analysis techniques for the research. This chapter also considers the ensuring of the research's reliability and validity through statistical techniques and pilot testing. To conclude the methodology chapter, ethical considerations are provided along with a description of potential limitations of the methodological approach.

1.6.4 Chapter 4: results and data analysis-study 1

Chapter 4 presents the results related to the aims of Study 1. These include the creating and testing of two new social sensitivity instruments (African and 'Other culture' instruments). The chapter also tests the original social sensitivity instrument in literature (Caucasian instrument). First, the chapter details the instrument development process. This is followed by an overview of the respondent demographics for the three instruments. The results of the psychometric testing guided which items from each instrument would be retained for further analysis. These retained items were then used to analyse the culture and gender differences across different cultural instruments. Lastly, the chapter details the development process to create a final shortened multicultural instrument to use in future studies and research.

1.6.5 Chapter 5: results and data analysis-study 2

Chapter 5 introduces the results for Study 2, particularly assessing the relationships between social sensitivity and its antecedents. The chapter first provides univariate results for each variable tested, followed by bivariate analysis that tests the net relationships between the derived independent variables and the dependent variable social sensitivity. Multivariate analysis relating to each hypothesis is then provided. Mediation and moderation tests are presented to assesses the relative strength of the relationships being tested. The chapter is concluded with a tabulation of hypotheses and their relevant results.

1.6.6 Chapter 6: results and data analysis-study 3

Chapter 6 introduces the results for Study 3. The chapter starts by assessing whether a collective intelligence factor emerges in the current context. Univariate statistics are presented for each relevant variable and the demographic characteristics of the sample. Bivariate analysis is used test the derived hypotheses. Multivariate analysis provides further evidence and discussion to the hypotheses. The chapter concludes with a justification of the results as a successful post-hoc investigation.

1.6.7 Chapter 7: discussion of findings-study 1

Chapter 7 discusses the results of Study 1 by discussing current study results in relation to the literature. The first topic is RMET performance across cultures. The second topic is gender performance on RMET across cultures. The chapter provides a review of these topics and the results for each of these topics are discussed by highlighting the key contributions to the literature. These results are examined in relation to similar and opposing findings in the literature, thus providing valuable commentary to literature on the relevant topic. The chapter conclusion reviews key discussion points for each topic.

1.6.8 Chapter 8: discussion of findings-study 2

Chapter 8 discusses the results of Study 2 by first examining social sensitivity results. Study 2 used a new shortened multicultural instrument from Study 1 to measure social sensitivity. The results were briefly compared to that of Study 1 to assess the relative success of the new instrument. Social sensitivity and its relationship with the potential antecedents are then discussed. The predictors include trait EI, personality and individual contextual factors. These antecedents are each discussed by considering theory related to the hypothesis, how the current study results either support or do not support the hypothesis and how current literature compares to the results. Once each predictor's direct relationship with social sensitivity is considered, the chapter discusses the outcomes of the mediation and moderation tests. Based on the discussion of moderation results, the chapter considers carefully the result that culture is a moderator for the trait EI-ToM relationship. The chapter then concludes with a summary of discussion insights.

1.6.9 Chapter 9: discussion of findings-study 3

Chapter 9 discusses the results of Study 3. The chapter discusses the collective intelligence factor in detail. Assessing its emergence patterns in different contexts and comparing it to how the collective intelligence factor emerged in Study 3. After considering the emergence of

the collective intelligence factor, social sensitivity is considered closely by discussing its continued importance to collective intelligence in an African context. Lastly, sub-hypotheses results are discussed to inform future research.

1.6.10 Chapter 10: conclusions and recommendations

Chapter 10 concludes this research by reviewing the research aims and justifying how they were achieved. The chapter briefly reviews key findings, which include the development of instruments and the answering of important research questions. These are discussed in relation to implications for both theory and practice. The chapter then provides the limitations to the current research as a guide for future research. Lastly, a summary of major knowledge contributions is provided with an overall conclusion to the thesis.

1.7 CONCLUSION

The introductory chapter highlights key issues regarding collective intelligence and social sensitivity. The significance of this research is emphasised by the methodological, knowledge and contextual gaps it fills in literature. The methodological gap relates to the lack of culturally inclusive social sensitivity instruments available in literature. The knowledge gap is that limited information exists in literature to explain cultural and gender differences in social sensitivity as well as what predicts higher social sensitivity. The contextual gap relates to a lack of evidence showing the emergence of the collective intelligence factor in an African location, specifically South Africa. This contextual gap is extended to its predictors, particularly focusing on social sensitivity's continued importance to collective intelligence literature. This chapter highlighted ways to close these gaps by answering multiple research questions as derived from the literature in the next chapter. The research questions and literature then guided the generation of relevant hypotheses and theoretical models. The last section provides a brief overview of the chapters and its contents in this thesis. The next section of this thesis will introduce a literature review of relevant research themes.

CHAPTER 2: LITERATURE REVIEW

2 LITERATURE REVIEW

2.1 INTRODUCTION AND STRUCTURE OF LITERATURE REVIEW

The following chapter presents the literature review of relevant concepts introduced in the preceding chapter. This chapter consists of three separate reviews, each reflecting the three studies in the overall research. The first review considers Theory of the Mind (ToM), how it develops in humans, and how it differs amongst individuals – this guides the research questions for Study 1. The second review considers the literature on potential determinants of ToM, these include EI, personality and individual contextual factors – these determinants form the hypotheses for Study 2. Finally, collective intelligence literature is reviewed, deriving the hypotheses to test in Study 3, a post-hoc experiment in this research. At the end of each review, concepts are then related to management theory. Once relevant literature for each study has been reviewed, the chapter is concluded.

2.2 STUDY 1: CULTURAL AND GENDER DIFFERENCES IN THEORY OF THE MIND

A background into ToM research shows differing levels of ToM ability across different cultures and genders. The following literature review explores why such differences exists, and whether current literature can explain why these differences are present.

2.2.1 Theory of the Mind

Premack and Woodruff (1978) introduced the term Theory of the Mind (ToM) to describe the ability to ascribe mental states. This concept has been dubbed a theory because mental states are not tangible and thus only exist in theory. ToM also appears to have a coherent explanatory structure. For example, the surprise mental state can be explained in relation to belief or expectation. This causal connection is a requirement for theories (Lillard, 1998, 1999; Wellman, 1992).

A key aspect of ToM is the connection it has to belief. An individual's belief shapes how they view the world (Lillard, 1998). This belief will ultimately dictate what mental states an individual ascribes to either oneself or to others. It is on this basis that Wimmer and Perner (1983) developed one of the most well-known ToM measurements today, called the false-belief task. In this task, children are presented with an experimental puppet show, where a puppet named Sally places a chocolate on the counter and then leaves the room. Anne, another puppet, is then seen moving the chocolate to a box. The children are asked by a

facilitator to predict where Sally will look for the chocolate, or where she thinks it will be when she returns. In the result, children younger than four years old answered that Sally would think that the chocolate was in the box. In contrast, children older than four years answered, as adults would, that Sally would think the chocolate was still on the counter. This difference in false belief understanding in children above four years old has led to an increased interest about how ToM develops.

The literature argues three theories of ToM development. The first of these is known as theory-theory which describes the process of individuals creating a body of knowledge or theory, and then referring to this knowledge to interpret mental states (Wellman, 1992). Theory-theory takes the view of a scientific approach to learning, where individuals collect evidence through observation and then adjust their theories accordingly (Gopnik, Meltzoff & Bryant, 1997; Gopnik & Wellman, 1994). For example, when a child observes another child crying for sweets and then notices that the child stops crying and smiles when given sweets, the observing child will adapt their theory to reflect that when something that is desired is given, the result is a state of happiness. To understand why children under the ages of four years fail the false-belief task, theory theorists explain that three-year-old children, or there about, lack a representational theory of mind and do not think that their belief can be false (Perner, 1991).

A second theory of ToM development proposed in literature is simulation theory. Simulation theory explains the process of placing oneself in the position of someone else (Gordon, 1986, 1992). In this position, a person assigns the mental state that they are feeling to the other person (Harris, 1992). Simulation theory does not rely on having a theory on mental states as with theory-theory. It rather describes the process of creating a simulation close to the original to evoke the same mental state (Goldman, 1989).

The third theory, often referred to in literature, is the Modular-Nativist theory. The Modular-Nativist theory posits that ToM is an inborn ability (Lillard, 1998). This ability uses domain-specific neural modules and are innate cognitive structures (Leslie, 1994; Scholl & Leslie, 1999). A neural module mandatory receives specific input, it then uses encapsulated domain specific information to quickly provide simple output (Fodor, 1983). Modular theorists believe that humans are born with neural ToM modules that become active at a pre-programmed time, similar to the way that puberty is triggered in teenagers (Scholl & Leslie,

2001). According to the false-belief task, ToM seems to be triggered at around four years old. These neural modules then enable the inference of mental states.

Baron-Cohen et al. (1985) provide the first evidence for the proposed ToM module. In a sample that consisted of Down Syndrome, autistic and normal children above the age of four years old, they found that 85% of normal and 86% of Down Syndrome children passed the false-belief task. However, only 20% of the autistic children passed the false-belief task. This led the authors to conclude that autism impairs a domain-specific module related to ToM. Later studies provided further evidence of an impairment of ToM ability in autistic subjects (Baron-Cohen et al., 1997; Baron-Cohen, Leslie & Frith, 1986; Baron-Cohen et al., 2001).

Although different theories exist on the development of ToM, all theories predict it as a universal ability where all humans have a ToM ability (Lillard, 1998). This is supported by a meta-analysis of false-belief tasks across different countries (Liu, Wellman, Tardif & Sabbagh, 2008; Wellman, Cross & Watson, 2001). ToM development (passing of the false-belief task) was consistent across different countries, but the age at which the false-belief task is passed was variable across countries in the meta-analysis. This suggests that variability in ToM ability may exist across cultures. In a comprehensive review of cultures and its effect on the mind, Lillard (1998) concludes that cultural variations should exist and is relevant to evaluating and refining developmental theories. One of the requirements for assessing and determining these variations is a ToM instrument that can measure subtle variations in ToM ability. To date the only instrument available to do this, is the RMET developed by Baron-Cohen et al. (2001).

2.2.2 Cultural differences in Theory of the Mind

When testing the RMET, Baron-Cohen et al. (2001) were able to replicate the finding of an impaired ToM ability in those affected by autism (Baron-Cohen et al., 1985). They were able to do this in adult samples and were satisfied that they had created an advanced ToM task that could measure variations of ToM in an adult sample group.

This instrument, in theory, can be used to measure potential variations in ToM across cultures. To measure ToM in different countries, many studies have translated the original English instrument into different languages. These include Spanish (de Achával et al., 2010), Japanese (Kunihira, Senju, Dairoku, Wakabayashi & Hasegawa, 2006), French (Prevost et al., 2013), Italian (Vellante et al., 2013), Turkish (Yıldırım et al., 2011) and Swedish (Hallerback et al., 2009). However, many of these studies lack the uniformity of instrument

or diverse sample to compare ToM across cultures. Instrument items are often dropped from the main instrument due to poor psychometric properties (Hallerback et al., 2009; Prevost et al., 2013; Vellante et al., 2013). This then makes it difficult to compare results across different studies. The samples of these studies are also often homogenous with limited culture diversification, where comparisons can be drawn, a cultural variation seems evident.

Prevost et al. (2013) found that participants who did not speak English or French as their home language had lower scores on the RMET when completing the English and French translated versions of the RMET. Their evidence suggests that this is due to cultural differences rather than language difficulties. In particular, Asian participants were shown to score significantly lower than North American participants. African participants, on the other hand, did not score significantly lower. However, their sample only included 12 African participants.

Contrary to this, there is a study that provides strong evidence for a ToM variation in African cultures. Dehning et al. (2012) found that Ethiopian students scored significantly lower than the stated low mean score of approximately 22 (correct out of the 36) as provided by Baron-Cohen et al. (2001). Baron-Cohen et al. (2001) found that adults with autism scored a mean of 21.9. This is considered a significant deficit compared to the mean of 26.2 for normal adults and 28 for students in their study.

Dehning and colleagues' (2012) Ethiopian student sample showed means of 14.2 (men) and 16.3 (women) for first years, and 17.2 (men) and 21.2 (women) for final year medical students. In addition, Dehning et al. (2012) reported an acceptable Cronbach's alpha of 0.7. Given the reliability of the instrument it is clear there is large cultural variation, and even a deficit, as the mean scores are even lower than those reported for autistic populations. This lead Dehning et al. (2012) to question the validity of the measurement in an African cultural context as it only had Caucasian faces. However, evidence exists showing that six basic emotions can be correctly identified on Caucasian pictures across cultures (Ekman, Sorenson & Friesen, 1969; Izard, 1971).

These emotions include happiness, anger, sadness, surprise, fear, and disgust. Although correct identification of these emotions is stated as above chance for all cultures, accuracy percentages appear to differ across cultures. The pattern of differences seems to place American/European cultures (75-83% accuracy) as the best performers, followed by Asian cultures (65% accuracy) and African cultures (50% accuracy) as the lowest performers in

identifying emotions through photographs (Izard, 1971). Interestingly, and complimentary to Dehning and colleagues' (2012) findings, a study on Ethiopian high school students showed only 52% emotion recognition accuracy on Ekman's (1976) stimuli measuring 'pure' facial expressions. This was less than the stated norm of 83% for Americans. These differences seem to continue to persist even when photographic stimuli are culturally compatible (Elfenbein, Mandal, Ambady, Harizuka & Kumar, 2002). It is suggested these cultural differences in emotion recognition are much larger when using more complex Caucasian stimuli (Izard, 1971; Vellante et al., 2013).

The RMET test is seen as a complex emotion recognition test. However, very few detailed studies exist to investigate these cultural differences (Vellante et al., 2013). One such study that investigated cultural differences in the RMET has found evidence of a same culture advantage. Adams Jr et al. (2010) tested the RMET instrument on a mixed Japanese and White American sample. They created a new RMET consisting of Japanese stimuli. This instrument along with the Caucasian instrument was then tested on the mixed sample. It was found that each culture performed better on the instrument that had the stimuli representing their own culture. Japanese participants scored higher on the Japanese instrument, whereas Caucasian participants scored higher on the Caucasian instrument. These findings were later replicated with the same two instruments by Franklin et al. (2015) and Bjornsdottir and Rule (2016). These findings support the meta-analysis presented by Elfenbein and Ambady (2002) that suggests there will be an improved accuracy in emotion recognition when identifying basic emotions of an individual's own culture. This in-cultural advantage appears to be attributable to variations in non-verbal cues across cultures (Elfenbein & Ambady, 2003a), deeper processing of own-ethnicity faces (Levin, 1996) and greater preference to focus on the eyes of members from the same culture (Kawakami et al., 2014). However, this advantage becomes less apparent when a person becomes more accustomed and exposed to other cultures (Bjornsdottir & Rule, 2016; Elfenbein & Ambady, 2003a).

The above suggests that the cultural variations in the RMET test, and by implication emotion recognition, is mostly caused by the culture of the stimuli. This cultural variation, however, was only tested on Japanese and Caucasian stimuli. It cannot be assumed that the large variations observed on the RMET (example, Dehning et al., 2012) and emotion recognition tests (example, Izard, 1971) in African samples are also due to an intra-cultural advantage. Especially, since the differences observed in African cultures are much larger than those observed in other cultures (for example between Asian and Caucasian). This observation

alone, indicates that African cultures are a unique sample. The extent of difference is substantial enough to consider that there may be an underlying factor, beyond facial stimuli, unique to African cultures that is prohibiting performance on emotion recognition tasks such as the RMET. This, in turn, will ultimately have an impact on African cultures' ToM ability and how it develops. A RMET with African stimuli is urgently required to both clarify and inform on the cultural variations observed, particularly on an African sample. The creation and testing of an African RMET test can then verify if an intra-cultural advantage is evident for African cultures, and if this can explain the observed variance on the Caucasian RMET.

Also evident in literature is the need for a more culturally diverse Asian RMET. The current Asian instrument only consists of Japanese stimuli. It is important to create a more representative RMET instrument to better examine the cultural nuances of Asian cultures' performance on the RMET. This current research creates an African and culturally diverse Asian RMET which is currently unavailable in literature. In doing so, it is possible to answer this key research question derived from the above literature:

What differences exist between cultures' ToM ability when they are presented with eye regions that are from either the same ethnic group or an alternative ethnic group?

Another key variation that arises in literature on the RMET is that between genders.

2.2.3 Gender differences in Theory of the Mind

Female infants tend to show more interest in looking at the face as opposed to male infants, who tend to show greater interest in objects (Connellan, Baron-Cohen, Wheelwright, Batki & Ahluwalia, 2000). Young women also display more interest in eye contact than young men (Lutchmaya, Baron-Cohen & Raggatt, 2002; Podrouzek & Furrow, 1988). Interestingly, this attention to the eyes and face from a young age appears to develop into a female advantage in interpreting non-verbal behaviour in adulthood. A meta-analysis of the decoding of non-verbal cues shows an adult female advantage in both visual and audio interpretation of cues (Hall, 1978). A significant difference was seen with visual cues, but the combination of both visual and audio cues shows a larger effect in favour of women. A later meta-analysis found a similar female advantage across nine counties (Hall, 1984). There has since been continued support for a female advantage in the interpretation of non-verbal cues (see Rosip and Hall, 2004 and Schmid, Schmid Mast, Bombari & Mast, 2011).

Women's increased attention to the eyes seems to persist into adulthood. Studies have found that female adults make more eye contact and process eye gaze information more effectively than males (Alwall, Johansson & Hansen, 2010; Bayliss, Pellegrino & Tipper, 2005; Deaner, Shepherd & Platt, 2007; Hall, Hutton & Morgan, 2010). This has allowed women to perform better than men in both accuracy and speed of emotion recognition (Hall et al., 2010). Evident from literature is a particular female advantage in accurately identifying facial emotions (Golan, Baron-Cohen & Hill, 2006; McBain, Norton & Chen, 2009; Montagne, Kessels, Frigerio, de Haan & Perrett, 2005). These observed differences throughout literature have prompted Baron-Cohen (2002) to propose the empathising/systemising theory of psychological sex differences. This theory dictates that women have a more empathising cognitive profile, where men are more attuned to a systemising cognitive profile. An empathising style shows more drive to identify other's emotions or thoughts, and then respond with an appropriate emotion (Baron-Cohen, 2002, 2010). This can be seen in a women's general interest in the face and eyes, suggesting a drive to identify underlying emotions. Alternatively, a systemising style looks to identify the underlying variables of a system predicting the behaviour (Baron-Cohen, 2002, 2010). For example, a systemising style would only derive an emotion such as sad or upset, if clear evidence - such as crying - exists to explain the emotion. Men's general interest in objects as opposed to facial features, such as the eyes, suggests a greater interest in systems. Empathising is intrinsically linked to ToM, as it involves the ascribing of mental states to others (Baron-Cohen, 2002).

Based on this evidence, a female advantage would be expected in ToM, where the identification of non-verbal cues is key to infer the mental states of others. Using a faux pas ToM task, women were found to have an advantage (Ahmed & Miller, 2011). In contrast, men performed better on a ToM Cartoon task (Russell, Tchanturia, Rahman & Schmidt, 2007). However, these ToM tasks lack the sensitivity to consistently produce subtle variations between men and women in an adult population to build sufficient support for any gender advantage in ToM (Kirkland et al., 2013). A test that does display enough variation in adult samples is the RMET. The RMET also focuses on emotion recognition and eye contact, concepts that, based on the preceding discussion, women tend to outperform men. It is, therefore, expected that women will outperform men on the RMET.

Evidence in literature suggest that this is the case. It has been stated as the most replicated finding in research using the RMET (Vellante et al., 2013). Many studies have reported a significant female advantage (Alaerts, Nackaerts, Meyns, Swinnen & Wenderoth, 2011;

Baron-Cohen et al., 2015; Carroll & Chiew, 2006; Yildrim et al., 2011; Franklin et al., 2015; Hallerback et al., 2009; Jankowiak-Siuda et al., 2016; Redondo & Herrero-Fernández, 2018; Vellante et al., 2013). Some studies report no significant gender effects (Mar et al., 2006; Olderbak et al., 2015; Valla et al., 2010). Very few studies have reported a male advantage (Nettle & Liddle, 2008; Pestana, Menéres, Gouveia & Oliveira, 2018). One of the strongest indications of a female advantage is found in a meta-analysis performed by Kirkland et al. (2013) across ten countries. The meta-analysis included 50 effect sizes from 40 studies and revealed a small, but significant, female advantage. However, it is noted that there is a general lack in reporting on RMET scores by gender (Vellante et al., 2013). Another issue surrounding gender differences in RMET scores relates to how culture may impact this result.

The interaction between gender and culture on the RMET test has received little attention in literature (Franklin et al., 2015). In similar areas of research on emotion, studies have shown larger gender differences in Europe and America samples as opposed to Japanese samples (Frymier, Klopf & Ishii, 1990; Zahn-Waxler, Friedman, Cole, Mizuta & Hiruma, 1996). These larger sex differences for European and American United States samples is also seen in other psychological research such as personality. Larger sex differences in personality are observed in countries with higher levels of human development. Areas where there is higher life expectancy and greater access to education and economic wealth (Schmitt, Realo, Voracek & Allik, 2008). These sex differences in personality appear to diminish from Western cultures to non-Western cultures.

The gender differences across cultures may also be related to stereotypes. Gender stereotypes are generalised inferences about the appearances and behaviours of men and women (Fiske & Neuberg, 1990). Gender stereotypes change the way one interprets, labels and predicts emotional behaviour (Durik et al., 2006; Fiske & Neuberg, 1990). It appears this would in turn affect ToM, which relies on inferences on mental states to predict behaviour. Gender stereotypes often place women in a more communal role (selfless and concerned with others) and men in a more agency role (self-focused) (Block, 1973). These stereotypes are often derived because each gender appears to occupy these social roles by engaging in gender specific activities (Eagly & Steffen, 1984). For example, women are more likely to engage in activities that are linked to caregiving and home-making such as looking after children. These activities require more emotional-based skills, thus confirming the stereotype that they fulfil a more communal role. Men, on the other hand, tend to engage in activities to gain economic provision. Economic provision requires skills such as self-assertiveness, leadership and self-

growth, thus, confirming the stereotype that men fulfil a more agency role. This suggests that the extent to which gender stereotypes effects RMET gender differences depends on the embracing of each gender to the stereotyped social roles mentioned above, particularly to what extent do women participate in activities of economic provision. An observation of the 2018 United Nations Human Development Report shows that female participation in the labour force in Africa is relatively high.

Table 4. Labour participation rates by region

Region	Female	Male	Difference (Male-Female)
Sub-Saharan Africa	65.2	74	8.8
Arab States	20.7	74.2	53.5
East Asia and the Pacific	60.1	77.3	17.2
Europe and Central Asia	45.5	70.3	24.8
Latin America and the Caribbean	51.6	77.5	25.9
South Asia	27.9	79.1	51.2

Note. Adapted from "Human Development Indices and Indicators: 2018 Statistical Update", by United Nations Development Programme, 2018, p.41. Copyright 2018 by United Nations Development Programme

Table 4 demonstrates that African countries, and by implication cultures, are less likely to adopt gender stereotypes, and therefore, do not reinforce the stereotype that places women in a more caregiving role, that would, in turn, prompt a greater social sensitivity and emotional advantage for women. This suggests a smaller gender gap between males and female scores on the RMET for African cultures.

Sub-Saharan Africa (non-Arab states) countries have a comparatively small gap of 8.3 between female and male participation in the labour force. This is almost half than the next region which is East Asia and the Pacific at a gap of 17.2. What is also clear is that the Arab and Asian countries, and by implication culture, have a relatively large gap between male and female participation in the labour force (Close to 50). One would expect a larger adoption of gender stereotypes in Arab and Asian cultures which would mean women are assuming the roles of caregivers, thereby increasing the chance of higher social sensitivity and emotional advantage in that culture. A further inspection of selected regions provides further evidence.

Table 5. Selected labour participations by region

Region	Female	Male	Difference (Male-Female)
United Kingdom	56.8	68.1	11.3
United States	55.7	68.3	12.6
South Africa	47.9	62	14.1
Angola	75.3	80.1	4.8
Ghana	74.8	79.2	4.5
Ethiopia	77.2	87.8	10.6
Egypt (part of Arab states)	22.2	73.7	51,5
India	27.2	78.8	51,6
Japan	50.5	70.6	20,1
World	48.7	75.3	26.6

Note. Adapted from "Human Development Indices and Indicators: 2018 Statistical Update", by United Nations Development Programme, 2018, p.41. Copyright 2018 by United Nations Development Programme

An observation of Table 5, again, suggests a cultural impact on gender stereotypes. The biggest gender gaps, and the lowest percentage of women involved in the workforce, are seen in Arab (Egypt) and Asian (Japan, India) cultures. The smallest gender gaps, and highest female participation rates are observed in African countries except for South Africa. South Africa, interestingly, has a gender gap like the United States and the United Kingdom. A possible reason for this similarity is the diversity in South Africa as well as the 'adoption' of multiple cultures into the country. South Africa is known as the 'Rainbow Nation' due to the vast number of cultures that reside in the country. In support of South Africa's diversity, there are high populations of White and Indian/Asian ethnicities in South Africa. Over 5 million of South Africa's population originates from outside Africa (STATS SA, 2017). This is the largest known number of people, who do not originate from Africa, to reside in an African country. Other African countries do not report on demographic groups originating from outside of Africa as the number is too small, relative to the larger population. With this increased level of outside cultural influence, it is probable that the South African population

at large, has assimilated to gender stereotypes common outside of Africa. Nevertheless, it appears that, overall, African cultures are less likely to engage in gender stereotypes compared to other cultures, which could lead to lower social sensitivity and emotional female advantage compared to other cultures. It also appears from the above observations that Arab and Asian cultures have strong gender stereotypes, that would likely lead to an increased female advantage in social sensitivity relative to other cultures. South Africa, due to its diversity seems the ideal locale to test these possible social sensitivity differences. In addition to identifying cross-cultural RMET gender differences, another important aspect that needs consideration is the role of the target group (cultural stimuli) and how this effects any potential culture-gender interaction (Kirkland et al., 2013).

A later study attempted to investigate this issue. Franklin et al. (2015) found that men showed greater activation of mind reading areas of the brain when completing the RMET of the same culture. Women showed no increase in mind reading activation for the same culture but a slight increase for other cultures. However, these findings did not translate into empirical results, where there was no statistical interaction between gender and culture when assessing the stimuli of the same culture. To what extent these results may appear empirically with an African sample and RMET instrument is not yet known. The same holds true for an RMET instrument containing Asian stimuli alternative to Japanese stimuli. With these two instruments now available through the current research, empirical findings can clarify the relationships and variations between gender, culture and stimuli culture, thus potentially answering the following derived research question:

What gender differences exist in one's ToM performance across different cultures and instruments?

This adds valuable knowledge to literature about gender differences across different cultures in the RMET, with particular strength in its African assessment.

Importance for management theory

Understanding what differences exist in ToM performance across both culture and gender is important to management theory. Modern organisations are not only focusing on creating teams, but also managing the diversity of those teams (McDowell et al., 2016; Bersin et al., 2017). Two key areas of diversification are ethnicity or culture and gender. A report by Hayton, Layton and Prince (2015) for McKinsey & Company (a leading management

consulting firm) indicates that of the 366 public companies investigated for diversity, the top quartile for ethnic and racial diversity were 35% more likely to have financial returns above their industry mean. Companies in the top quartile for gender diversification were 15% more likely to have greater financial returns than their industry mean. Díaz-García, González-Moreno and Jose Sáez-Martínez (2013) investigated the impact of gender diversity on radical innovation. Their study on R&D teams in 4 277 companies in Spain suggests that companies with more women had a higher chance of introducing radical new innovations to the market over a two-year period. In another study on culture diversity in firms, Nathan and Lee (2013) studied 7 600 firms in London and found a small but significant diversity advantage to company performance in areas such as innovation, market reach and entrepreneurship.

The above studies provide strong support for the importance of diversity in both culture and gender in the successful management of teams and organisations. However, management theory, and growth in understanding of diversity, have been constrained by the suggestion that diversity is a 'double edged sword' with both positive and negative effects on team performance (Miliken & Martins, 1996). The most stated negative effect, particularly in management literature, is conflict (van Knippenberg, De Dreu & Homan, 2004; Tsui, Egan & O'Reilly III, 1992; Nishii, 2013; Pelled, Eisenhardt & Xin, 1991; Díaz-García et al., 2013). This increased conflict from diversity can then also lead to higher employee absenteeism and employee turnover (Tsu et al., 1992). Interestingly, it is suggested that emotional conflict affects performance more than task conflict (Pelled et al, 1991). This suggests that conflict in teams can be better managed if team members are able to identify the emotions of other members and better adapt their behaviour to accommodate other team members' emotions. This is the implementation of ToM skills such as 'Reading the Mind in the Eyes' (RME). Based on conflict management, it is imperative for management theory that RMET and ToM differences across culture and gender are understood, as to effectively manage potential emotional conflict in diverse teams. This is echoed by literature, where it is argued that the problem faced by teams is not the presence or absence of conflict, but rather how conflict is managed (De Dreu & Weingart, 2003; Lovelace, Shapiro & Weingart, 2001; Simons & Peterson, 2000).

The above consideration of the literature highlighted that social sensitivity shows variation between individuals. It also highlighted that attention is required to understand what is causing these variations. This can potentially help individuals, teams and organisations with conflict management in diverse contexts. Culture and gender are two important variables

identified, but also important are other underlying factors that are potentially driving these variations. These are explored in the next section.

2.3 STUDY 2: POTENTIAL DETERMINANTS OF THEORY OF THE MIND

The above reviewed literature on ToM considers its development and ultimately the individual differences between cultures and gender. The review concluded the need for culturally diverse instruments and a reassessment of individual differences based on these new cultural instruments. The review also revealed that little is known about the underlying predictors of ToM, which could potentially explain the individual differences highlighted in literature. The following study derives potential determinants based on a review of relevant literature. These are derived below.

2.3.1 Emotional Intelligence

A look at the definitions of emotional intelligence and ToM shows stark overlaps between the two concepts.

Emotional Intelligence (EI) is defined as: "the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (Salovey & Mayer, 1990, p. 189).

Theory of the Mind (ToM) is defined as the ability to infer the mental states of oneself or another person and how this will in turn predict behaviour (Apperly, 2012; Baron-Cohen et al., 1985; Flavell, 1999; Premack & Woodruff, 1978; Saxe & Powell, 2006).

Both definitions refer to an ability that is applicable to oneself and another person. The definitions also indicate this ability is used to predict behaviour. The key difference is that the one definition focuses on identifying emotions while the other concentrates on a person's mental state. Mental states, however, include what a person feels, wants, believes and knows (Baron-Cohen et al., 1985). What a person feels refers to emotion, thus, inferring the mental states of others involves identifying emotions.

Vellante et al. (2013) describe the RMET as an emotion recognition task. Emotion recognition is defined as the ability to interpret emotional cues to inform on other's mental states to predict behaviour (Adolphs, 2009). Again, the definition of emotion recognition is similar to that of EI and ToM. Each ability appears to be interlinked and interdependent and can possibly be demonstrated by the model in Figure 4.

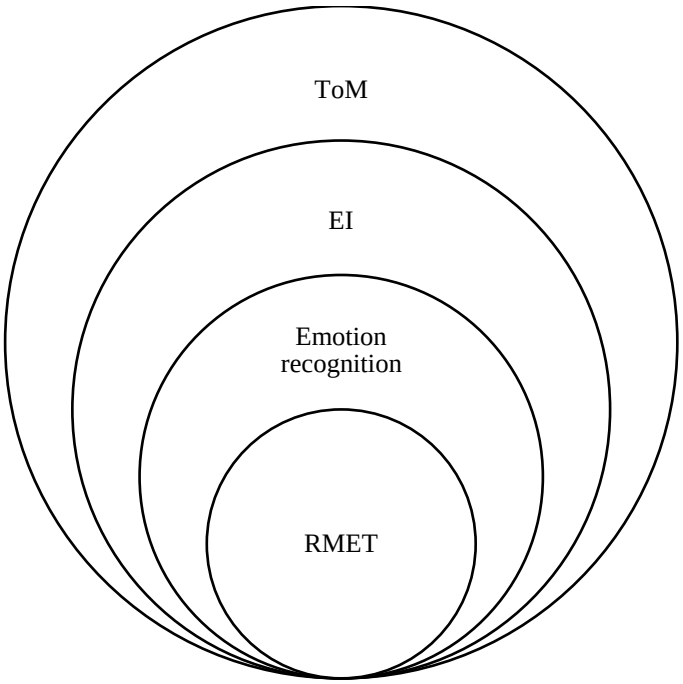


Figure 4. Depiction of contextual encompassing of Theory of the Mind and Emotional Intelligence model

ToM appears to include the ability to identify emotional states in order to uncover how a person feels and therefore includes emotional intelligence. EI includes perceiving emotions in others through recognising vocal cues, facial expression, language, and behaviour (Mayer, Caruso & Salovey, 2016). Emotional recognition is the skill used to perceive these emotions, therefore EI includes emotion recognition. The RMET is an instrument that activates this emotion recognition skill. These dependencies suggest a model as depicted by Figure 4.

The model depicted in Figure 4, proposes that ToM encompasses the whole of EI. This is contested in literature. Blair (2002) contends that EI and ToM are independent constructs that do not affect each other's development. In support of this, studies have found that in clinical conditions, such as autism, there are deficits in ToM but less so in EI (Blair, 2002). Psychopathy, on the other hand, shows deficits in EI but less so in ToM (Dolan & Fullam, 2004; Richell et al., 2003). So, rather than a complete overlap between ToM and EI, a degree of overlap is more likely (Ferguson & Austin, 2010), particularly since EI is described as a broad construct that contains many facets, some that one would not expect to impact ToM. Examples include self-esteem, motivation and regulation of personal emotion. However, as mentioned earlier, one would expect a greater overlap in components such as emotion perception, emotion understanding and managing emotions of others (Ferguson & Austin, 2010). What then appears is a model like that in Figure 5.

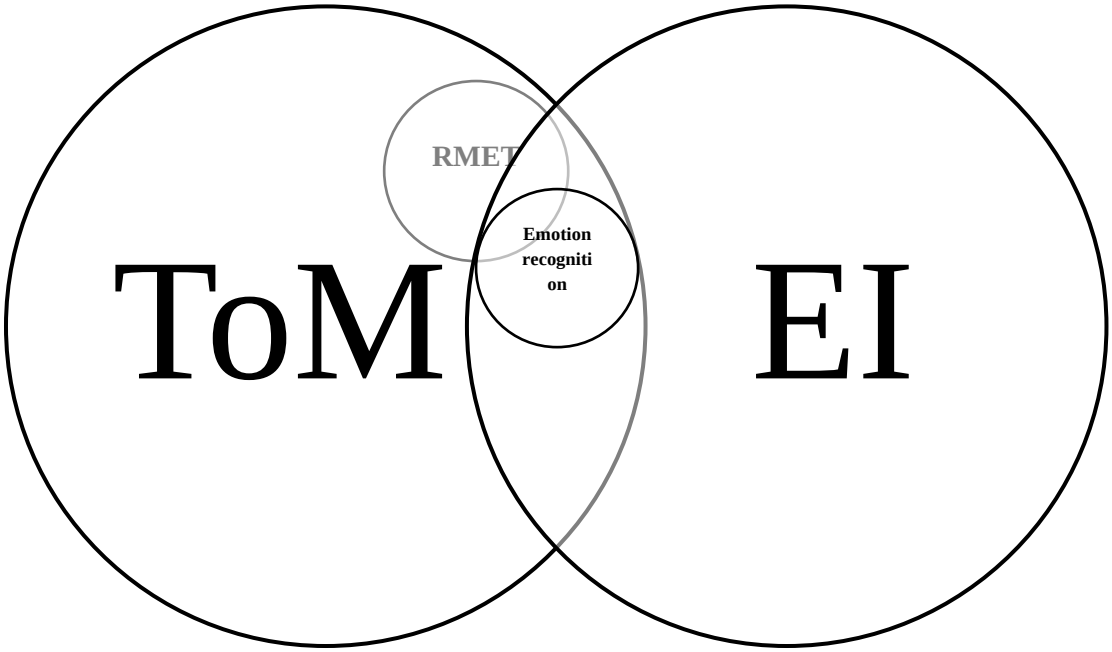


Figure 5. Depiction of contextual overlap model of Theory of the Mind and Emotional Intelligence

ToM measures other mental states that are not relevant to EI (for example, belief). EI is also suggested to contain facets unrelated to ToM (for example, emotion regulation). Where the two overlap is in one's ability to recognise and understand emotions to predict outcomes. A key overlap here is emotion recognition which includes interpretation of facial expressions, which can be measured through the RMET. The RMET can also measure non-emotional states such as suspicion, thus making it not only an emotion recognition task but a ToM task. Other areas of overlap with EI, outside of emotion recognition, may influence performance on the RMET. An example is emotional understanding. This could impact which mental state is recognised based on an individual's background governing the interpretation of that facial expression (for example culture may affect a person's understanding of mental states). Based on the theoretically derived model in Figure 5, this research proposes that ToM and EI are related concepts, where an increase in the one ability will positively affect the other. This relationship between ToM and EI is argued to be testable using the RMET due to its ability to test emotion recognition, a key area of theoretical overlap between ToM and EI. A review of the literature shows mixed results in this inquiry.

Contradictory to claims of association, it has been argued that EI and ToM are independent constructs that do not affect each other's development (Blair, 2002). This tension requires resolution. Qualter, Barlow and Stylianou (2011) began such an enquiry as, currently, limited empirical work has been done to establish a relationship between EI and ToM. This particular enquiry has proved fruitful in that associations between the two were recorded. This study looks to build on this line of investigation. To do this, it is important to further understand the two conceptualisations of each variable in literature.

ToM has been suggested to consist of two components. Tager-Flusberg and Sullivan (2000) propose that theory of the mind consists of a social-cognitive component and a social-perceptual component. Social-cognitive theory of the mind describes the reasoning of mental states. Social-perceptual theory of mind describes the rapid identifying of mental states through non-verbal cues. The social-perceptual ToM component is investigated in this research for a few reasons. First, it was found that social-perceptual ToM, measured using the RMET, is significantly correlated with collective intelligence (Woolley et al., 2010). It is, therefore, important to investigate social-perceptual ToM, as this component is influencing group intelligence. Second, social-perceptual ToM is also an area where subtle variations can be observed in an adult sample with the RMET (Baron-Cohen et al., 2001). This is important, as this research looks to test variables that can explain variations in social sensitivity in an adult sample. Third, social-perceptual ToM is less reliant on language or linguistic ability (Tager-Flusberg & Sullivan, 2000). In a multicultural sample, with multiple home languages, minimising the influence of language is crucial to successfully assess variable relationships across cultures. Lastly, social-perceptual ToM is suggested to be closely related to the emotional system of an individual (Tager-Flusberg & Sullivan, 2000). EI was identified as a key variable to ToM in this research. The connection between social-perceptual ToM and emotion is therefore promising.

The conceptualisation of EI has predominantly occurred in two camps. The first camp relates to ability EI and the second is trait EI. Ability EI is conceptualised as an intelligence that involves the ability to reason about one's emotions and then include this in the individual's own reasoning process (Mayer, Salovey & Caruso, 2008). Trait EI differs in that it considers an individual's self-perceptions on their emotional-related abilities (Petrides & Furnham, 2000; Petrides & Furnham, 2001).

Trait EI is the definition of emotional intelligence to be investigated in this study. This is mainly owing to trait EI's theoretical and relational similarities with social-perceptual ToM. By definition, ability EI focuses more on reasoning, this is analogous to social-cognitive ToM. Trait EI, however, relies on self-perceptions of emotional ability. It is argued this self-perception is important to ToM. Theoretically, this impact can be inferred from the importance of self-efficacy in the trait EI construct (Engel et al., 2015; Kirk, Schutte & Hine, 2008; Petrides, Frederickson & Furnham, 2004; Petrides & Furnham, 2003; Petrides, Sangareau, Furnham & Frederickson, 2006). Models have been used to show that emotional self-efficacy is important to one's self-development and social adaptation (Bandura, 1995, 1997). The relevance here is that for an individual's ToM skills to develop, acknowledgement of having emotional prowess and using it, is important. If individuals can see themselves as emotionally intelligent, they will more likely progress in their development and social adaptation, which will include improving their ToM ability. Self-efficacy is also developed through experience and social modelling (Bandura, Caprara, Barbaranelli, Gerbino & Pastorelli, 2003), suggesting that more interaction and experiences may lead to higher confidence in one's emotional abilities, and therefore, improve one's ToM ability. Social-perceptual ToM relies on the interpretation of visual cues. Development requires constant exposure to these visual cues to become better at identifying the underlying emotion. Experience and social modelling are, therefore, important to social-perceptual ToM. Increased experience and social modelling of non-verbal cues will improve one's emotional self-efficacy, which ultimately leads to a higher trait EI and by implication ToM, which includes social-perceptual theory of mind.

Relationally, trait EI has also been found to be associated with empathy (Austin, Evans, Goldwater & Potter, 2005). Empathy is theoretically and empirically linked to ToM (Lawrence et al., 2004; Voracek & Dressler, 2006). It is then expected that trait EI will be positively related with ToM which includes the social-perceptual component.

In literature, mixed results are reported on the proposed relationship between EI and ToM. Relationships have been found between both ability and trait EI with social-cognitive ToM (measured using a faux pas task) with a sample of children (Barlow, Qualter & Stylianou, 2010; Qualter et al., 2011). An adult sample replicated these results (Ferguson & Austin, 2010). The faux pas task presents a hypothetical social situation to respondents. Respondents are then asked whether something social awkward happened and how this would have affected those involved (Stone, Baron-Cohen et al., 1998). However, surprisingly, tests

performed with the RMET have not found any relationships between trait EI and the RMET (Ferguson & Austin, 2010; Montgomery, Stoesz & McCrimmon, 2012). Regardless of the mixed results, the lack of empirical evidence and testing for this theoretically derived relationship requires further investigation. This is especially important due to the need to identify causes for variations in social sensitivity.

Trait EI can be reduced to factors namely well-being, sociability, emotionality and self-control. These factors are scored in the following research to provide insight into what areas of trait EI is driving any potential relationship with social-perceptual ToM. This research adds informative testing on trait EI facets while assessing the main trait EI – social-perceptual ToM relationship. Thus, the following hypothesis is derived:

Hypothesis 2*: There is a significant positive association between trait EI and social sensitivity.*
Hypothesis 2_A: There is a significant positive association between well-being and social sensitivity.
Hypothesis 2_B: There is a significant positive association between sociability and social sensitivity.
Hypothesis 2_C: There is a significant positive association between emotionality and social sensitivity.
Hypothesis 2_D: There is a significant positive association between self-control and social sensitivity.

Another relevant relationship for this research is the one trait EI shares with personality. It is suggested that due to trait EI's ties to behavioural tendencies and self-perceived abilities it should be investigated within a personality framework (Petrides & Furnham, 2001). This study includes personality in its framework for measuring ToM. The complementary nature of the two constructs (trait EI and personality) makes them ideal constructs in this study's investigation of ToM. Empirical studies also present a strong relationship between trait EI and personality (Newsome, Day & Catano, 2000; O'Connor & Little, 2003; Van der Zee, Thijs & Schakel, 2002).

Apart from trait EI's appropriateness in terms of the proposed framework, it is still seen to impact on ToM independently. However, the concept of self-efficacy and ultimately trait EI improving ToM links closely to an individual's personality type. For example, openness to

experience and extraversion may lead to more experiences and social modelling thus improving self-efficacy. Neuroticism, on the other hand, would encourage fewer experiences and social modelling. It is because of these tight links and associations that this research suggests a framework in which personality and EI are antecedents of ToM. Based on these connections, it is also suggested that personality traits mediate the relationship between trait EI and ToM

A mediator is a variable that accounts for or explains, all or part of, the relationship between the independent and dependent variable (Baron & Kenny, 1986). Mediators address questions related to "how" and "why" a certain relationship is occurring (Frazier, Tix & Barron, 2004). Mediators derived from the literature are now presented.

It is possible that any relationship between trait EI and social sensitivity is being explained by personality acting as a mediator because many empirical studies present a strong relationship between the two variables (Newsome, Day & Catano, 2000; O'Connor & Little, 2003; Van der Zee, Thijs & Schakel, 2002). Literature also reports studies where both trait EI (see Johnson, Batey & Holdsworth, 2009 and Chamorro-Premuzic, Bennett & Furnham, 2007) and personality (see O'Connor and Athota, 2013) have acted as mediators to each other. This research performs mediation tests on personality traits to ensure the completeness of the proposed model. The mediation hypotheses are presented below:

Hypothesis 4: *Personality mediates the relationship between trait EI and social sensitivity.*
Hypothesis 4_A*: Extraversion mediates the relationship between trait EI and social sensitivity.*
Hypothesis 4_B*: Agreeableness mediates the relationship between trait EI and social sensitivity.*
Hypothesis 4_C*: Conscientiousness mediates the relationship between trait EI and social sensitivity.*
Hypothesis 4_D*: Neuroticism mediates the relationship between trait EI and social sensitivity.*
Hypothesis 4_E*: Openness to experience mediates the relationship between trait EI and social sensitivity.*

Personality and its direct relationships with ToM are now considered.

2.3.2 Personality

Personality describes individual differences in the way a person thinks, feels and acts (Kazdin, 2000). It has been found that much of these individual differences can be captured by five factors as derived from the natural language of personality descriptions, which has been named the Big Five (Goldberg, 1981). Subsequent research has then established support for the Big Five model across different samples, sources and instruments (Goldberg, 1993; McCrae & Oliver, 1992).

The Big Five is seen as the broadest level of personality differences, which include more distinct and specific personality characteristics (Costa Jr & McCrae, 1995). A look at the definition presented on personality, as with EI, shows overlaps with the definition of ToM. It describes individual differences in the way a person thinks, feels and acts. These three verbs that are used to describe personality appear, in some form, in ToM's definition. ToM relies on the way a person thinks or reasons about mental states. ToM involves identifying feelings and ToM ultimately uses the attribution of mental states to guide actions. It is, therefore, expected that individual personality differences will affect ToM performance, thereby leading to the following hypothesis proposition:

Hypothesis 3*: Personality is significantly associated with social sensitivity.*

To find the impact of these individual differences on ToM, the Big Five personality traits present the best and most comprehensive assessment for potential variations. These traits include extraversion, agreeableness, conscientiousness, neuroticism and openness to experience.

Extraversion describes personality characteristics that relate to high activity, energy, dominance, expressiveness, sociability and positive emotions (Benet-Martinez & John, 1998). This personality type promotes assertiveness and social interaction (DeYoung et al., 2010). It is expected that such an individual will likely be exposed to more social situations leading to more social modelling and experiences. This in turn, is hypothesised to lead to a higher self-efficacy which will improve ToM. It is also suggested that individuals who are more expressive show less interpersonal impairments (Gross & John, 2003). This suggests extraversion may, as a result, lead to a higher ToM. However, contradicting evidence on this matter is presented in literature. For example, it is suggested that those who are not as expressive in their facial features tend to judge other facial emotions more accurately (Buck,

1981; Izard, 1977). Another study showed no relationship between emotion recognition and extraversion (Rubin, Munz & Bommer, 2005). Two studies, using the RMET task, found a significant negative relationship between emotion recognition and extraversion (Ewing et al., 2016; Sun & Lau, 2018). This suggests that increased levels of extraversion may lead to a lower ToM opposing self-efficacy theory. It is, therefore, important to investigate this relationship.

Hypothesis 3_A: There is a significant positive association between extraversion and social sensitivity.

Agreeableness describes a personality that is friendly, cooperative, empathetic and trustworthy (McCrae & Oliver, 1992). This personality type may have a higher ToM, because of its cooperative and empathetic abilities. Theoretically, one has multiple reasons to propose the relationship between agreeableness and ToM (Nettle & Liddle, 2008). Agreeableness measurement items is often concerned with others' mental and emotional states (for example "is considerate and kind to almost everyone"). Agreeableness measures often show a female advantage similar to the one observed in the RMET (Costa Jr, Terracciano & McCrae, 2001; Schmitt et al., 2008). Cooperation, a trait of agreeableness, is positively correlated with ToM (Paal & Bereczkei, 2007). Lastly empathy, as measured by the empathy quotient (Baron-Cohen & Wheelwright, 2004), highly correlates with agreeableness (Nettle, 2007). This empathy quotient in turn is positively associated with the RMET (Lawrence et al., 2004). Based on the above evidence one would expect agreeableness to be positively associated with ToM. This relationship has been found to be true for social-cognitive ToM but not social-perceptual ToM (Ferguson & Austin, 2010; Nettle & Liddle, 2008). Ewing et al. (2016) found a negative non-significant correlation between agreeableness and social-perceptual ToM. These mixed results suggest that further investigation is necessary to clarify the above relationship.

Hypothesis 3_B: There is a significant positive association between agreeableness and social sensitivity.

Conscientiousness describes a personality that is dependable, methodical and task-orientated (Benet-Martinez & John, 1998; John & Srivastava, 1999). Individuals with a conscientiousness personality are also very attentive to detail. Matsumoto et al. (2000) suggests this helps such individuals in their ability to accurately recognise facial expressions. Their study supported this with a positive significant correlation between conscientiousness

and emotion recognition. It would then be expected that a higher score on conscientiousness would lead to a more accurate emotion recognition ability which would lead to a higher ToM. However, later studies did not show support for this positive significant association between conscientiousness and emotion recognition (Hurley, Anker, Frank, Matsumoto & Hwang, 2014; Laura, 2017; Terracciano, Merritt, Zonderman & Evans, 2006). These studies, in contrast, found a non-significant negative correlation. Specific to ToM, Nettle and Liddle (2008) found a non-significant negative association with social-perceptual ToM but a positive non-significant association with social-cognitive ToM. In support of the positive relationship between conscientiousness social-perceptual ToM, Ewing et al. (2016) found a positive correlation at a $p<0.001$ significance level. These mixed results in literature point to a lack of consensus, thus requiring further examination to add to the current body of knowledge.

Hypothesis 3_C: There is a significant positive association between conscientiousness and social sensitivity.

Neuroticism describes a personality that often experiences anxiety, nervous tension and depression (Benet-Martinez & John, 1998). This type of personality suggests higher levels of social anxiety and anti-social behaviour which may lead to lesser ToM. In support of this, Hall, Andrzejewski and Yopchick (2009) performed a study on interpersonal sensitivity, which included tests on perceiving the states of others. In their study they found that interpersonal sensitivity was negatively related to neuroticism, shyness, depression and other negative personality traits, thus suggesting the same negative relationship will be present with ToM, which involves perceiving the states of others. However, a review of related emotion recognition and ToM literature paints a different picture. Studies of emotion recognition report a non-significant relationship with neuroticism (Laura, 2017; Matsumoto et al., 2000; Terracciano et al., 2006). This finding was also observed with the RMET, where a non-significant relationship was present (Ewing et al., 2016; Nettle & Liddle, 2008). To cast even further division, Nettle and Liddle (2008) found a significant positive relationship between neuroticism and social-cognitive ToM. This led them to conclude that higher levels of anxiety might act as a motivator and lead to a higher ToM performance. It is, therefore, important to further understand this relationship and how it will affect ToM performance. Based on Nettle and Liddle's (2008) evidence a positive relationship is posited in the current study.

Hypothesis 3_D: There is a significant positive association between neuroticism and social sensitivity.

Openness to experience describes a personality that craves novelty and independence; this personality trait also shows characteristics of curiosity and imagination (Atkinson et al., 2014). In relation to social sensitivity, one would imagine that such an individual would have higher ToM. This is argued from the view that such individuals expose themselves to more situations that require different social skills. Such individuals are also curious, which may lead them to pay more attention to others to satisfy this curiosity. A review of the literature shows promising evidence for such a relationship. Openness to experience has been found to show a significant positive correlation with emotion recognition in multiple studies (Hurley et al., 2014; Matsumoto et al., 2000; Mill, Allik, Realo & Valk, 2009; Terracciano et al., 2006). In these studies, when considering other personality traits, openness to experience is seen as the most influential. Laura (2017), however, failed to replicate this significance in a study on emotion recognition.

The positive relationship has also had success in ToM research. With a positive relationship evident between openness to experience and the RMET (Ewing et al., 2016). But as with emotion recognition, there are also studies that report non-significant results (Ferguson & Austin, 2010; Nettle & Liddle, 2008). Although a positive relationship between openness to experience and ToM is posited in literature, enough evidence has not been provided, especially in ToM research, to make a more confident assertion that such a relationship indeed exists. Therefore, there is an opportunity to add empirical evidence about this relationship.

Hypothesis 3_E: There is a significant positive association between openness to experience and social sensitivity.

The above shows that personality and ToM are theoretically linked, where each personality trait is expected to have a different impact on ToM performance. However, literature regarding this is scarce and has contradictory findings. Evidence is presented across different inter-connected domains with different measures (for example: emotion recognition, social-perceptual ToM and social-cognitive ToM). This inherently causes fragmented findings where niche gaps need investigation. One such gap is the testing of all five personality traits' relationship with social-perceptual ToM, as measured by the RMET (Ferguson & Austin, 2010). In achieving this, one is also able to consider whether variations observed in the RMET is related to personality types. Another area that could explain social sensitivity variations is individual contextual factors. This is considered next.

2.3.3 Individual Contextual Factors

Literature suggests that the effects of individual differences and family background on ToM have been neglected (Cutting & Dunn, 1999), with this in mind, the current study derived a set of variables that together is referred to as individual contextual factors, thus producing the following hypothesis:

Hypothesis 1*: Individual contextual factors are significantly associated with social sensitivity.*

These individual contextual factors aim to provide the basis for investigation into the individual differences and background influencers suggested to impact ToM performance. This collective set of variables consists of gender, Black ethnicity, White ethnicity, field of study, level of study, financial background, parents' education and home language. Each variable and its reason for inclusion is discussed below.

Differing levels of gender social sensitivity have been observed in literature (see Vellante et al., 2013), with women generally displaying a social sensitivity advantage (see Kirkland et al., 2015). Theory suggests that gender is an individual difference that may impact ToM performance (see section on gender differences in ToM for full review). Therefore, variance in ToM performance is expected to be observed because of gender differences, particularly women showing greater ToM.

Hypothesis 1_A: There is a significant positive association between being a women and social sensitivity.

The variables of Black ethnicity, White ethnicity and home language are used as proxies for cultural differences. Culture is the collective mindset of a human group that distinguishes them from other human groups, each having their own system of values (Hofstede, 1984). Those of Black ethnicity, are seen in this context, as originating from an African culture, whereas those of White ethnicity are viewed as originating from a Western culture (see Agyemang, Bhopal, & Bruijnzeels, 2005). It is acknowledged that assimilation and adoption of cultures may have occurred (for example, those of Black ethnicity practising the values of Western cultures or vice versa). Consideration of home language is also used as an indicator of cultural orientation (Desmet, Ortuño-Ortín, & Wacziarg, 2017; Fearon, 2003). For example, those speaking English at home, are more likely to be engaging and exposed to

Western values, thus stimulating 'cultural programming' towards those values, as this is the originating area of that language. Similarly, languages originating from Africa show an African culture orientation and Asian originating languages an Asian culture orientation.

Consideration of both ethnicity and home language provides a layered approach to culture that can help to clarify the impact of culture on social sensitivity. The consideration of cultural differences by identifying African and Western cultures was derived out of need, as well as observations in literature (see section on culture differences in ToM for full review). African cultures show significantly lower scores in ToM compared to other cultures (Dehning et al., 2012; Loftus & Noordien, 2011). This lower ToM score is also seen when observing Black versus White ethnic groups (Loftus & Noordien, 2011). Culture as measured by White and Black ethnicity and home language is expected to account for variance in ToM performance.

Hypothesis 1_B: There is a significant negative association between Black ethnicity and social sensitivity.
Hypothesis 1_C: There is a significant positive association between White ethnicity and social sensitivity.
Hypothesis 1_I: There is a significant positive association between English home language and social sensitivity.

Two other individual contextual variables to be observed are level of study and field of study. In line, with Baron-Cohen and colleagues' (2002) empathising/systemising cognitive framework for psychological sex differences, Billington, Baron-Cohen and Wheelwright (2007) argue that those who enter fields related to engineering and science are more likely to have a systemising cognitive style irrespective of gender. In contrast, those entering fields related to humanities are more likely to have an empathising cognitive style. These differing cognitive styles inherently show variations in ToM performance. Therefore, it is expected that ToM differences will be observed across the different fields of study. Another relevant observation from literature lies in one's engagement in different literary texts. Adults who read literary fiction tend to show greater ToM ability (Kidd & Castano, 2013). Kidd and Castano (2013) suggest that engaging in works of art may influence ToM. Individuals in the fields of study that frequently engage in arts or English literature may have a higher ToM. It is expected that a certain amount of variance in ToM will be captured by a field of study.

Hypothesis 1_D: There is a significant negative association between a field of study and social sensitivity.

Education level is expected to affect ToM performance (Yıldirim et al., 2011) for several reasons. ToM correlates with intelligence quotient (IQ) (Ahmed & Miller, 2011). An increase in education will likely stimulate a higher IQ, which in turn leads to a higher ToM. A higher level of study may also increase exposure to various literary texts, which may include fiction, which enhances ToM. In support of this, it has been noted that literature has been used in education programs for doctors with the intention of increasing empathy (McLellan & Jones, 1996). In certain fields of study, an increase in education level will increase interaction with others, in the form of projects and job training. For example, degrees in commerce may encourage more social interactions through projects that mirror the team and work environment of the industry. This increase in social interaction will increase social modelling and experience which will likely lead to higher ToM. Thus, it is possible education level is likely to show variance in ToM.

Hypothesis 1_E: There is a significant positive association between level of study and social sensitivity.

The last two variables to be observed are financial background and parent's education. Both are used as measures of socio-economic position (Galobardes, Shaw, Lawlor, Lynch & Smith, 2006). The choice of these two variables is guided by literature. Parental education, largely relating to the mother, has been suggested to affect ToM differences in children (Cutting & Dunn, 1999). With a positive relationship found between the mother's level of education and children's ToM. Based on this, one would expect the parent's education to influence ToM in adulthood as well. Cutting and Dunn (1999) also found that children from deprived backgrounds struggle with their performance on ToM tasks, particularly, children from working-class families perform lower on ToM tasks than children from middle-class families. It is plausible that ToM variance can be captured by the financial background in an adult sample.

In this research, the financial background is measured by considering how students are funding their studies, particularly, identifying those who fund their studies using the National Student Financial Aid Scheme (NSFAS). NSFAS states its vision as "A model public entity that provides financial aid to all eligible public university and Technical and Vocational

Education and Training (TVET) college students from poor and working-class families" (NSFAS, n.d). Using this as a measure enables identifying students from deprived financial backgrounds.

Hypothesis 1_F: There is a significant negative association between an individual's National Student Financial Aid Scheme (NSFAS) status and social sensitivity.
Hypothesis 1_G: There is a significant positive association between mother's level of education and social sensitivity.
Hypothesis 1_H: There is a significant positive association between father's level of education and social sensitivity.

The above describes a set of individual contextual factors that are hypothesised to impact ToM directly and capture unique variance. It is possible that some of these variables will interact with trait EI and personality to both produce or moderate an effect on ToM.

A moderator is a variable that affects the strength or direction of a relationship between a dependent and independent variable (Baron & Kenny, 1986). Moderators address questions related to "when" and "for whom" a certain relationship is applicable (Frazier et al., 2004). Moderators derived from the literature are now presented.

The relationship between trait EI and social sensitivity is hypothesised to be moderated by four variables. The first is age. Qualter et al. (2011) suggest that as a person ages, they develop greater emotional understanding and become more aware of their emotional abilities (trait EI). This increased self-efficacy then affects ToM. Qualter et al. (2011), therefore, propose that the relationship between emotional understanding and ToM changes as a function of age. Thus, it is possible that age moderates the relationship between trait EI in that the strength improves with age. Thus, the following hypothesis is proposed:

Hypothesis 6*: Age moderates the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity gets stronger with age.*

The second predicted moderator is gender. Men tend to overestimate their EI ability (Petrides & Furnham, 2000), therefore, it would appear that the relationship between trait EI and social sensitivity will be stronger for women as they are more accurately reporting their EI.

Hypothesis 7*: Gender moderates the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for women.*

The third moderator for this relationship is culture. This is measured by the proxies: ethnicity and home language. Research suggests that culture is determining how one internalises and externalises emotion (Eid & Diener, 2001; Fernández, Carrera Levillain, Sánchez Fernández, Paez & Candia, 2000; Matsumoto, 1989, 1993; Mesquita & Frijda, 1992). These observations have been noted even when considering ethnicity (Matsumoto, 1993). Both trait EI and ToM have emotional themes. It is unclear to what extent the relationship between trait EI and ToM will be affected for different cultures. Assessing moderation will provide valuable insight and commentary on the cultural debate surrounding emotions and their expression. Therefore, the following hypotheses are proposed:

Hypothesis 5*: Ethnicity moderates the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for different ethnicities.*

Hypothesis 8*: Home language moderates the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for different languages.*

The last moderator variable assessed for the relationship between trait EI and social sensitivity is agreeableness. Agreeableness is often associated with higher levels of empathy both in definition and empirical results (Baron-Cohen & Wheelwright, 2004). Trait EI is also shown to be related to empathy (Austin et al., 2005). Lastly, empathy is also related to higher levels of social sensitivity (Lawrence et al., 2004). It is possible that the relationship between trait EI and social sensitivity will be greater for higher levels of agreeableness as this promotes higher empathy which would increase both one's trait EI and their social sensitivity. Thereby, the following hypothesis is proposed:

Hypothesis 9*: Agreeableness moderates the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for higher levels of agreeableness.*

The potential moderation relationships between personality and social sensitivity and now considered.

The relationship between neuroticism and social sensitivity is hypothesised to be moderated by gender. The same moderation variable is proposed for the relationship between agreeableness and social sensitivity. Women tend to be more neurotic and agreeable (Schmitt

et al., 2008). They are also suggested to be better at mind reading. If a woman is more neurotic or agreeable, one would expect a stronger relationship between neuroticism or agreeableness and social sensitivity. This is the result of their superior ability to employ mind reading skills. Thereby, suggesting the following hypotheses:

Hypothesis 10*: Gender moderates the relationship between agreeableness and social sensitivity such that the relationship between agreeableness and social sensitivity is stronger for women.*

Hypothesis 11*: Gender moderates the relationship between neuroticism and social sensitivity such that the relationship between neuroticism and social sensitivity is stronger for women.*

The relationship between neuroticism and social sensitivity is hypothesised to be moderated by mood. Neuroticism is associated with depression. Major depression is related to ToM deficits (Lee, Harkness, Sabbagh & Jacobson, 2005), alternatively, mild depression enhances ToM (Gleicher & Weary, 1991; Harkness, Sabbagh, Jacobson, Chowdrey & Chen, 2005). Mood may influence or exaggerate the extent to which the neurotic individual feels depressed, which in turn could lead to a ToM deficit or enhancement. Thus, current mood is likely to moderate the relationship between neuroticism and social sensitivity.

Hypothesis 12*: Mood moderates the relationship between neuroticism and social sensitivity such that the relationship between neuroticism and social sensitivity is stronger for lower moods and weaker for extremely low moods.*

Impact for management theory

The above review considered potential determinants of social sensitivity, particularly how theory suggests they can either increase or decrease the performance of an individual on the RMET. This is important to management theory as it demonstrates which individual characteristics are determining performance on the RMET. This has implications for how management approaches social sensitivity training and how it can be used as a tool to potentially manage conflict in diverse groups. Theory suggests characteristics such as EI and personality can influence ToM. In management literature, personality is considered an individual characteristic that adds diversity to teams and groups (McGrath, Berdahl & Arrow, 1995; Mannix & Neale, 2005). EI is also a desirable team skill that can potentially improve team performance (Bell, 2007). High EI is desirable in groups to reduce conflict (Curşeu et al., 2015). This suggests that management needs to understand the relationships between each

of these variables as to create an optimal framework for team performance. For example, management requires individuals of high social sensitivity and EI to manage conflict, but management also requires increased diversity through different personalities and individual backgrouds, so how do these variables interact with each other? This is a important consideration for organisatons to manage team performance in diverse contexts. This study addresses this concern.

The preceding literature reviews highlighted the need for culturally diverse instruments as well as assessment of these instruments within the context of culture. It further highlighted the need to understand what causes variations in social sensitivity. As a result, a model was derived with the aim of testing potential predictors of social sensitivity. The next section derives an experimental model to test social sensitivity's relationship with collective intelligence within the current context, thus a further literature review was undertaken.

2.4 STUDY 3: COLLECTIVE INTELLIGENCE

Studies on the collective intelligence factor have only been done in the United States, United Kingdom, India, Japan, Germany and the Netherlands (Barlow & Dennis, 2016; Bates & Gupta, 2017; Engel et al., 2015; Engel et al., 2014a; Meslec et al., 2016; Woolley et al., 2010). No studies have been performed within an African context. Furthermore, some studies dispute that the collective intelligence actually exists (Barlow & Dennis, 2016; Bates & Gupta, 2017; Credé & Howardson, 2017). Beyond this tension in literature, if the collective intelligence factor does exist, little contribution has been made to understand its determinants. This study looks to fill a contextual gap, contribute to the debate on whether the collective intelligence factor indeed exists, and lastly to explore what determines collective intelligence. Thus, the first hypothesis addresses the need to identify the emergence of the collective intelligence factor in the current context.

Hypothesis 1*: A collective intelligence factor emerges accounting for at least 30% of the variance in task performance.*

An assessment of literature suggests that social sensitivity is the most predictive of collective intelligence (Engel et al., 2014a; Woolley et al., 2010). Social sensitivity helps members of a group with their interpersonal interactions and allows for the effective moderating of an individual's behaviour to produce group harmony and effectiveness based on others' mental

states. This variable is, therefore, seen as the most important variable of consideration in this research and the main hypothesis for this study.

Hypothesis 2*: There is a significant positive association between social sensitivity and collective intelligence.*

A higher percentage of women in a group is seen to predict collective intelligence performance. However, this effect is largely mediated by social sensitivity (Woolley et al., 2010). Women tend to score higher on social sensitivity, which means that they interact effectively to improve group dynamics, therefore including this variable is important.

Hypothesis 5*: There is a significant positive association between percentage of female group members and collective intelligence.*

In the same way that social sensitivity is seen to improve group performance through improved interactions, this research proposes EI as a significant predictor of collective intelligence for similar reasons. High collective EI in groups show more cohesion, less conflict and improved group effectiveness (Curşeu et al., 2015). The relationship between EI and team performance appears consistent throughout literature (Barsade & Gibson, 2007; Feyerherm & Rice, 2002; Jordan, Ashkanasy, Härtel & Hooper, 2002) and it would be assumed, because of this, that EI affects collective intelligence, however, it appears that this relationship has not been directly tested. This study will be the first to attempt such an investigation.

Hypothesis 6*: There is a significant positive association between trait EI and collective intelligence.*

Woolley et al. (2010) argue that average member intelligence and maximum member intelligence are only moderately correlated to collective intelligence. They further claim that other factors such as social sensitivity are stronger predictors. However, Bates and Gupta (2017) argue that most of the variance in the collective intelligence factor is explained by individual intelligence as the strongest predictor of collective intelligence. Individual intelligence is expected to impact group performance as it describes an individual's general proficiency at completing a broad range of tasks. If a person has an above-average intelligence, he or she will be better equipped to contribute information and skills to help the

group complete tasks. To what extent individual intelligences predicts overall group performance is in dispute, thus consideration of both average and maximum intelligence is important to explore this tension.

Hypothesis 3*: There is a significant positive association between average individual intelligence and collective intelligence.*
Hypothesis 4*: There is a significant positive association between maximum individual intelligence and collective intelligence.*

The last variable to be assessed in this study on collective intelligence is personality. It is expected that certain personality traits would play a role in group cohesion and interaction like social sensitivity and EI do. Specifically, agreeableness promotes social actions that are considerate of others. One would expect this to the have positive effect on group cohesion. In support of this idea, Engel et al. (2014a) have found a significant positive relationship between agreeableness and collective intelligence. Other personality traits, such as openness to experience, may prompt greater collaboration which may then improve the groups' collective intelligence. Extraversion on the other hand may induce the opposite effect where members look to dominate the conversation thus reducing collaboration. This is especially relevant as equal conversation distribution was seen as a significant predictor for collective intelligence (Woolley et al., 2010). Individuals who are conscientious are often seen as dependable and task orientated. This would create the assumption that these individuals will foster greater group focus, which could lead to better team performance and a higher collective intelligence. Neurotic individuals may hinder team performance due to social anxiety prohibiting contribution or positive engagement. This would negatively impact team performance and collective intelligence. Given the above, personality is a suitable variable to consider as a determinant of collective intelligence. Tests in literature have shown no significant relationships thus far (Engel et al., 2014a; Woolley et al., 2010), with the exception of agreeableness (Engel et al., 2014a). Thus, the following hypotheses are derived:

Hypothesis 7*: Personality is significantly associated with collective intelligence.*
Hypothesis 7_A: There is a significant negative association between extraversion and collective intelligence.
Hypothesis 7_B: There is a significant positive association between agreeableness and collective intelligence.

Hypothesis 7_C: There is a significant positive association between conscientiousness and collective intelligence.
Hypothesis 7_D: There is a significant negative association between neuroticism and collective intelligence.
Hypothesis 7_E: There is a significant positive association between openness to experience and collective intelligence.

Importance for management theory

Study 3 will help organisations, particularly in the current context, to improve their knowledge about how teams perform and what drives this performance. This study will inform management theory on whether collective intelligence is a measurable construct in an African context, with a relatively diverse sample. Management theory can then begin to apply collective intelligence measures in the same way as individual intelligence measures, thereby opening new avenues on how to improve group and team performance. This study begins this by testing whether social sensitivity, a key variable in both literature and the current research, can potentially improve team performance in the current context. Other areas of interest to the management of teams such as personality, EI and individual intelligence are also tested, thus providing evidence to management theory about the key variables in team and group performance.

The above section presents literature that supports the experimental model of collective intelligence to be tested. The derived determinates are seen in an exploratory light to inform future research particularly with regard to the effect of social sensitivity on collective intelligence. The outcome of this study (Study 3) is seen to further support the importance of the preceding studies performed on social sensitivity (Studies 1 & 2).

2.5 CONCLUSION

The above literature review for each study discussed key concepts and literature relevant in this research and the importance of each to management theory. This was achieved by first reviewing the literature relevant to Study 1 that guided two research questions that related to social sensitivity differences across cultures and gender. Linked to this, Study 2 considered why these differences exist by deriving potential predictors from relevant literature. These variables were identified as emotional intelligence (EI), personality and individual contextual factors. These predictor variables were derived based on theoretical linkages in literature. These links included overlaps relating to definition, instrument, shared predictors, theory and empirical research. Potential moderation and mediation relationships were also derived from literature to further clarify the predictor variables relationships with ToM. For Study 3, collective intelligence literature was reviewed to reinforce social sensitivity's importance in the current context. The literature review also identified further predictors of collective intelligence to test and guide future research. The next section describes how the derived relationships in this chapter are tested. This is done by justifying the paradigm and methodology used and other methodological choices.

CHAPTER 3: METHODOLOGY

3 RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes the research methodology for this research. The paradigm that guides the beliefs of the researcher is presented first. These beliefs guide the appropriate research approach for the research. The chapter then presents research design and strategy by describing the instrument construction procedure. Further considerations in research design and strategy include identifying the population and the sampling strategy for this research. Lastly, the section describes the strategy for data collection, detailing how data is retrieved to support the research aims.

The data analysis strategy is then described and includes the techniques that are used to interpret the data collected for this research. The research piloting processes is then discussed along with reliability and validity. Finally, the chapter discusses upholding of ethical standards as well as the limitations of the research methodology. The chapter is then concluded.

3.2 RESEARCH PARADIGM AND APPROACH

A paradigm reflects a collection of basic beliefs about how a person views the world (Guba & Lincoln, 1994). These beliefs relate to ontology, epistemology, human nature and the methodological approach that a study can adopt (Burrell & Morgan, 2017). Many paradigms and debates surrounding each belief have been proposed in literature (Burrell & Morgan, 2017; Callaghan, 2016b, 2017b; Crotty, 1998; Guba, 1990; Guba & Lincoln, 1994). Although acknowledged, a thorough consideration of each falls out of the scope of this research. Common amongst these perspectives is the extent to which a researcher adopts an objective as opposed to subjective belief system. Simplistically, the two extremes are positivism (objective) and anti-positivism (subjective). This research follows a positivist paradigm.

Ontology

Ontology describes the type of reality being observed (Allison & Pomeroy, 2000). A positivist believes that there is a single tangible reality (Guba & Lincoln, 1994). This reality is external to an individual (Burrell & Morgan, 2017). An individual cannot change this reality regardless their personal beliefs. A researcher in a positivist paradigm believes that no relationship exists between an individual and what one is studying (Siangchokyoo & Sousa-Poza, 2012). Hence, this research treats reality as it is and how it appears.

Epistemology

Epistemology assesses the knowledge of the chosen reality. Epistemology considers whether knowledge is attainable and transferrable in tangible form (Burrell & Morgan, 2017). A positivist believes knowledge is attainable (Guba & Lincoln, 1994). The aims of this research are to attain tangible knowledge, making a positivist view appropriate.

Human nature

Human nature describes the relationship humans have with their environment, particularly, whether they control it or are controlled by it (Burrell & Morgan, 2017). A positivist believes that the environment influences human behaviour. This opposed to non-positivist paradigm where humans influence the environment. This research considers external environmental factors influencing human subjects to produce certain outcomes. This indicates the following of a positivist paradigm.

Methodology

Methodology describes how the inquirer will attain the knowledge he or she seeks (Guba & Lincoln, 1994). This is closely related to the philosophical foundations of the research (Siangchokyoo & Sousa-Poza, 2012). Since the philosophical foundations of this research lie within a positivist paradigm, a quantitative methodology is appropriate and was therefore used. This methodology is suitable because quantitative research primarily relies on a positivist view of creating knowledge (Johnson & Onwuegbuzie, 2004; Onwuegbuzie & Leech, 2005). As the beliefs within the chosen paradigm have been addressed, further justification for the paradigm choice in relation to the methodology is given in the following paragraph.

Paradigm choice

A positivist paradigm places emphasis on verifying hypotheses through observations (Bhattacherjee, 2012). This research aims at verifying hypotheses uncovered in the literature through observations, therefore indicating a positivist choice of paradigm. The aim of Study 2 requires the verification of hypotheses thus making the paradigm choice appropriate. Another indicator of this paradigm's overall appropriateness for this research lies in one of the thesis's aims. This aim relates to the extension of an experiment (Study 3). Such a research design relies mainly on a positivist foundation and guided the above overall paradigm choice.

3.3 RESEARCH DESIGN AND STRATEGY

The first two parts of this research (Studies 1 & 2) follow a field survey research design which uses a paper-based, closed questionnaire and is performed in an external environment which the researcher cannot control. The main strength of this survey type is that when the questionnaire is administered, not all extraneous variables and treatments can be controlled thus allowing for greater external validity (Bhattacherjee, 2012). This increased external validity enhances the ability to generalise the research results to the greater population and similar populations due to the capturing of variables in a real-life setting. This strength, however, also provides a trade-off resulting in lower internal validity. The real-life nature of the design means the survey is subject to extraneous variables and response bias (Bhattacherjee, 2012). This makes it difficult to make inferences about cause and effect between the dependent and independent variables. The relationships may be influenced by external factors thus correlations can be inferred when using a field survey research design. This study aims to make generalisations to the greater population rather than concluding cause and effect about social sensitivity. A field survey research design achieves this, thereby making it an appropriate choice.

The third part of this research (Study 3) follows a quasi-experimental research design. The experiment follows the procedure as outlined by Woolley et al. (2010), with minor adaptions which are outlined and explained in Appendix R. These adaptions were made to accommodate for the lack of clear published tasks and thus further extends literature. The experiment took place in a closed venue. The strength of this setting is its higher internal validity (compared to the questionnaire research design), but its trade-off is low external validity (Bhattacherjee, 2012). This choice of research design is guided by the aim of this research, which is to test for the emergence of the collective intelligence factor and its antecedents in a South African setting. To do this, the research design needs to closely match the one used by Woolley et al. (2010).

3.3.1 Instrument construction

Study 1

Study 1 created and tested new RMET instruments with different cultural stimuli and also tested the original Caucasian RMET in the current context (Baron-Cohen et al., 2001). The two new instruments are an African RMET test containing African stimuli, as well as an 'Other culture' RMET, which contained mixed Asian stimuli.

Based on the testing of all three instruments (African, 'Other culture', Caucasian), a shortened multicultural RMET instrument was derived. The construction of the new RMET instruments closely followed the prescribed method used to create the original Caucasian RMET while maintaining the same stimuli mental state options. Stimuli, although available in colour, were presented to respondents in black and white to keep precedent with literature. The construction method that was used for creating these instruments is as follows:

- Stimuli were identified reflecting the desired mental state.
    - In the current study, the stimuli were sourced from a professional travel photographer's Flickr page[2].
- Stimuli were presented to eight judges: four Female and four Males. If at least five judges picked the desired mental state, and no more than two judges picked the same foil mental state, the stimuli were included in the final instrument. If it did not meet this criterion, the stimuli were tested on another mental state or discarded completely.
- This process was repeated until a 36-item African and 'Other culture' RMET instrument was created that matched the structure of the Caucasian RMET instrument.
- All instruments (including the Caucasian variation) were then tested further on a larger population. This was to ensure that the stimuli reflected the desired mental state when applied to a larger population.
- After testing, only items where the target word was chosen by at least 50% (and no foil word was chosen by more than 25% of the population) were retained as the 'Correct stimuli'.

The result of the above instrument construction methodology was two newly constructed RMET instruments (see Appendix A & B), and three RMET instruments that could be used

[2] Permission was granted by the photographer.

with confidence that the stimuli was reflecting the desired mental state in the current context (see Appendix F & H & J). All these instruments provided a significant contribution to the literature and formed the basis for the subsequent studies in this research.

In the process of testing the instruments on a larger population, seven questions were added that related to demographics and were used to observe individual social sensitivity differences based on demographic factors such as ethnicity, gender and home language.

Using the 'Correct stimuli' as derived from the above, it was possible to create a shortened multicultural instrument. To do this, a new instrument construction method was developed (see Appendix L). This method provided an inclusive yet objective construction of a shortened multicultural instrument. Study 1 created such an instrument, and it was subsequently used as part of Study 2.

Study 2

A questionnaire survey was used in the second part of this research (Study 2), containing questions relating to the dependent and independent variables. The questionnaire format used closed questions, thus minimising the choices for the respondent, making it easier for the respondent to complete (Adams, Khan, Raeside & White, 2007).

The first part of the questionnaire (attached in Appendix M) required the participant to select, from four options, the most appropriate word describing the accompanying picture. This part of the questionnaire consisted of 21 questions and measured the participant's social sensitivity using the newly created shortened multicultural instrument from Study 1. The second part of the questionnaire followed a 7-point Likert scale and consisted of 37 questions relating to trait EI. The third part of the questionnaire followed a 5-point Likert scale and consisted of 44 questions relating to personality. The last part of the questionnaire asked nine questions relating to individual contextual factors. The questions relating to the independent variable and dependent variables were all sourced from past literature. By using the questions from past literature, issues relating to the operationalisation of intangible concepts was minimised (Adams et al., 2007). This helps to increase the study's reliability and validity.

Table 6 shows a breakdown of the questionnaire divided into its relevant variables and literature sources.

Table 6. Breakdown of questionnaire for Study 2

Theory authors	Theory /Literature name	Variable Name	Questions adapted from
Baron-Cohen *et al.* (2001)	Theory of Mind	Social sensitivity	Baron-Cohen et al. (2001), Study 1 (shortened multicultural RMET)
Petrides and Furnham (2006)	Trait EI	Emotional Intelligence	Petrides and Furnham (2006)
John, Donahue, and Kentle (1991)	Personality (BFI)	Personality	John et al. (1991)

Study 3

The third part of this research (Study 3) made use of the instrument from Study 2, to capture the variables social sensitivity, EI, personality and individual contextual factors.

Study 3 then used the Ravens Advanced Progressive Matrices (RAPM) to measure individual intelligence and lastly used multiple tasks from the McGrath Group Task Circumplex (McGrath, 1984) to measure collective intelligence as guided by literature. The RAPM and McGrath Group Task Circumplex (McGrath, 1984) are discussed below.

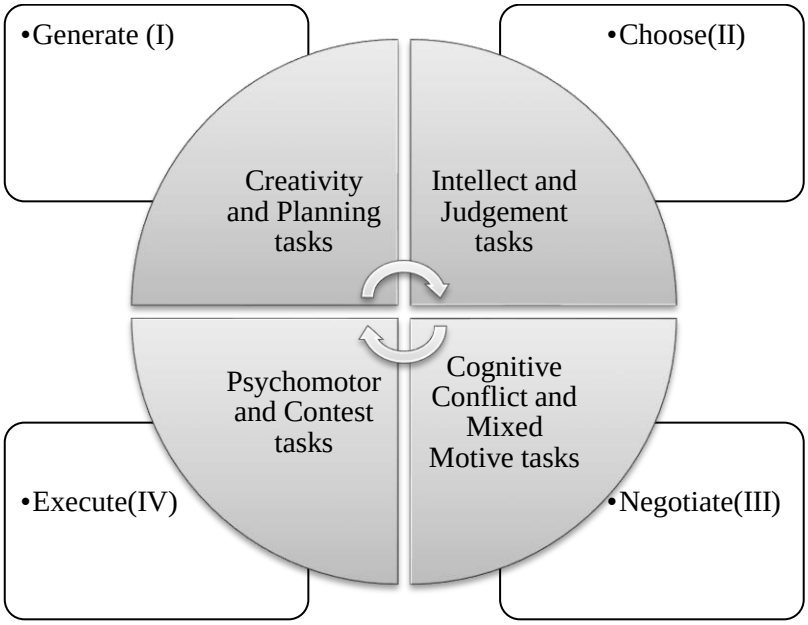
RAPM: This test is used to measure the general intelligence of each member in the group. The instrument has 36 items. Items present a 3x3 grid of shapes with the lower-right corner of the grid empty. The empty square is then filled with a shape (appearing in the other grid areas) that will correspond to only one correct answer. Examples of items appear in Appendix S.

McGrath Group Task Circumplex: This circumplex is a valid categorisation of tasks for groups, requiring certain coordination processes to complete. The four categories are listed below and are displayed in Figure 6:

- Generate tasks – involves the development of new ideas
- Choose task– decide on an issue
- Negotiate task – resolution of conflicts
- Execute task – output is a level of performance

A full outline of the specific tasks to be carried out in each category is presented in Appendix R.

Figure 6. McGrath group task circumplex



Note: Adapted from "Groups: Interaction and performance", by J.E McGrath, 1984, p. 61, Eaglewood Cliffs, NJ: Prentice-Hall. Copyright 1984 by Prentice-Hall

In addition to the above tasks, a more complex criterion task was tested at the end of each group session. Such a task served as another measure to judge the group's intelligence.

The above sections describe the instruments and how they were constructed for each study to meet the aims of this research.

3.3.2 Population

The population describes the entire (collective) unit of analysis that has the characteristics that a researcher wants to study (Bhattacherjee, 2012). In this research, the population describes all the individuals who are registered students of the University of the Witwatersrand. In this research, the population choice allows the creation of the social sensitivity instruments (Study 1), testing of potential hypotheses (Study 2) or the potential for a collective intelligence factor to emerge (Study 3).

This population allows the researcher to infer certain relationship across the studies. These relationships can then be generalised to populations that share similar characteristics to those of University of the Witwatersrand students. These could include other university students

and, to a lesser extent, the general young adult population. Therefore, there is a knowledge contribution on the potential important relationships between the tested variables.

3.3.3 Sample and sampling method

Sampling describes the process of selecting individuals that reflect the characteristics of the desired population (Adams et al., 2007). Individuals sampled were 18 years and older because there are ethical implications for surveying respondents under the age of 18 (with regards to obtaining consent). The individuals in the sample were required to be registered University of the Witwatersrand students. These individuals were selected by means of a sampling frame.

A sampling frame is a population list from which a sample can be drawn (Greener, 2008). This research generated an author-devised sampling frame to compensate for the inaccessibility of a readily available one. This inaccessibility is attributed to privacy prohibiting the attainment of a list of students. The sampling frame in this research consisted of a set of course codes (sourced from the University of the Witwatersrand). The course codes depicted classes from which the researcher could potentially access part of the population. This sampling frame still allowed for the application of random sampling, which helped reduce the convenience of the sample. Once a sampling frame was generated the desired sampling method was applied to select the sample.

The sampling method applied for all three studies was simple random sampling with replacement. Simple random sampling allows for an equal chance of inclusion in the sample (Kothari, 2004). This was achieved through the random selection of course codes from the sampling frame. The researcher then coordinated with the relevant lecturer of that course to access the students who then represented a sample of the overall population. If permission to survey the selected class was not granted, another course code was randomly selected as a replacement. The choice of simple random sampling also helps to mitigate the appearance of extraneous and confounding variables by reducing the researcher's influence in collecting the data (Bhattacherjee, 2012). This method helps mitigate bias, but does not eliminate it.

The sampling method was the same across all three studies, with the exception that invitations, rather than questionnaires, were handed out to attend the experiment for Study 3. The sampling method was run until the desired sample sizes were met as guided by literature. Sample size in relation to each study is now considered.

Study 1

Study 1 aimed to create two new RMET instruments with new cultural stimuli. Thereafter, it aimed to test these alongside the original RMET (Baron-Cohen et al., 2001). Table 7 gives an indication of the sample size of similar studies:

Table 7. Study 1 sample sizes in literature

Study authors	Study Description	Study sample (normal/student population)
Baron-Cohen et al. (1997)	Testing of the RMET instrument	N=50
Baron-Cohen et al. (2001)	Testing of the revised RMET	N=225
Adams Jr et al. (2010)	Testing of the revised RMET and Japanese version	N=34

In the current study a final sample of n=459 was collected for the African instrument, n= 404 for the 'Other culture' instrument and n= 443 for the Caucasian instrument. Based on similar studies in literature, the current samples are taken to be adequate to achieve the aims of Study 1.

Study 2

Study 2 aimed to test hypotheses to determine potential determinants of social sensitivity. Table 8 gives an indication of the sample size of similar studies:

Table 8. Study 2 sample sizes in literature

Study authors	Study Description	Study sample (normal/student population)
Nettle and Liddle (2008)	Testing of agreeableness as a determinant of RMET.	N=96
Ferguson and Austin (2010)	Testing of associations between emotional intelligence and ToM.	N=162
Ewing et al. (2016)	Testing of the relationship between spitefulness and other personality traits with ToM.	N=450

In the current study, a final sample of n=427 respondents were collected. Based on similar studies in literature, the current sample is taken to be adequate to achieve the aims of Study 2.

Study 3

Study 3 aimed to test for the emergence of the collective intelligence factor and its potential predictors. Table 9 gives an indication of the sample size of similar studies:

Table 9. Study 3 sample sizes in literature

Study authors	Study Description	Study sample (groups)
Woolley et al. (2010)	Testing for the emergence of a collective intelligence factor and its predictors (seminal work).	N=40 (Study 1) N=152 (Study 2)
Engel et al. (2015)	Testing for the emergence of the collective intelligence factor in different contexts.	N=68 (United States of America) N=116 (Germany) N=25 (Japan)
Meslec et al. (2016)	Testing for a collective intelligence factor and its relationship with social sensitivity.	N=30

In the current study a final sample of n=13 groups were tested. Based on similar studies in literature, the current sample is low. However, this is a post-hoc investigation that aims to inform on the previous two studies and provide justification for further research in the current context. Therefore, it is argued that the sample size of the current study is adequate for its intended purpose.

In addition to literature guiding sample collection, a recommended sample size was calculated to guide what sample would ensure the ability to generalise to the greater population. This was calculated at http://www.raosoft.com/samplesize.html with a 5% margin of error, 95% confidence interval and 50% response distribution on a population of 30 000. The recommended minimum sample size based on the preceding inputs is 380 respondents.

With the preceding guidance from both literature and a statistical guide, all three studies are taken to show adequate sample sizes to meet the research aims.

3.3.4 Data collection method

Data collection for Studies 1 & 2 was done face-to-face by administering a paper-based survey at the lecture venue of the randomly selected course. Face-to-face surveys tend to have higher response rates because there is human contact involved during the process (Gideon, 2012). Collecting data through a questionnaire also has benefits because of its low cost and greater collection control (Wilkinson & Birmingham, 2003). There are, however, certain biases such as non-response, social desirability and recall when using questionnaires to collect data (Bhattacherjee, 2012).

Study 3 (experiment) invited participants through letters requesting participation. These letters were distributed in person. The potential participants were also advised about a lucky draw, where a single participant would win R500 after the research was completed. This was done with the aim of stimulating interest in participation. Woolley et al. (2010) also used monetary reward as stimulant in their collective intelligence experiment. If a potential participant showed interest, they then provided their details via a 'sign up' form, and details of the experiment (such as venue and time) were communicated to them via email. Participants confirmed their availability via email or telephonically.

On the day of the experiment, participants were randomly assigned a number and asked to complete the individual tasks first. Once this was completed, students were allocated randomly to groups of varying sizes based on their randomly assigned number. This took place at a venue that was determined through negotiation with the university. Once a group was formed, a research assistant introduced the group to a series of tasks and provided facilitation and recorded results. Once the tasks were completed, participants were thanked, offered refreshments and then dismissed.

The researcher sourced help from only one research assistant at any given time during the data collection process. The researcher was continually present during data collection to help and supervise the research assistant.

3.4 DATA ANALYSIS STRATEGY

A Statistical Package for Social Sciences (SPSS-Version 22) was used to analyse the data. SPSS is a more flexible and user-friendly data analysis package than Excel (Adams et al., 2007) and is, therefore, a good choice for analysing data. The data was aggregated and summarised using descriptive and univariate statistics across all studies.

Study 1

Study 1 made use of analysis of variance (ANOVA) techniques to analyse the data. This technique indicates whether there are significant differences between means. One-way ANOVA compares means of only one classification (for example, gender) of a participant, whereas two-way ANOVA compares means of two classifications (for example, gender and culture) of a participant (Patten & Newhart, 2018). Two-way ANOVA tests whether the two classifications interact to produce an effect on the dependent variable. Both types of ANOVA analysis were used in Study 1.

Studies 2 & 3

Factor analysis followed by correlation and multiple regression analysis techniques were applied in Studies 2 & 3. Factor analysis is used to reduce the number of observed measures to a smaller number of unobserved variables (Bhattacherjee, 2012). This technique allows for grouping of original variables, based on their correlation, into factors (Kothari, 2004). These factors are used to test the hypotheses. This form of analysis played a crucial role in Study 3 in determining whether a collective intelligence factor emerges.

Once factors were identified, hypotheses testing was done by assessing the relationships between variables. This was done using both Pearson's correlation coefficient and multiple regression tests. Pearson's correlation coefficient measures the extent of the direct bivariate association between the variables in the studies (Adams et al., 2007). Multiple regression analysis is adopted when there are multiple independent variables predicting one dependent variable (Kothari, 2004). When this analysis is carried out, certain predictions can be made about the dependent variable based on the covariance of the independent variables (Kothari, 2004). These predictions relate to the relationship between the variables (Adams et al., 2007). As to the significance of these relationships, a significance level of 5% was used (α=0.05). It is at this point that the probability of rejecting a true null hypothesis (Type 1 Error) is considered the same as rejecting a false hypothesis (Type 2 Error) (Edwards, 1984). This significance level was also used when assessing the Pearson's correlation coefficient. In addition, assumptions of multiple regression were evaluated to ensure the correctness of results. These include assumptions of reliability of measurement, linear relationships, homoscedasticity and normality of residual distribution (Osborne & Waters, 2002). Results of these tests appear in Appendix AA & AB.

Lastly, moderation and mediation were tested using PROCESS (Hayes, 2012) in Study 2 only. PROCESS is a freely available computational tool for SPSS and SAS that contains a variety of analytical tools to test mediation and moderation.

3.5 PILOT TESTING

During the pilot testing of the instrument, issues regarding layout, question ambiguity and completion time are addressed (Wilkinson & Birmingham, 2003). A pilot test is carried out on a subset of the target population (Bhattacherjee, 2012).

Study 1

Study 1 piloting took place concurrently when testing stimuli with the eight judges. Many iterations of this type of testing was completed (13) to construct the final RMET instruments, thus allowing for ample feedback regarding questionnaire related issues. Altogether, 104 judges contributed to assessing stimuli and piloting the questionnaire.

Students were approached in different computer labs across the University of the Witwatersrand main campus. Pilot tests are often convenient in order to save the researcher time (Greener, 2008). In this case, computer labs were the most effective and convenient environment to stimulate participation in the pilot study.

Study 2

Study 2 underwent three separate pilots. The first consisted of a sample of 61 students. The second consisted of a sample 41 students. The third consisted of a sample of 17 students. These samples were randomly selected using the main study's sampling strategy. In addition to identifying questionnaire layout issues, these pilots helped identify potential reliability and validity issues. These issues are discussed in the validity and reliability section.

Study 3

Study 3, due to its resource intensive and time-consuming nature, did not undergo piloting. The researcher instead attempted each experimental task individually and adapted it accordingly. Focusing particularly on producing clear instruction material (Appendix U). It is acknowledged that this may present a weakness in this study. However, Study 3 serves to inform and enforce previous work rather than act as the core contribution to this research. Study 3 is, therefore, argued as a post-hoc investigation.

3.6 VALIDITY AND RELIABILITY

3.6.1 Reliability

Reliability is essentially the consistency of the instrument results (Adams et al., 2007; Bhattacherjee, 2012; Greener, 2008; Kothari, 2004). Reliability is an important aspect of the instruments and is improved by training data collectors to carry out collection or facilitation in a consistent manner, so it is replicable. Across all studies, data collectors were provided with guidelines on how to invite participation from potential respondents (Kothari, 2004). With regards to Study 3, a similar guideline was provided for the facilitation of the experiment. Relevant reliability statistics are now presented.

3.6.1.1 The Trait Emotional Intelligence Measure

The Trait Emotional Intelligence Questionnaire - Short Form (TEIQue-SF) instrument was used to measure trait EI in Studies 2 & 3. This measure consists of 30 items derived from the full form Trait Emotional Intelligence Questionnaire (TEIQue) which covers fifteen distinct facets represented by four main factors. These factors are well-being, emotionality, sociability and self-control. Responses range from 1 (‘‘Completely disagree’’) to 7 (‘‘Completely agree”) on a Likert scale. TEIQue-SF has been validated extensively and across different languages (Petrides, 2009). Under the guidance of the piloting process six new items were added and one item was repeated towards the end to improve the reliability at factor level. The repeated item with the lowest inter-construct item correlation, which was trait EI15 (in both Studies 2 & 3), was then removed during analysis. The final TEIQue-SF used in questionnaire is shown in Appendix O.

Cronbach’s alpha tests were then used to measure the internal consistency and reliability. In addition, a factor analysis was performed for Study 2 to understand the factor structure of the measure, this is included in Appendix AA.

Reliability of TEIQue-SF

Table 10 presents the results of the Cronbach's alpha tests for Studies 2 and 3. This is followed by support from literature indicating that these values fall within an acceptable range and showed the desired reliability.

Table 10. Trait EI Cronbach's alpha for Studies 2 and 3

Variable	Study 2	Study 3
Trait EI	0.855	0.927
Well-being	0.712	0.771
Self-control	0.628	0.782
Emotionality	0.554	0.752
Sociability	0.683	0.841

The trait EI Cronbach's alphas for both studies are in agreement with current literature on TEIQue-SF, which reports a Cronbach alpha's around 0.88 (Abe et al., 2013; Biggart, Corr, O'Brien & Cooper, 2010; Heffernan, Quinn Griffin, McNulty & Fitzpatrick, 2010; Jacobs, Sim & Zimmermann, 2015; Petrides et al., 2006; Sanchez-Ruiz, Mavroveli & Poullis, 2013; Stamatopoulou, Galanis & Prezerakos, 2016).

At factor level, Petrides (2009) states that TEIQue-SF factors have lower internal consistencies tending to a value of 0.69. Literature has also shown that the Cronbach's alphas for the factors range between 0.5 and 0.8 in previous studies (Abe et al., 2013; Biggart et al., 2010; Jacobs et al., 2015; Stamatopoulou et al., 2016). Thus, the scores obtained in this research fall within a satisfactory range according to TEIQue-SF literature.

3.6.1.2 The Personality Measure

The BFI instrument was used to measure personality. This measure consisted of 44 items measuring the five personality dimensions. These dimensions are extraversion, agreeableness, conscientiousness, neuroticism and openness to experience. Responses range from 1 ("Disagree Strongly") to 5 ("Agree Strongly") on a Likert scale. The final BFI instrument used is shown in Appendix O. Cronbach's alpha tests were then used to measure the internal consistency and reliability. In Study 2, item BFI 35 and BFI 41 were subsequently deleted as they showed poor internal consistency and a substantially higher reliability could be achieved if they were removed. In Study 3, only item BFI 41 was deleted. In addition, a factor analysis was performed for Study 2 to understand the factor structure and thus the validity of the measure, this is included in Appendix AA. After factor analysis, a further three items (BFI2,

BFI12, BF16) were dropped due to validity issues in Study 2. The sample for Study 3 was too small to perform a reliable factor analysis, thus only internal consistency was assessed.

Reliability of BFI

Table 10 presents the results of the Cronbach's alpha tests for Studies 2 and 3. Literature is then cited supporting that these values fall within an acceptable range and showed the desired reliability.

Table 11. BFI Cronbach's alpha for Studies 2 and 3

Variable	Study 2	Study 3
BFI	0.74	0.71
Extraversion	0.776	0.783
Agreeableness	0.671	0.574
Conscientiousness	0.787	0.687
Neuroticism	0.765	0.820
Openness to experience	0.690	0.703

Overall BFI reliability for both studies is aligned with current literature on BFI which reports a Cronbach's alpha ranging between 0.75 and 0.9 (John & Srivastava, 1999; Ruch & Heintz, 2014). These studies mean Cronbach alpha is also comparable to Schmitt and colleagues' (2007) mean alpha of 0.71 for their South African sample.

At factor level, the lower alphas for openness and agreeableness are to be expected as these two dimensions generally reflect lower reliabilities (John & Srivastava, 1999). Contextually, all the dimensions' reliabilities decrease when the instrument is administered in Africa (Schmitt, Allik, McCrae & Benet-Martínez, 2007). Thus, the scores obtained fall in a satisfactory range according to BFI literature. Validity is considered next.

3.6.2 Validity

Validity is essentially the accuracy of the instrument results (Adams et al., 2007). There are many forms of validity such as internal and external validity, which have been discussed before (see research design). Others such as content, face, discriminant and convergent validity will be discussed now.

Content validity describes to what degree the measuring instrument relates to the topic being studied (Bhattacherjee, 2012; Kothari, 2004). Face validity describes the initial assessment of whether an instrument item measures its construct by simple observation (Bhattacherjee, 2012). These two forms of validity were assessed and improved in the piloting process.

Discriminant validity is when an item does not measure other constructs as intended and convergent validity is when it measures its intended construct (Hubley, 2014). These two forms of validity were assessed by using factor analysis on the collected data. This was done in the piloting tests for Study 2 and on the final data (see Appendix AA).

Another key aspect of this research is that all the questionnaire items are taken from past literature where thorough testing on both reliability and validity have been done. With the above-mentioned reliability and validity testing further carried out by the researcher for this individual research, the reliability and validity for this study is seen as adequate.

3.7 ETHICAL CONSIDERATIONS

Ethical clearance was granted for this research by the non-medical ethics committee at the University of the Witwatersrand. The ethical clearance certificate is attached in Appendix Y. The committee's role is to monitor university research in humanities and social sciences from an ethical perspective by considering both risks and benefits that may occur to potential respondents (University of the Witwatersrand, 2017). The committee considers all aspects that may affect the informant, and these include: consent without coercion, confidentiality, privacy, providing of research information and the posing of inappropriate questions (University of the Witwatersrand, 2017). Thus, this research sought to meet all ethical standards and ensures that all relevant aspects of ethical conduct were adhered to. This was done by alerting potential participants that their involvement is voluntary, and no harm would come to them whether they participated or not. Participants' identities remain anonymous and in no way will a respondent be able to be tracked based on a response. All relevant aspects of the study such as its stakeholders and purpose were disclosed to the participants so that informed and independent decisions with regard to their participation were made. This was achieved using participation information sheets included in Appendix X. Finally, all aspects of analysis and reporting are disclosed, whether they were positive or negative. New findings are not reported as deliberate, but rather a product of analysis and post-hoc investigation. No adjustments were made to hypotheses to prove them after data analysis.

3.8 METHODOLOGICAL LIMITATIONS

Common limitations

This research's methodology is limited in terms of its representativeness. It is only representative of University of the Witwatersrand student population. The data collection method required physical attendance of students to lectures of randomly selected courses. This may skew the representativeness of the sample to students who consistently attend lectures as opposed to students who rarely attend lectures.

Study 1

Stimuli used for the new cultural instruments was limited to that of a single professional photographers Flickr account. This may have limited the stimuli to certain style of photography, lighting, editing and perspective. The volume of suitable stimuli was also limited to those accessible through the Flickr account. Respondents were also constrained to selecting one of four mental state options per stimuli, so no further feedback could be given as to how the photograph was interpreted by the respondent. The 'Other culture' instrument grouped multiple Asian cultures together, even though they don't share similar cultural practices. Instrument construction did not consider the race/ethnicity of judges. At this stage the main aim was get a battery of possible mental states to test further on larger sample, as such the ethnicity/race of judges was not seen to be high importance. However, many iterations of judges were used. The process therefore lent itself to adequate cultural representation.

Study 2

A key limitation of this study relates to the research instrument used. A closed questionnaire requires respondents to answer only the questions being presented to them. This diminishes the opportunity for valuable feedback and certain relationships may have been overlooked.

The field survey (real-life setting) research design means that certain extraneous variables and biases may have influenced statistical testing thus limiting insights to correlations rather than causal links.

Study 2 made use of the TEIQue-SF. This instrument is a short form measure of trait EI. This shortened measure has fewer items than the full measure which means it has limitations in its reliability and validity at facet level. This is particularly evident for its facets which, as

expected, showed relatively lower scores than the full measure (Petrides, 2009). Study 2, is therefore, limited in its measurement of trait EI facets, which may have been important to the dependent variable, social sensitivity.

Study 3

Study 3 was limited by its sample size. The post-hoc nature of the study means a smaller sample size was pursued. This limits the statistical power of the results and the inferences that can be made about potential relationships.

The lack of published instrument resources meant the researcher had to create or adapt experimental measures. A lack of a substantial pilot testing of these instruments also proves a limitation to this study. As a result, this may have introduced bias or operational weaknesses into the instruments.

Study 3 has further representativity limitations as a certain type of respondent may have been attracted to participate due to factors such as the human interaction, time and the monetary lucky draw involved in the study.

3.9 CONCLUSION

This chapter provided a description of the research methodology used in this research. It described the paradigm and approach that was adopted for the research. A positivist paradigm, with a quantitative methodology, was selected as appropriate based on the research aims. The chapter then detailed the research design and strategy. In this section, instrument construction procedure for each study was explained, followed by discussions about the population and appropriate sampling method and size for the research. The data analysis techniques used were then explained followed by the piloting process for each study. The piloting process then guided the discussion on the reliability and validity of the instruments and data. Finally, the ethics and research methodology limitations were considered to conclude the chapter.

CHAPTER 4: RESULTS AND DATA ANALYSIS - STUDY 1

4 STUDY 1 RESEARCH FINDINGS

4.1 INTRODUCTION

This chapter reports the results of the data collection and analysis phase of Study 1. This is achieved by first discussing how the surveys were designed, distributed and collected. Descriptive statistics are then provided for each survey. Each instrument that was used is considered individually. Each instrument's psychometric properties are evaluated to decide which items should remain. Thereafter, social sensitivity scores were calculated, and their distribution was considered for normality. Finally, gender and cultural differences were compared and analysed.

4.2 EYE TEST DEVELOPMENT

A series of photos from a professional photographer's Flickr page[3] were sourced to create the desired instruments. Permission was granted for the use of the photos towards creating a multicultural instrument. A popular Microsoft program called Snipping Tool was then used to create images only reflecting the person's eye-regions. The researcher then allocated the pictures to what he thought depicted the 36 targeted emotions as per Baron-Cohen and colleagues' (2001) original social sensitivity instrument. The instruments were then tested following the same procedure set out by Baron-Cohen et al. (2001). This procedure is detailed next.

The researcher piloted the items on groups of eight judges (four Male and four Female). The criterion required that at least five of the eight judges must agree that the item depicted the targeted emotion and no more than two judges picked a single foil. If an item failed to meet this criterion it was replaced and repiloted with successive groups of judges until the criterion was met. This is the same instrument construction method used to create the original Caucasian instrument by Baron-Cohen et al. (2001). This was done until a 36-item (with identical target words and foils to the original) African and 'Other culture' questionnaire was created and passed the aforementioned criterion. The title of the questionnaire refers to the race of photographed individuals in the instrument. These questionnaires, along with Baron-Cohen's et al. (2001) original, was then tested against a large sample.

[3] Eric Lafforgue: https://www.flickr.com/photos/41622708@N00/

4.3 SURVEY DISTRIBUTION AND COLLECTION

Data was collected over four months at lecture venues for courses chosen at random from a sampling frame of 3 514 courses. Certain courses were not accessible due to various reasons, these included: course being discontinued or inactive, permission not being granted to attend the venue by lecturers and course being field-based (no lectures). If a course was inaccessible, a new course was randomly selected.

At the lecture venues, the researcher invited all attending students to participate in the study. The researcher did this by verbally explaining the participant information sheet and instructions of the questionnaire, taking care to keep the exact wording in the instructions. One of either the African, 'Other culture' or Caucasian questionnaires was then distributed to the class, in some cases with help from a research assistant. Students then filled in the questionnaire and returned it to the researcher.

Upon completion of the four months of collecting data, 1 306 responses were gathered in total, of those, 459 participants completed the African instrument, 404 participants completed the 'Other culture' instrument and 443 participants completed the Caucasian instrument.

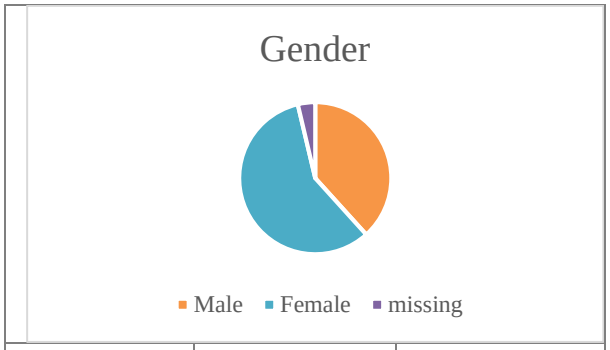
4.4 DATA SCREENING, MISSING VALUES AND OUTLIERS

A fair amount of responses to the questionnaires did contain missing values and, in some cases, double answers. These, however, could not be treated as random occurrences. Respondents may have believed the answer options given, did not reflect the emotion they saw, or they believed more than one option was applicable. Another reason respondents may have left out answers could be because of a deeper underlying social issue related to race, emotions or culture. It can be argued that these missing values and double answers constitute an answer, where none of the stated emotions reflect the stimuli shown. If treated in this manner, missing and double values contribute to determining whether that item is reflecting the desired emotion for that stimuli. Questionnaires with missing and double values are therefore included to avoid removing cases that are valuable to the study. Missing or double values are therefore treated as foils to the target emotion.

4.5 RESPONDENT PROFILE AND DEMOGRAPHICS

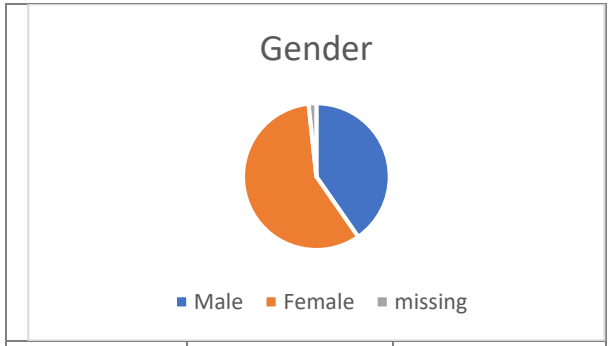
Table 12. Study 1: Gender profile

African questionnaire



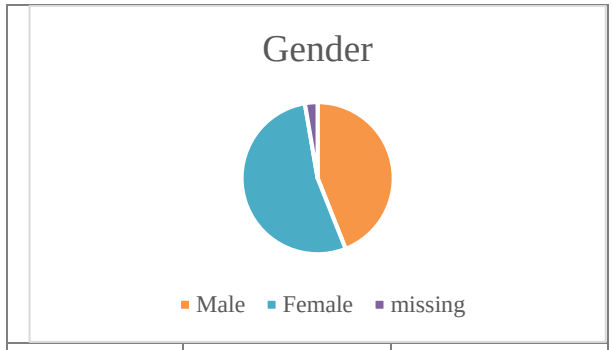
	Frequency	Percentage
Male	176	38.3
Female	266	58.0
missing	17	3.7
Total	459	100.0

Other Culture questionnaire



	Frequency	Percentage
Male	163	40.3
Female	234	57.9
missing	7	1.7
Total	404	100.0

Caucasian questionnaire

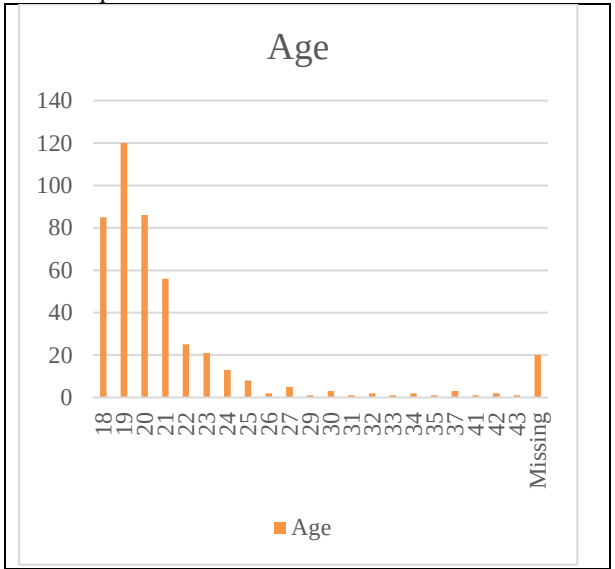


	Frequency	Percentage
Male	195	44.0
Female	236	53.3
missing	12	2.7
Total	443	100.0

Table 12 shows the gender composition of the respondents for each questionnaire. The gender composition for each questionnaire matches closely with the overall population composition, which is stated as 54.74% Female and 45.25% Male students at University of the Witwatersrand (University of the Witwatersrand, 2016). The above implies the study has a good representation of each gender mirroring the population statistics.

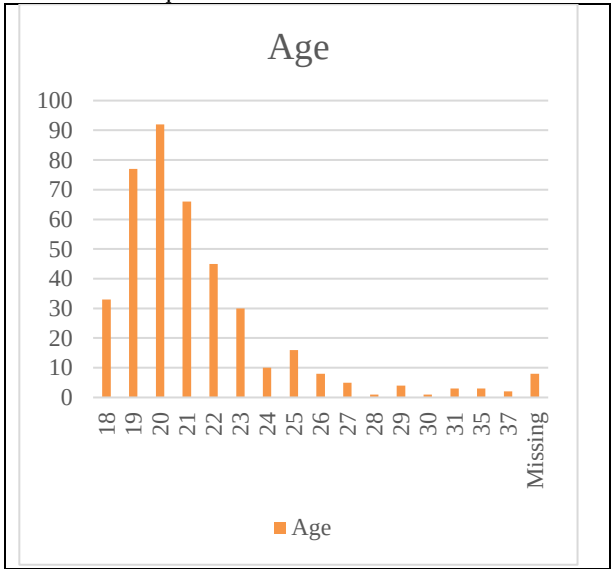
Table 13. Study 1: Age profile

African questionnaire



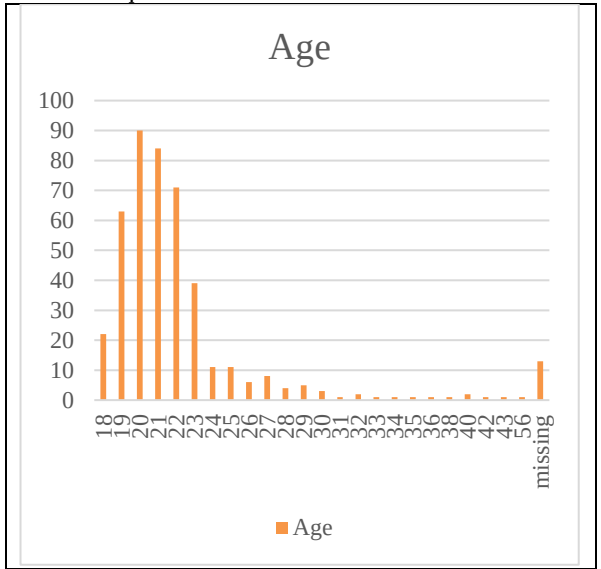
	Frequency	Percentage
18	85	18.5
19	120	26.1
20	86	18.7
21	56	12.2
22	25	5.4
23	21	4.6
24	13	2.8
25	8	1.7
26	2	0.4
27	5	1.1
29	1	0.2
30	3	0.7
31	1	0.2
32	2	0.4

Other Culture questionnaire



	Frequency	Percentage
18	33	8.2
19	77	19.1
20	92	22.8
21	66	16.3
22	45	11.1
23	30	7.4
24	10	2.5
25	16	4.0
26	8	2.0
27	5	1.2
28	1	0.2
29	4	1.0
30	1	0.2
31	3	0.7

Caucasian questionnaire



	Frequency	Percentage
18	22	5.0
19	63	14.2
20	90	20.3
21	84	19.0
22	71	16.0
23	39	8.8
24	11	2.5
25	11	2.5
26	6	1.4
27	8	1.8
28	4	0.9
29	5	1.1
30	3	0.7
31	1	0.2

33	1	0.2
34	2	0.4
35	1	0.2
37	3	0.7
41	1	0.2
42	2	0.4
43	1	0.2
Missing	20	4.4
Total	459	100.0

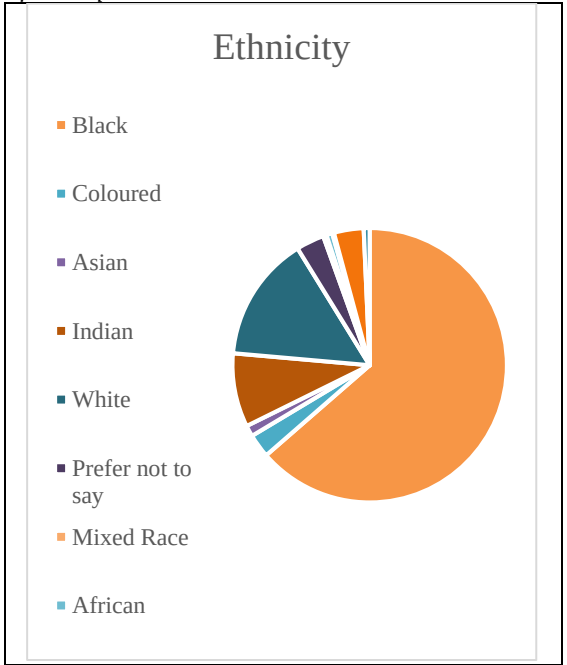
35	3	0.7
37	2	0.5
Missing	8	2.0
Total	404	100.0

32	2	0.5
33	1	0.2
34	1	0.2
35	1	0.2
36	1	0.2
38	1	0.2
40	2	0.5
42	1	0.2
43	1	0.2
56	1	0.2
Missing	13	2.9
Total	443	100.0

Table 13 presents the age composition of the respondents for each questionnaire. As expected, around 85% of the respondents were between the age of 18 and 24 years old across the three questionnaires. Similarly, 66.81% of the overall population falls within this range (University of the Witwatersrand, 2016). This implies that the study provides good representativity of a young student adult population between the ages 18-24 years old.

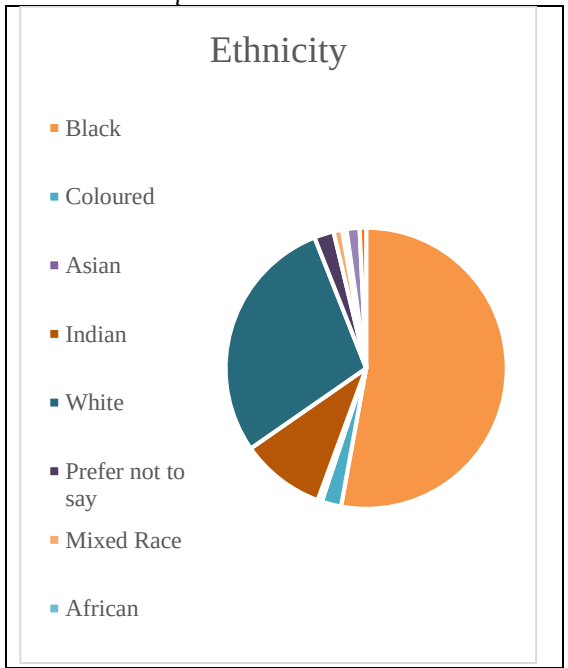
Table 14. Study 1: Ethnicity profile

African questionnaire



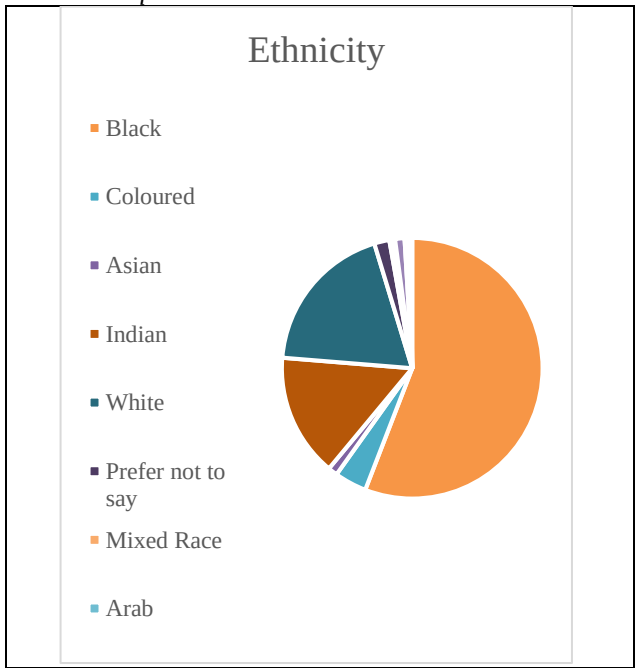
	Frequency	Percentage
Black	292	63.6
Coloured	13	2.8
Asian	6	1.3
Indian	40	8.7
White	68	14.8
Prefer not to say	15	3.3
Mixed Race	2	0.4
African	3	0.7
Human	1	0.2

Other Culture questionnaire



	Frequency	Percentage
Black	212	52.5
Coloured	9	2.2
Asian	2	0.5
Indian	39	9.7
White	115	28.5
Prefer not to say	9	2.2
Mixed Race	4	1.0
African	2	0.5

Caucasian questionnaire



	Frequency	Percentage
Black	238	53.7
Coloured	17	3.8
Asian	5	1.1
Indian	65	14.7
White	81	18.3
Prefer not to say	8	1.8
Mixed Race	2	0.5
Arab	1	0.2
African	5	1.1

missing	16	3.5
double	3	0.7
Total	459	100.0

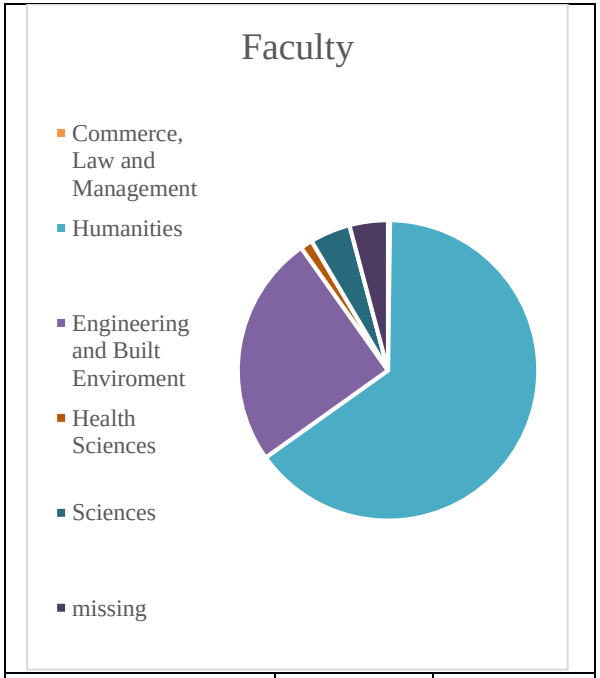
Human	1	0.2
Black Brutism	1	0.2
Dark Brown	1	0.2
missing	6	1.5
double	3	0.7
Total	404	100.0

Human	1	0.2
There was no black face	1	0.2
Unicorn	1	0.2
Indo-Algerian	1	0.2
Bengali	1	0.2
missing	12	2.7
double	4	0.9
Total	443	100.0

Table 14 shows the ethnic data of the respondents for each questionnaire. This reflects the composition of the overall population where 62.76% of the population enrolled is Black, followed by 19.88% White and then Indian (12,73%) and Coloured (4.11%) as the next most popular ethnicities (University of the Witwatersrand, 2016). This implies the questionnaires sample adequately represents the student population. It is also worth noting, due to the nature of the study, that certain respondents did not want to be associated with colour and therefore made use of the 'other' category to express this. This is shown by a series of 'actual responses' shown in Table 14 such as 'Human', 'Dark Brown' and 'African'. This sensitivity to race highlights from an ethical point of view, a need for a more inclusive questionnaire. The ethnicity question was the in the last section of the questionnaire, thus mitigating concerns that previous questions would have been influenced by these responses. This demonstrates that these responses point to a reactive action based on the sensitivity of the previous questions.

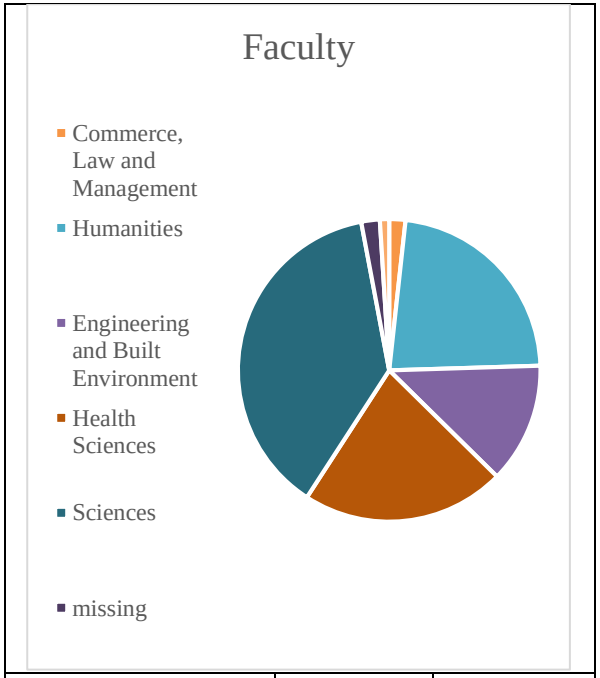
Table 15. Study 1: Faculty profile

African questionnaire



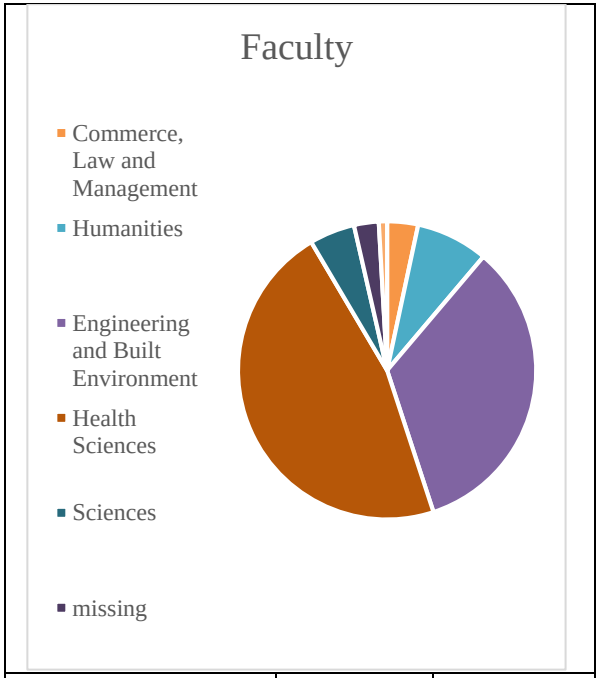
	Frequency	Percentage
Commerce, Law and Management	1	.2
Humanities	298	64.9
Engineering and Built Environment	115	25.1
Health Sciences	6	1.3
Sciences	20	4.4
missing	19	4.1
Total	459	100.0

Other Culture questionnaire



	Frequency	Percentage
Commerce, Law and Management	7	1.7
Humanities	92	22.8
Engineering and Built Environment	52	12.9
Health Sciences	88	21.8
Sciences	153	37.9
missing	8	2.0
double	4	1.0
Total	404	100.0

Caucasian questionnaire

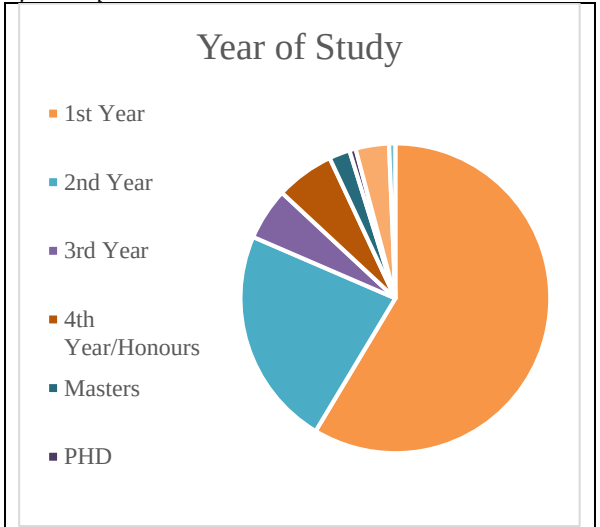


	Frequency	Percentage
Commerce, Law and Management	15	3.4
Humanities	35	7.9
Engineering and Built Environment	151	34.1
Health Sciences	208	47.0
Sciences	22	5.0
missing	12	2.7
Total	443	100.0
Total	404	100.0

Table 15 shows the faculty distribution for each questionnaire. The overall population shows a distribution between faculties ranging between 13.36% (Science) and 26.21% (Humanities) (University of the Witwatersrand, 2016). This was not reflected in the questionnaires' sample, as some courses that were randomly selected had more registered students than other courses. Simply, this was a random occurrence, where the number of students attending a class influenced the amount of data collected from each faculty.

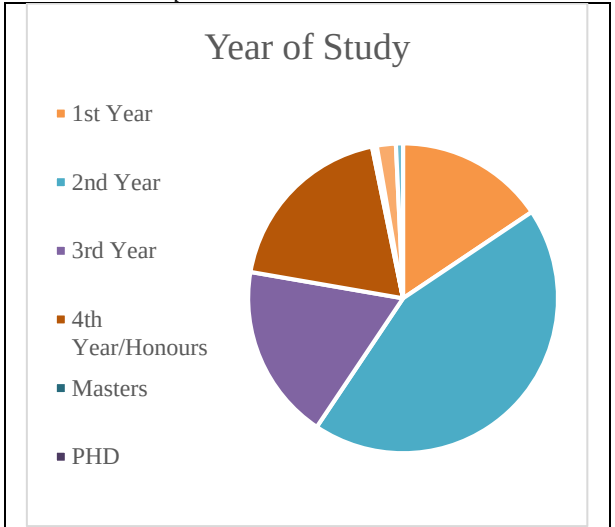
Table 16. Study 1: Year of study profile

African questionnaire



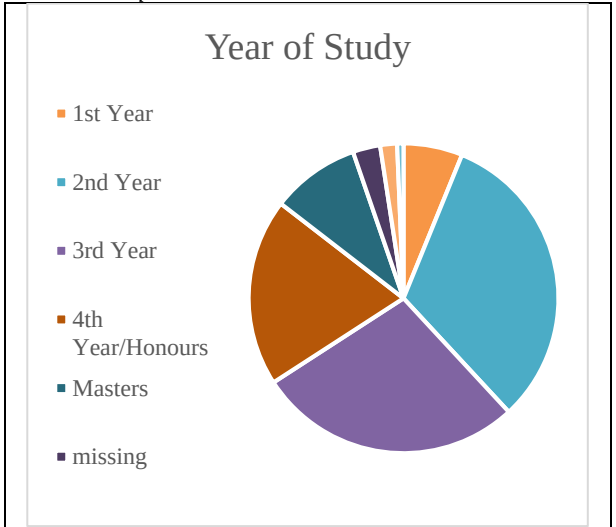
	Frequency	Percentage
1st Year	269	58.6
2nd Year	105	22.9
3rd Year	25	5.4
4th Year/Honours	28	6.1
Masters	10	2.2
PHD	3	0.7
missing	16	3.5
double	3	0.7
Total	459	100.0

Other Culture questionnaire



	Frequency	Percentage
1st Year	63	15.6
2nd Year	177	43.8
3rd Year	74	18.3
4th Year/Honours	77	19.1
Masters	1	0.2
PHD	1	0.2
missing	8	2.0
double	3	0.7
Total	404	100.0

Caucasian questionnaire

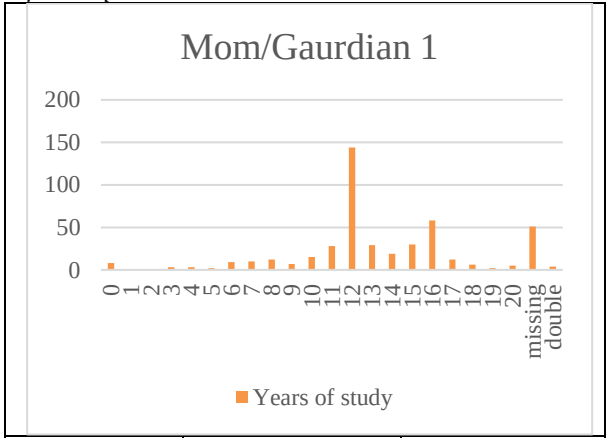


	Frequency	Percentage
1st Year	28	6.3
2nd Year	145	32.7
3rd Year	126	28.4
4th Year/Honours	89	20.1
Masters	42	9.5
missing	13	2.9
Total	443	100.0

As with faculty, the randomness of the research approach means that years of study was skewed to certain years if there was large number of registered students for a course. Generally, the samples for each questionnaire follows the distribution pattern of the population, where the population consists of 65% undergraduate students (first- to third-years) and 35% are postgraduate students (fourth-year and above) (University of the Witwatersrand, 2016). This implies the samples are mostly representative of the student population.

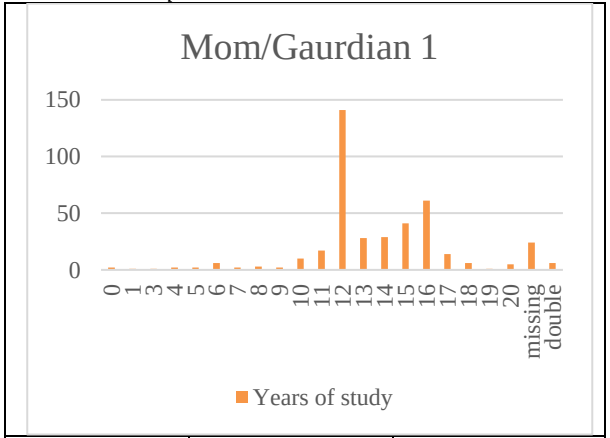
Table 17. Study 1: Mothers/guardian 1 education profile

African questionnaire



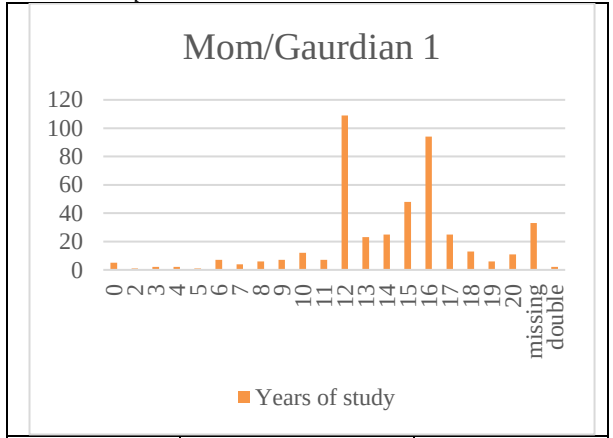
	Frequency	Percent
0	8	1.7
1	1	0.2
2	1	0.2
3	3	0.7
4	3	0.7
5	2	0.4
6	9	2.0
7	10	2.2
8	12	2.6
9	7	1.5
10	15	3.3
11	28	6.1
12	144	31.4
13	29	6.3
14	19	4.1
15	30	6.5
16	58	12.6
17	12	2.6
18	6	1.3

Other Culture questionnaire



	Frequency	Percent
0	2	0.5
1	1	0.2
3	1	0.2
4	2	0.5
5	2	0.5
6	6	1.5
7	2	0.5
8	3	0.7
9	2	0.5
10	10	2.5
11	17	4.2
12	141	34.9
13	28	6.9
14	29	7.2
15	41	10.1
16	61	15.1
17	14	3.5
18	6	1.5
19	1	0.2

Caucasian questionnaire



	Frequency	Percent
0	5	1.1
2	1	0.2
3	2	0.5
4	2	0.5
5	1	0.2
6	7	1.6
7	4	0.9
8	6	1.4
9	7	1.6
10	12	2.7
11	7	1.6
12	109	24.6
13	23	5.2
14	25	5.6
15	48	10.8
16	94	21.2
17	25	5.6
18	13	2.9
19	6	1.4

19	2	0.4
20	5	1.1
missing	51	11.1
double	4	0.9
Total	459	100.0

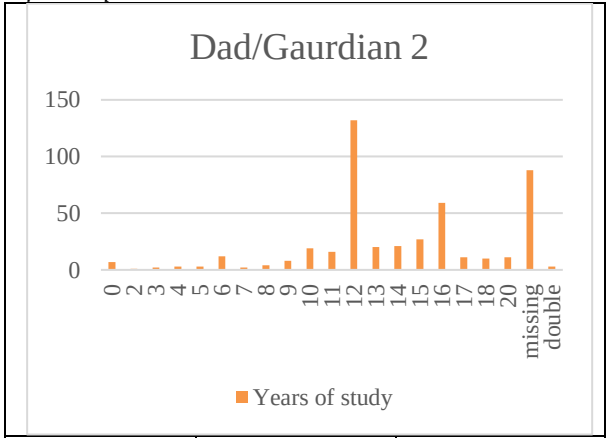
20	5	1.2
missing	24	5.9
double	6	1.5
Total	404	100.0

20	11	2.5
missing	33	7.4
double	2	0.5
Total	443	100.0

Father’s level of education is considered next, thereafter interpretation related to the demographic variable parents’ education is provided.

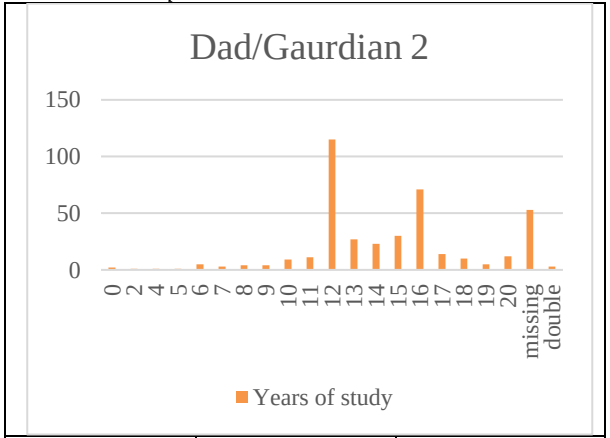
Table 18. Study 1: Fathers/guardian 2 education profile

African questionnaire



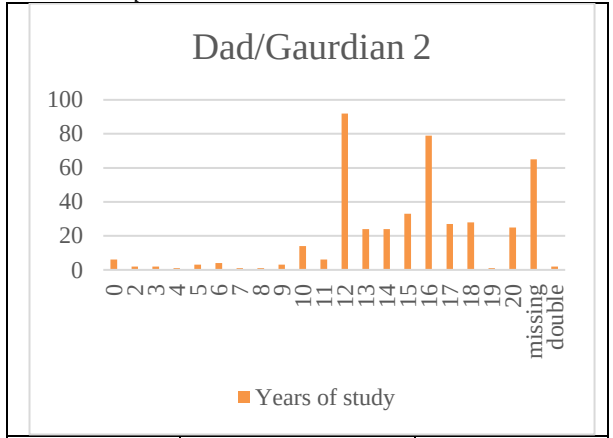
	Frequency	Percent
0	7	1.5
2	1	.2
3	2	.4
4	3	.7
5	3	.7
6	12	2.6
7	2	.4
8	4	.9
9	8	1.7
10	19	4.1
11	16	3.5
12	132	28.8
13	20	4.4
14	21	4.6
15	27	5.9
16	59	12.9
17	11	2.4
18	10	2.2
20	11	2.4

Other Culture questionnaire



	Frequency	Percent
0	2	.5
2	1	.2
4	1	.2
5	1	.2
6	5	1.2
7	3	.7
8	4	1.0
9	4	1.0
10	9	2.2
11	11	2.7
12	115	28.5
13	27	6.7
14	23	5.7
15	30	7.4
16	71	17.6
17	14	3.5
18	10	2.5
19	5	1.2
20	12	3.0

Caucasian questionnaire



	Frequency	Percent
0	6	1.4
2	2	.5
3	2	.5
4	1	.2
5	3	.7
6	4	.9
7	1	.2
8	1	.2
9	3	.7
10	14	3.2
11	6	1.4
12	92	20.8
13	24	5.4
14	24	5.4
15	33	7.4
16	79	17.8
17	27	6.1
18	28	6.3
19	1	.2

missing	88	19.2
double	3	.7
Total	459	100.0

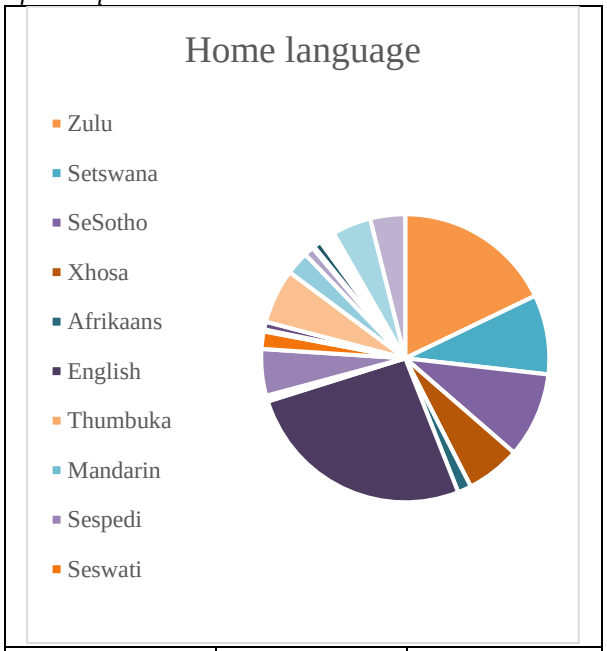
missing	53	13.1
double	3	.7
Total	404	100.0

20	25	5.6
missing	65	14.7
double	2	.5
Total	443	100.0

Table 17 and 18 show parents' education background for each questionnaire. Many of the respondents' parents have completed 12 years of education (Matric) thereafter the next popular level of education achieved was 16 years (completion of undergraduate degree or honours). What is worth noting is the increase in missing responses for father's education level, indicating that many students may have been raised without a father which could influence social sensitivity.

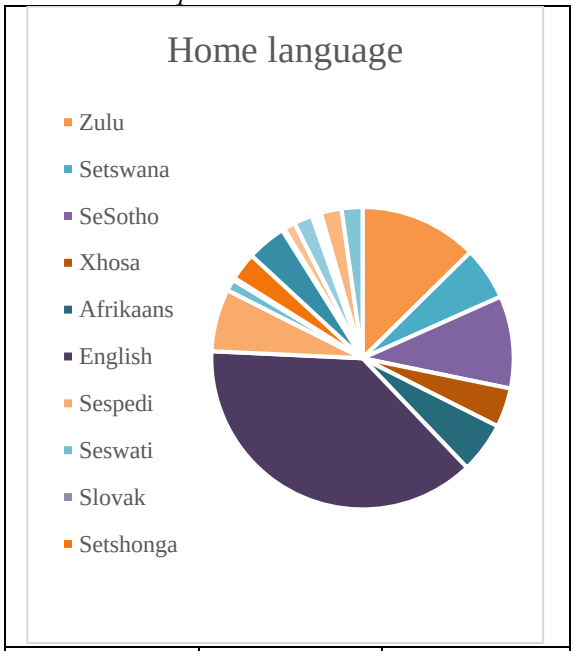
Table 19. Study 1: Home language profile

African questionnaire



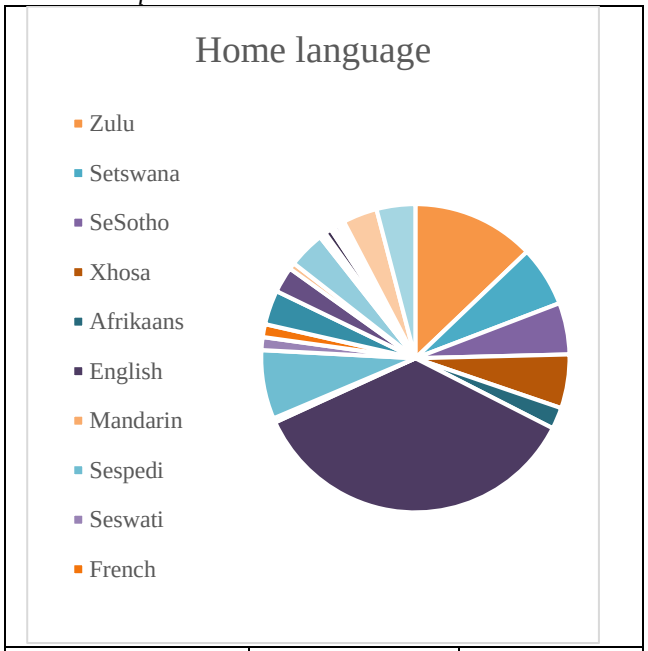
	Frequency	Percentage
Zulu	82	17.9
Setswana	41	8.9
Sesotho	44	9.6
Xhosa	28	6.1
Afrikaans	7	1.5
English	120	26.1
Thumbuka	2	.4
Mandarin	1	.2
Sepedi	24	5.2
SiSwati	9	2.0
Cantonese	1	.2
French	4	.9
Tsonga	28	6.1

'Other culture' questionnaire



	Frequency	Percentage
Zulu	51	12.6
Setswana	23	5.7
Sesotho	40	9.9
Xhosa	17	4.2
Afrikaans	22	5.4
English	153	37.9
Sepedi	27	6.7
SiSwati	5	1.2
Slovak	1	.2
Tsonga	12	3.0
Venda	17	4.2
Northern Sotho	1	.2
Ndebele	5	1.2

Caucasian questionnaire



	Frequency	Percentage
Zulu	57	12.9
Setswana	28	6.3
Sesotho	24	5.4
Xhosa	25	5.6
Afrikaans	10	2.3
English	158	35.7
Mandarin	2	.5
Sepedi	32	7.2
SiSwati	6	1.4
French	6	1.4
Tsonga	16	3.6
Venda	12	2.7
Ndebele	3	.7

Venda	12	2.6
Ndebele	5	1.1
Yoruba	1	.2
Shona	4	.9
Turkish	1	.2
Lingala	1	.2
Dutch	1	.2
Portuguese	1	.2
Coloured	1	.2
Southern Sotho	1	.2
Northern Sotho	1	.2
prefer not to say	1	.2
missing	20	4.4
double	18	3.9
Total	459	100.0

Shona	8	2.0
Japanese	1	.2
Hebrew	1	.2
Italian	1	.2
Kiswahili	1	.2
missing	9	2.2
double	9	2.2
Total	404	100.0

Shona	17	3.8
Chewa	1	.2
Malayalam (Indian Language)	1	.2
Swahili	1	.2
Arabic	3	.7
Northern Sotho	1	.2
Yoruba	1	.2
Greek	2	.5
Russian	1	.2
Bemba	1	.2
Bengali	1	.2
missing	16	3.6
double	18	4.1
Total	443	100.0

Table 19 shows the home language profile for each questionnaire. English is the most popular language spoken and Zulu is the next most popular language, followed by the other official African languages in South Africa. According to STATS SA (2018), 24.7% of South Africans speak Zulu at home, this is the language spoken the most at home among the population. English was only the sixth most spoken language at home (8.4%), behind languages such as Xhosa (15.6%) and Afrikaans (12.1%). However, English is stated as the second highest language spoken outside the household behind Zulu. A possible reason English is a popular home language in the current study is because the samples are of a relatively young educated age group which have grown up in an education system, that for the most part, is taught in English. This may have forced parents to adopt a more western value system at home to help their childrens' education goals. The University of the Witwatersrand's language of instruction is English, making it essential for students to be literate in English, and in turn assimilating English culture. Table 17 may not be representative of South Africa, but it is argued it is representative of a young student population in South Africa.

4.6 FINAL INSTRUMENT RESULTS

Data collection for each questionnaire was continued until the responses per questionnaire exceeded 380 (the recommended sample size to argue generalisation to the greater population). Proposed criteria by Baron-Cohen et al. (2001) was then applied to the data to create the final social sensitivity instruments. The criteria states that at least 50% of the respondents had selected the target word, and no more than 25% selected any one of the foils. A foil indicates the incorrect desired response chosen by the participant. If this criterion was met, items where included in a final 'Correct' instrument and subsequent analysis.

The reason for such criteria is that a clear majority chose the target word for the stimuli, and this was selected at least twice as much as any of the foils. No objective method for identifying underlying mental states is available thus correct matching of the stimuli to the mental state relies on the consensus of a large population (Baron-Cohen et al., 2001).

The results for each questionnaire are now considered and final instruments are derived.

4.6.1 African Questionnaire

Table 20. African questionnaire frequencies

Item	Target	Foil 1	Foil 2	Foil 3	Missing	Double
1	27.5	35.7	23.7	10.2	2.8	0
2	32.2	14.6	6.5	45.3	1.3	0
3	62.7	5.9	6.1	24.4	0.9	0
4	76	1.3	9.2	12	1.3	0.2
5	60.8	30.7	5	1.5	1.5	0.4
6	85.6	2.2	4.6	6.8	0.4	0.4
7	59.5	5.9	1.1	33.1	0	0.4
8	76.5	7.2	14.6	0.7	0.9	0.2
9	73.2	7.4	12.2	6.8	0.2	0.2
10	61.7	10.2	17.4	9.2	0.7	0.9
11	81.5	10.5	5	2	0.4	0.7
12	50.8	15.9	11.3	20.9	1.1	0
13	46.2	14.4	24.2	15	0	0.2
14	70.6	17.2	7	3.7	0.9	0.7
15	56.4	21.8	11.8	9.2	0.9	0
16	58.4	9.4	7.8	22.7	0.9	0.9
17	50.3	13.5	6.8	27.7	0.9	0.9
18	31.4	8.3	13.3	46	0.4	0.7
19	41.6	26.6	7.2	23.7	0.7	0.2
20	93.5	2	3.5	0.7	0.4	0
21	42.7	8.3	41.8	6.3	0.7	0.2
22	45.5	5	11.5	37	0.4	0.4
23	43.4	10	10.5	34.6	0.7	0.9
24	41.4	19	3.5	34	1.7	0.4
25	41.2	21.6	20.3	15	1.7	0.2
26	46.8	19	6.3	27	0.9	0
27	62.5	1.3	16.1	18.1	1.3	0.7
28	35.7	5.2	19.6	36.8	2.2	0.4
29	51.6	20.3	8.3	17	1.7	1.1
30	66.4	22.2	3.7	5.4	1.3	0.9
31	60.8	9.8	10.7	17.2	1.1	0.4
32	69.1	6.1	14.8	7.2	2.2	0.7
33	69.7	4.8	17	4.4	3.3	0.9
34	64.1	6.8	20.7	5.4	2.8	0.2
35	70.2	13.1	5.4	7.8	2.6	0.9
36	79.5	1.7	3.7	12.4	2.2	0.4

As can be seen in Table 18, items 1,2,5,7,13,17,18,19,21,22,23,24,25,26 and 28 did not meet the set-out criteria and were therefore dropped from the final instrument and further analysis. The final instrument is included in Appendix F. Further discussion on selected items and how different ethnicities answered it is detailed in Appendix Z.

4.6.2 'Other culture' Questionnaire

Table 21. 'Other culture' questionnaire frequencies

Item	Target	Foil 1	Foil 2	Foil 3	Missing	Double
1	78	9.7	9.7	2	0.7	0
2	50	5.2	8.4	35.4	1	0
3	76	6.2	6.9	10.1	0.7	0
4	76.5	0.7	8.7	13.6	0.2	0.2
5	57.2	14.9	15.6	11.4	1	0
6	81.7	3.5	5.9	6.9	2	0
7	72	8.9	3.5	14.6	0.7	0.2
8	74	3.5	21.3	0.5	0.7	0
9	79.2	7.7	8.9	4	0.2	0
10	61.1	9.9	22.3	5.7	1	0
11	86.9	9.2	3	0.5	0.5	0
12	83.4	6.9	3.7	5.4	0.5	0
13	58.4	23.5	10.6	6.9	0.2	0.2
14	66.1	17.3	11.9	4.2	0	0.5
15	39.6	10.4	31.7	17.8	0.5	0
16	73.5	4	2.5	19.6	0.2	0.2
17	81.2	3.2	2	12.6	0.7	0.2
18	48.5	8.9	20	22	0.2	0.2
19	51.2	25	7.2	16.1	0.5	0
20	72.8	3.2	14.6	7.7	1.2	0.5
21	20.5	13.9	50.5	13.6	1.2	0.2
22	69.3	4.5	4	21.8	0.5	0
23	57.4	6.9	5.2	29.2	1	0.2
24	57.2	15.6	3.5	22.8	0.5	0.5
25	55.9	3	28.5	11.9	0.7	0
26	63.6	17.1	2	15.6	1	0.7
27	54.5	1.2	21.3	21.3	1.7	0
28	39.6	2.7	20	35.6	2	0
29	33.2	29.7	6.4	28.7	1.2	0.7
30	77.5	8.9	6.4	5.7	1.2	0.2
31	28.5	22.5	14.1	32.7	1.7	0.5
32	80.7	4.5	12.1	1.5	1	0.2
33	85.1	2.7	7.7	2.2	2.2	0
34	70	6.9	12.4	8.4	2.2	0
35	42.8	13.4	10.9	31.4	1.5	0
36	68.3	6.4	11.6	11.6	1.5	0.5

As can be seen from Table 19, items 2,15,18,21,23,25,28,29,31 and 35 did not meet the set-out criteria and were therefore dropped from the final instrument and further analysis. The final instrument can be seen in the Appendix H. Further discussion on selected items and how different ethnicities answered it is detailed in Appendix Z.

4.6.3 Caucasian Questionnaire

Table 22. Caucasian questionnaire frequencies

Item	Target	Foil 1	Foil 2	Foil 3	Missing	Double
1	75.8	7.2	8.6	6.3	1.8	0.2
2	54.4	20.1	5.2	20.1	0.2	0
3	77.7	2.9	7.7	10.4	1.4	0
4	74.7	0.9	8.4	14.9	1.1	0
5	64.1	13.5	20.5	0.9	0.9	0
6	70.7	3.6	19.9	5.6	0.2	0
7	57.3	4.3	19	17.8	1.4	0.2
8	86.2	6.3	5.2	1.4	0.9	0
9	70.7	10.6	13.8	4.3	0.7	0
10	48.5	23.9	19.9	6.5	0.9	0.2
11	71.1	9.3	10.6	7.9	0.9	0.2
12	81	9.9	4.5	4.3	0	0.2
13	68.8	8.1	5	17.6	0.5	0
14	75.6	12.4	7	3.2	1.6	0.2
15	75.2	11.1	8.4	5	0	0.5
16	70	7.4	3.6	18.7	0.2	0
17	58.7	21	11.7	7.2	1.1	0.2
18	53.3	10.6	9.5	26.2	0.2	0.2
19	50.6	13.8	16	18.7	0.9	0
20	59.8	19.2	19.2	1.1	0.2	0.5
21	72.2	8.8	14	3.4	1.1	0.5
22	70.2	2.7	5.2	19.9	1.8	0.2
23	55.8	2.5	11.3	29.1	0.9	0.5
24	56.7	14	4.5	22.6	2	0.2
25	45.4	6.5	32.5	13.1	2.3	0.2
26	66.6	8.8	5.9	15.8	2.5	0.5
27	56.4	1.8	21.2	17.4	2.9	0.2
28	52.8	3.2	22.6	17.8	3.4	0.2
29	44.2	21.7	6.8	24.6	2.7	0
30	74.3	3.4	10.6	9	2.7	0
31	55.5	13.5	6.3	21	3.4	0.2
32	69.1	5.4	14.9	7.4	2.9	0.2
33	61.4	2.7	21.7	10.4	3.6	0.2
34	62.3	5.2	25.3	4.5	2.7	0
35	52.6	13.1	14.9	16.5	2.7	0.2
36	78.6	3.2	2.7	12.6	2.7	0.2

As can be seen Table 20, items did 10,18,23,25,29 and 34 not meet the set-out criteria and were therefore dropped from the final instrument and further analysis. The final instrument can be seen in the Appendix J. Further discussion on selected items and how different ethnicities answered it is detailed in Appendix Z.

4.7 FINAL INSTRUMENTS ANALYSIS

After dropping the relevant items, social sensitivity scores were calculated for each case and further analysis was done to understand its distribution and factors affecting the scores. This was done for each questionnaire.

4.7.1 African Questionnaire

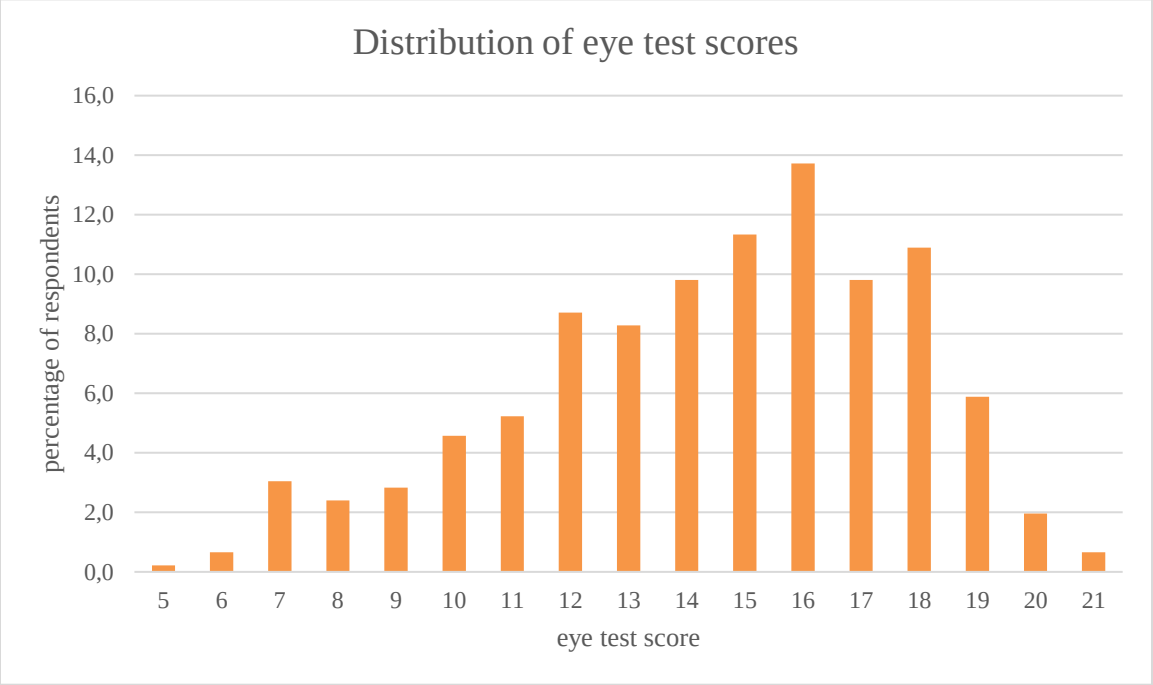


Figure 7. Distribution social sensitivity scores: African questionnaire

Figure 7 shows that social sensitivity scores for the African questionnaire follow a relatively normal distribution. The distribution has a mean of 14.4074 Standard Deviation of 3.30700, Skewness of -0.500 and Kurtosis of -0.346.

After determining that the scores follow a normal distribution, selected descriptive statistics, one-way ANOVA and two-way ANOVA tests were performed to see the variances between cultures and genders for social sensitivity.

4.7.1.1 Cultural Variations

As a proxy to determine whether one's culture effects their social sensitivity scores one-way ANOVA tests were run on ethnicity and home language. This process compares social sensitivity means between the different classification groups in a category and provides an indication whether the difference is statistically significant. The difference between social sensitivity means for ethnic groups is presented first followed by home language.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY ETHNICITY

DESCRIPTIVE STATISTICS

Table 23. African questionnaire: ethnicity*social sensitivity descriptive statistics

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Black	292	13.8014	3.30702	.19353	13.4205	14.1823	6.00	21.00
Coloured	13	15.7692	3.49175	.96844	13.6592	17.8793	7.00	19.00
Asian	6	15.6667	4.54606	1.85592	10.8959	20.4375	7.00	20.00
Indian	40	15.2000	2.76610	.43736	14.3154	16.0846	7.00	19.00
White	68	16.1176	2.88345	.34967	15.4197	16.8156	5.00	21.00
Prefer not to say	15	14.3333	2.66369	.68776	12.8582	15.8084	8.00	18.00
Mixed Race	2	17.5000	2.12132	1.50000	-1.5593	36.5593	16.00	19.00
African	3	16.0000	4.00000	2.30940	6.0634	25.9366	12.00	20.00
Missing	16	14.5625	3.30593	.82648	12.8009	16.3241	9.00	19.00
Double	3	12.6667	2.08167	1.20185	7.4955	17.8378	11.00	15.00
Total	458	14.4148	3.30677	.15452	14.1112	14.7185	5.00	21.00
Ethnicities where n=1 were removed								

Table 23 shows that those who identify themselves as Black have a lower mean social sensitivity score than other ethnic groups. Those who identify themselves as White have relatively high mean score to other ethnic groups. This is observed even though the stimuli used was of Black ethnicity, suggesting that there is no advantage for those of Black ethnicity in having stimuli of the same race.

ONE-WAY ANOVA

Table 24. African questionnaire: ethnicity *social sensitivity one-way ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	401.162	9	44.574	4.345	.000
Within Groups	4596.017	448	10.259		
Total	4997.179	457			
Ethnicities where n=1 were removed					

Table 24 shows that there is a significant difference in means between ethnic groups. This is evident by a significance value of at least 0.001. This significance value indicates that between group variance is greater than within group variance. To assess which specific groups are showing significant mean differences, a multiple mean comparisons test is presented below.

SELECTED MULTIPLE MEAN COMPARISONS

Table 25. African questionnaire: ethnicity *social sensitivity selected multiple mean comparisons

Dependent Variable: Social sensitivity						
Tukey HSD						
(I) Ethnicity	(J) Ethnicity	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Black	Coloured	-1.96786	.90790	.481	-4.8548	.9191
	Asian	-1.86530	1.32097	.923	-6.0657	2.3351
	Indian	-1.39863	.54001	.225	-3.1157	.3185
	White	-2.31628*	.43128	.000	-3.6876	-.9449
	Mixed Race	-3.69863	2.27258	.834	-10.9249	3.5276
	African	-2.19863	1.85871	.975	-8.1089	3.7116
Coloured	Black	1.96786	.90790	.481	-.9191	4.8548
	Asian	.10256	1.58082	1.000	-4.9241	5.1292
	Indian	.56923	1.02256	1.000	-2.6823	3.8207
	White	-.34842	.96955	1.000	-3.4313	2.7345
	Mixed Race	-1.73077	2.43282	.999	-9.4666	6.0050
	African	-.23077	2.05154	1.000	-6.7542	6.2926
Asian	Black	1.86530	1.32097	.923	-2.3351	6.0657
	Coloured	-.10256	1.58082	1.000	-5.1292	4.9241
	Indian	.46667	1.40225	1.000	-3.9922	4.9255
	White	-.45098	1.36407	1.000	-4.7884	3.8865
	Mixed Race	-1.83333	2.61521	1.000	-10.1491	6.4824
	African	-.33333	2.26484	1.000	-7.5350	6.8683
Indian	Black	1.39863	.54001	.225	-.3185	3.1157
	Coloured	-.56923	1.02256	1.000	-3.8207	2.6823
	Asian	-.46667	1.40225	1.000	-4.9255	3.9922
	White	-.91765	.63823	.915	-2.9471	1.1118
	Mixed Race	-2.30000	2.32077	.993	-9.6795	5.0795
White	Black	2.31628*	.43128	.000	.9449	3.6876

	Coloured	.34842	.96955	1.000	-2.7345	3.4313
	Asian	.45098	1.36407	1.000	-3.8865	4.7884
	Indian	.91765	.63823	.915	-1.1118	2.9471
	Mixed Race	-1.38235	2.29790	1.000	-8.6891	5.9244
	African	.11765	1.88958	1.000	-5.8908	6.1261
Mixed Race	Black	3.69863	2.27258	.834	-3.5276	10.9249
	Coloured	1.73077	2.43282	.999	-6.0050	9.4666
	Asian	1.83333	2.61521	1.000	-6.4824	10.1491
	Indian	2.30000	2.32077	.993	-5.0795	9.6795
	White	1.38235	2.29790	1.000	-5.9244	8.6891
	African	1.50000	2.92389	1.000	-7.7973	10.7973
African	Black	2.19863	1.85871	.975	-3.7116	8.1089
	Coloured	.23077	2.05154	1.000	-6.2926	6.7542
	Asian	.33333	2.26484	1.000	-6.8683	7.5350
	Indian	.80000	1.91732	1.000	-5.2966	6.8966
	White	-.11765	1.88958	1.000	-6.1261	5.8908
	Mixed Race	-1.50000	2.92389	1.000	-10.7973	7.7973
*. The mean difference is significant at the 0.05 level. Ethnicities where n=1 were removed						

Table 25 shows the difference in means between different ethnic groups versus the group in column I. The only significant mean difference observed is between those who identify themselves as Black ethnicity and those who associate with White ethnicity. Those who identify with Black ethnicity have a significantly lower mean social sensitivity.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY HOME LANGUAGE

DESCRIPTIVE STATISTICS

Table 26. African questionnaire: home language *social sensitivity descriptive statistics

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Zulu	82	13.5122	3.47209	.38343	12.7493	14.2751	7.00	21.00
Setswana	41	13.7561	3.35991	.52473	12.6956	14.8166	7.00	20.00
Sesotho	45	13.7333	3.17948	.47397	12.7781	14.6886	7.00	20.00
Xhosa	28	13.0714	3.71113	.70134	11.6324	14.5105	6.00	19.00
Afrikaans	7	16.5714	1.61835	.61168	15.0747	18.0682	15.00	19.00
English	120	15.9417	2.64192	.24117	15.4641	16.4192	5.00	21.00
Sepedi	25	14.3600	2.84136	.56827	13.1871	15.5329	8.00	19.00
SiSwati	9	13.5556	2.96273	.98758	11.2782	15.8329	9.00	17.00
Tsonga	28	13.2857	3.19557	.60391	12.0466	14.5248	6.00	20.00
Venda	12	15.5833	2.39159	.69039	14.0638	17.1029	11.00	19.00
Ndebele	5	13.4000	3.04959	1.36382	9.6134	17.1866	11.00	18.00
Shona	4	15.2500	1.25831	.62915	13.2478	17.2522	14.00	17.00
Other African Languages	5	15.6000	4.61519	2.06398	9.8695	21.3305	10.00	21.00
Other Asian Languages	2	19.0000	1.41421	1.00000	6.2938	31.7062	18.00	20.00
Other Caucasian Languages	7	15.4286	1.81265	.68512	13.7521	17.1050	12.00	17.00
Missing	20	13.7000	3.96166	.88585	11.8459	15.5541	6.00	19.00
Double	18	14.1111	3.62814	.85516	12.3069	15.9153	7.00	19.00
Total	458	14.4214	3.29699	.15406	14.1186	14.7241	5.00	21.00
Languages were further categorised based on origin, thereafter home languages where n=1 were removed								

Table 26 shows that those who speak English and Afrikaans as their home language have a higher mean social sensitivity score than other languages. African languages have relatively low mean social sensitivity scores in comparison.

ONE-WAY ANOVA

Table 27. African questionnaire: home language *social sensitivity one-way ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	603.203	16	37.700	3.809	.000
Within Groups	4364.467	441	9.897		
Total	4967.670	457			
Languages were further categorised based on origin, thereafter home languages where n=1 were removed					

Table 27 indicates that there is significant difference in means across home language.

SELECTED MULTIPLE COMPARISONS

Table 28. African questionnaire: home language *social sensitivity multiple mean comparisons

Dependent Variable: Social sensitivity						
Tukey HSD						
(I) Home language	(J) Home language	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Zulu	Setswana	-.24390	.60173	1.000	-2.3373	1.8495
	Sesotho	-.22114	.58363	1.000	-2.2516	1.8093
	Xhosa	.44077	.68858	1.000	-1.9548	2.8363
	Afrikaans	-3.05923	1.23875	.526	-7.3688	1.2504
	English	-2.42947*	.45074	.000	-3.9976	-.8614
	Sepedi	-.84780	.71872	.999	-3.3482	1.6526
	SiSwati	-.04336	1.10469	1.000	-3.8865	3.7998
	Tsonga	.22648	.68858	1.000	-2.1691	2.6221
	Venda	-2.07114	.97233	.772	-5.4538	1.3116
	Ndebele	.11220	1.44915	1.000	-4.9294	5.1538
	Shona	-1.73780	1.61086	1.000	-7.3420	3.8664
	Other African Languages	-2.08780	1.44915	.991	-7.1294	2.9538
	Other Asian Languages	-5.48780	2.25146	.551	-13.3206	2.3450
	Other Caucasian Languages	-1.91638	1.23875	.982	-6.2260	2.3932
Setswana	Zulu	.24390	.60173	1.000	-1.8495	2.3373
	Sesotho	.02276	.67920	1.000	-2.3402	2.3857
	Xhosa	.68467	.77126	1.000	-1.9985	3.3679
	Afrikaans	-2.81533	1.28655	.734	-7.2912	1.6605
	English	-2.18557*	.56908	.015	-4.1654	-.2057
	Sepedi	-.60390	.79828	1.000	-3.3811	2.1733
	SiSwati	.20054	1.15803	1.000	-3.8282	4.2293
	Tsonga	.47038	.77126	1.000	-2.2128	3.1536
	Venda	-1.82724	1.03253	.940	-5.4194	1.7649
	Ndebele	.35610	1.49021	1.000	-4.8283	5.5405
	Shona	-1.49390	1.64790	1.000	-7.2269	4.2391
	Other African Languages	-1.84390	1.49021	.998	-7.0283	3.3405
	Other Asian Languages	-5.24390	2.27810	.653	-13.1694	2.6816
	Other Caucasian Languages	-1.67247	1.28655	.997	-6.1484	2.8034
Sesotho	Zulu	.22114	.58363	1.000	-1.8093	2.2516
	Setswana	-.02276	.67920	1.000	-2.3857	2.3402
	Xhosa	.66190	.75722	1.000	-1.9725	3.2963
	Afrikaans	-2.83810	1.27818	.712	-7.2849	1.6087
	English	-2.20833*	.54991	.008	-4.1215	-.2952
	Sepedi	-.62667	.78473	1.000	-3.3567	2.1034
	SiSwati	.17778	1.14872	1.000	-3.8186	4.1742
	Tsonga	.44762	.75722	1.000	-2.1867	3.0820
	Venda	-1.85000	1.02208	.927	-5.4058	1.7058
	Ndebele	.33333	1.48300	1.000	-4.8260	5.4927

	Shona	-1.51667	1.64138	1.000	-7.2270	4.1937
	Other African Languages	-1.86667	1.48300	.998	-7.0260	3.2927
	Other Asian Languages	-5.26667	2.27339	.642	-13.1757	2.6424
	Other Caucasian Languages	-1.69524	1.27818	.996	-6.1420	2.7515
Xhosa	Zulu	-.44077	.68858	1.000	-2.8363	1.9548
	Setswana	-.68467	.77126	1.000	-3.3679	1.9985
	Sesotho	-.66190	.75722	1.000	-3.2963	1.9725
	Afrikaans	-3.50000	1.32939	.405	-8.1249	1.1249
	English	-2.87024*	.66025	.002	-5.1672	-.5732
	Sepedi	-1.28857	.86564	.988	-4.3001	1.7230
	SiSwati	-.48413	1.20544	1.000	-4.6778	3.7096
	Tsonga	-.21429	.84078	1.000	-3.1393	2.7108
	Venda	-2.51190	1.08544	.644	-6.2881	1.2643
	Ndebele	-.32857	1.52735	1.000	-5.6422	4.9851
	Shona	-2.17857	1.68156	.997	-8.0287	3.6715
	Other African Languages	-2.52857	1.52735	.966	-7.8422	2.7851
	Other Asian Languages	-5.92857	2.30257	.447	-13.9392	2.0820
	Other Caucasian Languages	-2.35714	1.32939	.939	-6.9821	2.2678
English	Zulu	2.42947*	.45074	.000	.8614	3.9976
	Setswana	2.18557*	.56908	.015	.2057	4.1654
	Sesotho	2.20833*	.54991	.008	.2952	4.1215
	Xhosa	2.87024*	.66025	.002	.5732	5.1672
	Afrikaans	-.62976	1.22323	1.000	-4.8854	3.6258
	Sepedi	1.58167	.69162	.664	-.8245	3.9878
	SiSwati	2.38611	1.08725	.730	-1.3964	6.1686
	Tsonga	2.65595*	.66025	.008	.3590	4.9529
	Venda	.35833	.95247	1.000	-2.9553	3.6720
	Ndebele	2.54167	1.43590	.939	-2.4538	7.5372
	Shona	.69167	1.59896	1.000	-4.8711	6.2544
	Other African Languages	.34167	1.43590	1.000	-4.6538	5.3372
	Other Asian Languages	-3.05833	2.24296	.995	-10.8615	4.7449
	Other Caucasian Languages	.51310	1.22323	1.000	-3.7425	4.7687
Tsonga	Zulu	-.22648	.68858	1.000	-2.6221	2.1691
	Setswana	-.47038	.77126	1.000	-3.1536	2.2128
	Sesotho	-.44762	.75722	1.000	-3.0820	2.1867
	Xhosa	.21429	.84078	1.000	-2.7108	3.1393
	Afrikaans	-3.28571	1.32939	.525	-7.9106	1.3392
	English	-2.65595*	.66025	.008	-4.9529	-.3590
	Sepedi	-1.07429	.86564	.998	-4.0858	1.9372
	SiSwati	-.26984	1.20544	1.000	-4.4636	3.9239
	Venda	-2.29762	1.08544	.781	-6.0739	1.4786
	Ndebele	-.11429	1.52735	1.000	-5.4279	5.1993
	Shona	-1.96429	1.68156	.999	-7.8144	3.8858
	Other African Languages	-2.31429	1.52735	.985	-7.6279	2.9993
	Other Asian Languages	-5.71429	2.30257	.517	-13.7249	2.2963
	Other Caucasian Languages	-2.14286	1.32939	.974	-6.7678	2.4821

*. The mean difference is significant at the 0.05 level.
Languages were further categorised based on origin, thereafter home languages where n=1 were removed

The above tables show a significant difference between ethnic group social sensitivity means and home language social sensitivity means. For ethnic groups, the biggest difference occurred between people who associated themselves with White and people who associated themselves with Black. The most substantial difference occurring amongst home languages was between English and Zulu, with further significant differences with a few other African languages. This suggests that culture is significant to social sensitivity.

4.6.1.2 Gender Variations

One-way ANOVA tests were used to determine whether a person's gender effects his or her social sensitivity scores. Social sensitivity scores for each gender were compared and tested for significance.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY GENDER

DESCRIPTIVE STATISTICS

Table 29. African questionnaire: gender *social sensitivity descriptive statistics

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Male	176	13.4602	3.26341	.24599	12.9747	13.9457	6.00	20.00
Female	266	15.0226	3.20487	.19650	14.6357	15.4095	5.00	21.00
Missing	17	14.5882	3.20271	.77677	12.9416	16.2349	9.00	19.00
Total	459	14.4074	3.30700	.15436	14.1041	14.7107	5.00	21.00

Table 29 shows that women have a higher mean social sensitivity than men.

ONE-WAY ANOVA

Table 30. African questionnaire: gender *social sensitivity one-way ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	259.111	2	129.555	12.438	.000
Within Groups	4749.704	456	10.416		
Total	5008.815	458			

Table 30 indicates that there is a significant mean difference between gender groups.

SELECTED MULTIPLE COMPARISONS

Table 31. African questionnaire: gender *social sensitivity multiple means comparisons

Dependent Variable: Social sensitivity						
Tukey HSD						
(I) Gender	(J) Gender	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	Female	-1.56233*	.31359	.000	-2.2997	-.8250
Female	Male	1.56233*	.31359	.000	.8250	2.2997
*. The mean difference is significant at the 0.05 level.						

Table 31 confirms a significant difference between men and women's social sensitivity.

TWO-WAY ANOVA

Two-way ANOVA compare the means of participants who are classified in two ways. The two classifications to be considered are culture and gender. This presents an assessment of how a person's culture potentially influences gender differences.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY ETHNICITY AND GENDER

AFRICAN ETHNICITY

African ethnicity in this study includes those who associated with Black, African or any other clear African related ethnicity responses.

Table 32. African questionnaire: gender *African*social sensitivity descriptive statistics

Descriptive Statistics				
Dependent Variable: Social sensitivity				
Gender	Ethnicity	Mean	Std. Deviation	N
Male	Other	14.8214	3.12821	56
	African ethnicity	12.7615	3.17950	109
	Total	13.4606	3.30096	165
Female	Other	16.3947	2.72313	76
	African ethnicity	14.4432	3.24846	185
	Total	15.0115	3.22429	261
Total	Other	15.7273	2.99386	132
	African ethnicity	13.8197	3.31891	294
	Total	14.4108	3.33717	426

Table 32 indicates that both men and women participants of African ethnicity performed lower on the social sensitivity instrument compared to other cultures.

Table 33. African questionnaire: gender *African*social sensitivity two-way ANOVA

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	605.286[a]	3	201.762	20.627	.000
Intercept	74855.075	1	74855.075	7652.661	.000
Gender	232.386	1	232.386	23.757	.000
African	352.930	1	352.930	36.081	.000
Gender * African ethnicity	.258	1	.258	.026	.871
Error	4127.824	422	9.782		
Total	93201.000	426			
Corrected Total	4733.110	425			
a. R Squared = .128 (Adjusted R Squared = .122)					

Figure 8. African questionnaire: gender *African*social sensitivity comparison

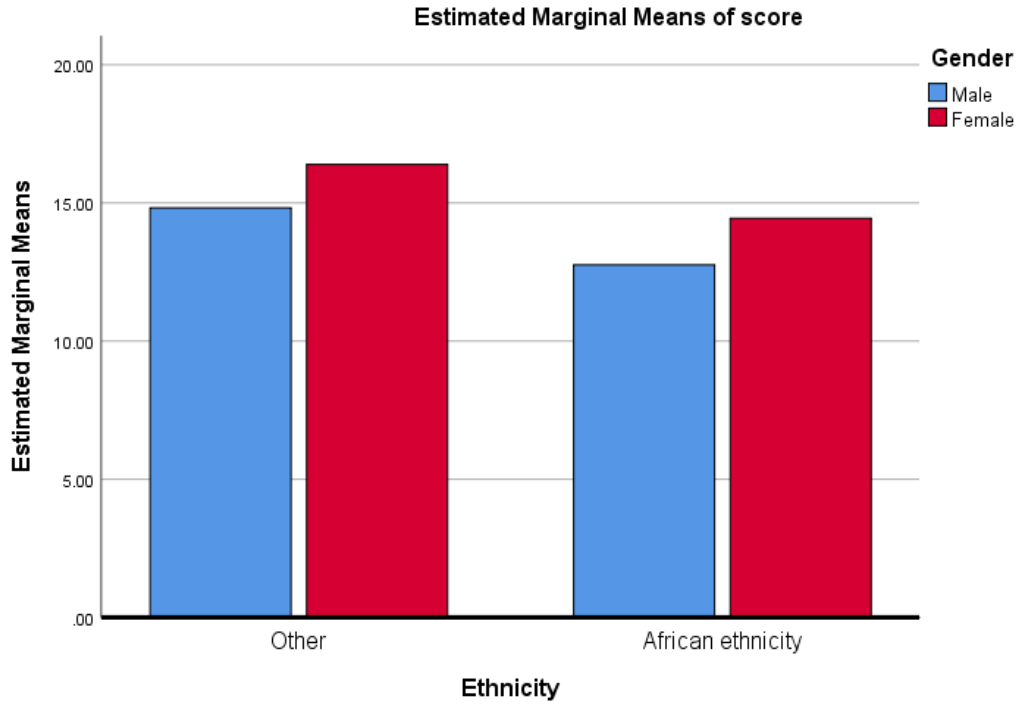


Table 33 and Figure 8, show that the gender difference observed, is not specific to the African ethnic group but is consistent with other ethnicities.

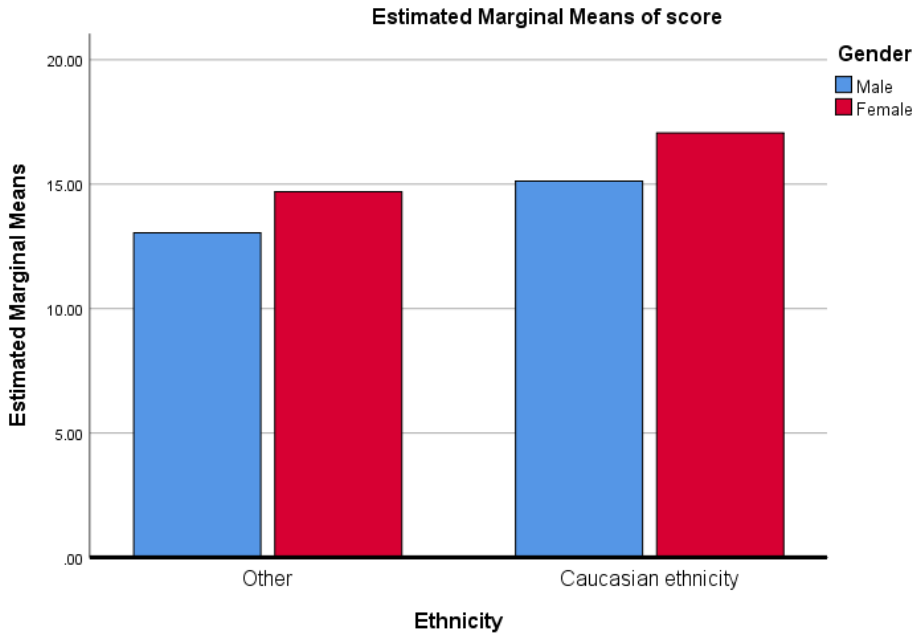
CAUCASIAN ETHNICITY

Caucasian ethnicity in this study includes those who associated with White or other European-related ethnicity responses.

Table 34. African questionnaire: gender *Caucasian ethnicity*social sensitivity two-way ANOVA

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	526.049[a]	3	175.350	17.589	.000
Intercept	50655.758	1	50655.758	5081.154	.000
Gender	181.353	1	181.353	18.191	.000
Caucasian ethnicity	277.922	1	277.922	27.878	.000
Gender * Caucasian ethnicity	1.160	1	1.160	.116	.733
Error	4207.062	422	9.969		
Total	93201.000	426			
Corrected Total	4733.110	425			
a. R Squared = .111 (Adjusted R Squared = .105)					

Figure 9. African questionnaire: gender *Caucasian*social sensitivity comparison



As with African ethnic groups, Table 34 and Figure 9, show that the gender difference observed, is not specific to the White ethnic group and is consistent with other ethnic group gender differences.

‘OTHER CULTURE’ ETHNICITY

‘Other culture’ ethnicity in this study includes those who associated with Coloured, Indian, Asian, Arab, Mixed race or those who associate with more than one race.

Table 35. African questionnaire: gender *‘Other culture’*social sensitivity two-way ANOVA

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	298.829[a]	3	99.610	9.480	.000
Intercept	42908.367	1	42908.367	4083.487	.000
Gender	112.305	1	112.305	10.688	.001
Other culture ethnicity	52.975	1	52.975	5.041	.025
Gender * Other culture ethnicity	.156	1	.156	.015	.903
Error	4434.281	422	10.508		
Total	93201.000	426			
Corrected Total	4733.110	425			
a. R Squared = .063 (Adjusted R Squared = .056)					

Figure 10. African questionnaire: gender *‘Other culture’*social sensitivity comparison

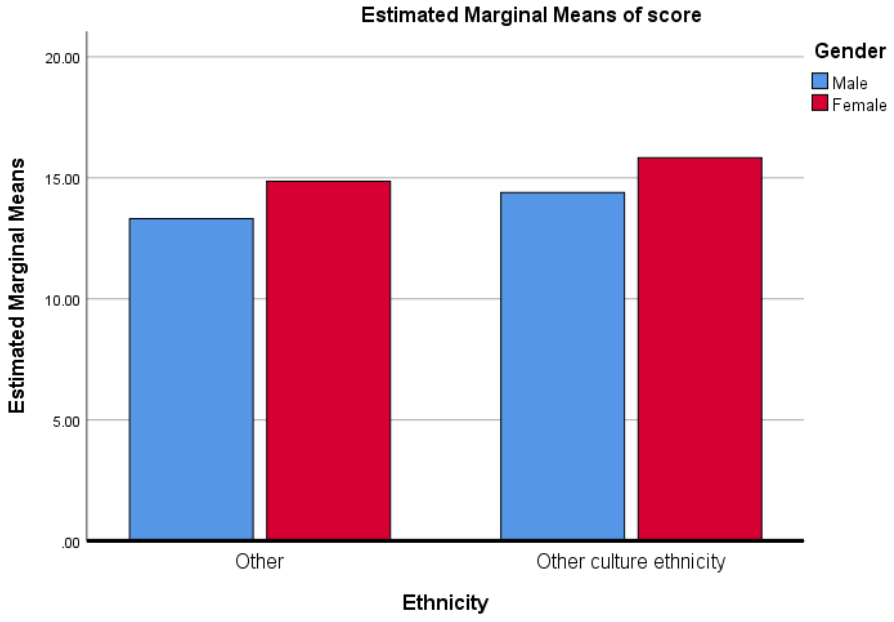


Table 35 and Figure 10, also show that the gender difference observed, is not specific to the ‘Other culture’ ethnic group. The relationship between gender and culture and its ultimate effect on social sensitivity is further assessed by considering home language.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY HOME LANGUAGE AND GENDER

AFRICAN LANGUAGES

Table 36. African questionnaire: gender *African languages*social sensitivity descriptive statistics

Descriptive Statistics				
Dependent Variable: Social sensitivity				
Gender	Language	Mean	Std. Deviation	N
Male	Other	15.2131	2.66530	61
	African Languages	12.6195	3.13197	113
	Total	13.5287	3.21787	174
Female	Other	16.1398	2.78424	93
	African Languages	14.4765	3.20909	170
	Total	15.0646	3.16222	263
Total	Other	15.7727	2.76657	154
	African Languages	13.7350	3.30115	283
	Total	14.4531	3.26866	437

Table 36 shows that both men and women participants who speak an African language at home performed lower on the social sensitivity instrument.

Table 37. African questionnaire: gender *African language*social sensitivity two-way ANOVA

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	679.833[a]	3	226.611	24.663	.000
Intercept	81576.566	1	81576.566	8878.484	.000
Gender	185.033	1	185.033	20.138	.000
African languages	432.726	1	432.726	47.096	.000
Gender * African languages	20.668	1	20.668	2.249	.134
Error	3978.455	433	9.188		
Total	95944.000	437			
Corrected Total	4658.288	436			
a. R Squared = .146 (Adjusted R Squared = .140)					

Figure 11. African questionnaire: gender *African language*social sensitivity comparison

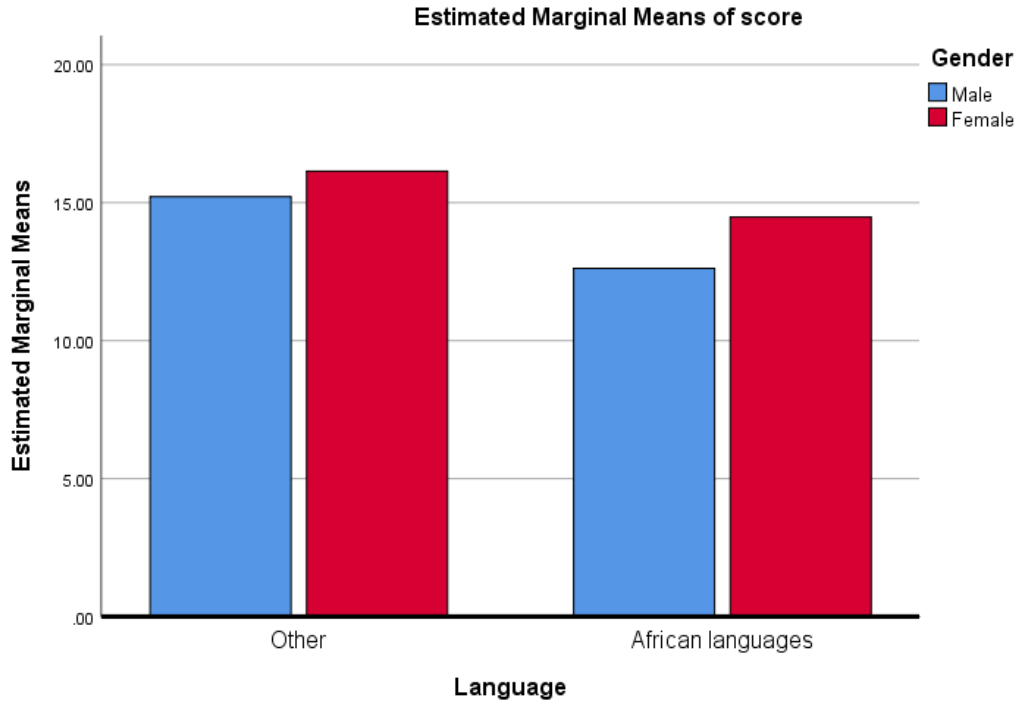


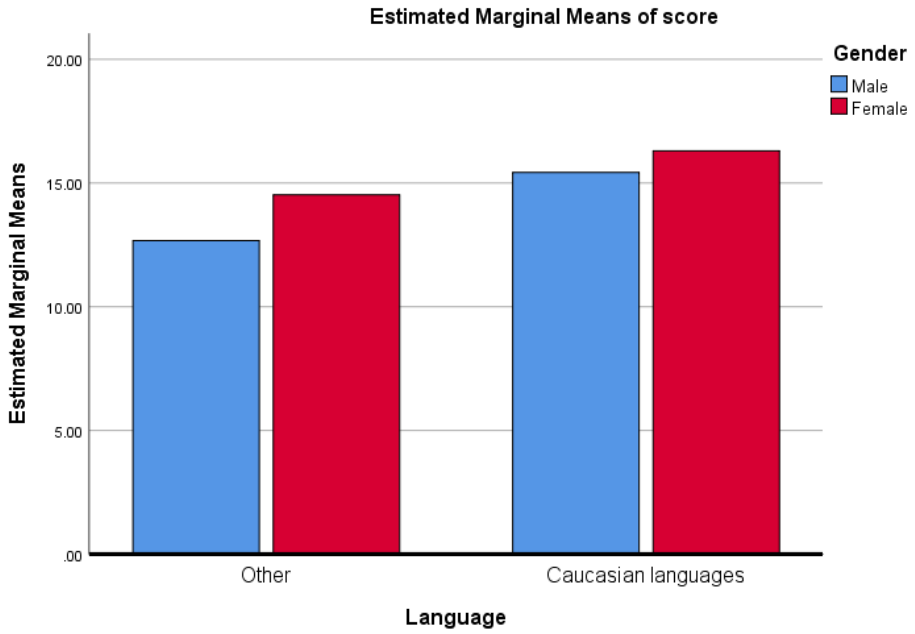
Table 37 and Figure 11, indicate that the gender difference observed, is not specific to the African languages but is consistent with other languages.

CAUCASIAN LANGUAGES

Table 38. African questionnaire: gender*Caucasian language*social sensitivity two-way ANOVA

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	704.320[a]	3	234.773	25.710	.000
Intercept	77476.586	1	77476.586	8484.480	.000
Gender	165.528	1	165.528	18.127	.000
Caucasian languages	457.148	1	457.148	50.062	.000
Gender * Caucasian languages	21.234	1	21.234	2.325	.128
Error	3953.968	433	9.132		
Total	95944.000	437			
Corrected Total	4658.288	436			
a. R Squared = .151 (Adjusted R Squared = .145)					

Figure 12. African questionnaire: gender *Caucasian language*social sensitivity comparison



As with African languages, Table 38 and Figure 12, suggest that the gender difference observed, is not specific to the Caucasian language speakers (for example, English).

The above concludes the analysis of the African instrument and the cultural and gender differences. The next section analyses the 'Other culture' instrument.

4.7.2 'Other culture' Questionnaire

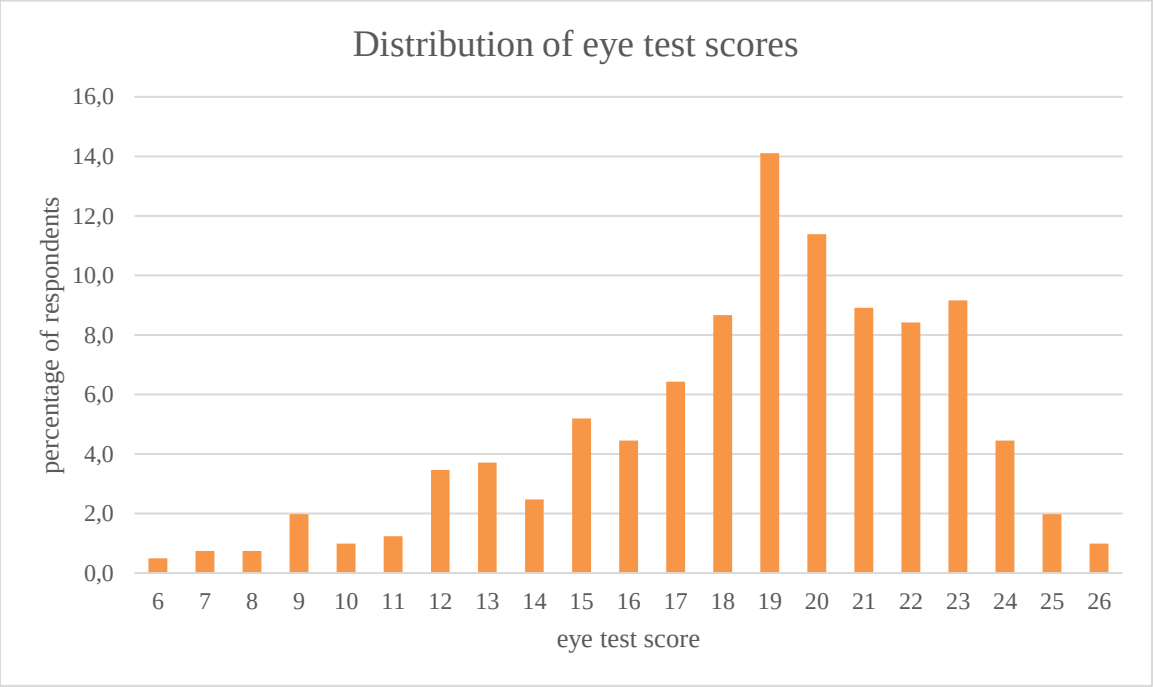


Figure 13. Distribution social sensitivity scores: 'Other culture' questionnaire

Figure 13 shows that social sensitivity scores for the 'Other culture' questionnaire follow a normal distribution. The distribution has a mean of 18.5545 Standard Deviation of 4.05661, Skewness of -0.767 and Kurtosis of 0.290.

After determining that the scores follow a relatively normal distribution, selected descriptive statistics, one-way ANOVA and two-way ANOVA tests were performed to see the variances between cultures and genders for social sensitivity.

4.7.2.1 Cultural Variations

As a proxy to determine whether a person's culture effects his or her social sensitivity scores one-way ANOVA tests were run on ethnicity and home language. The difference between social sensitivity means for ethnic groups is presented first followed by home language.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY ETHNICITY

DESCRIPTIVE STATISTICS

Table 39. 'Other culture' questionnaire: ethnicity *social sensitivity descriptive statistics

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Black	212	17.1934	4.45891	.30624	16.5897	17.7971	6.00	26.00
Coloured	9	20.5556	2.40370	.80123	18.7079	22.4032	17.00	24.00
Asian	2	21.0000	2.82843	2.00000	-4.4124	46.4124	19.00	23.00
Indian	39	19.6923	2.48314	.39762	18.8874	20.4972	15.00	25.00
White	115	20.4783	2.83570	.26443	19.9544	21.0021	12.00	26.00
Mixed Race	4	21.7500	2.75379	1.37689	17.3681	26.1319	19.00	25.00
African	2	18.0000	7.07107	5.00000	-45.5310	81.5310	13.00	23.00
Total	401	18.5686	4.05967	.20273	18.1700	18.9671	6.00	26.00
Ethnicities where n=1 were removed								

The above descriptive statistics in Table 39, for the 'Other culture' instrument, shows a similar finding to that in the African instrument. Those that identified themselves as Black have a lower mean social sensitivity score than other ethnic groups. Those that identified themselves as White have a relatively high mean to other ethnic groups. This has been observed with both African and 'Other culture' stimuli.

ONE-WAY ANOVA

Table 40. 'Other culture' questionnaire: ethnicity *social sensitivity one-way ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	972.484	9	108.054	7.518	.000
Within Groups	5619.880	391	14.373		
Total	6592.364	400			
Ethnicities where n=1 were removed					

Table 40 supports that there is a significant difference in means between ethnic groups.

SELECTED MULTIPLE MEANS COMPARISONS

Table 41. 'Other culture' questionnaire: ethnicity *social sensitivity multiple means comparisons

Dependent Variable: Social sensitivity						
Tukey HSD						
(I) Ethnicity	(J) Ethnicity	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Black	Coloured	-3.36216	1.29027	.218	-7.4680	.7436
	Asian	-3.80660	2.69339	.923	-12.3773	4.7641
	Indian	-2.49891*	.66056	.007	-4.6009	-.3969
	White	-3.28486*	.43907	.000	-4.6820	-1.8877
	Mixed Race	-4.55660	1.91339	.340	-10.6452	1.5320
	African	-.80660	2.69339	1.000	-9.3773	7.7641
Coloured	Black	3.36216	1.29027	.218	-.7436	7.4680
	Asian	-.44444	2.96371	1.000	-9.8753	8.9864
	Indian	.86325	1.40198	1.000	-3.5980	5.3245
	White	.07729	1.31225	1.000	-4.0984	4.2530
	Mixed Race	-1.19444	2.27822	1.000	-8.4440	6.0551
	African	2.55556	2.96371	.997	-6.8753	11.9864
Asian	Black	3.80660	2.69339	.923	-4.7641	12.3773
	Coloured	.44444	2.96371	1.000	-8.9864	9.8753
	Indian	1.30769	2.74865	1.000	-7.4388	10.0542
	White	.52174	2.70398	1.000	-8.0827	9.1261
	Mixed Race	-.75000	3.28326	1.000	-11.1977	9.6977
	African	3.00000	3.79119	.999	-9.0640	15.0640
Indian	Black	2.49891*	.66056	.007	.3969	4.6009
	Coloured	-.86325	1.40198	1.000	-5.3245	3.5980
	Asian	-1.30769	2.74865	1.000	-10.0542	7.4388
	White	-.78595	.70251	.983	-3.0214	1.4495
	Mixed Race	-2.05769	1.99043	.990	-8.3915	4.2761
	African	1.69231	2.74865	1.000	-7.0542	10.4388
White	Black	3.28486*	.43907	.000	1.8877	4.6820
	Coloured	-.07729	1.31225	1.000	-4.2530	4.0984
	Asian	-.52174	2.70398	1.000	-9.1261	8.0827
	Indian	.78595	.70251	.983	-1.4495	3.0214
	Mixed Race	-1.27174	1.92828	1.000	-7.4077	4.8643
	African	2.47826	2.70398	.996	-6.1261	11.0827
Mixed Race	Black	4.55660	1.91339	.340	-1.5320	10.6452
	Coloured	1.19444	2.27822	1.000	-6.0551	8.4440
	Asian	.75000	3.28326	1.000	-9.6977	11.1977
	Indian	2.05769	1.99043	.990	-4.2761	8.3915
	White	1.27174	1.92828	1.000	-4.8643	7.4077
	African	3.75000	3.28326	.980	-6.6977	14.1977
African	Black	.80660	2.69339	1.000	-7.7641	9.3773
	Coloured	-2.55556	2.96371	.997	-11.9864	6.8753
	Asian	-3.00000	3.79119	.999	-15.0640	9.0640
	Indian	-1.69231	2.74865	1.000	-10.4388	7.0542
	White	-2.47826	2.70398	.996	-11.0827	6.1261
	Mixed Race	-3.75000	3.28326	.980	-14.1977	6.6977

*. The mean difference is significant at the 0.05 level.
Ethnicities where n=1 were removed

In Table 41, it can be observed that there is a significant mean difference between those of White ethnic association and Black ethnic association. There is also a significant mean difference between Indian and Black ethnic associations. Both show Black participants having a significantly lower mean social sensitivity.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY HOME LANGUAGE

DESCRIPTIVE STATISTICS

Table 42. 'Other culture' questionnaire: home language *social sensitivity descriptive statistics

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Zulu	51	17.3529	4.65112	.65129	16.0448	18.6611	7.00	26.00
Setswana	23	18.3478	3.66319	.76383	16.7637	19.9319	11.00	26.00
Sesotho	40	18.1000	4.09377	.64728	16.7907	19.4093	10.00	25.00
Xhosa	17	17.5882	3.67524	.89138	15.6986	19.4779	11.00	23.00
Afrikaans	22	19.1818	2.82230	.60172	17.9305	20.4332	13.00	25.00
English	153	20.3529	2.70592	.21876	19.9207	20.7851	12.00	26.00
Sepedi	28	15.4643	4.84945	.91646	13.5839	17.3447	6.00	23.00
SiSwati	5	17.8000	3.56371	1.59374	13.3751	22.2249	12.00	21.00
Tsonga	12	17.1667	4.10838	1.18599	14.5563	19.7770	9.00	23.00
Venda	17	16.3529	3.98342	.96612	14.3049	18.4010	7.00	22.00
Ndebele	5	14.4000	4.15933	1.86011	9.2355	19.5645	8.00	18.00
Shona	8	18.2500	4.20034	1.48504	14.7384	21.7616	12.00	23.00
Other Asian Languages	2	20.0000	.00000	.00000	20.0000	20.0000	20.00	20.00
Other Caucasian Languages	2	23.0000	2.82843	2.00000	-2.4124	48.4124	21.00	25.00
Missing	9	15.8889	5.88312	1.96104	11.3667	20.4111	6.00	23.00
Double	9	18.8889	4.93570	1.64523	15.0950	22.6828	9.00	24.00
Total	403	18.5831	4.02046	.20027	18.1894	18.9768	6.00	26.00
Languages were further categorised based on origin, thereafter home languages where n=1 were removed								

Observations from Table 42 indicate lower mean scores for African languages.

ONE-WAY ANOVA

Table 43. 'Other culture' questionnaire: home language *social sensitivity one-way ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1173.378	15	78.225	5.686	.000
Within Groups	5324.587	387	13.759		
Total	6497.965	402			
Languages were further categorised based on origin, thereafter home languages where n=1 were removed					

Table 43 shows that the mean differences between home languages is significant.

SELECTED MULTIPLE COMPARISONS

Table 44. 'Other culture' questionnaire: home language *social sensitivity multiple means comparisons

Dependent Variable: Social sensitivity						
Tukey HSD						
(I) Home language	(J) Home language	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Zulu	Setswana	-.99488	.93165	1.000	-4.2081	2.2183
	Sesotho	-.74706	.78342	1.000	-3.4490	1.9549
	Xhosa	-.23529	1.03880	1.000	-3.8180	3.3474
	Afrikaans	-1.82888	.94613	.859	-5.0920	1.4342
	English	-3.00000*	.59975	.000	-5.0685	-.9315
	Sepedi	1.88866	.87244	.721	-1.1203	4.8976
	SiSwati	-.44706	1.73825	1.000	-6.4421	5.5480
	Tsonga	.18627	1.19010	1.000	-3.9183	4.2908
	Venda	1.00000	1.03880	1.000	-2.5827	4.5827
	Ndebele	2.95294	1.73825	.946	-3.0421	8.9480
	Shona	-.89706	1.41053	1.000	-5.7619	3.9677
	Other Asian Languages	-2.64706	2.67378	1.000	-11.8687	6.5745
	Other Caucasian Languages	-5.64706	2.67378	.756	-14.8687	3.5745
Afrikaans	Zulu	1.82888	.94613	.859	-1.4342	5.0920
	Setswana	.83399	1.10616	1.000	-2.9811	4.6490
	Sesotho	1.08182	.98456	.999	-2.3138	4.4775
	Xhosa	1.59358	1.19780	.995	-2.5375	5.7247
	English	-1.17112	.84576	.992	-4.0881	1.7458
	Sepedi	3.71753*	1.05677	.040	.0728	7.3622
	SiSwati	1.38182	1.83769	1.000	-4.9562	7.7198
	Tsonga	2.01515	1.33114	.980	-2.5758	6.6061
	Venda	2.82888	1.19780	.578	-1.3022	6.9600
	Ndebele	4.78182	1.83769	.400	-1.5562	11.1198
	Shona	.93182	1.53141	1.000	-4.3499	6.2135
	Other Asian Languages	-.81818	2.73947	1.000	-10.2664	8.6300
	Other Caucasian	-3.81818	2.73947	.991	-13.2664	5.6300

	Languages					
English	Zulu	3.00000*	.59975	.000	.9315	5.0685
	Setswana	2.00512	.82953	.536	-.8559	4.8661
	Sesotho	2.25294	.65870	.055	-.0189	4.5247
	Xhosa	2.76471	.94829	.212	-.5059	6.0353
	Afrikaans	1.17112	.84576	.992	-1.7458	4.0881
	Sepedi	4.88866*	.76243	.000	2.2591	7.5182
	SiSwati	2.55294	1.68572	.980	-3.2609	8.3668
	Tsonga	3.18627	1.11197	.238	-.6488	7.0214
	Venda	4.00000*	.94829	.003	.7294	7.2706
	Ndebele	5.95294*	1.68572	.039	.1391	11.7668
	Shona	2.10294	1.34527	.974	-2.5368	6.7427
	Other Asian Languages	.35294	2.63993	1.000	-8.7519	9.4578
	Other Caucasian Languages	-2.64706	2.63993	1.000	-11.7519	6.4578
Sepedi	Zulu	-1.88866	.87244	.721	-4.8976	1.1203
	Setswana	-2.88354	1.04383	.296	-6.4836	.7165
	Sesotho	-2.63571	.91397	.228	-5.7879	.5165
	Xhosa	-2.12395	1.14049	.891	-6.0574	1.8095
	Afrikaans	-3.71753*	1.05677	.040	-7.3622	-.0728
	English	-4.88866*	.76243	.000	-7.5182	-2.2591
	SiSwati	-2.33571	1.80086	.996	-8.5467	3.8753
	Tsonga	-1.70238	1.27982	.995	-6.1163	2.7116
	Venda	-.88866	1.14049	1.000	-4.8221	3.0448
	Ndebele	1.06429	1.80086	1.000	-5.1467	7.2753
	Shona	-2.78571	1.48701	.886	-7.9143	2.3429
	Other Asian Languages	-4.53571	2.71490	.953	-13.8991	4.8277
	Other Caucasian Languages	-7.53571	2.71490	.288	-16.8991	1.8277
Venda	Zulu	-1.00000	1.03880	1.000	-4.5827	2.5827
	Setswana	-1.99488	1.18639	.951	-6.0866	2.0969
	Sesotho	-1.74706	1.07392	.963	-5.4509	1.9568
	Xhosa	-1.23529	1.27227	1.000	-5.6232	3.1526
	Afrikaans	-2.82888	1.19780	.578	-6.9600	1.3022
	English	-4.00000*	.94829	.003	-7.2706	-.7294
	Sepedi	.88866	1.14049	1.000	-3.0448	4.8221
	SiSwati	-1.44706	1.88708	1.000	-7.9554	5.0613
	Tsonga	-.81373	1.39853	1.000	-5.6371	4.0097
	Ndebele	1.95294	1.88708	1.000	-4.5554	8.4613
	Shona	-1.89706	1.59033	.998	-7.3820	3.5878
	Other Asian Languages	-3.64706	2.77284	.995	-13.2103	5.9162
	Other Caucasian Languages	-6.64706	2.77284	.551	-16.2103	2.9162
Ndebele	Zulu	-2.95294	1.73825	.946	-8.9480	3.0421
	Setswana	-3.94783	1.83028	.727	-10.2603	2.3646
	Sesotho	-3.70000	1.75946	.762	-9.7682	2.3682
	Xhosa	-3.18824	1.88708	.949	-9.6966	3.3201
	Afrikaans	-4.78182	1.83769	.400	-11.1198	1.5562
	English	-5.95294*	1.68572	.039	-11.7668	-.1391
	Sepedi	-1.06429	1.80086	1.000	-7.2753	5.1467
	SiSwati	-3.40000	2.34594	.987	-11.4909	4.6909
	Tsonga	-2.76667	1.97441	.991	-9.5762	4.0429
	Venda	-1.95294	1.88708	1.000	-8.4613	4.5554
	Shona	-3.85000	2.11460	.908	-11.1431	3.4431

	Other Asian Languages	-5.60000	3.10339	.914	-16.3033	5.1033
	Other Caucasian Languages	-8.60000	3.10339	.290	-19.3033	2.1033
*. The mean difference is significant at the 0.05 level. Languages were further categorised based on origin, thereafter home languages where n=1 were removed						

The above tables show a significant difference between both ethnic groups and home language and the dependent variable social sensitivity. For ethnic groups, the biggest difference occurring between people who associated themselves with White and people who associated themselves with Black. There was also a significant difference between those who associated themselves with Indian and people who identified with Black. The most substantial difference occurring amongst home languages was between English and Zulu, with further significant difference with a few other African languages (see Table 44). This suggests the culture is significant to social sensitivity.

4.7.2.2 Gender Variations

One-way ANOVA tests were used to determine whether a person's gender affects his or her social sensitivity scores.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY GENDER

DESCRIPTIVE STATISTICS

Table 45. 'Other culture' questionnaire: gender *social sensitivity descriptive statistics

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Male	163	17.6933	4.46569	.34978	17.0025	18.3840	6.00	26.00
Female	234	19.1709	3.64589	.23834	18.7014	19.6405	7.00	26.00
Missing	7	18.0000	3.91578	1.48003	14.3785	21.6215	12.00	23.00
Total	404	18.5545	4.05661	.20182	18.1577	18.9512	6.00	26.00

Table 45 shows that women have a higher mean social sensitivity than men.

ONE-WAY ANOVA

Table 46. 'Other culture' questionnaire: gender *social sensitivity one-way ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	211.977	2	105.989	6.620	.001
Within Groups	6419.825	401	16.010		
Total	6631.802	403			

Table 46 presents significant mean differences between gender groups.

SELECTED MULTIPLE MEANS COMPARISONS

Table 47. 'Other culture' questionnaire: gender *social sensitivity multiple means comparisons

Dependent Variable: Social sensitivity						
Tukey HSD						
(I) Gender	(J) Gender	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	Female	-1.47769*	.40821	.001	-2.4380	-.5174
Female	Male	1.47769*	.40821	.001	.5174	2.4380
*. The mean difference is significant at the 0.05 level.						

Table 47 displays a significant mean difference between men and women, where women score higher than men on the social sensitivity instrument.

TWO-WAY ANOVA

The below analysis presents an assessment of how a person's culture potentially influences gender differences.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY ETHNICITY AND GENDER

AFRICAN ETHNICITY

Table 48. 'Other culture' questionnaire: gender *African*social sensitivity descriptive statistics

Descriptive Statistics				
Dependent Variable: Social sensitivity				
Gender	Ethnicity	Mean	Std. Deviation	N
Male	Other	20.3704	2.84370	54
	African ethnicity	16.2376	4.62850	101
	Total	17.6774	4.53834	155
Female	Other	20.3136	2.68805	118
	African ethnicity	18.0619	4.14747	113
	Total	19.2121	3.65026	231
Total	Other	20.3314	2.72964	172
	African ethnicity	17.2009	4.46497	214
	Total	18.5959	4.09464	386

Table 48 shows that both men and women participants who speak an African language at home performed lower on the social sensitivity instrument.

Table 49. 'Other culture' questionnaire: gender *African*social sensitivity two-way ANOVA

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1112.099	3	370.700	26.504	.000
Intercept	122913.809	1	122913.809	8788.013	.000
Gender	68.296	1	68.296	4.883	.028
African ethnicity	891.054	1	891.054	63.708	.000
Gender * African ethnicity	77.359	1	77.359	5.531	.019
Error	5342.854	382	13.987		
Total	139936.000	386			
Corrected Total	6454.953	385			
a. R Squared = .172 (Adjusted R Squared = .166)					

Figure 14. 'Other culture' questionnaire: gender *African*social sensitivity comparisons

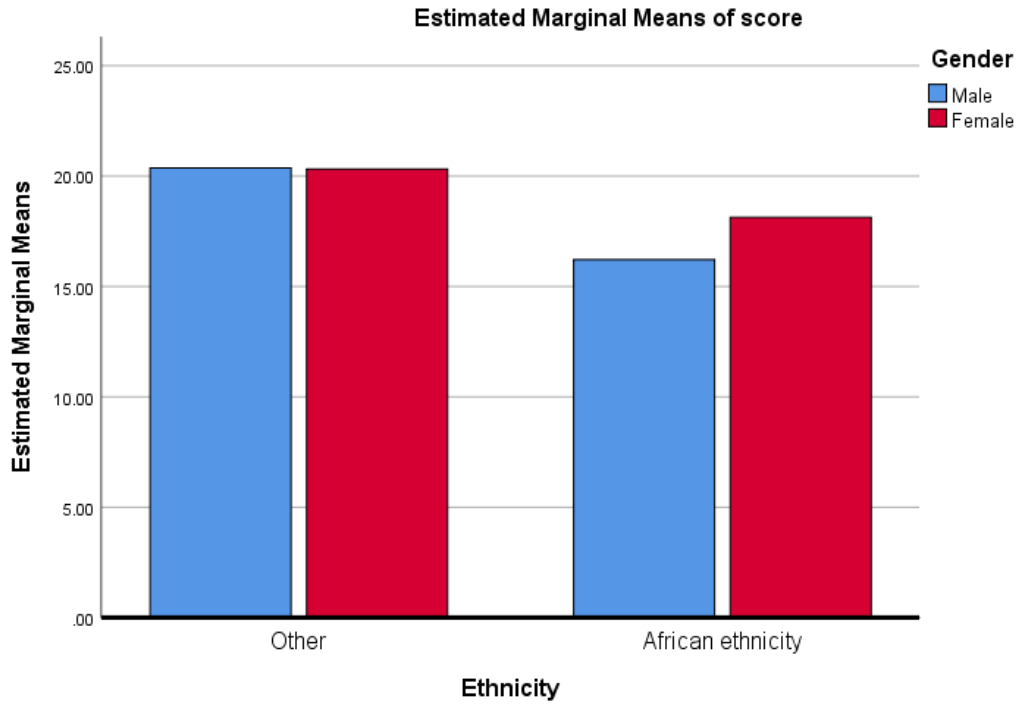


Table 49 and Figure 14 suggests that the gender difference in social sensitivity is specific to those of African ethnicity for the 'Other culture' instrument. It appears that only African females have a social sensitivity advantage over their male counterparts.

CAUCASIAN ETHNICITY

Table 50. 'Other culture' questionnaire: gender *Caucasian*social sensitivity two-way ANOVA

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	796.969	3	265.656	17.936	.000
Intercept	106263.630	1	106263.630	7174.412	.000
Gender	53.316	1	53.316	3.600	.059
Caucasian ethnicity	577.367	1	577.367	38.981	.000
Gender * Caucasian ethnicity	65.382	1	65.382	4.414	.036
Error	5657.984	382	14.811		
Total	139936.000	386			
Corrected Total	6454.953	385			
a. R Squared = .123 (Adjusted R Squared = .117)					

Figure 15. 'Other culture' questionnaire: gender * Caucasian *social sensitivity comparisons

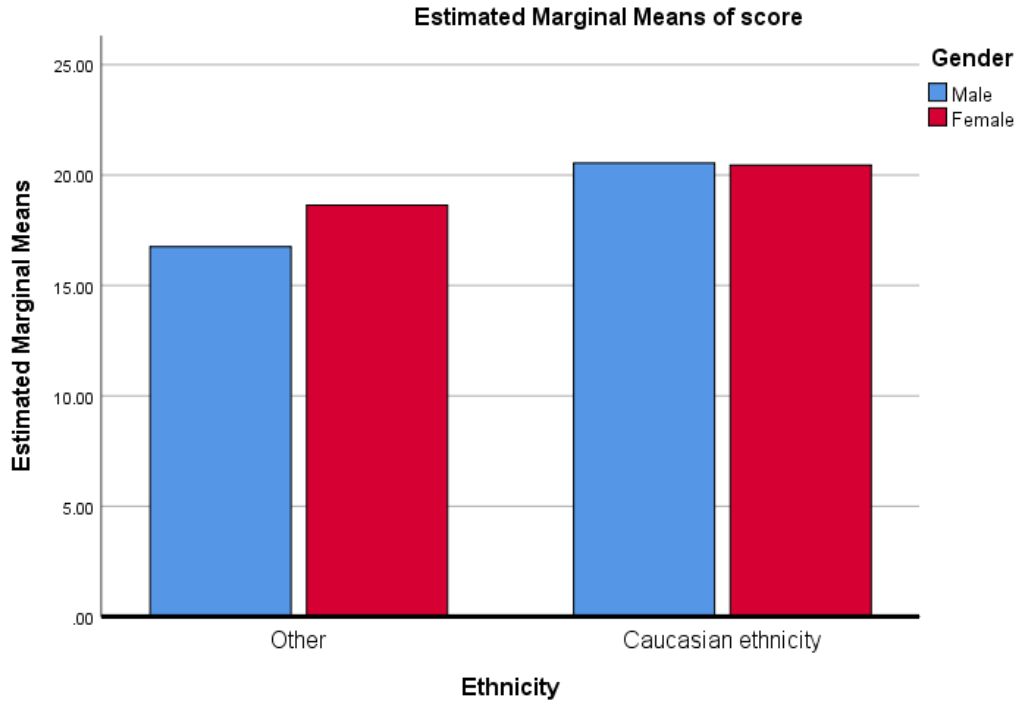


Table 50 and Figure 15 indicates that the gender differences or lack thereof, is specific to White ethnic groups. There is a female social sensitivity advantage, but not for those who associate with being White.

OTHER CULTURE ETHNICITY

Table 51. 'Other culture' questionnaire: gender * 'Other culture'*social sensitivity

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	355.440	3	118.480	7.420	.000
Intercept	60732.532	1	60732.532	3803.554	.000
Gender	29.845	1	29.845	1.869	.172
Other culture ethnicity	136.225	1	136.225	8.531	.004
Gender * Other culture ethnicity	26.428	1	26.428	1.655	.199
Error	6099.513	382	15.967		
Total	139936.000	386			
Corrected Total	6454.953	385			
a. R Squared = .055 (Adjusted R Squared = .048)					

Figure 16. 'Other culture' questionnaire: gender * 'Other culture' *social sensitivity comparisons



Table 51 and Figure 16 indicates that the gender differences or lack thereof, is not specific to 'Other culture' (such as Asian and Indian) ethnic groups. There is a female social sensitivity advantage for other cultures, but this does not reach a significant level as with Caucasian ethnicities.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY HOME LANGUAGE AND GENDER

AFRICAN LANGUAGES

Table 52. 'Other culture' questionnaire: gender *African languages*social sensitivity two-way ANOVA

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1000.358[a]	3	333.453	25.181	.000
Intercept	127557.305	1	127557.305	9632.696	.000
Gender	59.793	1	59.793	4.515	.034
African languages	803.928	1	803.928	60.710	.000
Gender * African languages	78.307	1	78.307	5.914	.015
Error	5151.184	389	13.242		
Total	142829.000	393			
Corrected Total	6151.542	392			
a. R Squared = .163 (Adjusted R Squared = .156)					

Figure 17. 'Other culture' questionnaire: gender *African language*social sensitivity comparisons

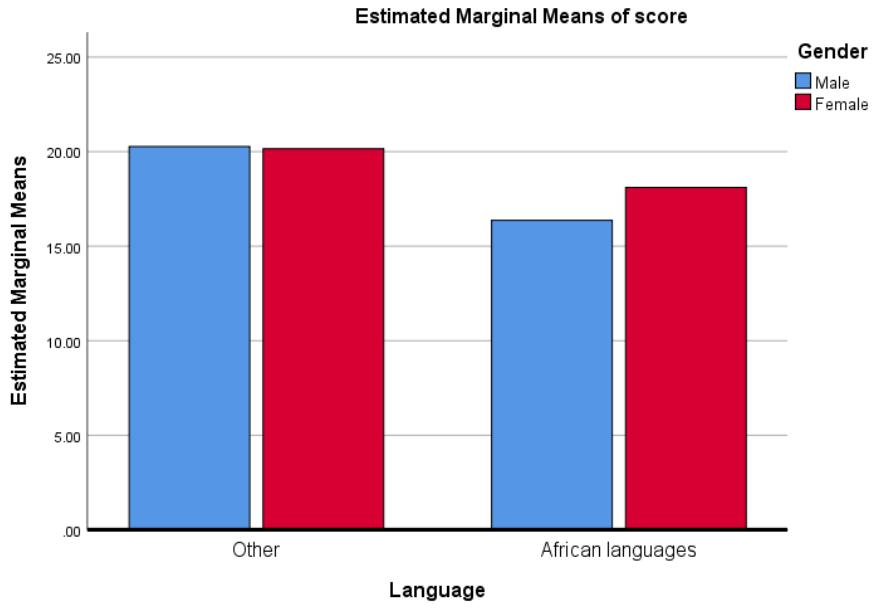


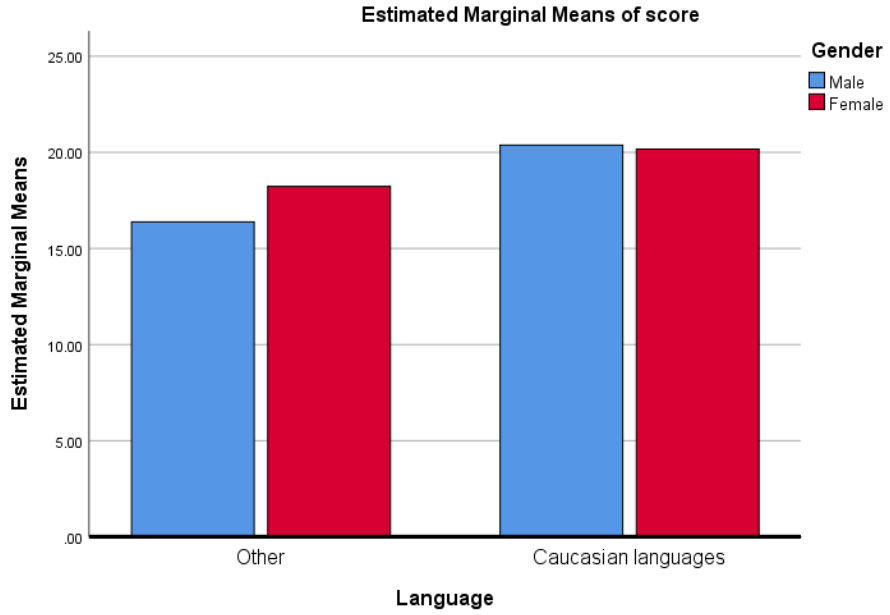
Table 52 and Figure 17 suggest that the observed gender differences are specific to those who speak an African language at home. Only women who speak an African language enjoy a significant social sensitivity advantage for the 'Other culture' questionnaire.

CAUCASIAN LANGUAGES

Table 53. 'Other culture' questionnaire: gender *Caucasian languages*social sensitivity two-way ANOVA

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	998.997[a]	3	332.999	25.140	.000
Intercept	127783.992	1	127783.992	9647.267	.000
Gender	60.862	1	60.862	4.595	.033
Caucasian languages	797.853	1	797.853	60.235	.000
Gender * Caucasian languages	96.253	1	96.253	7.267	.007
Error	5152.545	389	13.246		
Total	142829.000	393			
Corrected Total	6151.542	392			
a. R Squared = .162 (Adjusted R Squared = .156)					

Figure 18. 'Other culture' questionnaire: gender *Caucasian languages*social sensitivity comparisons



Similar to African languages scores, Table 45 and Figure 18 suggest that the observed gender differences, or lack thereof, is specific to those who speak a Caucasian language at home. Only women who speak a Caucasian home language fail to show significant social sensitivity advantage for the 'Other culture' questionnaire. The above concludes the analysis of the 'Other culture' instrument and the cultural and gender differences. The next section analyses the Caucasian instrument.

4.7.3 Caucasian Questionnaire

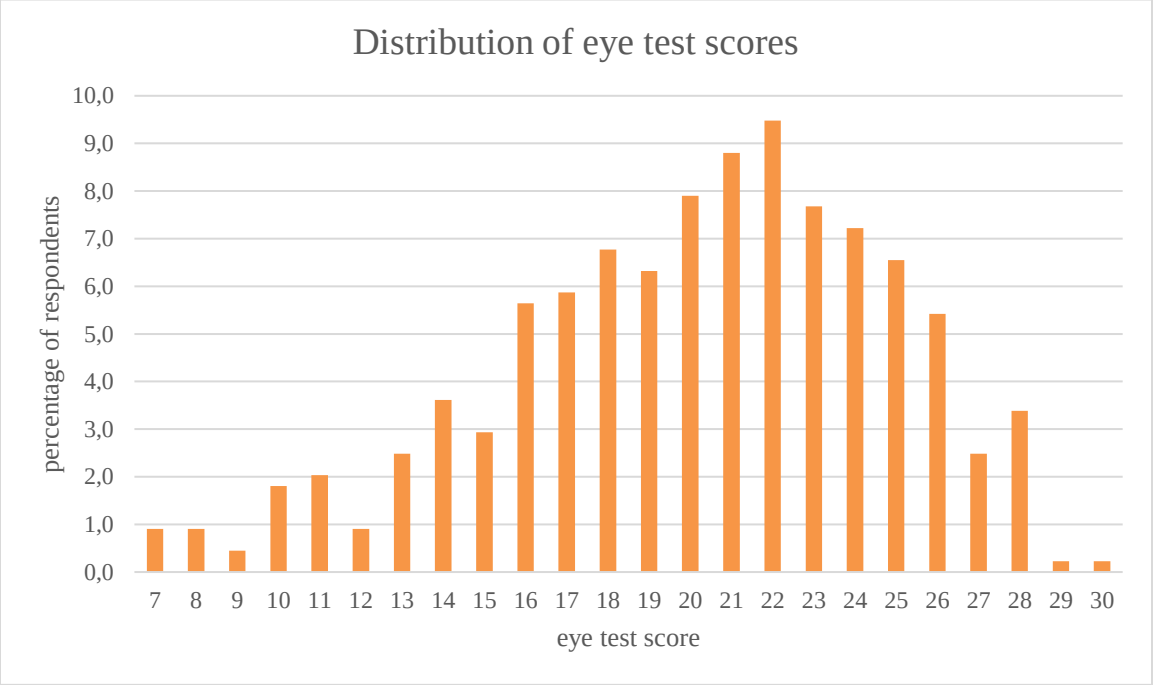


Figure 19. Distribution of social sensitivity scores: Caucasian questionnaire

Figure 19 shows that social sensitivity scores for the Caucasian questionnaire follow a relatively normal distribution. The distribution has a mean of 20.088 Standard Deviation of 4.70668, Skewness of -0.515 and Kurtosis of -0.126.

After determining that the scores follow a normal distribution, selected descriptive statistics, one-way ANOVA and two-way ANOVA tests were performed to see the variances between cultures and genders for social sensitivity.

4.7.3.1 Cultural Variations

As a proxy to determine whether a person's culture affects his or her social sensitivity scores, one-way ANOVA tests were used for ethnicity and home language. The difference between social sensitivity means for ethnic groups is presented first followed by home language.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY ETHNICITY

DESCRIPTIVE STATISTICS

Table 54. Caucasian questionnaire: ethnicity *social sensitivity descriptive statistics

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Black	238	18.5840	4.55525	.29527	18.0023	19.1657	7.00	28.00
Coloured	17	21.9412	2.46147	.59699	20.6756	23.2067	17.00	25.00
Asian	5	20.6000	4.03733	1.80555	15.5870	25.6130	16.00	27.00
Indian	65	22.2462	3.88519	.48190	21.2835	23.2089	7.00	28.00
White	81	22.9012	3.59376	.39931	22.1066	23.6959	8.00	30.00
Prefer not to say	8	21.1250	5.05505	1.78723	16.8989	25.3511	14.00	28.00
Mixed Race	2	27.0000	1.41421	1.00000	14.2938	39.7062	26.00	28.00
African	5	12.6000	3.36155	1.50333	8.4261	16.7739	9.00	17.00
missing	12	18.5833	4.20948	1.21517	15.9088	21.2579	11.00	25.00
Double	4	15.2500	4.57347	2.28674	7.9726	22.5274	10.00	21.00
Total	437	20.0686	4.69480	.22458	19.6273	20.5100	7.00	30.00
Ethnicities where n=1 were removed								

Table 54 repeats the pattern of lower mean social sensitivity scores for those of Black ethnicity.

ONE-WAY ANOVA

Table 55. Caucasian questionnaire: ethnicity *social sensitivity one-way ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2046.967	9	227.441	12.841	.000
Within Groups	7562.974	427	17.712		
Total	9609.941	436			
Ethnicities where n=1 were removed					

Table 55 confirms a significant difference between mean social sensitivity scores across ethnic groups.

SELECTED MULTIPLE MEAN COMPARISONS

Table 56. Caucasian questionnaire: ethnicity *social sensitivity selected multiple mean comparisons

Dependent Variable: Social sensitivity						
Tukey HSD						
(I) Ethnicity	(J) Ethnicity	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Black	Coloured	-3.35714	1.05655	.050	-6.7176	.0033
	Asian	-2.01597	1.90179	.988	-8.0647	4.0328
	Indian	-3.66212*	.58899	.000	-5.5354	-1.7888
	White	-4.31720*	.54137	.000	-6.0391	-2.5953
	Mixed Race	-8.41597	2.98837	.134	-17.9207	1.0887
	African	5.98403	1.90179	.055	-.0647	12.0328
Coloured	Black	3.35714	1.05655	.050	-.0033	6.7176
	Asian	1.34118	2.14109	1.000	-5.4687	8.1510
	Indian	-.30498	1.14646	1.000	-3.9514	3.3414
	White	-.96006	1.12274	.998	-4.5310	2.6109
	Mixed Race	-5.05882	3.14608	.844	-15.0651	4.9475
	African	9.34118*	2.14109	.001	2.5313	16.1510
Asian	Black	2.01597	1.90179	.988	-4.0328	8.0647
	Coloured	-1.34118	2.14109	1.000	-8.1510	5.4687
	Indian	-1.64615	1.95317	.998	-7.8583	4.5660
	White	-2.30123	1.93934	.974	-8.4694	3.8670
	Mixed Race	-6.40000	3.52112	.724	-17.5991	4.7991
	African	8.00000	2.66172	.082	-.4658	16.4658
Indian	Black	3.66212*	.58899	.000	1.7888	5.5354
	Coloured	.30498	1.14646	1.000	-3.3414	3.9514
	Asian	1.64615	1.95317	.998	-4.5660	7.8583
	White	-.65508	.70083	.995	-2.8841	1.5739
	Mixed Race	-4.75385	3.02133	.860	-14.3634	4.8557
	African	9.64615*	1.95317	.000	3.4340	15.8583
White	Black	4.31720*	.54137	.000	2.5953	6.0391
	Coloured	.96006	1.12274	.998	-2.6109	4.5310
	Asian	2.30123	1.93934	.974	-3.8670	8.4694
	Indian	.65508	.70083	.995	-1.5739	2.8841
	Mixed Race	-4.09877	3.01241	.938	-13.6799	5.4824
	African	10.30123*	1.93934	.000	4.1330	16.4694
Mixed Race	Black	8.41597	2.98837	.134	-1.0887	17.9207
	Coloured	5.05882	3.14608	.844	-4.9475	15.0651
	Asian	6.40000	3.52112	.724	-4.7991	17.5991
	Indian	4.75385	3.02133	.860	-4.8557	14.3634
	White	4.09877	3.01241	.938	-5.4824	13.6799
	African	14.40000*	3.52112	.002	3.2009	25.5991
African	Black	-5.98403	1.90179	.055	-12.0328	.0647
	Coloured	-9.34118*	2.14109	.001	-16.1510	-2.5313
	Asian	-8.00000	2.66172	.082	-16.4658	.4658
	Indian	-9.64615*	1.95317	.000	-15.8583	-3.4340
	White	-10.30123*	1.93934	.000	-16.4694	-4.1330
	Mixed Race	-14.40000*	3.52112	.002	-25.5991	-3.2009

*. The mean difference is significant at the 0.05 level.
Ethnicities where n=1 were removed

Table 56 further clarifies mean differences across ethnicities, presenting that significant mean differences are observed between African ethnic groups, and White and Indian ethnic groups. White and Indian participants have a significantly higher social sensitivity mean.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY HOME LANGUAGE

DESCRIPTIVE STATISTICS

Table 57. Caucasian questionnaire: home languages *social sensitivity descriptive statistics

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Zulu	57	18.4386	5.25771	.69640	17.0435	19.8337	7.00	28.00
Setswana	28	19.0357	4.03211	.76200	17.4722	20.5992	11.00	26.00
Sesotho	24	18.5417	4.21157	.85968	16.7633	20.3201	7.00	26.00
Xhosa	25	20.2800	4.30620	.86124	18.5025	22.0575	8.00	28.00
Afrikaans	10	24.0000	2.05480	.64979	22.5301	25.4699	21.00	28.00
English	158	22.4304	3.70637	.29486	21.8480	23.0128	8.00	30.00
Sepedi	33	17.8788	5.05444	.87986	16.0866	19.6710	7.00	26.00
SiSwati	6	18.0000	2.82843	1.15470	15.0317	20.9683	14.00	22.00
Tsonga	16	17.8750	4.19325	1.04831	15.6406	20.1094	10.00	25.00
Venda	12	14.6667	3.22866	.93203	12.6153	16.7181	10.00	21.00
Ndebele	3	19.0000	1.00000	.57735	16.5159	21.4841	18.00	20.00
Shona	17	18.1765	4.26080	1.03340	15.9858	20.3672	12.00	26.00
Other African Languages	4	21.5000	2.64575	1.32288	17.2900	25.7100	18.00	24.00
Other Asian Languages	7	19.2857	6.01981	2.27527	13.7183	24.8531	9.00	25.00
Other Caucasian Languages	9	20.5556	3.74537	1.24846	17.6766	23.4345	16.00	27.00
missing	16	17.1250	4.51479	1.12870	14.7192	19.5308	11.00	25.00
Double	18	20.7222	5.21091	1.22822	18.1309	23.3135	10.00	28.00
Total	443	20.0880	4.70668	.22362	19.6485	20.5275	7.00	30.00
Languages were further categorised based on origin, thereafter home languages where n=1 were removed								

Table 57 shows a relatively lower social sensitivity scores for non-English speaking home languages.

ONE-WAY ANOVA

Table 58. Caucasian questionnaire: home languages *social sensitivity one-way ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2110.420	16	131.901	7.315	.000
Within Groups	7681.146	426	18.031		
Total	9791.567	442			
Languages were further categorised based on origin, thereafter home languages where n=1 were removed					

Confirming observations from Table 57, Table 58 gives a significant value for mean differences.

SELECTED MULTIPLE MEAN COMPARISONS

Table 59. Caucasian questionnaire: home languages *social sensitivity multiple mean comparisons

Dependent Variable: Social sensitivity						
Tukey HSD						
(I) Home language	(J) Home language	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Zulu	Setswana	-.59712	.97994	1.000	-4.0070	2.8128
	Sesotho	-.10307	1.03326	1.000	-3.6985	3.4924
	Xhosa	-1.84140	1.01861	.928	-5.3859	1.7031
	Afrikaans	-5.56140*	1.45582	.016	-10.6272	-.4956
	English	-3.99178*	.65609	.000	-6.2748	-1.7088
	Sepedi	.55981	.92883	1.000	-2.6722	3.7919
	SiSwati	.43860	1.82249	1.000	-5.9031	6.7803
	Tsonga	.56360	1.20136	1.000	-3.6168	4.7440
	Venda	3.77193	1.34867	.297	-.9210	8.4649
	Ndebele	-.56140	2.51528	1.000	-9.3138	8.1910
	Shona	.26213	1.17344	1.000	-3.8211	4.3454
	Other African Languages	-3.06140	2.19637	.994	-10.7041	4.5813
	Other Asian Languages	-.84712	1.70064	1.000	-6.7648	5.0706
	Other Caucasian Languages	-2.11696	1.52308	.994	-7.4168	3.1829
Setswana	Zulu	.59712	.97994	1.000	-2.8128	4.0070
	Sesotho	.49405	1.18120	1.000	-3.6162	4.6043
	Xhosa	-1.24429	1.16842	1.000	-5.3100	2.8215
	Afrikaans	-4.96429	1.56430	.122	-10.4076	.4790
	English	-3.39467*	.87068	.012	-6.4244	-.3650
	Sepedi	1.15693	1.09103	1.000	-2.6395	4.9534
	SiSwati	1.03571	1.91026	1.000	-5.6114	7.6829
	Tsonga	1.16071	1.33075	1.000	-3.4699	5.7913
	Venda	4.36905	1.46510	.197	-.7291	9.4672
	Ndebele	.03571	2.57958	1.000	-8.9405	9.0119
	Shona	.85924	1.30560	1.000	-3.6839	5.4024

	Other African Languages	-2.46429	2.26973	1.000	-10.3623	5.4337
	Other Asian Languages	-.25000	1.79438	1.000	-6.4939	5.9939
	Other Caucasian Languages	-1.51984	1.62708	1.000	-7.1816	4.1419
Sesotho	Zulu	.10307	1.03326	1.000	-3.4924	3.6985
	Setswana	-.49405	1.18120	1.000	-4.6043	3.6162
	Xhosa	-1.73833	1.21347	.992	-5.9609	2.4842
	Afrikaans	-5.45833	1.59824	.061	-11.0197	.1031
	English	-3.88871*	.93027	.004	-7.1258	-.6516
	Sepedi	.66288	1.13916	1.000	-3.3010	4.6268
	SiSwati	.54167	1.93815	1.000	-6.2025	7.2859
	Tsonga	.66667	1.37048	1.000	-4.1022	5.4355
	Venda	3.87500	1.50129	.443	-1.3490	9.0990
	Ndebele	-.45833	2.60030	1.000	-9.5066	8.5900
	Shona	.36520	1.34608	1.000	-4.3188	5.0492
	Other African Languages	-2.95833	2.29325	.997	-10.9382	5.0215
	Other Asian Languages	-.74405	1.82404	1.000	-7.0912	5.6031
	Other Caucasian Languages	-2.01389	1.65973	.999	-7.7893	3.7615
Xhosa	Zulu	1.84140	1.01861	.928	-1.7031	5.3859
	Setswana	1.24429	1.16842	1.000	-2.8215	5.3100
	Sesotho	1.73833	1.21347	.992	-2.4842	5.9609
	Afrikaans	-3.72000	1.58881	.624	-9.2486	1.8086
	English	-2.15038	.91398	.615	-5.3308	1.0300
	Sepedi	2.40121	1.12589	.771	-1.5165	6.3190
	SiSwati	2.28000	1.93038	.999	-4.4372	8.9972
	Tsonga	2.40500	1.35947	.940	-2.3256	7.1356
	Venda	5.61333*	1.49124	.019	.4242	10.8024
	Ndebele	1.28000	2.59452	1.000	-7.7482	10.3082
	Shona	2.10353	1.33487	.979	-2.5414	6.7485
	Other African Languages	-1.22000	2.28669	1.000	-9.1770	6.7370
	Other Asian Languages	.99429	1.81578	1.000	-5.3241	7.3127
	Other Caucasian Languages	-.27556	1.65066	1.000	-6.0194	5.4682
Afrikaans	Zulu	5.56140*	1.45582	.016	.4956	10.6272
	Setswana	4.96429	1.56430	.122	-.4790	10.4076
	Sesotho	5.45833	1.59824	.061	-.1031	11.0197
	Xhosa	3.72000	1.58881	.624	-1.8086	9.2486
	English	1.56962	1.38463	.999	-3.2485	6.3877
	Sepedi	6.12121*	1.53280	.008	.7875	11.4549
	SiSwati	6.00000	2.19277	.335	-1.6302	13.6302
	Tsonga	6.12500*	1.71173	.036	.1687	12.0813
	Venda	9.33333*	1.81815	.000	3.0067	15.6600
	Ndebele	5.00000	2.79524	.934	-4.7266	14.7266
	Shona	5.82353	1.69225	.056	-.0650	11.7121
	Other African Languages	2.50000	2.51213	1.000	-6.2415	11.2415
	Other Asian Languages	4.71429	2.09259	.689	-2.5673	11.9959
	Other Caucasian Languages	3.44444	1.95103	.941	-3.3446	10.2335
English	Zulu	3.99178*	.65609	.000	1.7088	6.2748

	Setswana	3.39467*	.87068	.012	.3650	6.4244
	Sesotho	3.88871*	.93027	.004	.6516	7.1258
	Xhosa	2.15038	.91398	.615	-1.0300	5.3308
	Afrikaans	-1.56962	1.38463	.999	-6.3877	3.2485
	Sepedi	4.55159*	.81272	.000	1.7236	7.3796
	SiSwati	4.43038	1.76614	.497	-1.7153	10.5760
	Tsonga	4.55538*	1.11402	.006	.6789	8.4319
	Venda	7.76371*	1.27149	.000	3.3393	12.1881
	Ndebele	3.43038	2.47475	.994	-5.1810	12.0418
	Shona	4.25391*	1.08386	.011	.4824	8.0254
	Other African Languages	.93038	2.14985	1.000	-6.5505	8.4112
	Other Asian Languages	3.14467	1.64011	.887	-2.5624	8.8518
	Other Caucasian Languages	1.87482	1.45518	.997	-3.1888	6.9384
Sepedi	Zulu	-.55981	.92883	1.000	-3.7919	2.6722
	Setswana	-1.15693	1.09103	1.000	-4.9534	2.6395
	Sesotho	-.66288	1.13916	1.000	-4.6268	3.3010
	Xhosa	-2.40121	1.12589	.771	-6.3190	1.5165
	Afrikaans	-6.12121*	1.53280	.008	-11.4549	-.7875
	English	-4.55159*	.81272	.000	-7.3796	-1.7236
	SiSwati	-.12121	1.88455	1.000	-6.6789	6.4365
	Tsonga	.00379	1.29357	1.000	-4.4974	4.5050
	Venda	3.21212	1.43142	.695	-1.7688	8.1930
	Ndebele	-1.12121	2.56060	1.000	-10.0314	7.7889
	Shona	-.29768	1.26769	1.000	-4.7089	4.1135
	Other African Languages	-3.62121	2.24813	.974	-11.4441	4.2016
	Other Asian Languages	-1.40693	1.76698	1.000	-7.5555	4.7417
	Other Caucasian Languages	-2.67677	1.59682	.962	-8.2332	2.8797
Tsonga	Zulu	-.56360	1.20136	1.000	-4.7440	3.6168
	Setswana	-1.16071	1.33075	1.000	-5.7913	3.4699
	Sesotho	-.66667	1.37048	1.000	-5.4355	4.1022
	Xhosa	-2.40500	1.35947	.940	-7.1356	2.3256
	Afrikaans	-6.12500*	1.71173	.036	-12.0813	-.1687
	English	-4.55538*	1.11402	.006	-8.4319	-.6789
	Sepedi	-.00379	1.29357	1.000	-4.5050	4.4974
	SiSwati	-.12500	2.03275	1.000	-7.1984	6.9484
	Venda	3.20833	1.62157	.858	-2.4343	8.8509
	Ndebele	-1.12500	2.67156	1.000	-10.4212	8.1712
	Shona	-.30147	1.47904	1.000	-5.4481	4.8452
	Other African Languages	-3.62500	2.37374	.984	-11.8849	4.6349
	Other Asian Languages	-1.41071	1.92426	1.000	-8.1066	5.2851
	Other Caucasian Languages	-2.68056	1.76928	.985	-8.8371	3.4760
Venda	Zulu	-3.77193	1.34867	.297	-8.4649	.9210
	Setswana	-4.36905	1.46510	.197	-9.4672	.7291
	Sesotho	-3.87500	1.50129	.443	-9.0990	1.3490
	Xhosa	-5.61333*	1.49124	.019	-10.8024	-.4242
	Afrikaans	-9.33333*	1.81815	.000	-15.6600	-3.0067
	English	-7.76371*	1.27149	.000	-12.1881	-3.3393
	Sepedi	-3.21212	1.43142	.695	-8.1930	1.7688

	SiSwati	-3.33333	2.12314	.979	-10.7212	4.0546
	Tsonga	-3.20833	1.62157	.858	-8.8509	2.4343
	Ndebele	-4.33333	2.74096	.978	-13.8711	5.2044
	Shona	-3.50980	1.60100	.731	-9.0808	2.0612
	Other African Languages	-6.83333	2.45159	.303	-15.3641	1.6975
	Other Asian Languages	-4.61905	2.01951	.664	-11.6463	2.4082
	Other Caucasian Languages	-5.88889	1.87243	.131	-12.4044	.6266
Shona	Zulu	-.26213	1.17344	1.000	-4.3454	3.8211
	Setswana	-.85924	1.30560	1.000	-5.4024	3.6839
	Sesotho	-.36520	1.34608	1.000	-5.0492	4.3188
	Xhosa	-2.10353	1.33487	.979	-6.7485	2.5414
	Afrikaans	-5.82353	1.69225	.056	-11.7121	.0650
	English	-4.25391*	1.08386	.011	-8.0254	-.4824
	Sepedi	.29768	1.26769	1.000	-4.1135	4.7089
	SiSwati	.17647	2.01638	1.000	-6.8399	7.1929
	Tsonga	.30147	1.47904	1.000	-4.8452	5.4481
	Venda	3.50980	1.60100	.731	-2.0612	9.0808
	Ndebele	-.82353	2.65912	1.000	-10.0765	8.4294
	Other African Languages	-3.32353	2.35974	.993	-11.5347	4.8877
	Other Asian Languages	-1.10924	1.90695	1.000	-7.7449	5.5264
	Other Caucasian Languages	-2.37908	1.75045	.995	-8.4701	3.7120

*. The mean difference is significant at the 0.05 level.
Languages were further categorised based on origin, thereafter home languages where n=1 were removed

The above tables show a significant difference between both ethnic groups and home language and the dependent variable social sensitivity. For ethnic groups, the biggest difference occurring between people who associated themselves with White and people who associated themselves with Black. There was also a significant difference between those who associated themselves with Indian and people who identified with black. There were substantial differences between English, Afrikaans and other African languages in Table 59. This suggests that culture is significant to social sensitivity.

4.7.3.2 Gender Variations

One-way ANOVA tests were used to determine whether a person's gender affects his or her social sensitivity scores.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY GENDER

DESCRIPTIVE STATISTICS

Table 60. Caucasian questionnaire: gender *social sensitivity descriptive statistics

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Male	195	18.7795	4.77726	.34211	18.1048	19.4542	7.00	28.00
Female	236	21.2331	4.38866	.28568	20.6702	21.7959	8.00	30.00
Missing	12	18.8333	3.99621	1.15361	16.2943	21.3724	11.00	25.00
Total	443	20.0880	4.70668	.22362	19.6485	20.5275	7.00	30.00

Men appear to have a lower social sensitivity than women in Table 60.

ONE-WAY ANOVA

Table 61. Caucasian questionnaire: gender *social sensitivity one-way ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	662.200	2	331.100	15.958	.000
Within Groups	9129.367	440	20.749		
Total	9791.567	442			

The one-way ANOVA in Table 61 confirms that a significant social sensitivity mean difference is evident in the current sample.

SELECTED MULTIPLE COMPARISONS

Table 62. Caucasian questionnaire: gender *social sensitivity multiple mean comparisons

Dependent Variable: Social sensitivity						
Tukey HSD						
(I) Gender	(J) Gender	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	Female	-2.45356*	.44082	.000	-3.4902	-1.4169
Female	Male	2.45356*	.44082	.000	1.4169	3.4902
*. The mean difference is significant at the 0.05 level.						

Table 62 shows that, on average, women score 2.45 units higher on the social sensitivity instrument.

TWO-WAY ANOVA

The below analysis presents an assessment of how a person's culture potentially influences gender differences.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY ETHNICITY AND GENDER

AFRICAN ETHNICITY

Table 63. Caucasian questionnaire: gender *African*social sensitivity descriptive statistics

Descriptive Statistics				
Dependent Variable: Social sensitivity				
Gender	Ethnicity	Mean	Std. Deviation	N
Male	Other	21.3649	3.94335	74
	African Ethnicity	17.1709	4.61872	117
	Total	18.7958	4.81611	191
Female	Other	23.0099	3.67558	101
	African Ethnicity	19.7360	4.31267	125
	Total	21.1991	4.34922	226
Total	Other	22.3143	3.86683	175
	African Ethnicity	18.4959	4.63546	242
	Total	20.0983	4.71826	417

Table 63 shows that both men and women participants who speak an African language at home performed lower on the social sensitivity instrument.

Table 64. Caucasian questionnaire: gender *African*social sensitivity

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1993.961	3	664.654	37.774	.000
Intercept	165326.970	1	165326.970	9395.894	.000
Gender	443.549	1	443.549	25.208	.000
African ethnicity	1395.553	1	1395.553	79.312	.000
Gender * African ethnicity	21.181	1	21.181	1.204	.273
Error	7267.008	413	17.596		
Total	177705.000	417			
Corrected Total	9260.969	416			
a. R Squared = .215 (Adjusted R Squared = .210)					

Figure 20. Caucasian questionnaire: gender *African*social sensitivity comparisons

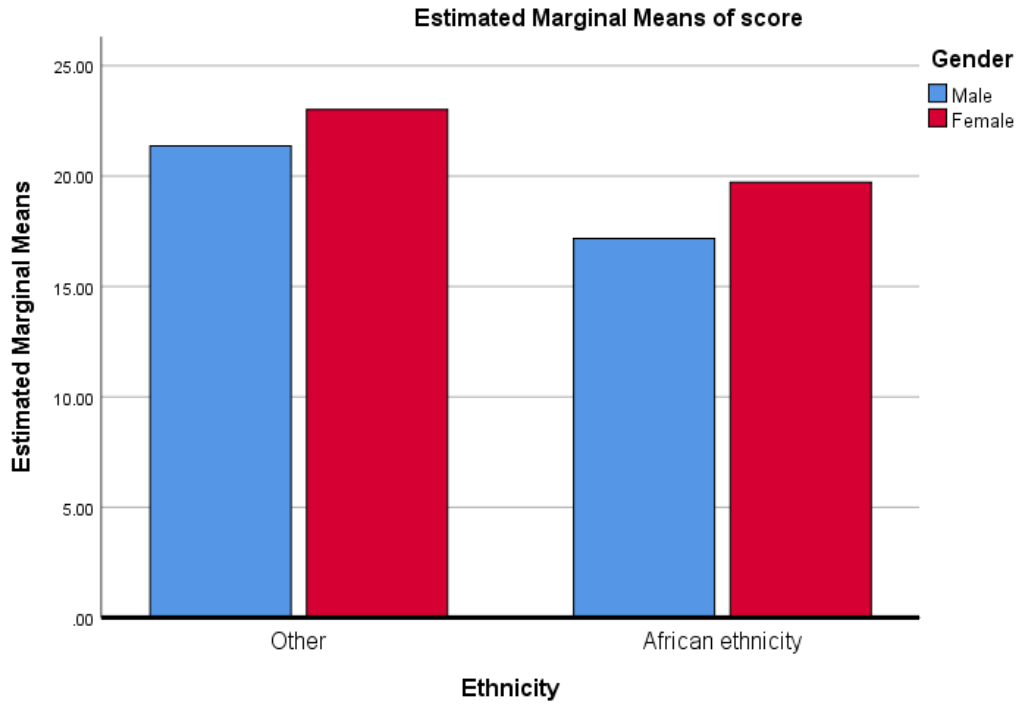


Table 64 and Figure 20 suggest that the gender differences are not only observed amongst those of an African ethnicity.

CAUCASIAN ETHNICITY

Table 65. Caucasian questionnaire: gender *Caucasian*social sensitivity

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1408.012	3	469.337	24.683	.000
Intercept	115106.462	1	115106.462	6053.640	.000
Gender	270.464	1	270.464	14.224	.000
Caucasian ethnicity	804.980	1	804.980	42.335	.000
Gender * Caucasian ethnicity	22.031	1	22.031	1.159	.282
Error	7852.956	413	19.014		
Total	177705.000	417			
Corrected Total	9260.969	416			
a. R Squared = .152 (Adjusted R Squared = .146)					

Figure 21. Caucasian questionnaire: gender *Caucasian*social sensitivity comparisons

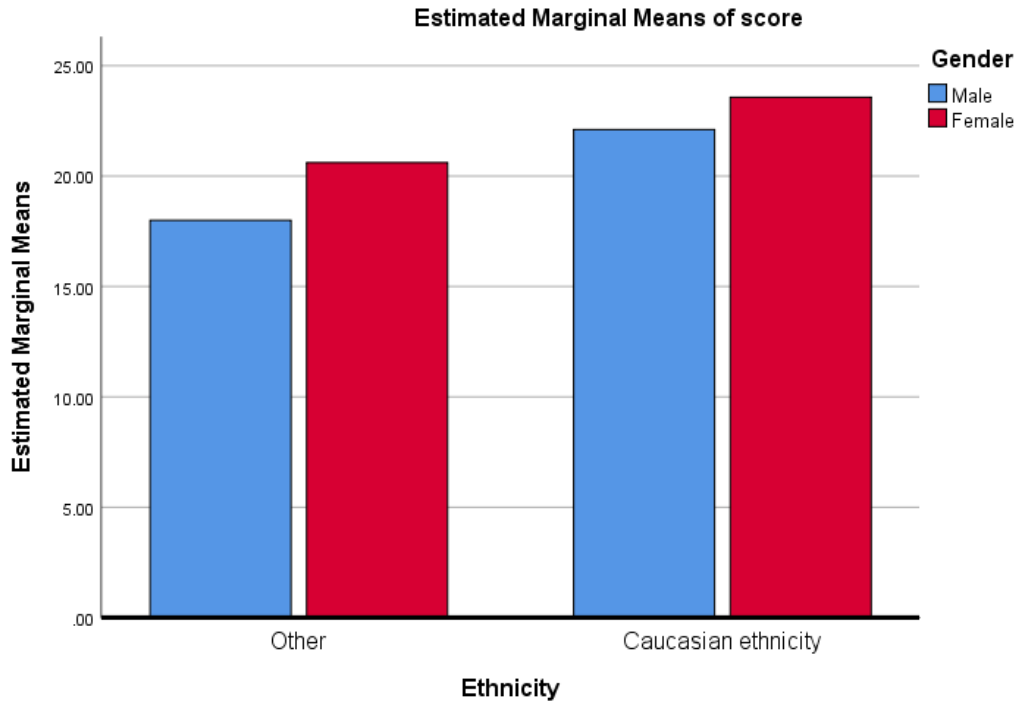


Table 65 and Figure 21 suggest that the gender differences are not only observed amongst those of White ethnicity.

‘OTHER CULTURE’ ETHNICITY

Table 66. Caucasian questionnaire: gender * ‘Other culture’ *social sensitivity

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	895.996	3	298.665	14.746	.000
Intercept	118843.392	1	118843.392	5867.601	.000
Gender	329.629	1	329.629	16.275	.000
Other culture ethnicity	296.405	1	296.405	14.634	.000
Gender * ‘Other culture’ ethnicity	3.085	1	3.085	.152	.697
Error	8364.972	413	20.254		
Total	177705.000	417			
Corrected Total	9260.969	416			
a. R Squared = .097 (Adjusted R Squared = .090)					

Figure 22. Caucasian questionnaire: gender * ‘Other culture’ *social sensitivity comparisons



Table 66 and Figure 22 replicate that findings on African and White ethnicity that the gender differences observed are not specific to ‘Other culture’ ethnicities.

COMPARISON OF SOCIAL SENSITIVITY MEANS BY HOME LANGUAGE AND GENDER

AFRICAN LANGUAGES

Table 67. Caucasian questionnaire: gender *African languages*social sensitivity

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2028.297[a]	3	676.099	39.009	.000
Intercept	170228.090	1	170228.090	9821.779	.000
Gender	533.862	1	533.862	30.803	.000
African languages	1326.723	1	1326.723	76.549	.000
Gender * African languages	14.313	1	14.313	.826	.364
Error	7296.644	421	17.332		
Total	182944.000	425			
Corrected Total	9324.941	424			
a. R Squared = .218 (Adjusted R Squared = .212)					

Figure 23. Caucasian questionnaire: gender *African languages*social sensitivity comparisons

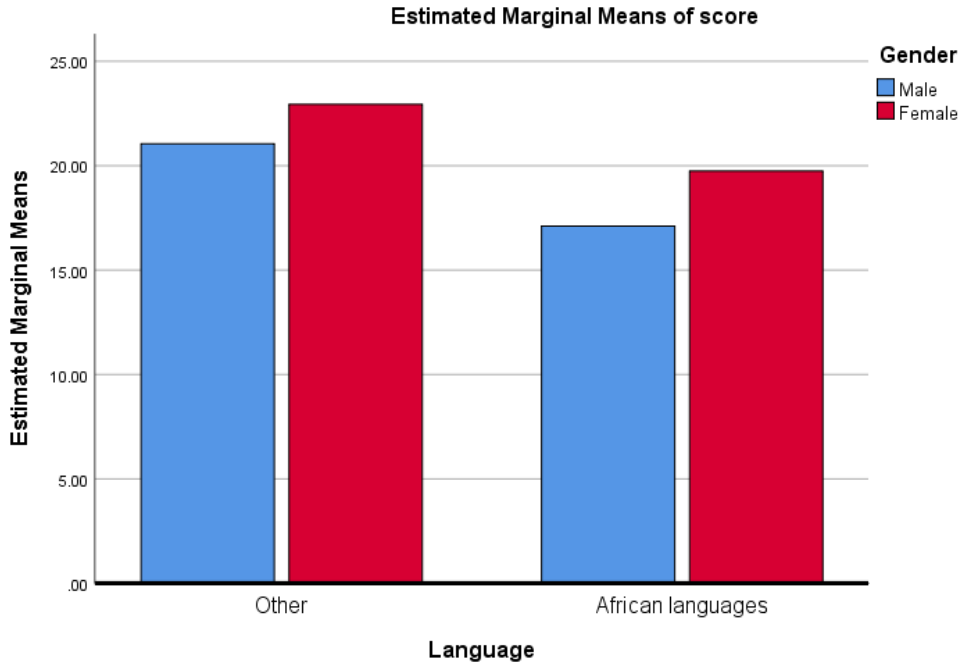


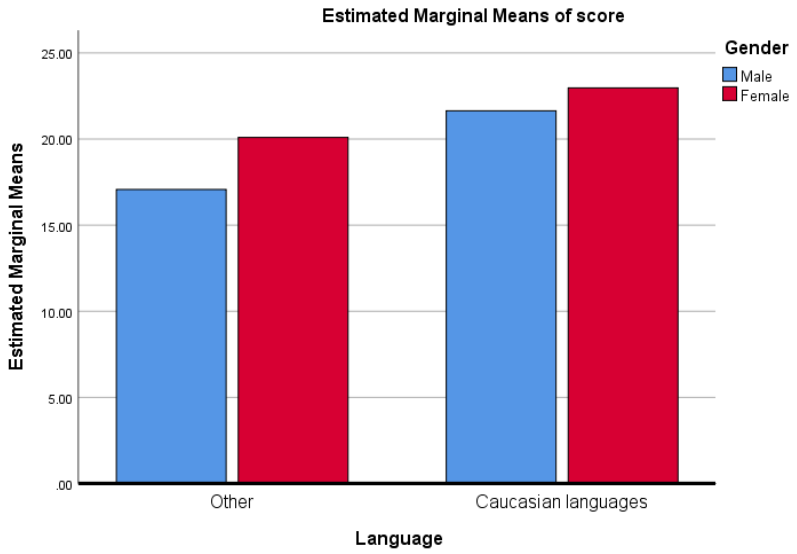
Table 67 and Figure 23 provide evidence that the gender differences are not specific to those who speak an African home language.

CAUCASIAN LANGUAGES

Table 68. Caucasian questionnaire: gender *Caucasian languages*social sensitivity

Tests of Between-Subjects Effects					
Dependent Variable: Social sensitivity					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2124.088[a]	3	708.029	41.395	.000
Intercept	169503.441	1	169503.441	9910.069	.000
Gender	478.672	1	478.672	27.986	.000
Caucasian languages	1405.137	1	1405.137	82.152	.000
Gender * Caucasian languages	72.503	1	72.503	4.239	.040
Error	7200.853	421	17.104		
Total	182944.000	425			
Corrected Total	9324.941	424			
a. R Squared = .228 (Adjusted R Squared = .222)					

Figure 24. Caucasian questionnaire: gender *Caucasian languages*social sensitivity comparisons



In contrast to African languages, Table 68 and Figure 24 provide evidence that gender differences, or lack thereof, are specific to those who speak a Caucasian home language. Women who speak a Caucasian home language show a significantly smaller social sensitivity advantage over men than those who speak other home languages. This concludes the analysis of results derived from the final three cultural instruments. Cultural and gender variations were considered across all three instruments. The next section describes the process used to create multicultural instrument.

4.8 SHORTENED MULTICULTURAL INSTRUMENT DEVELOPMENT

In addition to having created and/or tested questionnaires that contain different cultures to measure social sensitivity, the researcher created a shortened, balanced multicultural instrument to test and use in the subsequent studies. This was done in the interest of preserving validity and reliability of results when testing other variables by reducing respondent fatigue and cultural bias. To create this shortened multicultural instrument, the following objective method was used to select pictures of eyes from the valid pool of items from Study 1 for the new instrument:

- The new 21-item instrument was split evenly amongst the three culture groups divided into seven items each (African, 'Other culture', Caucasian).
- Of the seven items, two groups consisted of four males and three females, and one group of four females and three males. This was randomly allocated. The reason for an extra male item was because there were more male items to choose from.
- The seven items were split into three categories to ensure balanced difficulty of identifying the underlying mental states (guided by the percentage of times correctly chosen in Study 1). These categories are:
    - 2 items=50-59%
    - 2 items=60-69%
    - 2 items=70-79%
    - 1 item=80=%
- Items were then chosen in that category, if there are multiple items, by identifying which was closest to the category midpoint except for the 80%+ category. In this category, the closest to 80% was chosen to avoid overly obvious items.
- If there was a tie, the item with the lowest closest foil would be chosen.
- If there was no item in the category, the lowest item in the next category was chosen.
- No target emotion could be repeated in same category.
- The same question could only appear twice, once, in the entire instrument to maintain a good spread of emotions and to avoid respondent learning.

The final shortened multicultural instrument is shown in Appendix M. This instrument was then used/tested in Studies 2 and 3.

4.9 CONCLUSION

The preceding chapter detailed the analysis for Study 1. The first part of the chapter focused on assessing the African, 'Other culture' and Caucasian instrument results, and reducing each instrument down to only items that met the set-out criterion to indicate majority selection of the desired mental states. Once the 'Correct' items were identified, social sensitivity scores were calculated for each case. These scores where then used to analyse cultural and gender differences across the instruments. Differences were analysed using mean inspection as well as ANOVA tests. The results were interesting, particularly between African cultures and Caucasian cultures. These results are discussed further in Chapter 7. Lastly, the method for the creation of a multicultural instrument was presented. The next chapter presents the results and analysis for Study 2.

CHAPTER 5: RESULTS AND DATA ANALYSIS - STUDY 2

5 STUDY 2 RESEARCH FINDINGS

5.1 INTRODUCTION

This chapter reports the results of the statistical testing for Study 2. In the previous chapter, an instrument was developed to provide a more inclusive and time-efficient social sensitivity instrument that allows for a realistic and practical investigation into social sensitivity as a dependant variable. Using this instrument, this chapter extends the work of the previous chapters by testing the derived multicultural questionnaire. Empirical testing of the hypotheses derived in the literature review is then presented.

Study 2 empirically tests three main independent variables, namely trait EI, personality and individual contextual factors to further understand their relationship with social sensitivity as suggested by theory. This is achieved through the testing of derived hypotheses relating to each variable. Before reporting on hypothesis testing, univariate analysis is presented. Univariate analysis is then followed by the bivariate results. Thereafter, hypothesis testing commences by reporting the results of the multivariate tests for each hypothesis. Relevant tests of assumptions relating to these tests are also reported.

This chapter, therefore, presents the results of tested hypotheses for Study 2, which is then discussed in subsequent chapters. Univariate analysis of Study 2 is now presented.

5.2 UNIVARIATE ANALYSIS

Responses were checked for substantial missing data. A total of 15 responses were discarded during initial screening because of the following reasons:

- Respondents failed to complete at least one test (Social sensitivity test, trait EI test or BFI test) with less than 10% missing data.
- The respondents were below the age of 18 years of age.
- The response followed an obvious pattern indicating response bias. An obvious pattern was identified if a student answered all questions with the same response (e.g. Choosing to disagree for everything).

After initial screening, 427 responses were recorded. Many responses contained missing values but had enough data when doing initial screening (completed at least one section with no less

than 10% missing values) to be recorded for further analysis. Thereafter, a list wise deletion strategy was used when analysing variables. A list wise deletion strategy removes cases that have missing values for any of the variables being examined.

After cleaning the data, univariate analysis could begin. This was done by reporting measures of location, central tendency and statistical dispersion for each variable. Measures of normality, namely skewness, kurtosis, Kolmogorov-Smirnov and Shapiro-Wilk statistics are also provided. Central limit theorem suggests that if sampled data is close to normal then distribution is also expected to be normal; this is especially likely for samples greater than 30 data points (Field, 2009).

One way to assess normality is to calculate z scores. To calculate z scores, determine the Skewness or Kurtosis value minus the mean of the distribution (0) divided by the standard deviation of the distribution (the standard error). This value is then taken to be significant, and unsupportive of normality, if their values are greater are greater (in absolute value) than 1.96 for significance at the $p<0.05$ level and 2.58 for significance at the $p<0.001$ level (Field, 2009) However, such criterion for assessing normality becomes less effective for larger samples as small standard errors arise making it significant even for small deviations from normality, incorrectly suggesting a significant deviation from normality (Field, 2009; Tabachnick & Fidell, 2007).

It is suggested that for samples over 200 data points a visual inspection of the distributions shape is more effective than assessing its significance (Field, 2009). Hence, as this study has a relatively large sample, a visual inspection of the distribution's shape was performed, as well as Kolmogorov-Smirnov and Shapiro-Wilk tests to make an informed decision on the distribution normality. This decision then guided whether to apply bootstrapping to the sample (Efron & Tibshirani, 1994).

Bootstrapping is a technique that allows the researcher to estimate the properties of the sample distribution from the sample data if normality of the current sample is not clear. It achieves this by taking small samples, called bootstrap samples, from the current sample data and creating mean scores for each. The sample means then act as an estimate for the sampling distribution. This new estimate of sample distribution then allows for a calculation of standard error which in

turn allows for the calculation of confidence intervals and significance levels (Field, 2009). With these confidence intervals and significance levels one can make claims about the sample data, even though the normality of the sample is not clear. In this research claims are made at a 95% confidence interval. This study used 1 000 bootstrap samples. It is suggested, that at a 95% confidence, a minimum of 399 bootstrap samples should be run (Davidson & MacKinnon, 2000). This research carries out 1000 bootstrap samples exceeding the minimum suggested amount.

The univariate statistics for social sensitivity are now reported to inform its reliability as a newly tested instrument. The results of the univariate analysis for the trait EI measures are considered. Lastly, the univariate results of the personality and individual contextual factors are presented.

5.2.1 Social Sensitivity: Univariate Analysis

The previous chapter derived a new multicultural instrument. This instrument was then used in this study to measure social sensitivity. The measures of location, central tendency and statistical dispersion for social sensitivity across the sample are reported in Table 69.

Table 69. Social sensitivity: location, central tendency and statistical dispersion

Variable	Mean	Median	Mode	Std. Deviation	Variance
Social sensitivity	13.3783	14	15	3.30068	10.859

In addition, the skewness for the sample was -0.493 and kurtosis 1.25. To further understand the distribution, Kolmogorov-Smirnov and Shapiro-Wilk tests were performed and both proved significant.

Taking these tests and visual inspection into account normality could not be assumed of the distribution. Thus, bootstrapping with 1 000 iterations was applied to all relevant analysis from this point onwards. The univariate statistics related to trait EI are considered next.

5.2.2 Trait Emotional Intelligence: Univariate Analysis

As discussed in Chapter 2, theoretical foundations and links strongly suggest that trait EI is associated with an individual's social sensitivity. Testing for this relationship is performed in this chapter and further discussed in subsequent chapters. The measures of location, central tendency and statistical dispersion for trait EI are detailed in Table 70.

Table 70. Trait EI: location, central tendency and statistical dispersion

Variable	Mean	Median	Std. Deviation	Variance	Skewness	Kurtosis
Trait EI	4.6620	4.6250	0.69255	0.480	0.152	-0.18
Well-being	5.2153	5.3333	1.02337	1.047	-0.759	0.864
Self-control	4.3303	4.3750	0.93955	0.883	-0.046	-0.086
Emotionality	4.5854	4.5556	0.84285	0.710	-0.005	-0.050
Sociability	4.5372	4.4444	0.88496	0.783	0.197	0.032

To further understand the distribution, Kolmogorov-Smirnov and Shapiro-Wilk tests were performed. Well-being was the only variable to meet significance on both tests. Sociability reached significance on the Kolmogorov-Smirnov.

Taking these tests and visual inspection into account normality seems likely for trait EI, self-control and emotionality. Regardless, bootstrapping with 1 000 iterations was applied to all relevant analysis from this point onwards. The univariate statistics related to personality are considered next.

5.2.3 Personality: Univariate Analysis

As with the trait EI dimensions, the Big Five personality traits have also been linked with a person's social sensitivity. In addition, it interacts strongly with trait EI making it a complementary variable when testing the holistic effects on social sensitivity. These affects are considered and discussed in later chapters. The measures of location, central tendency and statistical dispersion for Big Five personality traits are detailed in Table 71.

Table 71. Personality: location, central tendency and statistical dispersion

Variable	Mean	Median	Std. Deviation	Variance	Skewness	Kurtosis
Extraversion	2.9447	2.8571	0.84033	0.706	0.295	-0.540
Agreeableness	3.7992	3.8571	0.66606	0.444	-0.269	-0.471
Conscientiousness	3.4450	3.4444	0.71983	0.518	-0.100	-0.562
Neuroticism	2.8652	2.8750	0.77990	0.608	0.078	-0.488
Openness	3.8231	3.8750	0.61265	0.375	-0.458	0.048

The univariate results of the Kolmogorov-Smirnov and Shapiro-Wilk tests indicate significant results for all for all variables except for neuroticism. The Kolmogorov-Smirnov test proved non-significant and the Shapiro-Wilk just reached significance for neuroticism. These results and visual inspection suggest normality cannot be assumed and thus bootstrapping will be applied in future analysis. Lastly, the univariate statistics for Individual contextual factors will now be presented.

5.2.4 Individual Contextual Factors: Univariate Analysis

Table 72 outlines the univariate statistics of a selection of key individual contextual factors.

Table 72. Individual contextual factors: descriptive statistics

Variable	Mean	Std. Deviation	Variance	Skewness	Kurtosis
Gender					
Male	60.5%				
Female	39.5%				
Age	22.03	5.612	31.493	2.219	4.564
Feeling	3.50	0.850	0.722	-0.042	0.182
Ethnicity					
Black	64.4%				
Coloured	2.2%				
Asian	1.4%				
Indian	11.5%				
White	13.6%				
Faculty					
Commerce, Law and Management	2.1%				
Humanities	2.6%				
Engineering and Built Environment	48.8%				
Health Sciences	4%				
Sciences	42.4%				
Level of Study					
1st Year	43.3%				
2nd Year	28%				
3rd Year	11.5%				
4th/Honours	4.1%				
Masters	12.4%				
Funding					
Personal	12%				
Parents	30.9%				
Sponsored	38.1%				
Loan	3.6%				
National student financial aid scheme	12.9%				
Mother/Gaurdian1 level of education (years)	12.81	3.6	12.960	-1.147	2.252
Father/Gaurdian2 level of education (years)	13.25	3.569	12.740	-1.249	3.055
Home language^					
English	28.5%				
Zulu	11.7%				
Northern Sotho	9.8%				
Xhosa	7.7%				
Sotho	7.4%				

*means of ordinal/Categorical variables are instead reported as percentages
^the top 5 are reported here

The results of the Table 72 are discussed further, where appropriate, in subsequent chapters. Again, bootstrapping will be applied in future analysis to improve the normality of the sample. The preceding section reported the univariate statistics of this study and considered its distribution properties. The next section will report the bivariate findings of this study.

5.3 BIVARIATE ANALYSIS

The bivariate associations of appropriate independent variables with the dependent variable will now be presented. The first variable and its dimensions to be reported is trait EI. This is then followed by the personality dimensions.

5.3.1 Trait Emotional Intelligence

Table 73. Correlations between trait EI and its dimensions with social sensitivity

	Social sensitivity			
	Pearson Correlation	**Significance**	**Bootstrap 95 % Confidence interval**	
Trait EI	0.039	0.467	Lower	-0.057
			Upper	0.137
^Well-being	0.013	0.917	Lower	-0.095
			Upper	0.120
^Self-control	-0.042	0.356	Upper	-0.140
			Lower	0.054
^Emotionality	0.074	0.212	Upper	-0.024
			Lower	0.170
^Sociability	0.097	0.072	Upper	-0.004
			Lower	0.191
	Notes. N=346. Bootstrapping with 1000 iterations was applied. ^these dimensions make up trait EI thus are included to inform future research although the main variable being studied is trait EI *Correlation is significant at the 0.05 level (2-tailed).			

Table 73 highlights the bivariate relationship between trait EI, its facets, and social sensitivity. Trait EI showed a positive relationship with social sensitivity. Trait EI was not significantly correlated with social sensitivity. None of trait EI's facets reached a significant correlation at a 95% confidence interval. The strongest correlation was observed between sociability and social sensitivity. Self-control was the only facet to show a negative correlation. These bivariate and their implications for potential relationships are discussed in later chapters.

5.3.2 Personality

Table 74. Correlations between personality and social sensitivity

	Social sensitivity			
	Pearson Correlation	**Significance**	**Bootstrap 95 % Confidence interval**	
Extraversion	-0.020	0.698	Lower	-0.133
			Upper	0.085
Agreeableness	-0.102*	0.043	Lower	-0.202
			Upper	-0.005
Conscientiousness	-0.002	0.963	Upper	-0.105
			Lower	0.095
Neuroticism	0.128*	0.011	Upper	0.040
			Lower	0.222
Openness to Experience	0.077	0.126	Upper	-0.010
			Lower	0.157

Notes. N=396. Bootstrapping with 1000 iterations was applied.
***Correlation is significant at the 0.05 level (2-tailed).**
****Correlation is significant at the 0.01 level (2-tailed).**

Table 74 bivariate results indicate two significant relationships. Agreeableness had a significant negative correlation with social sensitivity. Neuroticism had a significant positive correlation with social sensitivity. These were both evaluated at 95% confidence interval. No other personality trait showed significant correlations. The next closest to reaching significance was openness to experience, which is positively correlated with social sensitivity. Extraversion and consciousness are both negatively correlated with social sensitivity.

The above Pearson's correlation analysis allows us to evaluate the strength of the association between the relationships of two variables.

Next, regression tests were used to evaluate hypothesis. Simple regression tests show the relation between the dependent variable and an independent variable (Field, 2012). A multiple regression test allows for the combined relationships of the independent variables on the dependent variables to be evaluated and determine the strength of their effects in the presence of one another (Kothari, 2004). The combination of bivariate analysis and multivariate analysis helps us to understand more thoroughly the relationships between the variables being studied.

5.4 MULTIVARIATE ANALYSIS

Certain assumptions should be considered before the regression tests could begin. These assumptions were tested, and the results appear in section 3 of Appendix AA.

Once it was found that none of these assumptions were not violated, regression testing could begin. Key demographic variables were tested together in a multiple linear regression model to evaluate the hypotheses associated with each. Thereafter, hypotheses relating to trait EI and personality where tested using multiple linear regression controlling for selected demographic factors. To conclude the multivariate analysis, tests of mediation and moderation where carried out to inform on the hypothesised relationships. These results are shown under their relevant hypothesis headings, followed by a regression equation and table summarising the outcomes for that hypothesis where appropriate.

5.4.1 Individual contextual factors

Table 75. Multiple regression results for individual contextual factors

		Beta	Bias	Std. Error	Sig. (2-tailed)	BCa 95% Confidence Interval	
						Lower	Upper
1	(Constant)	10.465	.037	.955	.001	8.593	12.392
	Female	1.189	.002	.348	.001	.514	1.849
	Black	-.362	-.005	.589	.535	-1.534	.757
	White	.869	-.010	.576	.126	-.297	2.040
	Engineering	1.225	.020	.454	.004	.343	2.189
	Level of study	-.327	-.008	.173	.053	-.666	-.028
	NSFAS	-.422	-.027	.609	.490	-1.577	.645
	Mother's level of education	.068	.001	.078	.378	-.086	.226
	Father's level of education	.101	-.002	.076	.187	-.057	.246
	English	1.751	-.013	.557	.001	.600	2.855
Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples Dependent variable: social sensitivity							

As per Table 75 the following is concluded regarding the detailed hypotheses:

Null Hypothesis 1A: There is no significant association between being a women and social sensitivity.

While accounting for other individual contextual factors, gender where Female = 1 showed a beta coefficient of $\beta = 1.189$, $p = 0.001$, which reached statistical significance at a $p<0.01$ level. Thus, the null hypothesis is rejected.

Null Hypothesis 1B: There is no significant association between Black ethnicity and social sensitivity.

In the presence of other individual contextual factors, respondents who identified themselves of a Black ethnic group showed a beta coefficient of $\beta = -0.362$, $p = 0.535$, which failed to reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

Null Hypothesis 1C: There is no significant association between White ethnicity and social sensitivity.

While accounting for other individual contextual factors, respondents who identified themselves of a White ethnic group showed a beta coefficient of $\beta = 0.869$, $p = 0.126$, which failed to reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

Null Hypothesis 1D: There is no significant association between field of study being engineering and social sensitivity.

In the presence of other individual contextual factors, respondents whose field of study was engineering showed a beta coefficient of $\beta = 1.225$, $p = 0.004$, which to reached statistical significance at a $p<0.01$ level. Thus, the null hypothesis is rejected.

Null Hypothesis 1E: There is no significant association between level of study and social sensitivity.

While accounting for other individual contextual factors, level of study showed a beta coefficient of $\beta = -0.327$, $p = 0.053$, which failed to reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

Null Hypothesis 1F: There is no significant association between an individual's National Student Financial Aid Scheme (NSFAS) status and social sensitivity.

In the presence of other demographic factors respondents who indicated that they were on NSFAS showed a beta coefficient of $\beta = -0.442$, $p = 0.490$, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis was accepted.

Null Hypothesis 1G: There is no significant association between mother's level of education and social sensitivity.

While accounting for other individual contextual factors, mother's level of education showed a beta coefficient of $\beta = 0.068$, $p = 0.378$, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

Null Hypothesis 1H: There is no significant association between father's level of education and social sensitivity.

In the presence of other demographic factors father's level of education showed a beta coefficient of $\beta = 0.101$, $p = 0.187$, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

Null Hypothesis 1I: There is no significant association between English home language and social sensitivity.

While accounting for other individual contextual factors, respondents whose home language was English showed a beta coefficient of $\beta = 1.751$, $p = 0.001$, which did reach statistical significance at a $p<0.01$ level. Thus, the null hypothesis is rejected.

The below represents the derived individual contextual factor equation for predicting social sensitivity:

Social Sensitivity = b_0 + b_1 (Female) + b_2 (Black) + b_3 (White) + b_4 (Engineering) + b_5 (Level of Study) + b_6 (NSFAS) + b_7 (Mother level of Education) + b_8 (Fathers Level of Education) + b_9 (English) + ε

Where b_0 is the intercept, b_{1-9} are the beta coefficients and ε represents the error term.

Social Sensitivity = 10.465 + 1.189 (Female) -0.362 (Black) + 0.869 (White) + 1.225 (Engineering) -0.327 (Level of Study) -0.422 (NSFAS) + 0.068 (Mothers level of Education) + 0.101 (Fathers level of Education) + 1.751 (English) + ε

The above equation explains 22.4% of the variance in social sensitivity as determined by R^2. Adjusted for the number of predictors in the regression equation, the equation explains 20.3% of the variance in social sensitivity as determined by adjusted R^2.

Table 76. Summary of hypothesis testing for individual contextual factors

Hypothesis	Beta	Significance (p-value)	H0
H1A	1.189	.001	reject
H1B	-.362	.535	accept
H1C	.869	.126	accept
H1D	1.225	.004	reject
H1E	-.327	.053	accept
H1F	-.422	.490	accept
H1G	.068	.378	accept
H1H	.101	.187	accept
H1I	1.751	.001	reject

5.4.2 Trait Emotional Intelligence

Null Hypothesis 2: There is no significant association between trait EI and social sensitivity.

Table 77. Model summary for the relationship between trait EI and social sensitivity

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.551[a]	.303	.280	2.86907	.303	13.021	9	269	.000
2	.553[b]	.306	.280	2.86928	.002	.961	1	268	**.328**
a. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black									
b. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black, trait EI									

The addition of trait EI to the control variables as shown by Table 77 did not significantly alter R^2. In the presence of the control variables trait EI showed a beta coefficient of $\beta = 0.243$, $p = 0.309$, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted

To inform future research, trait EI's facets were considered in multivariate tests. These sub-hypotheses are considered next.

Null Hypothesis 2A: There is no significant association between well-being and social sensitivity.

Table 78. Model summary for the relationship between well-being and social sensitivity

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.495[a]	.245	.223	3.03380	.245	11.125	9	309	.000
2	.499[b]	.249	.225	3.03010	.004	1.755	1	308	**.186**
a. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black									
b. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black, well-being									

The addition of well-being to the control variables as shown by Table 78 did not significantly alter R^2. In the presence of other demographic factors well-being showed a beta coefficient of $\beta =$

0.219, p = 0.177, which did not reach statistical significance at a p<0.05 level. Thus, the null hypothesis is accepted.

Null Hypothesis 2B: There is no significant association between sociability and social sensitivity.

Table 79. Model summary for the relationship between sociability and social sensitivity

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.503[a]	.253	.231	3.03617	.253	11.306	9	300	.000
2	.505[b]	.255	.230	3.03819	.001	.600	1	299	**.439**
a. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black									
b. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black, sociability									

The addition of sociability to the control variables as shown by Table 79 did not significantly alter R^2. In the presence of other demographic factors sociability showed a beta coefficient of $\beta = 0.155$, $p = 0.388$, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

Null Hypothesis 2C: There is no significant association between emotionality and social sensitivity.

Table 80. Model summary for the relationship between emotionality and social sensitivity

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.497[a]	.247	.225	2.95476	.247	11.153	9	306	.000
2	.502[b]	.252	.228	2.94896	.005	2.206	1	305	**.139**
a. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black									
b. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black, emotionality									

The addition of emotionality to the control variables as shown by Table 80 did not significantly alter R^2. In the presence of other demographic factors emotionality showed a beta coefficient of β

= 0.296, p = 0.126, which did not reach statistical significance at a p<0.05 level. Thus, the null hypothesis is accepted.

Null Hypothesis 2D: There is no significant association between self-control and social sensitivity.

Table 81. Model summary for the relationship between self-control and social sensitivity

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.525[a]	.275	.255	2.89154	.275	13.181	9	312	.000
2	.526[b]	.277	.254	2.89340	.001	.599	1	311	**.440**
a. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black									
b. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black, self-control									

The addition of self-control to the control variables as shown by Table 81 did not significantly alter R^2. In the presence of other demographic factors self-control showed a beta coefficient of $\beta = 0.132$, $p = 0.458$, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

The above findings are summarised in Table 82 below:

Table 82. Hypothesis summary for trait EI and its dimensions

	R^2 change	**Significance F Change**	**Beta**	**Significance (p-value)**	**H_0**
H2	.002	.328	.243	.309	accept
H2A	.004	.186	.219	.177	accept
H2B	.001	.439	.155	.388	accept
H2C	.005	.139	.296	.126	accept
H2D	.001	.440	.132	.458	accept

5.4.3 Personality

Null Hypothesis 3A: There is no significant association between extraversion and social sensitivity.

Table 83. Model summary for the relationship between extraversion and social sensitivity

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.497[a]	.247	.226	2.96473	.247	11.606	9	318	.000
2	.497[b]	.247	.224	2.96923	.000	.038	1	317	**.845**
a. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black									
b. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black, Extraversion									

The addition of Extraversion to the control variables as shown by Table 83 did not significantly alter R^2. In the presence of other demographic factors extraversion showed a beta coefficient of $\beta = -0.039$, $p = 0.858$, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

Null Hypothesis 3B: There is no positive association between agreeableness and social sensitivity.

Table 84. Model summary for the relationship between agreeableness and social sensitivity

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.494[a]	.244	.223	2.96693	.244	11.452	9	319	.000
2	.495[b]	.245	.221	2.96993	.001	.356	1	318	**.551**
a. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black									
b. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black, Agreeableness									

The addition of agreeableness to the control variables as shown by Table 84 did not significantly alter R^2. In the presence of other demographic factors agreeableness showed a beta coefficient of $\beta = -0.154$, $p = 0.538$, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

Null Hypothesis 3C: There is no significant association between conscientiousness and social sensitivity.

Table 85. Model summary for the relationship between conscientiousness and social sensitivity

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.492[a]	.242	.220	2.97874	.242	11.174	9	315	.000
2	.494[b]	.244	.220	2.98027	.002	.676	1	314	**.412**
a. Predictors: (Constant), English, Female, Level of study, Mothers level of education, NSFAS, White, Engineering, Fathers level of education, Black									
b. Predictors: (Constant), English, Female, Level of study, Mothers level of education, NSFAS, White, Engineering, Fathers level of education, Black, conscientiousness									

The addition of conscientiousness to the control variables as shown by Table 85 did not significantly alter R^2. In the presence of other demographic factors conscientiousness showed a beta coefficient of $\beta = 0.194$, $p = 0.436$, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

Null Hypothesis 3D: There is no significant association between neuroticism and social sensitivity.

Table 86. Model summary for the relationship between neuroticism and social sensitivity

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.493[a]	.243	.221	2.98055	.243	11.223	9	315	.000
2	.493[b]	.243	.219	2.98397	.001	.278	1	314	**.599**
a. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black									
b. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black, Neuroticism									

The addition of neuroticism to the control variables as shown by Table 86 did not significantly alter R^2. In the presence of other demographic factors neuroticism showed a beta coefficient of $\beta = -0.116$, $p = 0.592$, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

Null Hypothesis 3E: There is no significant association between openness to experience and social sensitivity.

Table 87. Model summary for the relationship between openness to experience and social sensitivity

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.492[a]	.242	.221	2.97424	.242	11.092	9	312	.000
2	.497[b]	.247	.222	2.97089	.004	1.705	1	311	.193
a. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black									
b. Predictors: (Constant), English, Female, Level of study, Mother's level of education, NSFAS, White, Engineering, Father's level of education, Black, Openness to experience									

The addition of openness to experience to the control variables as shown by Table 87 did not significantly alter R^2. In the presence of other demographic factors openness to experience showed a beta coefficient of $\beta = 0.360$, $p = 0.198$, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis is accepted.

The above results are summarised in Table 88 below:

Table 88. Hypothesis summary for Big Five Inventory and its dimensions

	R^2 change	**Significance F Change**	**Beta**	**Significance (p-value)**	**H_0**
H3A	.000	.845	-.0.039	.858	accept
H3B	.001	.551	-.0154	.538	accept
H3C	.002	.412	.194	.436	accept
H3D	.001	.599	-.116	.592	accept
H3E	.004	.193	.360	.198	accept

5.5 MEDIATION

Mediation is when the relationship between an independent and the dependent variable can be explained by their relationship with a third variable (Field, 2013). To test if mediation is present the following four conditions must be met (Baron & Kenny, 1986):

1. The independent variable must significantly predict the dependent variable.
2. The independent variable must significantly predict the mediator.
3. The mediator must significantly predict the dependent variable.
4. The independent variable predicts the dependent variable less when the mediator is present.

The above method is used to test the proposed hypotheses derived from literature regarding mediation relationships.

Null Hypothesis 4A: Extraversion does not mediate the relationship between trait EI and social sensitivity.

There is no significant relationship between trait EI and social sensitivity (see Hypothesis H2), thus there is no relationship to be mediated. Therefore, the null hypothesis is accepted.

Null Hypothesis 4B: Agreeableness does not mediate the relationship between trait EI and social sensitivity.

There is no significant relationship between trait EI and social sensitivity (see Hypothesis H2), thus there is no relationship to be mediated. Therefore, the null hypothesis was accepted.

Null Hypothesis 4C: Conscientiousness does not mediate the relationship between trait EI and social sensitivity.

There is no significant relationship between trait EI and social sensitivity (see Hypothesis H2), thus there is no relationship to be mediated. Therefore, the null hypothesis was accepted.

Null Hypothesis 4D: Neuroticism does not mediate the relationship between trait EI and social sensitivity.

There is no significant relationship between trait EI and social sensitivity (see Hypothesis H2), thus there is no relationship to be mediated. Therefore, the null hypothesis was accepted.

Null Hypothesis 4E: Openness to experience does not mediate the relationship between trait EI and social sensitivity.

There is no significant relationship between trait EI and social sensitivity (see Hypothesis H2), thus there is no relationship to be mediated. Therefore, the null hypothesis was accepted.

Based on the above, personality does not mediate the relationship between trait EI and social sensitivity. Moderation relationships are considered next.

5.6 MODERATION

Moderation is the combined effect of two independent variables on a dependent variable (Field, 2013). To test if moderation is present an interaction term is derived and tested to see if it is a significant predictor of the dependent variable in the presence of the dependent variable and moderator. If it is significant the moderator is said to moderate the relationship between the dependent and independent variable (Baron & Kenny, 1986):

The above method was used to test the proposed hypotheses derived from literature regarding moderation relationships.

Null Hypothesis 5: Ethnicity does not moderate the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for different ethnicities.

Figure 26. Moderation: White ethnicity*trait EI and social sensitivity

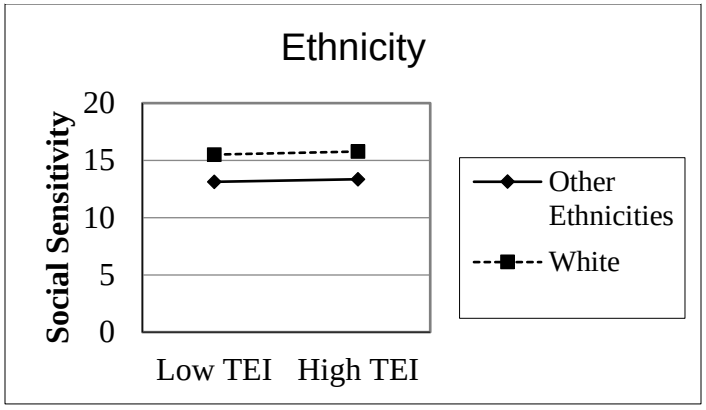
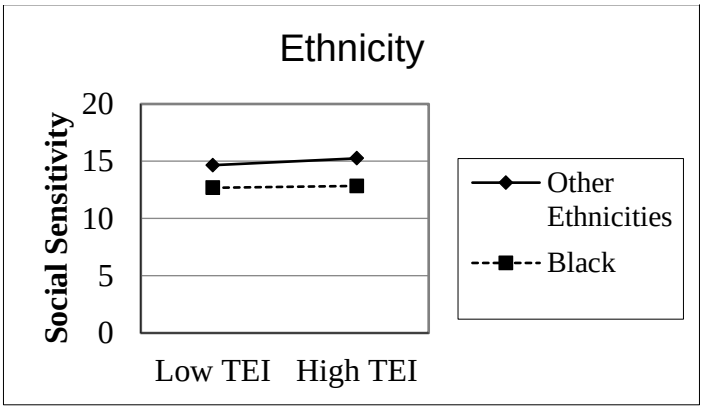


Figure 25. Moderation: Black ethnicity*trait EI and social sensitivity



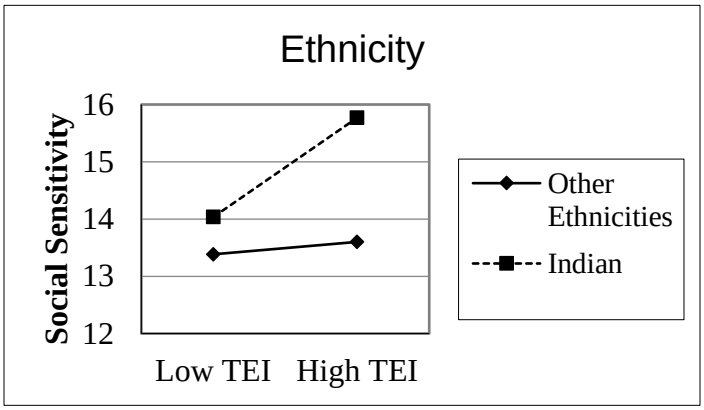


Figure 27. Moderation: Indian ethnicity*trait EI and social sensitivity

Table 89. Moderation effects of ethnicity on trait EI-social sensitivity

	Moderator	Interaction term coefficient	Interaction term coefficient with controls	Significance	Significance with controls	H_0
H6A	White	0.0295	0.2962	**0.9625**	0.6272	accept
H6B	Black	-0.3146	-0.8248	**0.5209**	0.0948	accept
H6C	Indian	1.0965	1.2175	**0.1390**	0.0742	accept

Given that none of the ethnicity's interaction terms where statistically significant at $p<0.05$ level as presented in Table 89. Therefore, the null hypothesis is accepted.

Null Hypothesis 6: Age does not moderate the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity gets stronger with age.

Figure 28. Moderation: age*trait EI and social sensitivity

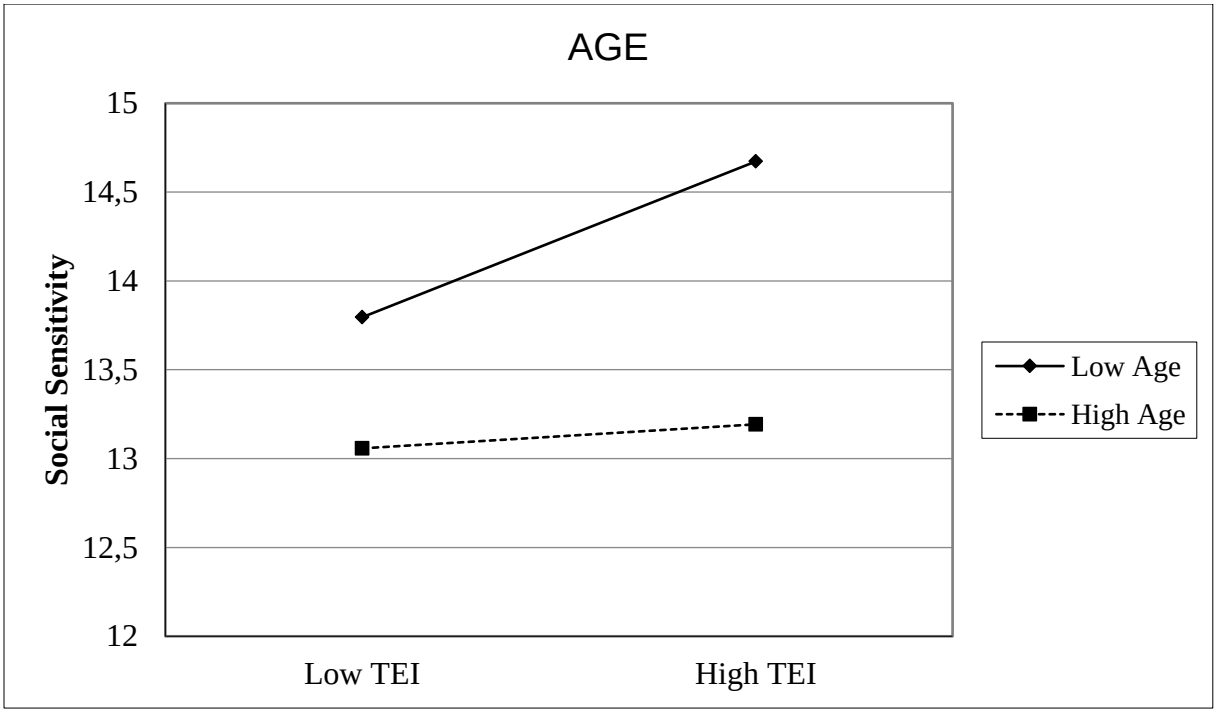


Table 90. Moderation effects of age on trait EI-social sensitivity

	coefficient	se	t	p
Constant	9.2543	5.0314	1.8391	0.0668
trait EI	1.4162	1.0214	1.3865	0.1665
Age	0.1236	0.2260	0.5468	0.5849
Interaction term	-0,0477	0.0452	-1.0552	**0.2921**
Interaction term with controls	-0.0678	0.0424	-1.6012	0.1105

As per Table 90, the interaction term does not reach statistical significance at $p<0.05$ level. Hence, the null hypothesis is accepted.

Null Hypothesis 7: Gender does not moderate the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for women.

Figure 29. Moderation: gender*trait EI and social sensitivity

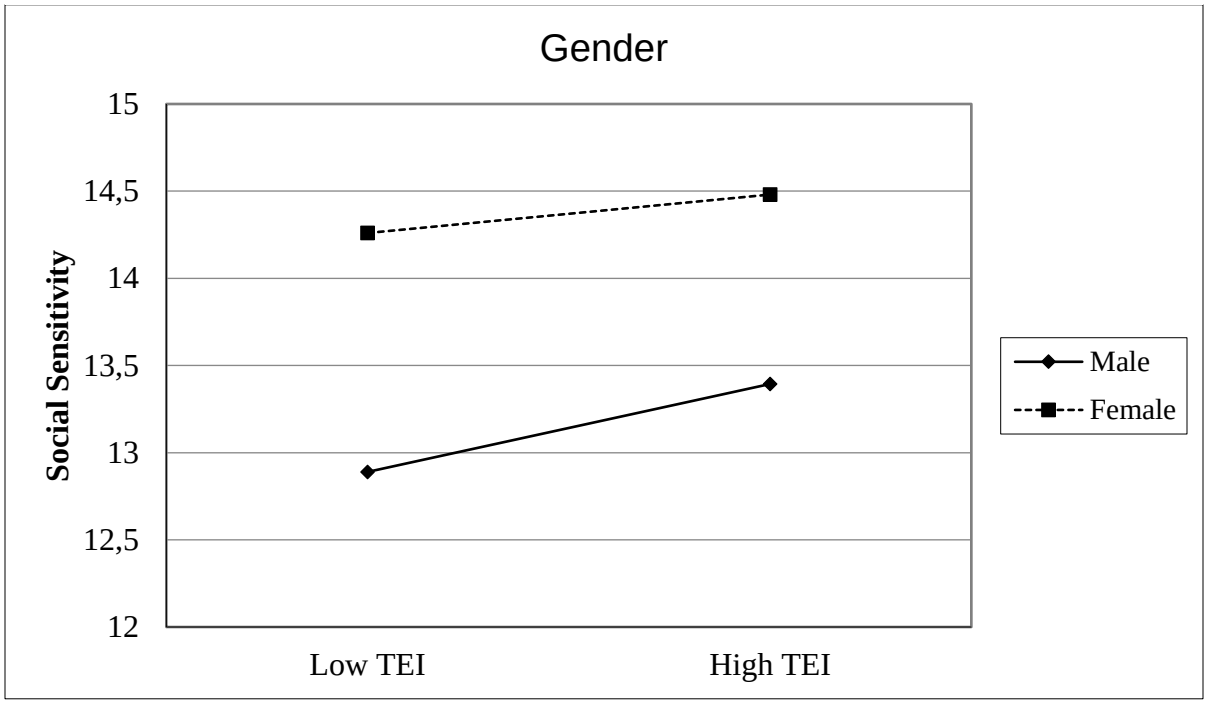


Table 91. Moderation effects of gender on trait EI-social sensitivity

	coefficient	se	t	p
Constant	11.4443	1.5013	7.6230	0.0000
trait EI	0.3641	0.3155	1.1538	0.2494
Gender	2.1847	2.4568	0.8850	0.3768
Interaction term	-0.2051	0.5264	-0.3896	**0.6971**
Interaction term with controls	-0.5318	0.5134	-1.0359	0.3012

As per Table 91, the interaction term does not reach statistical significance at $p<0.05$ level. Therefore, the null hypothesis is accepted.

Null Hypothesis 8: Home language does not moderate the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for different languages.

Figure 31. Moderation: English*trait EI and social sensitivity

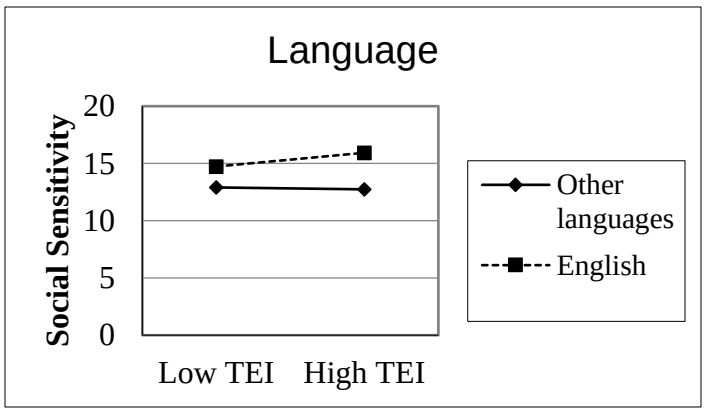


Figure 30. Moderation: African languages*trait EI and social sensitivity

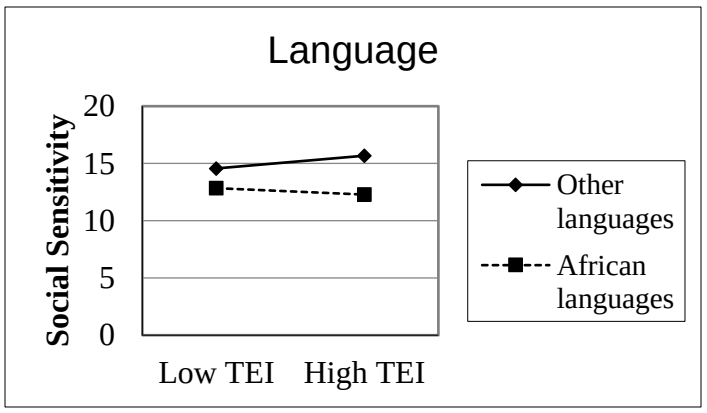


Figure 33. Moderation: Northern Sotho*trait EI and social sensitivity

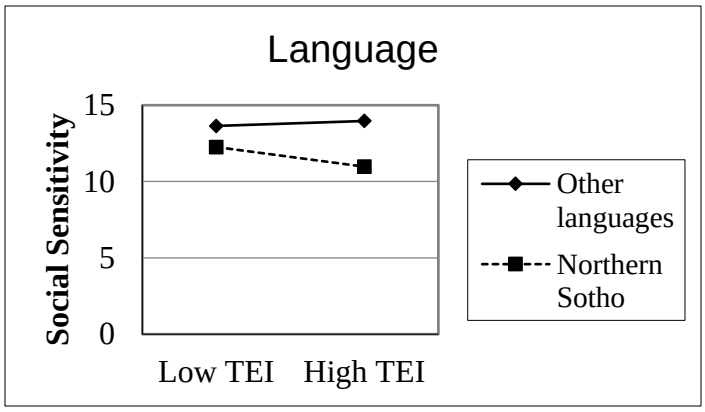


Figure 32. Moderation: Zulu*trait EI and social sensitivity

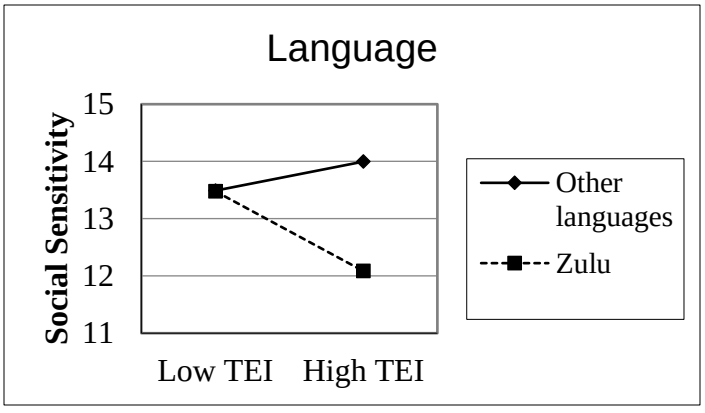


Figure 34. Moderation: Xhosa*trait EI and social sensitivity

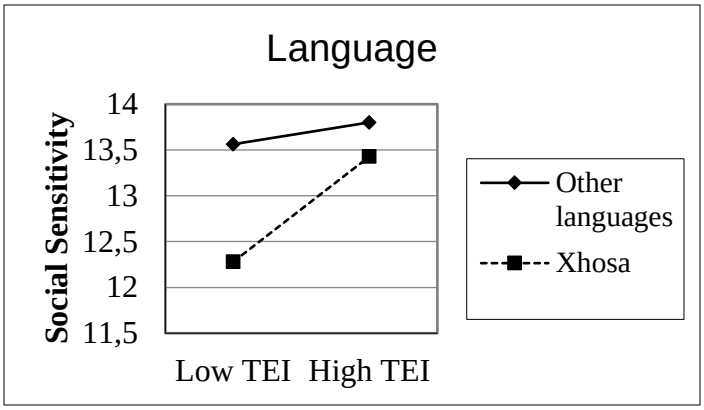


Figure 35. Moderation: Sotho*trait EI and social sensitivity

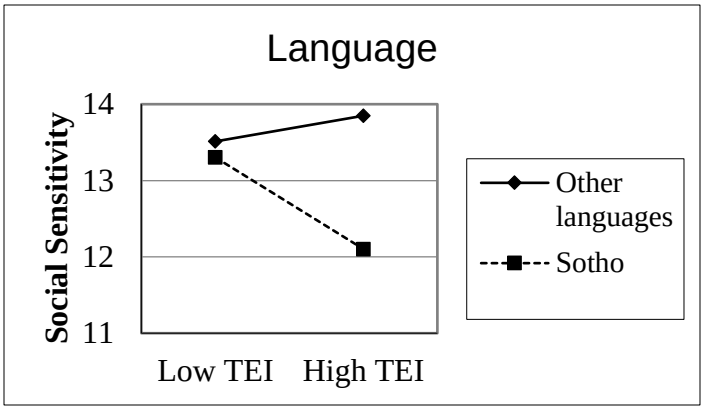


Table 92. Moderation effects of home language on trait EI-social sensitivity

	Moderator	Interaction term coefficient	Interaction term coefficient with controls	Significance	Significance with controls	H_0
H9A	English	0.9844	1.1997	***0.0489***	*0.0178*	reject
H9B	Zulu	-1.3727	-0.9209	**0.1109**	0.2629	accept
H9C	Northern Sotho	-1.1628	-1.8706	**0.2295**	*0.0411*	reject
H9D	Xhosa	0.6576	1.0429	**0.5270**	0.3645	accept
H9E	Sotho	-1.1092	-0.9003	**0.5220**	0.6043	accept
H9F	African Languages	-1.2052	-1.1865	***0.0103***	*0.0139*	reject

Table 92 shows that home language and trait EI interact to produce a significant positive effect for those who speak English at a significance level of $p<0.05$. However, African languages and trait EI interact to produce a significant negative effect at a significance level of $p<0.05$. These effects remain significant when controlling for other demographic factors. Northern Sotho also produced a significant negative effect on trait EI when controlling for other demographic factors. Thus, the null hypothesis is rejected.

Null Hypothesis 9: Agreeableness does not moderate the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for higher levels of agreeableness.

Figure 36. Moderation: agreeableness*trait EI and social sensitivity

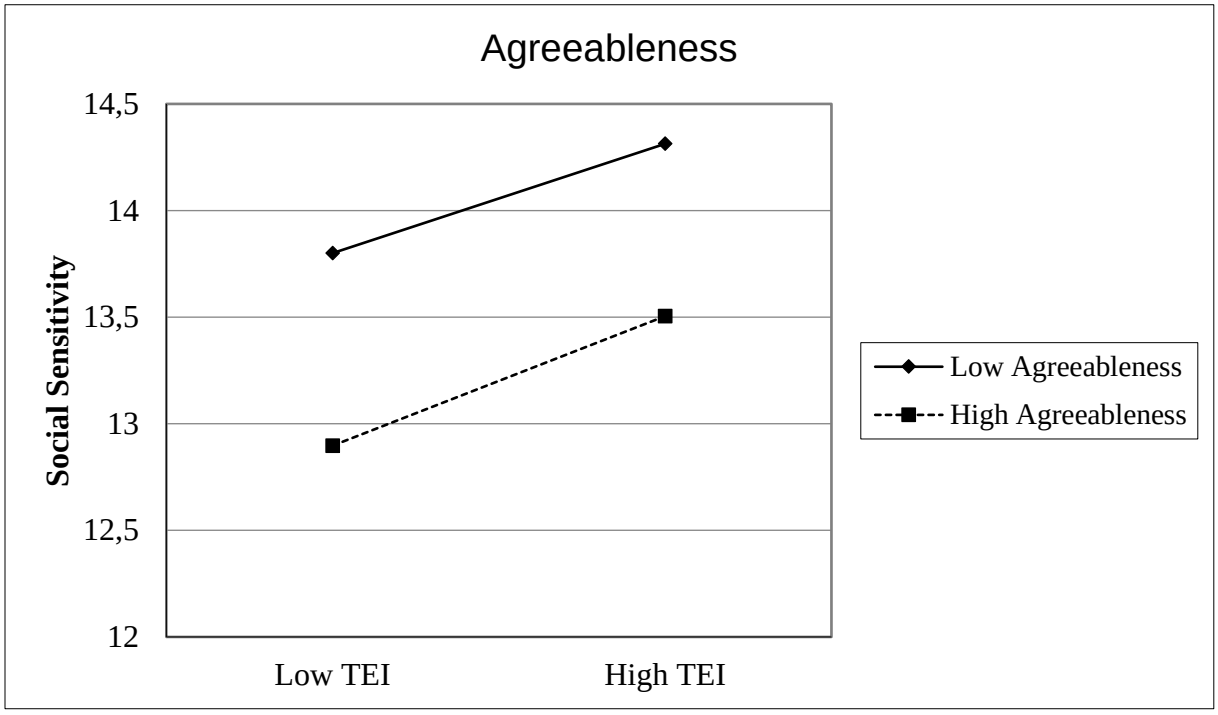


Table 93. Moderation effects of Agreeableness on trait EI-social sensitivity

	coefficient	**se**	**t**	**p**
Constant	15.0925	6.3040	2.3941	0.0172
trait EI	0.2095	1.3617	0.1539	0.8778
Agreeableness	-0.8815	1.6949	-0.5201	0.6033
Interaction term	0.0513	0.3574	0.1435	**0.8860**
Interaction term with controls	0.2276	0.3496	0.6510	0.5156

As per Table 93, the interaction term does not reach statistical significance at $p<0.05$ level. Hence, the null hypothesis is accepted.

Null Hypothesis 10: Gender does not moderate the relationship between agreeableness and social sensitivity such that the relationship between agreeableness and social sensitivity is stronger for women.

Figure 37. Moderation: gender*agreeableness and social sensitivity

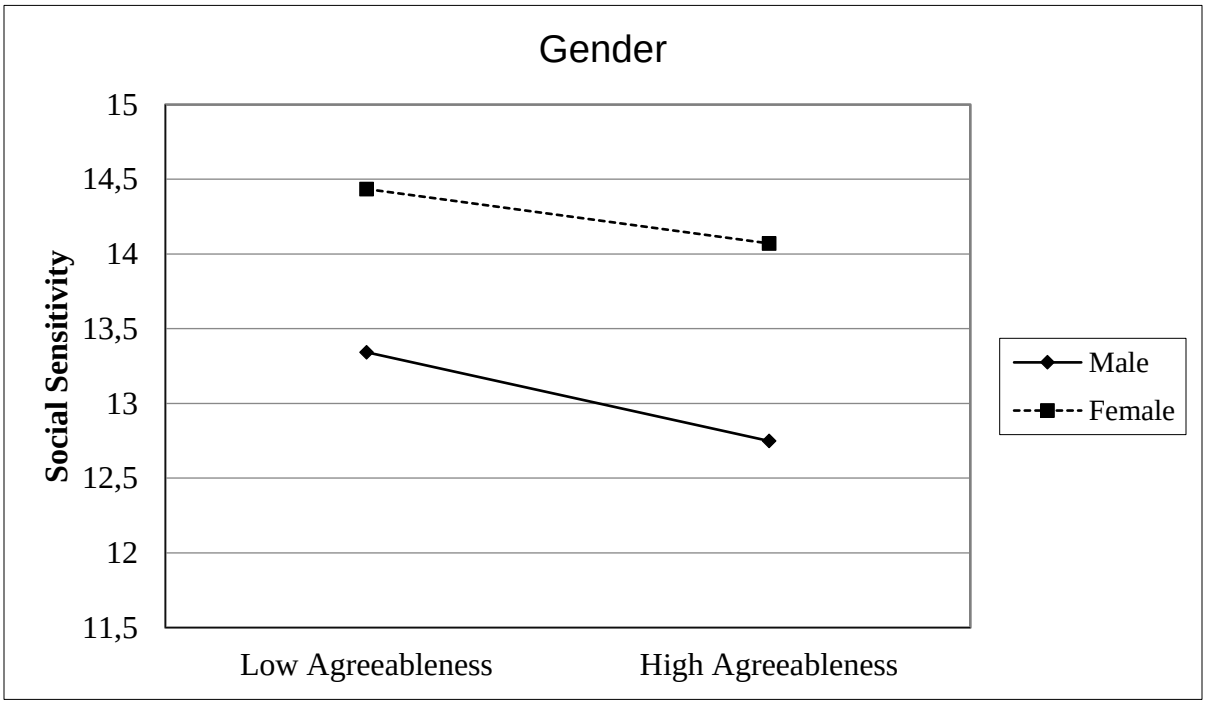


Table 94. Moderation effects of gender on agreeableness-social sensitivity

	coefficient	**se**	**t**	**p**
Constant	14.7398	1.2046	12.2358	0.0000
Agreeableness	-0.4459	0.3109	-1.4342	0.1523
Gender	0.5510	1.8636	0.2956	0.7677
Interaction term	0.1727	0.4852	0.3558	**0.7222**
Interaction term with controls	0.0862	0.5211	0.1655	0.8687

As per Table 94, the interaction term does not reach statistical significance at $p<0.05$ level. Therefore, the null hypothesis is accepted.

Null Hypothesis 11: Gender does not moderate the relationship between neuroticism and social sensitivity such that the relationship between neuroticism and social sensitivity is stronger for women.

Figure 38. Moderation: gender*neuroticism and social sensitivity

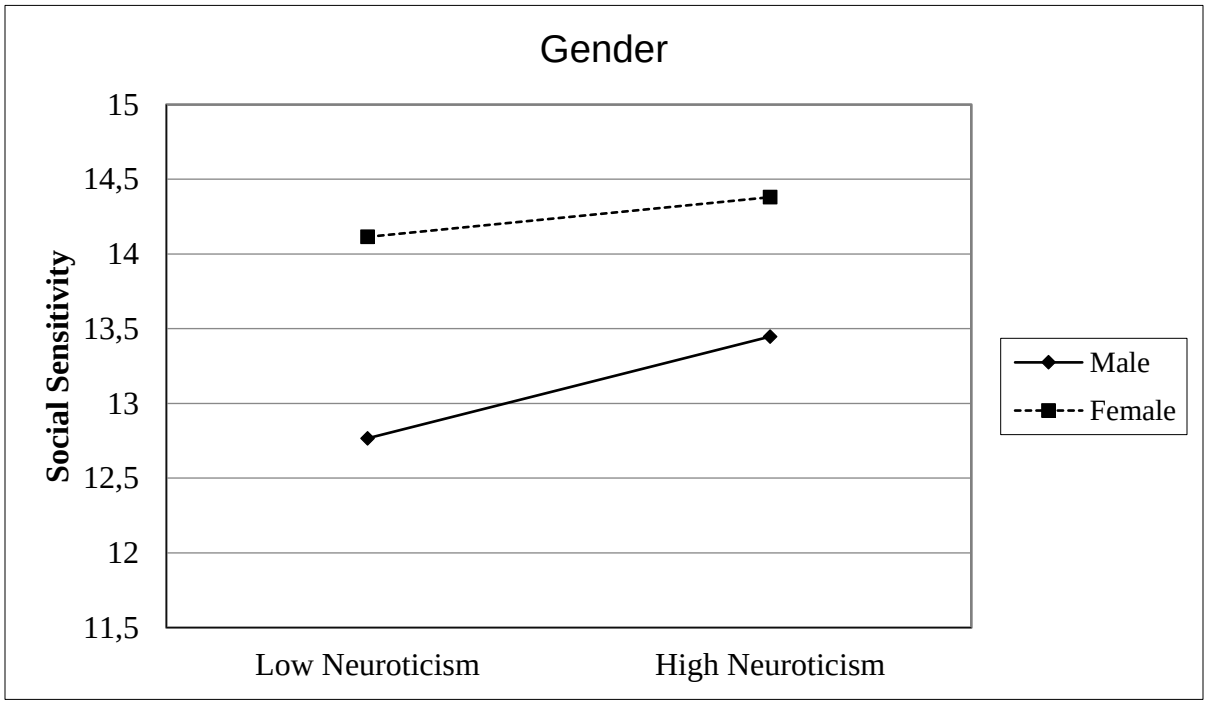


Table 95. Moderation effects of gender on neuroticism-social sensitivity

	coefficient	se	t	P
Constant	11.8568	0.7739	15.3199	0.0000
Neuroticism	0.4364	0.2731	1.5982	0.1108
Gender	1.9029	1.3068	1.4562	0.1461
Interaction term	-0.2661	0.4277	-0.6221	**0.5343**
Interaction term with controls	0.0604	0.4459	0.1354	0.8924

As per Table 95, the interaction term does not reach statistical significance at $p<0.05$ level. Hence, the null hypothesis is accepted.

Null Hypothesis 12: Mood does not moderate the relationship between neuroticism and social sensitivity such that the relationship between neuroticism and social sensitivity is stronger for lower moods and weaker for extremely low moods.

Figure 39. Moderation: mood*neuroticism and social sensitivity

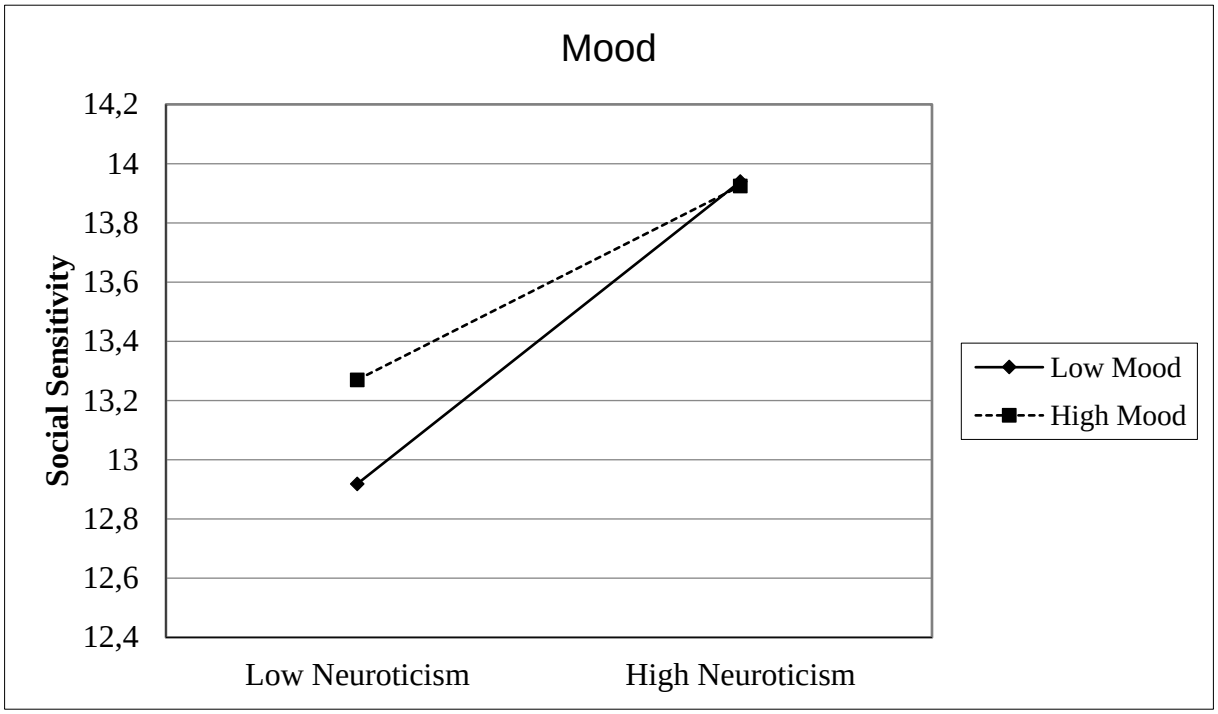


Table 96. Moderation effects of feelings on neuroticism-social sensitivity

	coefficient	**se**	**t**	**p**
Constant	10.2585	2.7180	3.7743	0.0002
Neuroticism	1.0165	0.8396	1.2107	0.2267
Feeling	0.4904	0.7114	0.6892	0.4911
Interaction term	-0.1370	0.2269	-0.6036	**0.5465**
Interaction term with controls	-0.1197	0.2355	-0.5083	0.6116

As per Table 96, the interaction term does not reach statistical significance at $p<0.05$ level. Therefore, the null hypothesis is accepted.

5.7 CONCLUSION

This chapter shows the results of Study 2. This was done by presenting the results of the univariate, bivariate and multivariate tests for individual contextual factors, trait EI and personality. The results of the hypothesis tested relating to individual contextual factors is summarised in Table 97. This is followed by Table 98, which summarises the hypothesis tests for those relating to trait EI. Lastly the hypothesis tests relating to personality are summarised in Table 99. These results are discussed in Chapter 8.

The first two studies focused on extending social sensitivity literature by creating and testing multiple cultural RMET instruments, assessing how demographics effects these instrument results and testing potential predictors to see what underlying individual traits would affect social sensitivity performance. The reason this was considered was because social sensitivity is considered a key predictor of collective intelligence. To assess this, a post-hoc study was conducted with a small sample to confirm social sensitivity's importance to collective intelligence. The results of this study are presented in the next chapter.

Table 97. The results of the testing of null-hypothesis relating to individual contextual factors

Null Hypothesis/Sub Hypothesis	Accepted	Rejected
Null Hypothesis 1A: There is no significant association between being a women and social sensitivity.		✓
Null Hypothesis 1B: There is no significant association between Black ethnic group and social sensitivity.	✓	
Null Hypothesis 1C: There is no significant association between White ethnic group and social sensitivity.	✓	
Null Hypothesis 1D: There is no significant association between field of study being engineering and social sensitivity.		✓
Null Hypothesis 1E: There is no significant association between level of study and social sensitivity.	✓	
Null Hypothesis 1F: There is no significant association between an individual's National Student Financial Aid Scheme (NSFAS) status and social sensitivity.	✓	
Null Hypothesis 1G: There is no significant association between mother's level of education and social sensitivity.	✓	
Null Hypothesis 1H: There is no significant association between father's level of education and social sensitivity.	✓	
Null Hypothesis 1I: There is no significant association between English home language and social sensitivity.		✓

Table 98. The results of the testing of null-hypothesis relating to trait EI

Null Hypothesis/Sub Hypothesis	Accepted	Rejected
Null Hypothesis 2: There is no significant association between trait EI and social sensitivity.	✓	
Null Hypothesis 2A: There is no significant association between well-being and social sensitivity.	✓	
Null Hypothesis 2B: There is no significant association between sociability and social sensitivity.	✓	
Null Hypothesis 2C: There is no significant association between emotionality and social sensitivity.	✓	
Null Hypothesis 2D: There is no significant association between self-control and social sensitivity.	✓	
Null Hypothesis 4A: Extraversion does not mediate the relationship between trait EI and social sensitivity.	✓	
Null Hypothesis 4B: Agreeableness does not mediate the relationship between trait EI and social sensitivity.	✓	
Null Hypothesis 4C: Conscientiousness does not mediate the relationship between trait EI and social sensitivity.	✓	
Null Hypothesis 4D: Neuroticism does not mediate the relationship between trait EI and social sensitivity.	✓	
Null Hypothesis 4E: Openness to experience does not mediate the relationship between trait EI and social sensitivity.	✓	
Null Hypothesis 5: Ethnicity does not moderate the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for different ethnicities.	✓	
Null Hypothesis 6: Age does not moderate the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity gets stronger with age.	✓	
Null Hypothesis 7: Gender does not moderate the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for women.	✓	
Null Hypothesis 8: Home language does not moderate the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for different languages.		✓
Null Hypothesis 9: Agreeableness does not moderate the relationship between trait EI and social sensitivity such that the relationship between trait EI and social sensitivity is stronger for higher levels of agreeableness.	✓	

Table 99. The results of the testing of null-hypothesis relating to personality

Null Hypothesis/Sub Hypothesis	Accepted	Rejected
Null Hypothesis 3A: There is no significant association between extraversion and social sensitivity.	✓	
Null Hypothesis 3B: There is no significant association between agreeableness and social sensitivity.	✓	
Null Hypothesis 3C: There is no significant association between conscientiousness and social sensitivity.	✓	
Null Hypothesis 3D: There is no significant association between neuroticism and social sensitivity.	✓	
Null Hypothesis 3E: There is no significant association between openness to experience and social sensitivity.	✓	
Null Hypothesis 10: Gender does not moderate the relationship between agreeableness and social sensitivity such that the relationship between agreeableness and social sensitivity is stronger for women.	✓	
Null Hypothesis 11: Gender does not moderate the relationship between neuroticism and social sensitivity such that the relationship between neuroticism and social sensitivity is stronger for women.	✓	
Null Hypothesis 12: Mood does not moderate the relationship between neuroticism and social sensitivity such that the relationship between neuroticism and social sensitivity is stronger for lower moods and weaker for extremely low moods.	✓	

CHAPTER 6: RESULTS AND DATA ANALYSIS - STUDY 3

6 STUDY 3 RESEARCH FINDINGS

6.1 INTRODUCTION

This chapter reports the results of the statistical testing on Study 3 and extends the work of the previous chapters by confirming the relationship between social sensitivity and collective intelligence.

In the previous chapter, potential predictors of social sensitivity were explored, to shed light on a variable that has constantly been a key predictor of collective intelligence (Engel et al., 2014a; Woolley et al., 2010).

Study 3 aims to confirm this key relationship by first confirming the emergence of a collective intelligence factor and thereafter exploring other predictors of collective intelligence as part of a post-hoc test. The results of the factor analysis tests used to confirm the emergence of a single dominant factor were first presented. This factor was then used in subsequent analysis as the dependent variable (collective intelligence) to test four main independent variables, namely social sensitivity, group trait EI, group personality and individual intelligence to further understand their relationships with collective intelligence. Additional variables such as maximum intelligence and percentage of female group members were also assessed for potential relationships. The results of these hypothesis are detailed in this chapter.

Firstly, the emergence of the collective intelligence factor was tested. Univariate analysis was then presented. Thereafter, hypothesis testing commences by reporting the results of the bivariate tests for each relevant hypothesis. Multivariate tests further explored significant bivariate relationships. Relevant tests of assumptions relating to these tests were also reported. This chapter, therefore, presents the results of tested hypotheses for Study 3, which is then discussed in subsequent chapters.

6.2 COLLECTIVE INTELLIGENCE FACTOR

Null Hypothesis 1: A collective intelligence factor does not emerge accounting for at least 30% of the variance in task performance.

Following precedent by Woolley et al. (2010), multiple tests were performed to provide insight into whether multiple group tasks measured a single dominant factor. The results of these tests partially support the hypothesis of a single collective intelligence factor. First, the average inter-item correlation between group tasks on different tasks is positive (r = 0.28).

This inter-item correlation is identical to the one reported in Woolley et al. (2010). Next, a factor analysis was run on team scores to see if a single dominate factor emerges explaining at least 30%-50% of the variance. This analysis yielded one factor with an initial eigenvalue accounting for more than 46.413% of the variance with the next factor accounting for only 31.416%. This supports the hypothesis that collective intelligence factor emerges accounting for at least 30% of the variance in task performance. However, the emergence of a second factor accounting for more 30% was not expected. Implications and possible reasons for this is discussed in later chapters. A visual inspection of the scree plot (Cattell, 1966) suggests that a three-factor solution may be appropriate.

Parallel analysis (Horn, 1965) suggested that at a 95% confidence interval none of the factors should be retained. Given the small sample size in this study, the mixed results of the above tests are to be expected. However, comparisons between Woolley et al. (2010) factor loading results and the results in this study (Appendix AB) suggest enough similarities exist to conclude the first factor explaining 46.413% is the collective intelligence factor. This factor was therefore converted into a factor score to use in subsequent analysis. Hence, the null hypothesis was tentatively rejected.

6.3 UNIVARIATE ANALYSIS

A total of 36 respondents participated in the experiment, equating to a total of 13 groups. There were 10 groups consisting of 3 members and 3 groups consisting of 2 members. Responses were examined for missing data.

Four respondents missed a limited amount of questions in the individual tasks used to measure trait EI and personality. One respondent missed the entire instrument involving social sensitivity, trait EI, personality and demographics and this was treated as a random occurrence. However, a pairwise deletion strategy was used when creating average group scores. Averages at group level were only created with cases that did not include missing values. Although not ideal, a pairwise deletion strategy was chosen for a few reasons. First, the pairwise deletion strategy preserves more data than the listwise deletion strategy (Acock, 2005). This is important with a small sample. Second, pairwise deletion is less biased when considering missing at random data (Kang, 2013). The missing data in this study was considered as random. Third, imputation of the series mean is not a recommended remedy in literature and thus should be avoided if possible (Graham, 2009; Kang, 2013). This study was afforded the opportunity to avoid mean imputation as scores are further averaged to group level. Therefore, average group scores were derived from the individual tasks using a pairwise deletion strategy, these were then used for analysis at the group level. After this procedure, at group level, no missing data was present.

After cleaning the data, univariate analysis could begin. As with the previous chapters, this was done with measures of central tendency and tests of normality such as skewness, kurtosis, Kolmogorov-Smirnov and Shapiro-Wilk statistics. The univariate statistics for the dependent variables are now presented.

6.3.1 Independent Variables: Univariate Analysis

Table 100 represents the univariate statistics of the independent variables being tested in this study. These include key individual characteristics which each group member brings to the group dynamic, thereby increasing or decreasing the prominence of that characteristic to the group.

Table 100. Independent variable: univariate statistics

Variable	Mean	Median	Std. Deviation	Variance	Skewness	Kurtosis
Average intelligence	7.6	8	1.82643	3.336	0.495	0.252
Maximum intelligence	10.38	10	2.219	4.923	0.939	0.260
Average trait EI	4.5140	4.3600	0.61578	0.379	0.360	-1.249
Average social sensitivity	14.5869	14.6600	1.58978	2.527	-0.889	0.459
Extraversion	3.1419	3.1267	0.62709	0.393	0.026	-0.701
Agreeableness	3.7623	3.7800	0.37910	0.144	1.500	-4.140
Conscientiousness	3.4423	3.4500	0.39810	0.158	0.202	-0.529
Neuroticism	2.9933	2.7933	0.40496	0.164	0.219	-1.923
Openness	3.8583	3.8167	0.37292	0.139	1.014	0.417

The univariate results of the Kolmogorov-Smirnov and Shapiro-Wilk tests only indicate significant results for neuroticism and agreeableness (both significant for Shapiro-Wilk). The other independent variables showed acceptable normality. However, bootstrapping was applied in future analysis to improve normality. The next section provides insight into the general demographic characteristics of the sample used.

6.3.2 Demographic Characteristics: Univariate Analysis

Table 101 outlines the univariate statistics of a selection of key demographic factors.

Table 101. Demographic characteristics: univariate statistics

Variable	Mean	Std. Deviation	Variance	Skewness	Kurtosis
Gender					
Male	40%				
Female	60%				
Age	22.40	4.565	20.835	3.275	14.586
Feeling	3.43	0.778	0.605	-0.544	1.817
Ethnicity					
Black	68.6%				
White	14.3%				
Coloured	5.7%				
Indian	5.7%				
Persian	2.9%				
Prefer not to say	2.9%				
Faculty					
Commerce, Law and Management	11.4%				
Humanities	34.3%				
Engineering and Built Environment	45.7%				
Sciences	8.6%				
Level of Study					
1st Year	40%				
2nd Year	8.6%				
3rd Year	17.1%				
4th/Honours	25.7%				
Masters	8.6%				
Funding					
Personal	8.6%				
Parents	45.7%				
Sponsored	11.4%				
Loan	5.7%				
National student financial aid scheme	25.7%				
Multiple	2.9%				
Mother/Gaurdian1 level of education (years)	14.11	2.139	4.575	-0.310	2.994
Father/Gaurdian2 level of education (years)	15.85	13.412	12.740	-0.232	7.632
Home language					
English	20%				
Sotho	14.3%				
Zulu	11.4%				
Xhosa	11.4%				
Tswana	11.4%				

Northern Sotho	8.6%				
Multiple	8.6%				
Swazi	5.7%				
Afrikaans	5.7%				
Venda	2.9%				

*means of ordinal/Categorical variables are instead reported as percentages
Based on sample of 35

Generally, Table 101 indicates a diverse sample with representation from almost all demographic groups in the population. The preceding section reported the univariate statistics of this study and considered its distribution properties. The next section will report the bivariate findings of this study and relate them to each hypothesis.

6.4 BIVARIATE ANALYSIS

The bivariate associations of appropriate independent variables with the dependent variable will now be presented. The Pearson correlations are described for each in relation to the dependent variable under the appropriate hypothesis headings. Study 3, due to its small sample size and post-hoc nature, evaluates the hypotheses based on bivariate analysis. These results then guide further investigation into multivariate tests to provide further information on significant bivariate relationships.

Table 102. Correlations between the independent variables and collective intelligence

	Collective intelligence			
	Pearson Correlation	**Significance**	**Bootstrap 95 % Confidence interval**	
Average Intelligence	0.505	0.079	Lower	-0.218
			Upper	0.892
Maximum Intelligence	0.331	0.270	Lower	-0.366
			Upper	0.807
Average social sensitivity	0.560*	0.047	Lower	0.001
			Upper	0.898
Percentage of female group members	0.167	0.585	Lower	-0.490
			Upper	0.703
Average trait EI	0.042	0.891	Lower	-0.519
			Upper	0.617
Extraversion	-0.037	0.905	Lower	-0.575
			Upper	0.671
Agreeableness	0.234	0.442	Lower	-0.221
			Upper	0.672
Conscientiousness	0.164	0.593	Lower	-0.497
			Upper	0.646
Neuroticism	-0.077	0.802	Lower	-0.558
			Upper	0.385
Openness to Experience	-0.339	0.257	Lower	-0.839
			Upper	0.316

Notes. N=13. Bootstrapping with 1000 iterations was applied.

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

Null Hypothesis 2: There is no significant association between social sensitivity and collective intelligence.

Social sensitivity showed a correlation coefficient of r = 0.560, p = 0.047, which reached statistical significance at a $p<0.05$ level. Thus, the null hypothesis was rejected.

Null Hypothesis 3: There is no significant association between average individual intelligence and collective intelligence.

Average individual intelligence showed a correlation coefficient of r = 0.505, p = 0.079, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis was accepted

Null Hypothesis 4: There is no significant association between maximum individual intelligence and collective intelligence.

Maximum individual intelligence showed a correlation coefficient of r = 0.331, p = 0.270, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis was accepted.

Null Hypothesis 5: There is no significant association between percentage of female group members and collective intelligence.

Percentage of female group members showed a correlation coefficient of r = 0.167, p = 0.585, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis was accepted.

Null Hypothesis 6: There is no significant association between trait EI and collective intelligence.

Percentage of female group members showed a correlation coefficient of r = 0.042, p = 0.891, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis was accepted.

Null Hypothesis 7A: There is no significant association between extraversion and collective intelligence.

Extraversion showed a correlation coefficient of r = -0.037, p = 0.905, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis was accepted.

Null Hypothesis 7B: There is no significant association between agreeableness and collective intelligence.

Agreeableness showed a correlation coefficient of r = 0.234, p = 0.442, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis was accepted.

Null Hypothesis 7C: There is no significant association between conscientiousness and collective intelligence.

Conscientiousness showed a correlation coefficient of r = 0.164, p = 0.593, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis was accepted.

Null Hypothesis 7D: There is no significant association between neuroticism and collective intelligence.

Neuroticism showed a correlation coefficient of r = -0.077, p = 0.802, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis was accepted.

Null Hypothesis 7E: There is no significant association between openness to experience and collective intelligence.

Openness to experience showed a correlation coefficient of r = -0.339, p = 0.257, which did not reach statistical significance at a $p<0.05$ level. Thus, the null hypothesis was accepted.

The above evaluated the net relationships between the independent variables and the dependent variables. The next section will run multivariate analysis tests to determine the relationships when they are in presence of one another.

6.5 MULTIVARIATE ANALYSIS

Before the regression tests could begin, certain assumptions had to be adhered to and these assumptions were tested. The results appear in section 2 of Appendix AB. Once it was found that none of these assumptions were violated, regression testing could begin. Following the bivariate analysis, where social sensitivity proved to be the only significant relationship with collective intelligence, multivariate tests aimed to further evaluate the relationship. Thus, multivariate analysis was used to see how this relationship was affected by the inclusion of other variables. Results are presented below on a sample of 13 groups:

Table 103. Collective intelligence model summaries

Model Summary[c]									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.472[a]	.223	-.554	1.24671627	.223	.287	6	6	.923
2	.718[b]	.516	-.161	1.07771677	.293	3.029	1	5	**.142**
a. Predictors: (Constant), Avg Openness, Avg Conscientiousness, Avg Extraversion, Avg Neuroticism, Percentage of female group members, Avg Agreeableness									
b. Predictors: (Constant), Avg Openness, Avg Conscientiousness, Avg Extraversion, Avg Neuroticism, Percentage of female group members, Avg Agreeableness, Avg social sensitivity									
c. Dependent Variable: Collective intelligence									

According to Table 103, the addition of social sensitivity to the first model, increases the R^2 value by 29.3% which is not significant at a 95% confidence interval as shown by the Sig. F value Change statistic being greater than the desired 0.05 level. Thus, based on the current data, the addition of social sensitivity does not significantly improve the explanatory power of model at a 95% confidence interval. This, however, becomes significant at an 85% confidence interval.

Table 104. Collective intelligence models ANOVA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.674	6	.446	.287	.923[b]
	Residual	9.326	6	1.554		
	Total	12.000	12			
2	Regression	6.193	7	.885	.762	.642[c]
	Residual	5.807	5	1.161		
	Total	12.000	12			
a. Dependent Variable: Collective intelligence						
b. Predictors: (Constant), Avg Openness, Avg Conscientiousness, Avg Extraversion, Avg Neuroticism, Percentage of female group members, Avg Agreeableness						
c. Predictors: (Constant), Avg Openness, Avg Conscientiousness, Avg Extraversion, Avg Neuroticism, Percentage of female group members, Avg Agreeableness, Avg social sensitivity						

Table 104 shows that neither the model without social sensitivity nor with social sensitivity are significant predictors of collective intelligence with the current data. However, the model with social sensitivity is a more significant predictor of collective intelligence than the model without it.

Table 105. Collective intelligence model

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.105	9.677		.528	.617
	Percentage of female group members	.012	.017	.295	.694	.514
	Avg Extraversion	.076	.610	.048	.125	.905
	Avg Agreeableness	.056	1.508	.021	.037	.971
	Avg Conscientiousness	-.087	1.256	-.035	-.069	.947
	Avg Neuroticism	-.304	1.110	-.123	-.274	.794
	Avg Openness	-1.315	1.206	-.490	-1.090	.318
2	(Constant)	-3.604	9.748		-.370	.727
	Percentage of female group members	.010	.014	.267	.724	.502
	Avg Extraversion	-.287	.567	-.180	-.506	.634
	Avg Agreeableness	.330	1.313	.125	.251	.812
	Avg Conscientiousness	-.797	1.160	-.317	-.687	.523
	Avg Neuroticism	.567	1.082	.229	.523	.623
	Avg Openness	-.779	1.087	-.290	-.716	.506
	Avg Social sensitivity	.457	.262	.726	1.740	**.142**
a. Dependent Variable: Collective intelligence						

Table 106. Collective intelligence model (Bootstrapped coefficients)

Bootstrap for Coefficients							
Model		B	Bootstrap[a]				
			Bias	Std. Error	Sig. (2-tailed)	BCa 95% Confidence Interval	
						Lower	Upper
1	(Constant)	5.105	-2.497[b]	31.620[b]	.803[b]	-75.955[b]	103.518[b]
	Percentage of female group members	.012	.007[b]	.083[b]	.806[b]	-.131[b]	.122[b]
	Avg Extraversion	.076	.052[b]	2.904[b]	.956[b]	-3.752[b]	3.445[b]
	Avg Agreeableness	.056	-.319[b]	8.173[b]	.993[b]	-16.867[b]	9.929[b]
	Avg Conscientiousness	-.087	.715[b]	4.432[b]	.963[b]	-6.266[b]	8.376[b]
	Avg Neuroticism	-.304	.073[b]	3.399[b]	.844[b]	-24.966[b]	38.324[b]
	Avg Openness	-1.315	.151[b]	6.277[b]	.615[b]	-5.239[b]	3.099[b]
2	(Constant)	-3.604	5.012[c]	50.770[c]	.856[c]	-56.498[c,d]	97.869[c]
	Percentage of female group members	.010	.011[c]	.121[c]	.805[c]	-.122[c,d]	.163[c]
	Avg Extraversion	-.287	.065[c]	4.260[c]	.859[c]	-7.340[c,d]	5.236[c]
	Avg Agreeableness	.330	-.187[c]	10.942[c]	.916[c]	-17.996[c,d]	16.970[c]
	Avg Conscientiousness	-.797	.976[c]	7.230[c]	.810[c]	-8.462[c,d]	12.438[c]
	Avg Neuroticism	.567	-.819[c]	4.541[c]	.784[c]	-10.155[c,d]	6.121[c]
	Avg Openness	-.779	-.502[c]	7.772[c]	.748[c]	-13.807[c,d]	9.372[c]
	Avg Social sensitivity	.457	-.285[c]	1.616[c]	.575[c]	-1.609[c,d]	2.295[c]
a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples							
b. Based on 941 samples							
c. Based on 775 samples							
d. Some results could not be computed from jack-knife samples, so this confidence interval is computed by the percentile method rather than the BCa method.							

Further analysis of individual variables beta and significance values reveal social sensitivity has a positive relationship with collective intelligence. Social sensitivity has a beta value of 0.457. This does not reach significance at $p<0.05$ confidence interval. Social sensitivity is, however, the closest to reaching significance amongst all the variables tested.

6.6 CONCLUSION

This chapter detailed the results of the experiment carried out to form part of a post-hoc study. This study, named Study 3, aimed to assess, the already suggested relationship between social sensitivity and collective intelligence by Woolley et al. (2010). Other independent variables were tested to inform future research. This chapter achieved this by arguing the emergence of a collective intelligence factor, presenting the univariate statistics, describing the bivariate relationships and running further multivariate tests to provide further understanding of relationship strength. The results of the hypotheses tested, indicated social sensitivity to be the only variable with a significant net relationship with collective intelligence. Multiple regression tests could not confirm this relationship in the presence of other variables, but given the small sample size, this was to be expected. Results do show that out of all the variables tested social sensitivity was the most likely to predict collective intelligence. These results are further discussed in Chapter 9.

This chapter concludes the data analysis sections of this research. In total, three data analysis chapters where presented, representing the three studies carried out for this research. The next chapter discusses findings of the first study where following chapters discusses the findings of the other two studies.

CHAPTER 7: DISCUSSION OF FINDINGS - STUDY 1

7 STUDY 1 DISCUSSION

7.1 INTRODUCTION

This chapter provides a detailed discussion of the results for Study 1 and examines how they contribute and compare to the current literature. The main themes to be explored in this chapter focus on how cultural stimuli and participant culture interact to impact RMET performance. Gender differences on ToM performance are then discussed and explored in the context of different cultural stimuli and cultural identification. Theory will first be introduced highlighting the reason for this study's inclusion in the current research. Results and their contributions are then explained, and the results are discussed in the context of current literature – exploring both converging and diverging findings in the literature.

7.2 RMET PERFORMANCE ACROSS CULTURES

7.2 1 Introduction to theory and reason for investigation

The main aim of Study 1 was to provide alternative ToM instruments that allow the testing of whether there are differences between the ToM performance of different cultures when presented with stimuli of eye regions that are from individuals from the same ethnic group or from an alternative ethnic group.

The literature suggests that culture has an important role to play in ToM abilities (Adams Jr et al., 2010). Notably, studies suggest an advantage in performance on ToM when reading the minds of people of the same race and culture (Adams Jr et al., 2010; Slaughter & Perez-Zapata, 2014). Although studies have attempted to shed light on this same cultural advantage, no studies have attempted this with African stimuli or diverse Asian cultural stimuli. To date, the only available stimuli for the RMET are Caucasian (Baron-Cohen et al., 1997; Baron-Cohen et al., 2001) and Japanese (Adams Jr et al., 2010). This is surprising given that studies have shown that African samples have performed lower than the mean score on the Caucasian instrument (Dehning et al., 2012; Loftus & Noordien, 2011). Results of studies performed on the Japanese instrument would suggest this could be due to a same cultural advantage effect. This, however, can only be confirmed by creating a RMET instrument that contains African stimuli and comparing performance between different cultures on such an instrument.

7.2.2 Introduction to present study findings and contribution

In the present study, after closely following the criterion set out by Baron-Cohen et al. (2001), a final instrument of 21 African stimuli was created. Social sensitivity scores were then calculated for each participant, based on how many mental states they correctly identified from the 21 items. One-way ANOVA tests indicate a significant difference between cultural groups' performance on the African RMET. This contributes to the current body of literature on cultural differences in ToM abilities. However, this study's findings do not support the notion of same-culture advantage in the South African context.

Respondents that were of the same ethnic group as the stimulus presented (Black), scored significantly less than those who identified themselves as White. Using home language as a further indicator of cultural position, ANOVA tests again present a significant difference in ToM abilities between home languages.

Further analysis shows that individuals who spoke African languages, on average, scored significantly less on the instrument than people who identified English as their home language. This suggests that home language closely reflects one's general cultural background. The results of this study thus suggest that the same culture advantage in ToM abilities is not valid with African cultures, and the lower scores for African samples found in the literature (Dehning et al., 2012; Loftus & Noordien, 2011) cannot be explained by the racial group of the stimuli.

To further explore the relationship that racial group stimuli have with ToM, a mixed 'Other culture' instrument (e.g. Asian, Middle Eastern, Indian, Indonesian) was created using the same process used to create the African instrument. A final instrument of 26 items of 'Other culture' stimuli was created. This instrument is the first to include other Asian cultural groups besides Japanese stimuli. ANOVA tests replicated the African instrument results, indicating a significant difference between cultures. This again provides further support of differing ToM abilities between cultures.

Further investigation revealed 'Other culture' groups scored significantly higher than those who identified themselves as Black, but failed to score higher those who identified themselves as White. This is inconclusive in determining whether those who identify themselves in a racial group besides Black or White have an advantage in identifying the emotions of same culture stimuli.

ANOVA tests of home languages proved significant with the 'Other culture' stimuli. The significant differences in languages are once more between English and African languages, with African languages scoring lower in the newly created ToM instruments.

The two newly created instruments suggest that same race stimuli are not providing a ToM advantage, but generally those who identify as White or speak English as their home language have a ToM advantage. To have a holistic view of the effect of racial stimuli on ToM performance, Baron-Cohen and colleagues' (2001) original Caucasian instrument was also tested.

Following the process of testing with the first two instruments, the final instrument analysed consisted of 30 items of Caucasian stimuli. ANOVA tests confirmed the findings of the first two instruments. There are significant ToM differences between ethnic groups. These differences, as with the previous two instruments, are between those associating themselves with Black ethnicity and those associating with White or 'Other culture' ethnic groups.

The Black ethnic group scored significantly lower on the Caucasian instrument. Further analysis of home language mirrors the findings of the first two instruments. ANOVA tests of home language suggest significant differences in ToM between languages. This difference is mainly between English and African languages. These results suggest that those in the White ethnic group enjoy a ToM advantage in general over those belonging to the Black ethnic group, independent of the racial stimuli used to measure ToM. Analysis of an individual's home language suggests that those who mainly speak English at home have a ToM advantage over those who speak an African language. Together, this suggests that ToM performance in an African context may be dictated by deeper underlying cultural facets, as opposed to a visual indicator of racial group. This is considered in a later study (see Study 2 discussion).

7.2.3 Findings that conform to the literature

This current study confirms the importance of culture in ToM differences suggested in the literature. Prevost et al. (2013) validated a French version of the RMET by testing whether culture modulated the performance on the test in Canada. They found that culture does modulate performance: participants outside Canada whose home language was not English, or French (in the case of the French-translated RMET), performed lower on the RMET. The study also found no difference between Caucasian and non-Caucasian participants outside Canada – thus leading

the researchers to conclude that the differences were not based on the perception of facial indices.

Similarly, the current study provides further evidence that facial indices are not the main contributing factor to differences in ToM observed between cultures.

Monique et al. (2013) tested a German version of the RMET and found lower scores of ToM for their sample – compared to Baron-Cohen and colleagues' (2001) original instrument. They suggested that this could be due to 12 of the 36 items showing questionable psychometric properties, by not being chosen by a clear majority. They also suggested only subtle differences occurred in language translation, thus suggesting little increase in item difficulty. Their findings of lower scores and questionable psychometric properties mirror the current study. The current study had to drop 6 of the original 36 items due to questionable psychometric properties on the original Caucasian instrument. Therefore, independent of instrument language translations, when used in a different culture setting – certain items on the original instrument do not retain validity. Similarly, many other studies have found questionable psychometric properties for certain items independent of translation, which led them to suggest differences in culture as being the most likely reason (Hallerback et al., 2009; Prevost et al., 2013; Vellante et al., 2013). Furthermore, even when questionable items were dropped in the current study, the lower scores among African cultures persisted.

Dehning et al. (2012) performed a study in Ethiopia to compare differences in empathy between first and final year medical students at Jimma University. One of the instruments used was the Caucasian RMET. The results of RMET showed the Ethiopian sample scored an average of 14.4 for first-year students and 17.8 for final-year students. This is lower than the low mean score of 22 (Baron-Cohen et al., 2001). This is comparable to the current study's lower mean scores for ethnicities and languages associated with an African culture. This pattern of lower mean social sensitivity scores has also been reproduced in a South African sample. Lazarus (2009) found that Zulu and Xhosa adult participants performed significantly lower on the Caucasian RMET. They also observed that Zulu and Xhosa participants looked up more words in the definition hand-out compared to English participants. Multiple reasons were offered for these results. First, Xhosa and Zulu participants did not understand the English mental states' words, stating that certain words did not exist in their culture; second, in Zulu and Xhosa cultures, it is disrespectful to

make direct eye contact; and lastly, the stimuli consisted of Caucasian-based cultures (Lazarus, 2009). In another South African sample, Loftus and Noordien (2011) tested the Caucasian RMET on a tertiary student population in South Africa. Results of their study showed a statistically significant effect of race, where non-Whites scored lower than Whites on the test. They also found that participants whose home language was not English had lower performance scores on the instrument (Loftus & Noordien, 2011).

These lower testing results between South African 'non-White' cultures and their 'White' cultural counterparts have also been replicated in other Western neuropsychological tests such as the Raven's Standard Progressive Matrices (Rushton, Skuy & Fridjhon, 2002). These differences are constant with the current study – thus providing further evidence of cultural factors contributing to differences in neuropsychological tests and particularly showing that participants with African cultural associations score significantly lower on the RMET than other cultures. The reason offered for this difference is still unclear in literature. Many studies have suggested that this difference is because the facial stimuli in the RMET test (Baron-Cohen et al., 2001) are all photos of Caucasian faces (Adams Jr et al., 2010; Dehning et al., 2012; Franklin et al., 2015; Lazarus, 2009; Loftus & Noordien, 2011). Therefore, the consensus is that having the same cultural stimuli will lead to an advantage, and thus improved performance on the RMET.

7.2.4 Findings that differ from the literature

Perez Zapta et al. (2016) assessed the "higher level" mind-reading ability between an Australian and Chilean sample. Higher level mind reading refers to identifying causes behind a target's behaviour (Heyes & Frith, 2014). Their results indicated that mind-reading is more accurate and faster, when reading people from the same cultural background. They also suggested that giving participants more time to read the mind of another culture does not improve the accuracy of mindreading. Adam Jr et al. (2010) tested cross-cultural mindreading at the "lower level" using the RMET. Lower level mind reading is automatically interpreting physical cues such as facial expressions or eye gaze (Slaughter & Perez-Zapata, 2014). They used the Caucasian instrument as provided by Baron-Cohen, Wheelwright et al. (2001), and created an Asian instrument with stimuli reflective of the Japanese ethnic group. Their results suggested an intra-cultural advantage in ToM performance. They also found an increased activation of the brain region often associated with understanding mental states when confronted with same-culture stimuli.

Franklin et al. (2015) replicated this same cultural advantage using the same afore-mentioned Asian (Adams Jr et al., 2010) and Caucasian (Baron-Cohen et al., 2001) RMET instruments.

Bjornsdottir and Rule (2016) further tested the same instruments with a Caucasian and East Asian sample in Canada, and the results suggested an advantage when identifying emotions of own versus other ethnicity targets. They tested to see if factors such as the amount of time living in Canada, time interacting with Caucasians, increased endorsement of Canadian values, as well as decreased endorsement of heritage culture values, affected ToM performance. The results suggested that same ethnic ToM performance may rely on acculturation and cultural experience with the target culture. Other studies have also shown favourable results for an intra-cultural advantage in other tests of emotion and mental state recognition (Elfenbein & Ambady, 2002; Paulmann & Uskul, 2014). The above studies all suggest that when a person attempts to read the mind of an individual of the same culture, they will experience a culturally linked advantage in mindreading. This advantage allows them to more accurately identify a person's feelings or thoughts.

Contradictory the above cited in literature, the results of this research indicate that those associated with an African culture do not enjoy an intra-cultural advantage. This is the first study to test this intra-cultural advantage hypothesis using an African version of the RMET. In addition, using a newly created mixed 'Other culture' instrument, there is further evidence that this intra-cultural advantage is not easily replicated across mixed cultures. In general, there seems to be an independent advantage for Caucasians when it comes to interpreting the mental states of others by, assessing their target eye regions. Therefore, it seems that culturally, more emphasis is placed on mind reading in Western contexts. This study also found that facial stimuli do not affect this advantage.

This is in line with other studies that have shown that cultural differences in emotion and mental state recognition exist – regardless of the targets group (Elfenbein & Ambady, 2002; Prevost et al., 2013). These observations are critical, as they show that the "intra-cultural advantage" as dictated by same race stimuli is not universal, and is not the explanation for differences in performance on the RMET across cultures.

This however leaves a key unanswered question: "What is causing these differences in ToM tests across cultures as represented by the RMET?" A possible explanation is provided and discussed

in relation to Study 2 results in the next chapter. Another key issue in the literature is the gender difference in ToM performance.

The literature has shown a female advantage in ToM performance. However, it is not yet known if this is replicable across all cultural groups.

7.3 GENDER PERFORMANCE ON RMET ACROSS CULTURES

7.3.1 Introduction to theory and reason for investigation

The second aim of Study 1 was to investigate the reported female advantage in ToM performance and to determine whether this is consistent across different cultural instruments. The literature suggests that women perform better on the RMET than men (Baron-Cohen et al., 1997; Baron-Cohen et al., 2001) – so much so that it has been stated as being the most replicated finding in past RMET studies (Vellante et al., 2013). The main theory supporting this advantage is the empathising/systematising theory of psychological sex differences, which proposes that women are more empathetic, so enabling them to better recognise mental states (Adenzato et al., 2017; Baron-Cohen, 2002, 2010).

Although this female advantage has been found in literature, few studies report on it (Vellante et al., 2013). This is particularly the case with the revised RMET, and there is a need to replicate the reported female advantage (Monique et al., 2013). This study looks to investigate this female advantage with the revised RMET to see if the results replicate those found in the literature.

Another consideration overlooked in the literature is the impact that culture has on this advantage, and although the need has been identified (Franklin et al., 2015; Monique et al., 2013), hardly any studies have investigated this. Thus, this study examined whether cultural indicators and stimuli affected the proposed female advantage.

7.3.2 Introduction to present study findings and contribution

In the present study, gender differences were examined for all three tested and revised instruments. Two were created and tested in the current study – the African instrument and the 'Other culture' instrument – and the last instrument was the original revised RMET produced by Baron-Cohen et al. (2001).

The first instrument that examined gender differences was the African instrument. One-way ANOVA tests indicated a significant difference between genders – with women generally scoring higher than men. This contributes to the current literature and the evidence of gender differences in ToM abilities, and more specifically a female advantage in ToM performance. To assess whether this result is impacted by culture, two-way ANOVA tests were conducted with first ethnicity and then home language. The two-way ANOVA of ethnicity revealed that the interaction between African ethnicity and gender did not produce a significant effect on social sensitivity scores. This result was then reproduced when assessing the interactions of Caucasian and 'Other culture' ethnicities with gender. Home language investigations further supported a non-significant cultural interaction, with African and Caucasian language interactions with gender providing a non-significant effect on the RMET results. This indicates that women performing better on the African RMET, was not linked or specific to their cultural background. The 'Other culture' instrument was then examined to determine if this result could be replicated with mixed Asian stimuli.

When using the 'Other culture' instrument, one-way ANOVA supported the finding that there is a gender difference in the RMET. Again, this difference was represented by women scoring higher than men with the test. However, investigation into cultural indicators revealed interesting results across cultures. Those identifying themselves as belonging to an African or Caucasian ethnicity showed a significant interaction with gender when predicting the RMET scores. This is contrary to the previous result of the African instrument, where no significant interaction was found between these ethnicities and gender. This result suggests that the pattern of gender differences in social sensitivity is being determined by whether an individual's ethnicity is African or Caucasian. Further investigation of 'Other culture' ethnicities (e.g. Asian, Indian) did not replicate this significant interaction. This suggests that significant gender differences in the 'Other culture' RMET are specific to African and Caucasian cultures. Further assessment highlights that African ethnicities show a unique and significant female advantage for the 'Other culture' instrument. Surprisingly, Caucasian ethnicity did not show a female advantage. Rather, social sensitivity scores were similar between genders. This lack of gender difference was significant and unique compared to other cultures. This cultural dependence was further supported by two-way ANOVA test on different home languages. African languages and Caucasian languages show a significant interaction with gender, the same pattern of gender

differences as with ethnicity, where women who spoke an African language showed a female advantage but women who spoke a Caucasian language did not show a female advantage. This suggests that culture – namely African and Caucasian - impacts the effect that gender has on social sensitivity. This effect was only evident for the 'Other culture' questionnaire and not the previously discussed African questionnaire. The Caucasian instrument was considered to shed further light on the relationships between culture and gender.

When using the Caucasian instrument, one-way ANOVA tests between gender and social sensitivity showed significant differences between men and women. As expected, women performed better on the RMET. This contributes to the current literature that suggests a female advantage for this instrument. An investigation into ethnic group influence on the female advantage showed there is no interaction between all three ethnic categories (African, Caucasian and 'Other cultures') and gender – replicating the results of the African instrument. Consideration of home languages shows that African languages do not interact with gender to produce an effect on social sensitivity. However, Caucasian languages significantly interacted with gender to impact on social sensitivity scores. These results suggest that ethnic association does not impact the effect of gender on social sensitivity with the Caucasian instrument. This lack of interaction effect was also present for African languages. Caucasian home languages, on the other hand, interact with gender to produce an effect on Caucasian RMET scores. Specifically, this interaction presents a unique, small gender gap between women and men, for those who speak a Caucasian language at home. These results provided interesting insight into cultural patterns associated with gender.

Across all three instruments, there is a clear gender difference, with women scoring significantly higher than men on the RMET tests. This advantage was not linked to cultural background with the African stimuli. 'Other culture' stimuli showed that African and Caucasian gender differences were impacted by culture. 'Other cultures' did not show the same significant interaction. Caucasian stimuli showed no significant interaction between gender and African cultures and 'Other cultures'. Caucasian cultures only showed a significant interaction based on their home language.

Assessing this study's results, cultural ethnicity other than African or Caucasian does not impact gender's effect on social sensitivity. However, it is less clear what impact African and Caucasian

cultural indicators are having on gender's effect on the RMET. From these results it seems that Caucasian cultures show a smaller gender gap when assessing the 'Other culture' and Caucasian instruments. Alternatively, African cultures tend to show a relatively larger gender gap in performance, in favour of women – particularly with the 'Other culture' instrument. This result is surprising, as the literature posits that African cultures should show a smaller gender gap due to weakened adoption of gender stereotypes, as dictated by a higher percentage of African women participating in the workforce. Therefore, it seems unlikely that gender stereotypes related to workforce participation play a role in cultural gender differences. Other cultural factors in an African context, such as masculinity and hierarchy, could be creating the gender gap. This result suggests an opportunity for further exploration into cultural gender differences in ToM.

In summary, this study contributes to the literature by confirming a general female advantage, not only with the Caucasian RMET but also with an African and 'Other culture' RMET. This result was produced with a diverse sample. In addition, this study shed light on the interaction between culture and gender and their effect on social sensitivity. It appears that the gender effect is independent of culture, but the influence of culture, especially African and Caucasian cultures, can produce a larger or smaller female advantage with certain instruments. This suggests that uncovering the reason behind these cultural differences is important for clarifying performance on the RMET. This is investigated further in a later chapter.

The results discussed above are now considered in the context of current literature.

7.3.3 Findings that conform to the literature

The current study supports evidence that a female advantage exists in the RMET. Previously, the original Caucasian instrument (Baron-Cohen et al., 2001) was the main instrument examined for this gender difference in the literature.

The original Caucasian instrument has been considered with different samples in the literature. Hallerback et al. (2009) found in a Swedish population that a significant female advantage exists. This finding was replicated in other European populations, which include Belgium (Alaerts et al., 2011), the United Kingdom (Baron-Cohen et al., 2015; Carroll & Chiew, 2006), Austria (Voracek & Dressler, 2006), Turkey (Yilidrim et al., 2011), Spain (Redondo & Herrero-Fernández, 2018) and Italy (Vellante et al., 2013).

Interestingly, limited samples from the United States are reported, with seemingly only one showing a significant gender effect (Franklin et al., 2015). Unfortunately, many studies fail to report scores by gender (Vellante et al., 2013) – thereby limiting the ability to confirm this gender effect across cultures.

Kirkland et al. (2013) performed a meta-analysis across 10 countries to determine if there were any gender differences in the afore-mentioned instrument. In a sample of 4 290 healthy adults, they found a significant effect in favour of women. Tested moderators of language of the test administered, country, group of researchers, and reported versus unreported data, all proved non-significant in relation to this result. Although their research provided strong evidence of a female advantage, they conceded there was a limitation to their study because most of the 10 countries studied share a cultural context that was primarily individualistic. In fact, none of the listed countries were from Africa or Asia – therefore providing limited research on gender differences within these two contexts.

The studies that have been conducted in African and Asian contexts have shown a strong female advantage. Khorashad et al. (2015) examined an Iranian population with a Persian translation of the Caucasian RMET. They found a strong and significant female advantage. Dehning et al. (2012) studied an Ethiopian sample and produced a strong indication of a female advantage.

The results of the current study support the above literature – particularly the strong significance of the gender effect in an African sample on the Caucasian RMET. However, this effect is relatively unexplored across other cultural RMET instruments.

The study of Franklin et al. (2015) is the only one to investigate if instrument stimuli have an effect on this female advantage. They tested their Cross-Cultural Reading the Mind in the Eyes Test containing Japanese stimuli, as well as the Baron-Cohen et al. (2001) Caucasian instrument. Their results suggest that culture does not impact gender's effect on RMET. They also observed an overall female advantage, thus concluding that women outperform men on the RMET, regardless of culture (Franklin et al., 2015). The literature therefore can confirm a female advantage that is common among cultures when using an Asian and Caucasian instrument.

However, no instruments, such as the ones created in the current research (Appendix F, H), have been able to confirm this female advantage among African and other Asian cultures. Therefore,

the results of the instruments created in the current study are valuable in providing further insight into the gender effects on performance on RMET across cultures. The results confirm that the observed female advantage remains across African and 'Other cultures' cultures when using the original Caucasian instrument and the newly created African and 'Other culture' instruments. This confirms Franklin and colleagues' (2015) finding that a female advantage occurs regardless of culture, and provides new evidence that this remains true with African and 'Other cultures'. Although strong evidence exists for female advantage on RMET, many studies have failed to find this significant gender effect.

7.3.4 Findings that differ from the literature

Vellante and colleagues' (2013) analysis of studies that reported RMET scores by gender, showed that 11 out of 17 studies revealed a non-significant gender difference. Beyond the studies identified by Vellante et al. (2013), other studies in the literature report non-significant gender differences (for example, Olderback et al., 2015). However, many of these studies show that women have higher mean scores than men (Baron-Cohen et al., 2001; Chapman et al., 2006; Cook & Saucier, 2010; Harkness, Jacobson, Duong & Sabbagh, 2010; Olderbak et al., 2015; Valla et al., 2010). Furthermore, none of the studies assessed by Vellante et al. (2013) showed men scoring higher than women. This lack of advantage for men is evident in the literature, as only two studies found reported a small male advantage on the RMET (Monique et al., 2013; Nettle & Liddle, 2008). This suggests that if an advantage exists, it would be a female advantage. The current research is in favour of this advantage.

One study proposes that this female advantage may be determined by cultural target stimuli. Franklin et al. (2015) investigated the neural differences in mind reading between men and women when reading stimuli of different cultures. They found that men show increased mentalising-related neural activation when reading same culture faces compared to other culture faces, whereas women showed no difference between cultures – but rather more increased activation for other cultural groups. This suggests that male and female performance could be determined by cultural stimuli and a person's own culture. The current study results are contrary to this view, as they suggest that the female advantage generally exists across all cultural instruments, including the respondent's own culture.

Although the gap between male and female performance changes based on the cultural instrument, at no stage does it appear that men or women perform better on stimuli of their own culture. In fact, even though Franklin et al. (2015) found neural evidence for cultural effects on gender performance with same culture stimuli, their own empirical behavioural study carried out before their neural imaging study, supports the notion that the female advantage is not affected by the culture of the target stimuli. This does not rule out that subtle gender advantages could occur because of the target culture. However, it is more likely that this female advantage has increased due to a combination of societal gender roles, adoption of stereotypes (where women perform more care-giving related activities), as well as maternal instincts. This discussion section has highlighted that the current study results show a female advantage on the RMET across different instruments, each containing different cultural stimuli.

Although there are differing opinions and results in the literature, this study provides further support and evidence that a female advantage exists – particularly adding new knowledge that this advantage exists for an African and 'Other culture' RMET instrument.

7.4 CONCLUSION

Study 1 set out to resolve the cultural uncertainty surrounding RMET performance. It did this by creating two new instruments – an African RMET instrument and the 'Other culture' RMET instrument. These were tested alongside the original Caucasian instrument available in the literature in a generally diverse sample. They were then tested to determine cultural effects and differences across the instruments, as well to assess gender differences. The results showed that Caucasians enjoy a ToM advantage regardless of cultural stimuli, and African participants perform lower on the RMET compared to other cultures. Women, in general, enjoy a ToM advantage across all cultural instruments. These results were discussed and then placed in the context of the current literature.

The next chapter discusses the results of Study 2, and further investigates social sensitivity and the unanswered questions found in this study – in particular "Why are African participants performing lower on the RMET tests?"

CHAPTER 8: DISCUSSION OF FINDINGS - STUDY 2

8 STUDY 2 DISCUSSION

8.1 INTRODUCTION

This chapter provides a detailed discussion of the results for Study 2, and focuses on how these results contribute and compare to the literature. The main question to be discussed in this chapter is: "What determines social sensitivity?" This is achieved by considering the results of the tested hypotheses, under headings relating to individual contextual factors, trait EI and personality. Moderation and mediation effects are also explored and discussed. Each section first introduces the related theory and then highlights the reason for its inclusion in the research. The results and their contribution are then explained. Lastly, results are discussed in the context of the literature – exploring both converging and diverging opinions.

8.2 SOCIAL SENSITIVITY

The main aim of Study 2 was to understand what determines social sensitivity. This will provide further insight into why differences occur in ToM performance, as shown in Study 1.

To effectively measure all the desired variables and their relationships with social sensitivity, certain bias related to participant fatigue, culture and gender had to be considered. To avoid this bias, a new 21-item shortened multicultural instrument (see Appendix M) was developed by combining stimuli from the African, 'Other culture' and Caucasian instruments tested in Study 1. The combined instrument followed an objective criterion of selection detailed in Chapter 4 and Appendix L. This is the first RMET instrument that has multiple cultures as its stimuli – thus, allaying concerns of cultural advantages and inclusivity affecting instrument results, which are often expressed in the literature (Dehning et al., 2012; Hallerback et al., 2009; Prevost et al., 2013; Vellante et al., 2013). The shortened instrument also answers the calls for a shortened, more practical instrument for measuring ToM (Olderbak et al., 2015; Redondo & Herrero-Fernández, 2018).

The results of the new instrument mirror those found in Study 1. Significant differences were found between cultural indicators and gender, where African cultures preformed significantly lower on the multicultural RMET than other cultures, and women scored higher than men. These results not only support the reliability of the new, shortened multicultural instrument, but also confirm what was interpreted in Study 1 – that regardless of cultural stimuli, African cultures

score lower scores on the RMET compared to other cultures. This highlights the need to understand the determinants of social sensitivity as measured by this instrument. Thus, a conceptually derived model was created that included social sensitivity, emotional intelligence, personality and individual contextual factors. This model highlights potential variables and relationships that may influence social sensitivity. The first variable investigated was trait EI.

8.3 TRAIT EMOTIONAL INTELLIGENCE

8.3.1 Introduction to variable theory and reason for investigation

Researchers have consistently linked trait EI to ToM, citing the theoretical foundation that a greater understanding of emotions and self-efficacy will lead to more advanced ToM abilities (Ferguson & Austin, 2010; Hughes & Leekam, 2004; Terwogt & Stegge, 2001). However, concerns have been raised that very few studies have attempted to empirically test this relationship (Ferguson & Austin, 2010; Qualter et al., 2011). This current study investigates whether trait EI is associated with ToM.

8.3.2 Introduction to present variable findings:

Null Hypothesis 2: There is no significant association between trait EI and social sensitivity.

Alternative Hypothesis 2: There is a significant positive association between trait EI and social sensitivity.

Analysis of the bivariate relationships between trait EI and ToM indicated a positive but non-significant association. Further exploratory investigation showed that none of the facets that make up the trait EI variable were significantly correlated with ToM.

Multivariate analysis revealed that with the inclusion of individual contextual factors as control variables – a non-significant amount of variance is explained by trait EI. This non-significant impact was replicated when testing its facets.

These results suggest that trait EI does not influence social sensitivity, or, alternatively, the facets of trait EI may provide greater insight into trait EI's effect on ToM than the overall trait EI measure. Sociability and emotionality provide promise in terms of a potential relationship. Sociability showed a strong, non-significant, correlation in bivariate tests. Sociability refers to a person's social intelligence and includes characteristics such as social awareness, assertiveness

and emotion management (Petrides, 2009). Emotionality, however, was the best performing facet in multivariate testing – adding the most variance to the model out of all the facets. This added variance by emotionality was very low in the current study, but still informs on its potential to be influential in future studies. Emotionality is associated with a person's 'personal' intelligence, and includes characteristics such as emotion perception, emotion recognition, trait empathy, and relationships (Petrides, 2009). Given that the instrument used has limited items measuring these facets and that its main purpose was to measure trait EI (Cooper & Petrides, 2010; Petrides, 2009), item reliability on these facets are clearly an issue. Results also do not provide substantial evidence of a relationship with social sensitivity. However, exploring these facets can guide and inform current and future research. The findings relating to this relationship provide new empirical evidence concerning trait EI's lack of a significant direct impact on ToM. Therefore, the null hypothesis was not rejected.

8.3.3 Findings that conform to the literature

This is not first study that struggled to find an association between trait EI and ToM. The most relevant study is Ferguson and Austin (2010), who failed to find a significant relationship between trait EI and ToM as measured by the Caucasian RMET in an adult sample. Many other studies have also found that trait EI has weak correlations with other measures of ToM. Barlow et al. (2010) found that trait EI, in a sample of children, did not correlate with false belief understanding. In a later study, Qualter et al. (2011) replicated this non-significant association between trait EI and false belief – again with sample of two groups of children. One group was aged 5–7 years and the other group 8–10 years. However, Qualter et al. (2011) suggest that this highlights the importance of emotional knowledge and understanding to ToM performance. This emotional knowledge and understanding are obtained through mastery, which comes with age. The importance of mastery is emphasised in their study as the older group's performance on false belief tasks was positively correlated with their emotional abilities. According to Qualter et al. (2011), there is a general increase in performance of the older group with a more advanced ToM test – the faux pas test. The above suggests that with a sample containing older individuals, a person's emotional knowledge and understanding will become more established, and, by implication, their emotional self-efficacy as measured by trait EI. This in turn will lead to higher levels of ToM as measured by more complex instruments. This relationship– particularly measured using faux pas – is evident in literature.

8.3.4 Findings that differ from the literature

Ferguson and Austin (2010) found that trait EI was significantly correlated with ToM as measured by faux pas in an adult sample. This significant association was also found in a sample for children above eight years of age (Barlow et al., 2010; Qualter et al., 2011). These results seem to support a relationship between trait EI and advanced ToM instruments. RMET is considered an advanced ToM instrument. The differences and conflict in the literature seem to lie in instrument choices and measures. The trait EI–ToM relationship appears to only occur when the respondents are above a certain age (e.g. eight years old) and when the ToM measure is an advanced ToM task such as faux pas. As mentioned earlier, Qualter et al. (2011) believe this explanation regarding age has to do with mastery of emotional skills. However, this does not explain why a relationship between trait EI and ToM is not being established in an adult sample, while using a generally advanced ToM task such as the RMET. This lack of relationship is both found in the current research and in Ferguson and Austin's (2010) study. A possible reason lies in the ToM components.

Ferguson and Austin (2010) explain that ToM should be considered in two components. Tager-Flusberg and Sullivan (2000) propose the components of ToM to be social-cognitive ToM and social-perceptual ToM. Social-cognitive ToM is described as one's ability to reason about the mental states of others. Social-perceptual, on the other hand, focuses more on rapid interpretation of these states by reading non-verbal cues. Ferguson and Austin (2010) then used these categories by assigning the faux pas test as an indication of social-cognitive ToM and the RMET as an indication of social-perceptual ToM. They then hypothesised that trait EI would more likely be associated with social-perceptual ToM, as with the current research, and ability EI with faux pas. Contrary to expectations, in their study trait EI was more associated with social-cognitive ToM and no association was found with social-perceptual ToM.

Unfortunately, although Ferguson and Austin (2010) highlighted that social-perceptual ToM failed to be significantly correlated with trait EI after suggesting it would – they failed to explain or explore why this is the case. Therefore, a clear tension in the literature remains unresolved. Given that Ferguson and Austin's (2010) study is the only one to test the trait EI relationship with social-perceptual ToM in adults, the current study's results provide a much-needed contribution to the topic. It may seem, from the current study's results, that there is a lack of relationship

between trait EI and social-perceptual ToM. Later considerations in this chapter – particularly assessing moderation effects – show that this relationship may exist, but is being influenced by individual contextual factors. This latter consideration underlines the importance of the current study by offering an explanation for the lack of a relationship between trait EI and social-perceptual ToM – something Ferguson and Austin (2010) could not provide.

Another important relationship considered in this study was personality and social sensitivity, and this is discussed next

8.4 PERSONALITY

8.4.1 Introduction to variable theory and reason for investigation

When investigating trait EI, it is suggested that a personality framework be included due to the strong linkages between the two variables (Petrides & Furnham, 2001). Apart from the complementary nature of personality justifying its inclusion in this study, many theoretical indicators suggest that personality differences affect ToM. There are strong theoretical overlaps between personality traits and varying social skills, which in turn correlates and identifies with differing ToM levels (Ewing et al., 2016; Nettle & Liddle, 2008). Very few studies have however investigated the potential relationship that personality has with social sensitivity (Ewing et al. 2016; Ferguson & Austin, 2010; Nettle & Liddle, 2008), and fewer while considering trait EI as part of the testing framework (Ferguson & Austin, 2010). The current study investigates whether personality traits – extraversion, conscientiousness, agreeableness, neuroticism and being open to experiences – are associated with ToM.

8.4.2 Introduction to present variable findings

Null Hypothesis 3: There is no significant association between personality traits and social sensitivity.

Alternative Hypothesis 3: There is a significant association between personality traits and social sensitivity.

The bivariate relationship analysis indicated that, of the five personality traits studied, two reached a significant level of association. Agreeableness showed a significant negative association with ToM, and neuroticism showed a positive significant relationship. Extraversion and conscientiousness showed non-significant negative relationships with ToM. Openness to

experience had a non-significant positive association with ToM, and was the closest out of three non-significant variables to becoming significant – suggesting it is the most likely of the three non-significant variables, to influence social sensitivity.

The addition of individual contextual factors in multivariate analysis, as with trait EI, strongly dampened the effects of the associations between the personality traits and ToM. All personality traits had non-significant relationships with ToM when controlling for demographic variables. The trait closest to having a significant impact on the model was openness to experience. The findings relating to the relationships between personality and ToM provide new empirical evidence concerning personality's lack of a significant direct impact on ToM. Therefore, the null hypothesis was not rejected.

The strong impact of individual contextual factors suggests that if any relationship exists between personality and ToM, it is may be influenced by an outside variable. This stresses the importance of further exploration into moderation and mediation relationships. Other studies have not examined moderation and mediation effects for these variables, but have considered the direct relationships.

8.4.3 Findings that conform to the literature

Following the suggested splitting of ToM into two components, social-cognitive and social-perceptual, Nettle and Liddle (2008) found that none of the personality traits were significantly associated with social-perceptual ToM. Ferguson and Austin (2010) tested agreeableness and openness to experience in their study and found non-significant relationships with social-perceptual ToM. The results from these studies align closely with the current study when considering the results of the multivariate analysis.

It is interesting to observe that when considering bivariate tests, a different perspective on the potential relationships is revealed across studies. In the current study, agreeableness has a significant bivariate relationship with social-perceptual ToM. Nettle and Liddle (2008) and Ferguson and Austin (2010) only found that agreeableness has a significant positive relationship with social-cognitive ToM. These authors' findings led them to conclude that agreeableness is only correlated with social-cognitive ToM (Ferguson & Austin, 2010; Nettle & Liddle, 2008). Similarly, Nettle and Liddle (2008) found a significant positive relationship between neuroticism and ToM, but only with social-cognitive ToM. The current study paints a different picture –

showing, through bivariate tests, a direct relationship between neuroticism and social-perceptual ToM.

In the current study, these significant relationships between agreeableness and social sensitivity, as well as between neuroticism and social sensitivity, are largely affected by individual contextual factors as shown by the multivariate tests. This is to be expected, as the sample used is vastly different from that of the studies in literature. The current study's sample was collected in an African context where many cultures are represented, and some previously unconsidered in literature. This cultural difference is further highlighted in the contrasting direction of relationship between agreeableness and ToM in the current study and the studies in literature compared above.

The literature results, as opposed to the current study, showed a significant positive relationship between agreeableness and ToM. The current study however showed a significant negative relationship. This differing result is surprising and required investigation. The significant negative relationship seems to suggest that in the current context, containing African cultures, the traits associated with agreeableness such as being friendly, cooperative, empathetic and trustworthy are not a positive indicator of high ToM – but indicate lower ToM scores. Culturally, this may indicate that assessing mental states through facial indices in African cultures, suggests a personality that is less empathetic, cooperative, friendly and trustworthy. A post-hoc investigation of how culture moderates the relationship between agreeableness and social sensitivity provides interesting insights into this proposition.

Figure 40. Moderation: English*agreeableness and social sensitivity

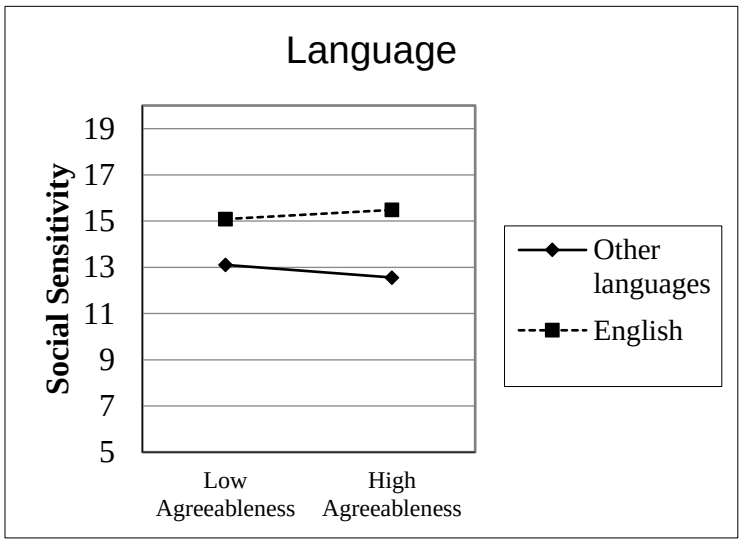


Figure 41. Moderation: African*agreeableness and social sensitivity

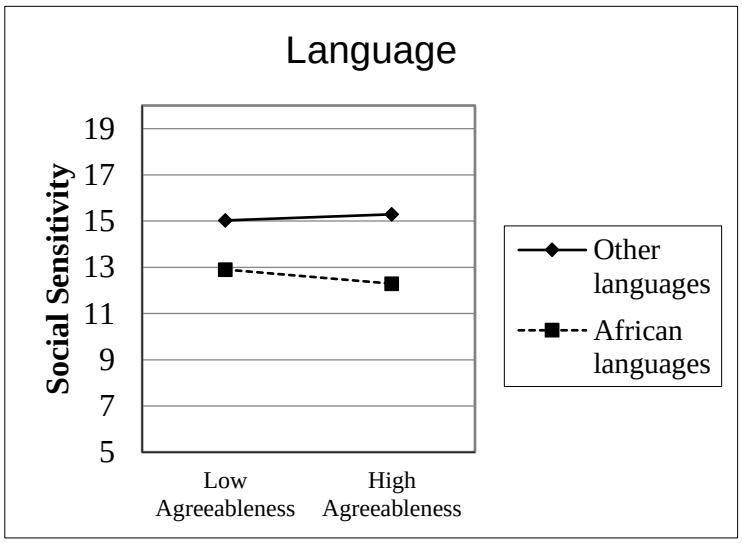


Table 107. Moderation effects of home language on agreeableness-social sensitivity

Moderator	Interaction term coefficient	Interaction term coefficient with controls	Significance	Significance with controls
English	0.7070	0.9185	***0.1793***	0.1124
African Languages	-0.6574	-0.6599	***0.1714***	0.2055

Figure 40 (above) shows a pattern where English home language speakers show greater levels of ToM when they show higher levels of agreeableness. Table 107 confirms this by indicating a positive coefficient for the interaction term for English home language respondents. This positive relationship is expected and is seen in the literature (Abe et al., 2013; Ferguson & Austin, 2010; Nettle & Liddle, 2008). In contrast, Figure 41 shows a pattern where African home language speakers show lower levels of ToM when they show higher levels of agreeableness. Table 107 confirms this, by indicating a negative coefficient for the interaction term for African home language respondents. This result was not expected, and suggests that cultural norms are governing the agreeableness and social sensitivity relationship. High levels of agreeableness and its traits such as empathy and cooperation, do not necessarily indicate higher ToM performance –

contrary to a proposition often argued for in the literature (Ferguson & Austin, 2010; Lawrence et al., 2004; Nettle, 2007; Nettle & Liddle, 2008; Paal & Bereczkei, 2007). Rather, the relationship direction between agreeableness seems dependent on cultural background and influencers. Cultural background appears to govern whether high ToM performance is in fact a desirable ability in terms of becoming a more empathetic and cooperative individual. A high ToM ability may depict a less empathetic and cooperative person in different cultures, in this case, African cultures. Taking the above insights into account, we can begin to make sense of the significant negative relationship between agreeableness and social sensitivity identified in the bivariate tests. Although the interaction terms of the post-hoc moderation tests in Table 104 were not significant, the comparisons between the interaction terms for English and African home languages show a clearly divergent pattern. African cultures show a negative relational pattern with social sensitivity, and English cultures show a positive relational pattern. The current study was performed in an African context, where a large portion of the sample was accustomed to African cultural norms. The significant negative relationship between agreeableness and ToM in the bivariate test can, therefore, be explained by African cultural norms. The other relationship found was a significant positive relationship between neuroticism and social sensitivity, which is discussed next.

The neuroticism personality trait also had a positive relationship with ToM in literature (Ferguson & Austin, 2010; Nettle & Liddle, 2008). However, this relationship was only significant with social-cognitive ToM. The current research found the same positive significant relationship in bivariate analysis, but with social-perceptual ToM. This appears to be the first occurrence in literature of a potential relationship between neuroticism and social-perceptual ToM – thus making this finding a unique contribution.

Neuroticism describes a person who is often anxious, nervous and depressed. This positive relationship with social sensitivity is possibly explained by an increased attention to their environment in order to conceal the mannerisms displayed in this personality trait. Society often perceives such traits as negative, with much stigma surrounding depression and anxiety. Therefore, individuals with these traits are more likely to be attentive in social situations to portray a more socially acceptable image. Previous research supports increased social sensitivity for individuals who show behaviours of the neuroticism trait. For example, mild depression or

dysphoria have been found to enhance ToM (Gleicher & Weary, 1991; Harkness et al., 2005). It has been suggested that this is likely because negative mood improves focus in order to maintain social connections (Allen & Badcock, 2003). Motivation has also been proposed as a key reason behind this relationship, suggesting that heightened levels of anxiety act as a motivator to identify social cues (Nettle & Liddle, 2008), so supporting the explanation that increased attention is being exercised to preserve social status. Although a relationship between neuroticism and social-cognitive ToM has been established in the literature, there is no clear reason why this relationship shouldn't be represented with social-perceptual ToM, especially since Harkness et al. (2005) found mild depression enhances social-perceptual ToM. The current study found this to be true. A significant positive bivariate relationship between neuroticism and social-perceptual ToM does indeed emerge in the current context.

To summarise then, along with neuroticism, it was also found that agreeableness had a significant bivariate relationship with social-perceptual ToM in the current study. The literature was only able to replicate these relationships with social-cognitive ToM. The direction of the agreeableness relationship was also different, with the current study suggesting a negative relationship as opposed to the literature which suggests a positive association. Based on the post-hoc investigation, the reason for the directional difference was identified as potentially cultural. The results indicate that these personality traits, namely neuroticism and agreeableness, play a part in ToM, with literature suggesting a relationship with social-cognitive ToM (Ferguson & Austin, 2010; Nettle & Liddle, 2008) and the current study social-perceptual ToM. Contrary to this, one other study has suggested that significant relationships exist with the other personality traits (Ewing et al., 2016).

8.4.4 Findings that differ from the literature

Ewing et al. (2016) aimed to test the relationship between spitefulness and ToM using the RMET (a social-perceptual ToM test). In their study, they included the HEXACO model of personality representing Honesty-Humility, Emotionality, Extraversion, Agreeableness, Consciousness and Openness to Experience. This model is similar to the Big Five model, with emotionality (comparable to neuroticism) and agreeableness reflecting slightly rotated versions of the Big Five model (Ashton, Lee & de Vries, 2014). With this model of personality, it was found that extraversion had a significant negative relationship with ToM, while conscientiousness and

openness to experience had significant positive relationships. Agreeableness and emotionality did not have a significant relationship. However, Ewing et al. (2016) indicated the agreeableness relationship to be negative. As mentioned before, they used an instrument related to the HEXACO model of personality, which may explain in large part why significant relationships are being found for extraversion, conscientiousness and openness to experience. Other instruments used in literature, such as the International Personality Item Pool (Goldberg, 1999) and the current studies Big Five Inventory (Benet-Martinez & John, 1998), found comparable non-significant relationships. Ewing and colleague's (2016) study rather serves to inform on another perspective – than provide a clear comparison. Particularly informative is the significant relationship found for openness to experience.

The current study showed that openness to experience seemed to be the next closest to have a significant effect on ToM, and thus taken together such a relationship may be plausible under ideal conditions. Consensus regarding which personality traits are important to enhanced levels of ToM, is unclear. Another contention was whether this appears at the social-perceptual level or just at the cognitive level. The current study contributes to this sparsely explored debate by providing further evidence that at the social-perceptual ToM level, there are bivariate relationships for agreeableness and neuroticism. In addition, it was identified that directionality of the agreeableness and social sensitivity relationship appears to be dependent on culture – a proposition previously unconsidered in literature. There is, therefore, a need for further investigation into personality differences in different cultures, as highlighted by an unexpected negative agreeableness association with social sensitivity. This cultural importance is further reflected by an almost complete dampening of the influence of personality traits on social sensitivity, with the inclusion of individual contextual factors such as gender, ethnicity, home language, and faculty in multi regression tests.

8.5 INDIVIDUAL CONTEXTUAL FACTORS

8.5.1 Introduction to variable theory and reason for investigation

A strong theme that emerged from current research results is the prominent role that individual contextual factors play in determining ToM differences. This is not unexpected, as studies in the literature have found that gender (Vellante et al., 2013), ethnicity (Loftus & Noordien, 2011), field of study (Billington et al., 2007; Kidd & Castano, 2013), level of study (Dehning et al.,

2012), family background (Cutting & Dunn, 1999) and language (Prevost et al., 2013) all capture variance in social sensitivity. These differences are dictated by different theories relating to empathy, mastery, culture, social development and cognitive styles. The importance of individual contextual factors, although considered, arguably has not produced the insights that the current study can provide – given the instruments and context used in the current study.

8.5.2 Introduction to present variable findings

Null Hypothesis A: There is no significant association between individual contextual factors and social sensitivity.

Alternative Hypothesis A: There is a significant association between individual contextual factors and social sensitivity.

The use of a multicultural instrument in the current study allowed for an unbiased cultural view of social sensitivity, in order to rule out any effects caused by racial and cultural indicators on the instrument. This provides an objective analysis of individual contextual factors' effects on ToM, as measured by the RMET. To date, this is the only study that can claim to offer this objective cultural insight.

A regression analysis containing all the individual contextual factors was run to see which variables were the most important. Women showed a significantly strong positive relationship with social sensitivity and home language, where first language was English, and scored significantly higher than other languages. Gender as well as home language were the strongest predictors of social sensitivity. The only other variable to reach statistical significance was field of study. Engineering and Built Environment degrees significantly outperformed other fields. All other variables, namely level of education, ethnicity, source of funding and parent's education, failed to reach significance. These results show that a person's individual background and identity predicts differences in ToM. Gender and home language are particularly indicative. This was in line with the findings discussed in Study 1, which highlighted that these predictors are strong regardless of instrument stimuli. Therefore, the alternative hypothesis was accepted, and the null hypothesis was rejected.

8.5.3 Findings that conform to the literature

The above results further reinforced the findings in Study 1. Specifically, that gender and home language are key indicators of a person's social sensitivity. The literature supports these relationships. As seen in the Study 1 discussion, home languages significantly impacted on ToM performance (Loftus & Noordien, 2011; Prevost et al., 2013) (for a full discussion see Chapter 7). However, there is limited research that seeks to understand the reasons behind this relationship. This study proposes that culture is the underlying factor driving this relationship. The relatively diverse sample, especially regarding different languages, in the current research confirms this – an investigation into both Study 1 and Study 2 home language differences showed that participants speaking English at home score higher on the RMET than other languages. It is highly probable that those speaking English at home follow Western cultural norms, where this research argues higher ToM is more common. It is also clear that African cultures, as indicated by African languages in the current research, follow a norm of lower ToM. The other result reproduced in this study, was a significant female advantage on the RMET tasks.

This female advantage has been reproduced in a large meta-analysis (Kirkland et al., 2013) and other reviewed studies (Vellante et al., 2013) (for a full discussion see Chapter 7). This observed difference is seen both in Study 1 and Study 2 of this research – thus further highlighting that this advantage is replicable across cultures and the used instruments. This aligning of the literature to the current research results also speaks to the reliability of the newly created instruments.

The last significant result found by the multiple regression analysis was that Engineering students outperformed other students. This result was not expected, as engineering students are expected to have a more scientific style of thinking (Lawrence, 2006) and thus should have higher levels of the systemising quotient as opposed to the empathy quotient (Billington et al., 2007). A systemising cognitive style identifies system variables to predict behaviour, whereas an empathising cognitive style identifies emotions and thoughts to predict behaviour (Baron-Cohen, 2002, 2010).

8.5.4 Findings that differ from the literature

Higher levels of systemising and lower levels of empathy often indicate a decreased ToM due to the inherent positive relationship between the empathy quotient and ToM (Billington et al., 2007). An investigation into the current study's sample provides some insight in respect of the opposite result in the current study (Engineering students having higher ToM). Most of the randomly selected sample collected was from Engineering and the Built Environment, and Science degrees – such as Mathematics. Over 90% of the sample consisted of students studying Engineering and Built Environment degrees and Science degrees, with 48.8% doing Engineering degrees and 42.4% doing Science degrees. The result, therefore, speaks more to the difference between these two degrees. This, although unintentional, provides further support for the proposition in literature that more scientific fields of study will have lower levels of ToM. What the current result highlighted was that Science degrees such as Mathematic based degrees are possibly attracting students with a cognitive style that is significantly more systemised compared to Engineering and Built environment students – thereby explaining the ToM differences in favour of the latter. Considering this, the result begins to make sense. Although Engineering and Built Environment degrees probably have higher levels of systemising, it is argued that more social skills would be involved in these degrees as opposed to Science degrees. This is probable, as courses such as project management are often included in Engineering degrees – where team dynamics are key aspects of an Engineer's job. It has been noted that there has been a shift in Engineering programmes to focus more on teamwork, collaboration and communication (Walther, Miller & Sochacka, 2017). Such human interaction is not as common in the mathematics and theoretical courses. The result provides an interesting insight into the two groups of people and suggests that Science degrees show more extreme gaps between cognitive styles than Engineering degrees. This also implies they should be studied separately in research related to emotion and psychology, in order to avoid participants from Science degrees creating biased results.

All other variables failed to reach significance in the current study; multiple reasons could inform these non-significant results.

For ethnicity, most of the effect on social sensitivity may have been captured by home language. Although not fully indicative, this was expected because Black ethnic individuals will likely

speak an African language at home. Home language is argued to more closely determine the cultural norms a respondent follows, hence why it proved to be a more significant predictor of ToM than ethnicity in the current study. This also reinforces the notion that differences seen between ethnicities, particularly Black and White, are being dictated to by the underlying cultural norms (indicated by language) and not race.

For level of study, the current study may have been biased toward first and second year students, as 71.4% of the sample consisted of those two years of study – thus influencing any potential relationship level of study could have with ToM.

Family background provided significant results in determining ToM in samples containing children (Cutting & Dunn, 1999). This failed to reflect in the current sample consisting of young adults. Family background was measured by variables such as source of funding and parent's education which proved non-significant to social sensitivity. These results suggest that as children get older, their ToM ability evolves so that differences are less influenced by family dynamics and background and more by their individual characteristics.

To conclude then, this study's investigation into individual contextual factors revealed two strong predictors that continue to appear as key indicators of ToM in the current research – gender and home language. With such a strong result, it is possible that the lack of significant relationships found between the independent variables personality and trait EI, and the dependent variable social sensitivity, is because of potential moderation and mediation effects.

8.6 MODERATION AND MEDIATION

8.6.1 Introduction to variable theory and reason for investigation

In the current model, theory suggests that the strong relationship between trait EI and personality could reveal mediating effects of personality on the relationship between trait EI and ToM. In addition, theory indicates the potential for moderation effects of culture (Chasiotis, Kiessling, Hofer & Campos, 2006), gender (Baron-Cohen, 2002, 2004), age (Qualter et al., 2011), agreeableness (Ferguson & Austin, 2010) and mood (Nettle & Liddle, 2008).

All these moderation variables have been suggested to affect the relative strength of at least one of the observed variables, and have a relationship in some form with the dependent (ToM) and independent variables (personality, trait EI). Given the observed strength of individual contextual

factors, it is important to identify how these moderator variables interact with the independent variables, in order to gain a better understanding of their relationships with ToM.

8.6.2 Introduction to findings

Mediation

Mediation was tested using the method prescribed by Baron and Kenny (1986). No mediation relationships were found. Trait EI and personality failed to provide evidence of a significant relationship with ToM. Hence, there was no relationship to be mediated. Personality and trait EI were strongly correlated, as expected. However, the lack of associations with the dependent variable, social sensitivity, was not anticipated. Possible reasons for these non-significant relationships with the dependent variable were discussed previously. The outcome of the preceding discussions pointed to individual contextual factors. Thus, it is suggested that individual contextual factors are moderating these relationships.

Moderation

Again, moderation testing was carried out using the procedure set out by Baron and Kenny (1986). Trait EI's relationship with ToM is considered first for moderation effects.

The moderating factor of age failed to significantly impact trait EI's relationship with ToM. The interaction term showed a non-significant moderation effect between trait EI and ToM. The moderating factor of agreeableness also showed a non-significant interaction term for the trait EI and ToM relationship. Therefore, there is no evidence in the current study for agreeableness moderating the relationship between trait EI and ToM. The next two moderators tested were highlighted in preceding discussions as being the strongest and most promising in explaining ToM differences. Gender was the first of these two identified variables. The moderating effect of gender proved to be non-significant, but the second variable, culture, provided interesting results. Culture was tested using ethnicity and home language as proxy variables. Ethnicity lacked a significant interaction term for the trait EI and ToM relationship. Home language, for selected languages, showed a significant moderating effect on the relationship between trait EI and ToM. This pattern of home language acting differently in relation to ethnicity was reflected in previous results. It was argued that the reason for this is because home language is more indicative of the underlying culture values of an individual, than ethnicity. This is further demonstrated in the

current results. Trait EI has a significant positive relationship with ToM when participants speak English at home. This effect was however negative when respondents spoke Zulu, Sotho and Northern Sotho at home. To provide clarity on this cultural difference, African languages were grouped together. African languages then showed a strong significant negative interaction term for the trait EI and ToM relationship – suggesting that trait EI has a significant negative relationship with ToM when participants speak an African language at home. This explains why the unexpected non-significant relationship between trait EI and ToM was found in the previous analysis. Home language affected the results, as two cultures are showing opposing relational effects – thereby cancelling out any potential relationship either way. This is the first account of these relational differences and interactions with these variables across cultures. This surprising finding and theoretical reasons are discussed in detail, in the next section. The last relationship considered for moderation effects was between personality and ToM.

Gender was investigated as a potential moderator for the relationships between the independent variables, agreeableness and neuroticism, and the dependent variable ToM. Gender did not moderate either of the relationships – therefore indicating that gender did not significantly alter the relationship between the independent and dependent variables. The last moderator tested was the participant's current mood and their effect on the relationship between neuroticism and ToM. Again, a significant interaction did not materialise, but an inspection of the moderation plot suggested that as a person's neurotic behaviour increases, social sensitivity will increase – and at a faster rate with negative mood. This implies that the driver of social sensitivity in the neurotic personality trait is potentially negative moods.

8.6.3 Literature analysis

The potential for a participant's current mood to interact with neuroticism to produce varying effects on ToM, makes sense when considering the literature. Not only has negative mood been found to be associated with ToM (Nettle & Liddle, 2008), but neurotic individuals tend to be more depressed and sad (Benet-Martinez & John, 1998), and mild depression enhances ToM (Gleicher & Weary, 1991; Harkness et al., 2005). According to the current results, it is likely that the more neurotic the personality and the lower the person's mood, the more heightened his or her ToM ability will be. Interestingly, if a person has positive moods and a low neuroticism personality, he or she will still outperform neurotic individuals with a low mood. This supports

the notion that if a person has low mood, or depression, they will have lower ToM. This is suggested by Lee et al. (2005), whose study indicates major depression is associated with ToM deficits. The current study results suggest that negative mood only enhances a person's ToM ability – the more neurotic a person's personality. This implication further supports the literature and the current study's explanation that the relationship between neuroticism and ToM is due to aspects of depression and anxiety causing individuals to protect their social status by paying greater attention to social cues. The non-significant moderation effect of gender on personality and social sensitivity is considered next.

The literature provides evidence that women score higher on neuroticism and agreeableness (Schmitt et al., 2008). Women have also been found to score higher on social sensitivity (Kirkland et al., 2013; Vellante et al., 2013). Gender, however, contrary to the above connections and associations, did not interact with these personality traits to affect ToM in the current study. The reasons for this may be cultural. As discussed previously, the associative direction of agreeableness in the current context is opposite to the hypothesised relationship indicated in the literature. This may indicate that how gender interacts with personality in the current context, is different from other countries. It is also possible that the effect of gender and the identified personality traits on ToM, are independent of each other. This potential moderation relationship however needs to be tested further in other contexts to provide further comparative insight. The non-significant moderation effect of agreeableness on trait EI and social sensitivity is considered next.

In the literature, agreeableness has been seen to associate with higher levels of empathy (Baron-Cohen & Wheelwright, 2004). Trait EI is also shown to be related to empathy (Austin et al., 2005). This, coupled with empathy's relationship with ToM (Lawrence et al., 2004), indicates a potential interaction effect between agreeableness and trait EI, based on the higher levels of empathy associated with agreeableness. This interaction was however not found. Contextual differences play a role in this interaction; agreeableness and trait EI are affected heavily by culture (home language). Therefore, in this context, it is more likely that if moderation is occurring, it will be through individual contextual factors. These are considered next – specifically for the relationship between trait EI and social sensitivity.

Age is a potential individual contextual factor that has been considered in the literature. An increase in age is suggested to mature an individual's trait EI – as he or she obtains more emotional knowledge and self-efficacy (Barlow et al., 2010; Qualter et al., 2011). Therefore, moderation was expected, but no significant effect was observed. Considering the relatively small age range in the current sample, this is not surprising, and proves a limitation to this study.

Gender was also tested as being a potential moderator. Gender differences have been observed in ToM (Vellante et al., 2013) and trait EI (Palmer, Gignac, Manocha & Stough, 2005; Shahzad & Bagum, 2012). However, gender and trait EI did not interact to produce an effect on ToM in the current study. This infers, in the current context, that gender's strength of relationship with ToM in the current study does not affect trait EI's relational strength. It acts independently of trait EI on social sensitivity.

The next contextual factor to be tested for moderation was ethnicity. Ethnicity was used, along with home language, as a proxy for culture. Ethnicity failed to show a moderation effect between trait EI and ToM. This, in part, was unexpected, as one would believe that racial identity would indicate cultural values. However, in today's world with increased globalisation and assimilation, many individuals are adopting and practising cultures that are not necessarily their culture at birth. Home language, therefore, appears to be the true cultural indicator in this study. Home language was tested for moderation between trait EI and ToM. A significant moderation interaction was found. This discovery helps unpack cultural differences in ToM that are observed in Study 1 and 2.

8.6.4 Culture moderates trait EI-ToM

The two language groups that show significant moderation effects were English and African languages. Interestingly, they showed opposite interaction effects. English home language speaker's social sensitivity increases with increased trait EI. African home language speaker's social sensitivity however decreases with increased trait EI. Based on this evidence, the relationship between trait EI and social sensitivity is being moderated by home language in this context. The opposing direction of interaction between the identified languages, supports the notion of an underlying cultural influence.

It is argued, based on evidence from the current study, that in African cultures, lower levels of social sensitivity – as measured by RMET – are seen as a good indicator of high self-reported EI.

It is, therefore, desirable in African cultures to not be skilled at reading others' emotions derived from eye contact. This implies that African respondents scoring lower on the RMET self-report that they are more emotionally adept in their culture. This result was supported by the negative association between trait EI and ToM in African languages. The opposite is suggested in Western cultures. In Western cultures, individuals who self-report they are more emotionally skilled score higher on the RMET – implying that in Western cultures it is more desirable to interpret emotions through eye contact. The above demonstrates that literature cannot assume that those of an African culture have the same views on social sensitivity and emotional intelligence as Western cultures. This study's evidence suggests that African cultures do not see mind-reading through eye contact as being emotionally intelligent, something which was previously assumed based on Western cultural norms. The literature supports the proposition that cultural differences exist in EI and emotion recognition. Ang et al. (2007) suggest that a person may be emotionally intelligent in one culture, but not in another culture.

EI across cultures is determined by cultural norms and values (Geher & Mayer, 1996; Gunkel, Schlaegel & Engle, 2014a , 2014b; Mayer, Salovey & Caruso, 2000; Offermann & Phan, 2002). The importance of cultural beliefs and values on emotions and perceptions has also been confirmed by a meta-analytical study (Taras, Kirkman & Steel, 2010). Part of a person's EI includes judging other's emotions. The literature further supports the finding that the judgement of other's emotions is influenced by culture. Matsumoto (1989) proposes that a country's culture influences emotional displays and assessment. He argues that although emotions are biologically programmed, the regulation and expression practices of emotions are determined by culture. The literature suggests cultural differences across EI and emotion recognition, but fall short of providing clear empirical evidence to support these claims. The current study is the first study to empirically show these differences and the interaction between EI and emotion recognition. The unanswered questions that emerges from these findings are: "Why do these differences exist across cultures?" More specifically, "What cultural norm or value is causing this difference?"

The literature provides some insight into this question. Gunkel, Schlaegel, et al. (2014a, 2014b) tested culture as an antecedent of EI. They defined culture using Hofstede's (2003) five dimensions of culture, and found the dimension of collectivism to be positively related to EI. Collectivism describes a culture that puts the interests of the group before that of individuals

(Hofstede, 1984). African cultures are viewed as a collectivist culture (Eaton & Louw, 2000; Triandis, 1989). A key value supporting the collectivist culture of an African population is the underlying belief of *ubuntu* across many African cultures. *Ubuntu* is described as a multi-faceted concept that guides the core values of African cultures, and includes beliefs promoting respect and dignity for our humanity, collective belonging, interdependence, solidarity, hospitality and communalism – to name a few (Kamwangamalu, 1999). A core value from *ubuntu* that clearly suggests a collectivist culture is communalism. Communalism describes the belief that the group is of greater importance than the individual members of society (Kamwangamalu, 1999). Gunkel, Schlaegel, et al. (2014a, 2014b) suggest that collectivist cultures can identify and control their own emotions and have a high EI, but often suppress these emotions in outward expressions – in the interest of keeping social cohesion. The lack of openness of emotional expression is, therefore, impeding their ability to recognise the emotions of others. Thus, it is possible that the underlying cultural value causing the negative interaction between trait EI and ToM for African languages, is the collectivism dimension. This implies, in the current study, that the respondents scoring high on trait EI and low on the RMET were showing greater levels of collectivism.

Although it is a possible explanation for current results, weaknesses in the literature are evident for the hypothesis that collectivism is the sole cause of observed cultural differences.

First, Gunkel and collegues' (2014a, 2014b) study of nine countries did not include Africa. Second, few studies have been done in Africa exploring it as a collectivist culture. With the introduction of Western cultural norms and values through colonisation and today's ease of immigration, it is suggested that this influence may have dampened the collectivist practices in favour of more individualistic practices. Interestingly, in support of this, Xhosa participants in the current study showed a positive moderation interaction – i.e. opposite to other African languages and modelling the behaviour of the English home language. Xhosa participants' social sensitivity increased with increased trait EI scores. Based on the preceding discussions, this suggests that Xhosa people are displaying more individualistic behaviours. Lastly, it has been noted that the collectivism dimension is not the strongest predictor of EI (Gunkel, Schlaegel, et al., 2014a, 2014b; Taras et al., 2010), and thus it is argued that an alternative and complementary explanation may exist.

In African cultures, especially those in traditional environments, certain non-verbal communication cues such as direct eye contact is seen as being unacceptable. It is seen as a sign of disrespect to make eye contact with one's seniors or those of higher social status (Ntuli, 2012). In Western cultures, direct eye contact is desirable and shows honesty (Varner & Beamer, 2005). This clearly shows a cultural divergence with regard to emotional recognition through eye contact.

The RMET relies heavily on a person's ability to assess the eyes. Evidence suggests that the underlying cultural norm or belief affecting social sensitivity could be cultural views regarding eye contact. Based on this knowledge, eye contact in African cultures may be viewed as an act of lower EI – as it is contrary to a fundamental social norm and an African cultural definition of EI. This implies that beliefs leading to good or bad levels of social sensitivity may differ across cultures. African cultures may deem it to be desirable to show lower levels of social sensitivity than in English-speaking cultures. This does not mean that people in African cultures are weaker in terms of their ability to be emotionally intelligent – but rather they are only weaker in their ability to recognise emotions through eye contact. Alternatively, Western cultures rely on higher social sensitivity to be viewed as emotionally intelligent.

To conclude then, the analysis of mediation and moderation relationships in the current study model revealed only one significant relationship. Home languages, particularly English and African languages – showed a significant moderation effect between trait EI and ToM. However, these effects, surprisingly, were opposite. English home language had a positive effect – whereas African languages had a negative effect. This is argued to be influenced by cultural norms. Collectivism was highlighted as a possible explanation from the literature. An alternative explanation relating to cultural views on eye contact was also presented. Therefore, it appears that when considering social sensitivity, consideration of cultural norms and practices is important. As with EI, views on social sensitivity in one culture may differ from another culture.

8.7 CONCLUSION

Study 2 set out to answer the question: "What determines social sensitivity?" Personality, trait EI and a variety of individual contextual factors were tested as potential determinants. In the current study, social sensitivity was determined by field of study, gender and home language. Investigation of mediation and moderation presented no mediation effects – but a moderation effect of English and African home language on trait EI and ToM. Trait EI determined social sensitivity, but this was moderated by whether a person spoke English or an African language. In addition to Study 2 addressing the core research question: "What determines social sensitivity?" Results provided insight into the unanswered question that emerged from Study 1.

In the conclusion of Study 1, the following question was left unanswered: "Why are African participants scoring lower on the RMET?" Literature failed to empirically test or provide an evidence-based reason. Study 2 can now provide a tentative answer –supported by empirical research. African participants may be performing lower on RMET, not because of the instrument stimuli, but due to cultural norms governing the way they interpret emotions and how they view EI. The evidence of Study 2 shows that in African cultures it may be desirable and more emotionally intelligent to have lower levels of social sensitivity as measured by the RMET. This has important implications in a diverse and global population. People are interacting in teams and groups on a daily basis to the benefit of society and companies. With social sensitivity being key to optimising human interaction and collective intelligence, it is clear that further understanding is required in relation to what social sensitivity means across cultures. This study shows that African cultures may have a different perspective on social sensitivity than English cultures, which could affect team interaction and optimisation. With this in mind, Study 3, a post-hoc experiment, looks to test whether Woolley and colleagues' (2010) result of a significant effect of social sensitivity on collective intelligence, is replicable in the current context – given the culturally divergent view of social sensitivity observed in Study 2. The results of Study 3 are discussed in the next chapter.

CHAPTER 9: DISCUSSION OF FINDINGS - STUDY 3

9 STUDY 3 DISCUSSION

9.1 INTRODUCTION

This chapter provides a detailed discussion of the results for Study 3. The main question to be investigated in this chapter is: "Is social sensitivity a predictor of collective intelligence in the current context?" To investigate this question, the chapter first considers the collective intelligence factor and how it emerged in the current study, and then compares this to previous studies in the literature. Social sensitivity and its relationship with collective intelligence are then discussed in relation to the current findings and previous literature findings. Lastly, sub-hypotheses are also considered to inform future research. The chapter is then concluded.

9.2 COLLECTIVE INTELLIGENCE

To answer the main research question, a collective intelligence factor needs to be found to act as the dependent variable for this study. This was the first attempt to establish a collective intelligence factor in an African setting.

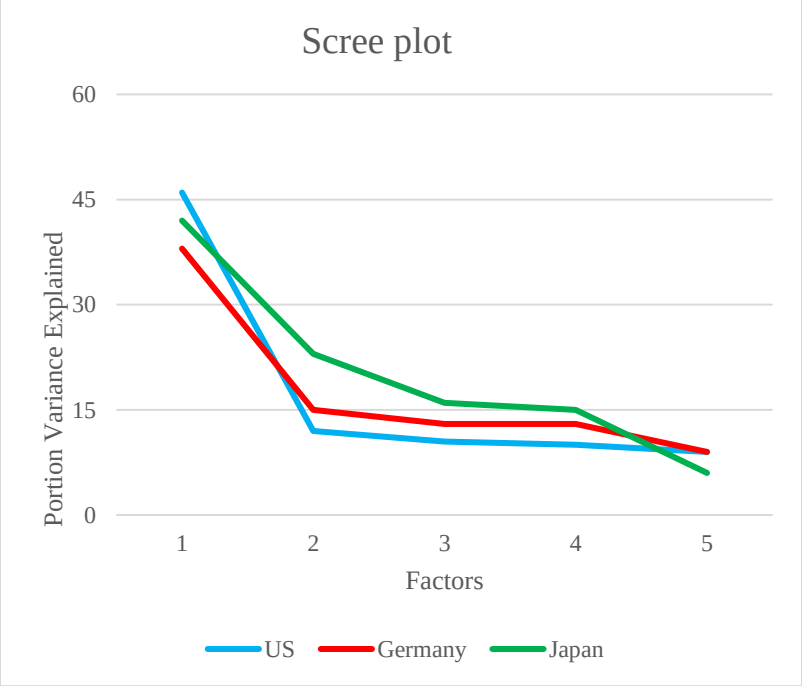
The collective intelligence factor is a single factor that emerged out of the correlation of multiple tasks completed by groups (Woolley et al., 2010). The current study results proved insightful, but lacked the number of participants and number of tasks to make strong claims on the generalisation of the collective intelligence factor in Africa.

Nevertheless, in conjunction with results from the previous two studies, an interesting narrative around culture appears to take shape. The analysis presented in Appendix AB concluded that the collective intelligence factor appears to emerge in the current context. This conclusion, however, was not as clear as in previous studies performed on samples in the United States and Germany (Engel et al., 2015; Engel et al., 2014a; Woolley et al., 2010). This may be due to the small sample used, the low number of tasks or the poor operationalisation of tasks in the current study. However, the literature suggests that this unclear emergence of collective intelligence could be linked to cultural context.

Engel et al. (2015) performed the collective intelligence assessment using an online battery of tasks following the instrument precedent set by Woolley et al. (2010) across three different contexts – the United States, Germany and Japan.

Online administration and collaboration have been tested previously and found to produce a collective intelligence factor in the same way as face-to-face groups (Engel et al., 2014a; Kim et al., 2015). This implies that both mediums are comparable. What Engel et al. (2015) found was that all three samples had a single dominant factor, with over 40% variance being explained by that factor. The current study showed the same pattern, where differences appeared is in the strength of the second factor. Interestingly, in Engel and colleagues' (2015) study, the Japanese sample shows a relatively strong second factor – as can been seen by Figure 42. This is comparable to the current study's finding of a stronger second factor, which was not expected, based on previous studies. Culture appears to impact collective intelligence. If this is the case, what cultural dimension or dynamic is causing this impact?

Figure 42: Engel and colleagues' (2015) estimated scree plot across cultures



Note. Adapted from "Collective Intelligence in Computer-Mediated Collaboration Emerges in Different Contexts and Cultures", by Engel et al., 2015, Paper presented at the Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems, Seoul, Korea., p.3775. Copyright 2015 by ACM

It is suggested that the two dimensions having this impact are individualism versus collectivism and high versus low context cultures (Engel et al., 2015). Individualism versus collectivism

cultures were discussed previously in relation to social sensitivity effects at an individual level. The individualism versus collectivism dimension describes an individual's view on pursuing his or her own interests (individualism), rather than the group's interests (collectivism) (Hofstede, Hofstede & Minkov, 2010). At a group level, collectivist cultures will generally have higher commitment to the group – thus reducing the variance that can be expected in team performance (Engel et al., 2015). This implies that fewer individual-related factors influence group performance across tasks. Individuals are less likely to pursue personal interests within the group – but rather group interests. This would lead to lower variance in team performances in collective cultures, as groups are showing greater commitment to reaching team goals. Therefore, collectivist teams are less likely to have a predictable collective intelligence construct due to insufficient performance variance.

The dimension of high versus low context cultures describes the depth of relationship between individuals. High context cultures have deeper relationships between individuals, and communication is dictated less by explicit expressions and more by implicit messages (Hall, 1976). Engel et al. (2015) argue that high context cultures would struggle to connect with strangers – thus causing extra variance across different tasks. The extra variance across different tasks decreases the chance of a consistent measure of performance, thus reducing the chance of a collective intelligence factor emerging in high context cultures. The lack of connection between strangers can be explained by implicit messages not being understood and by suppressing explicit messages. High context cultures are closely related to collectivist cultures (Hall, 1976). The current study took place in an environment seen to have high levels of collectivism, and thus high-context cultural values. Based on the preceding discussion, the current research results argue that the collective intelligence factor emerges, but its appearance was clouded by cultural factors. However, some have argued that no collective intelligence factor exists – regardless of cultural effects.

Although Woolley et al. (2010) have gained much recognition and attention for their finding of a collective intelligence factor, some authors dispute their findings and suggest that a collective intelligence factor does not exist (Barlow & Dennis, 2016; Bates & Gupta, 2017; Credé & Howardson, 2017).

Credé and Howardson (2017) argue that the identified collective intelligence factor explains little variance between tasks, suggesting that more than fifty percent of variance should be explained by the collective intelligence factor. They also argue for factor loadings above 0.70 and that there are low levels of internal consistency between tasks in studies performed on the collective intelligence factor. Woolley, Kim and Malone (2018) responded by presenting literature that stated that many well-developed individual cognitive batteries of tasks show consistent variance loadings of 30-50% on the first factor (Chabris, 2007), which is analogous to the collective intelligence factor. On the point of adequate factor loadings, Woolley et al. (2018) defend their position by drawing on supporting literature that a factor loading of 0.40 is acceptable in psychometrics and task development – Clark and Watson (1995). Factor loadings in the current results compare favourably, with two tasks loading above 0.70, one above 0.40 and only one below the 0.40 mark (see Appendix AB). On the second point of low internal consistency, Woolley et al. (2018) responded by citing literature explaining that ideal inter-item correlation is 0.20–0.40 for broad constructs such as collective intelligence – see Epstein (1983). The current study has an average inter-item correlation of 0.28. In conclusion, Woolley et al. (2018) refute Crede and Howardson's (2017) notion that a collective intelligence factor does not exist, but acknowledge that its measurement is still in its very early stage – citing the growth path of the measurement of individual intelligence as an example. Knowing the impact that individual intelligence measures have had on the psychology field, it would be short-sighted and naïve to conclude that a collective intelligence factor does not exist based on the evidence provided by Credé and Howardson (2017) – especially because of the potential impact such a measurement can have for society.

Another contention in the literature is that the collective intelligence factor is the general factor of intelligence 'g' (average IQ of group members). Bates and Gupta (2017) ran three studies measuring both collective intelligence and average individual intelligence across groups. Their results suggest that average individual intelligence strongly predicts collective intelligence and explains most of the variance in collective intelligence. Bates and Gupta (2017) argue that the current tests measuring collective intelligence are redundant and the same results can be achieved by using the individual intelligence measures already developed. Their results and perspective are not shared by Woolley and colleagues, who found that average individual intelligence is not significantly correlated with the collective intelligence factor (Woolley et al.,

2010). The current study provides support for a non-significant association between average individual intelligence and collective intelligence.

The current study failed to reach significance at a 95% confidence interval in both bivariate and multivariate analysis - for average individual intelligence. Although the power of the current results is weak, a position alongside Woolley and colleagues is taken – specifically that average individual intelligence is a relatively weak predictor of collective intelligence. This position is taken based on the observed similarities between the current study and the study of Woolley and colleagues (2010).

It is also seems incorrect to argue that a group's performance is not affected by other individual factors. Stankov (2017) believes there has been an overemphasis on 'g' (individual intelligence), which has hindered the growth and understanding of other cognitive constructs. This is clear in the above contention by Bates and Gupta (2017). Individual intelligence undoubtedly has a role to play in group performance, but other cognitive domains should have an equal and, sometimes, a more important role. To determine this importance, a measurement of collective intelligence is required. To date, the studies by Woolley et al. (2010) are the clearest indication yet of a measurement that can capture variance apart from average individual intelligence. The current study also supports this, as social sensitivity captured more variance in collective intelligence than average individual intelligence – thus supporting the notion that collective intelligence is capturing factors other than average individual intelligence. Social sensitivity is also failing to significantly predict average individual intelligence – thus suggesting a unique effect on collective intelligence alone. Forgoing the collective intelligence factor in favour of the 'g' factor is ill-advised, as insight into the effects of other important cognitive factors on group performance will be lost.

One other study contests the emergence of a collective intelligence factor based on their empirical study. Barlow and Dennis (2016) argue that the collective intelligence factor only emerges under certain conditions. Their study of groups took place through computer-mediated communication software at Midwestern University in the United States. A collective intelligence factor did not emerge in their study – with two dominant factors as opposed to the desired single dominant factor. Like the current study, the second factor was stronger than expected. However, unlike the current study, there was minimal difference between their first and the second factor,

with a difference of only eight percent variance. The current study showed a difference of sixteen percent – double the amount observed in Barlow and Dennis's (2010) study. The current study also showed a stronger first factor, explaining forty seven percent variance as opposed to the forty two percent in Barlow and Dennis (2016). Thus, it appears that it is more likely that the collective intelligence factor emerged in the current study – as opposed to Barlow and Dennis's (2010) study. Barlow and Dennis (2016) believe that the reason for their unexpected results are the tasks and technology used in their study. They suggest that their tasks required more coordination, and thus the use of virtual software and communication may have adversely affected group performance. This is contrary to Engel and colleagues' (2014a) successful identification of the collective intelligence factor using an online platform. Barlow and Dennis (2016) argue that Engel and colleagues' (2014a) online tasks are more 'intelligence-based tests' and the online system they used was created to benefit their research goal – as they used commercial software for group collaboration.

Since the current study used face-to-face group interaction, the strength of the second factor and less obvious emergence of the collective intelligence factor in the current study, are unlikely to be related to tasks and technology. The notion that collective intelligence emerges under different conditions support the assertion that culture affects the emergence of the collective intelligence factor. With this in mind, it is argued that the first factor in the current study is indeed the collective intelligence factor – but cultural factors produce a stronger than expected second factor. Another indication that this is the case, is the significant association social sensitivity has with the first factor in the current study.

Collective intelligence has been found to be associated with social sensitivity (Engel et al., 2014a; Engel et al., 2015; Engel et al., 2014b; Woolley et al., 2010; Meslec et al., 2016).

9.3 SOCIAL SENSITIVITY

"Is social sensitivity a predictor of collective intelligence in the current context?"

This is the main question investigated in this study. Evidence partially supports the proposition that social sensitivity is a predictor of collective intelligence in the current context. To arrive at this conclusion, a collective intelligence factor was identified (see previous section), bivariate tests were run, and, lastly, multivariate tests were considered.

The results of the bivariate tests showed a significant positive association between social sensitivity and the collective intelligence factor. This relationship was established at a ninety five percent confidence interval. However, this relationship failed to reach significance at this same confidence interval during multivariate tests. It only managed to reach significance at an eighty five percent confidence interval. However, social sensitivity was the closest to reaching the desired ninety five percent significance level in multivariate testing. Based on these results, support is only found for the proposed research question in bivariate tests.

The literature shows favourable support for the relationship between social sensitivity and collective intelligence. In the seminal article on the collective intelligence factor, Woolley et al. (2010) found strong support for a relationship between social sensitivity and collective intelligence. Not only did they find it correlates at a ninety nine percent confidence interval, but it was the only factor to reach significance in a multivariate analysis including other highly correlated variables. In a later study, Engel et al. (2014a) replicated these findings in both face-to face groups and online groups. They again showed a correlation at a ninety-nine percent interval across both groups.

Interestingly, the addition of the variable 'amount of communication' reduced the significance of social sensitivity below the ninety five percent confidence interval in face-to-face communication. This suggests that in face-to-face interactions, increased communication could compensate for lower levels of social sensitivity (Engel et al., 2014a). This has an interesting cultural implication. If, as shown in Study 1 and 2, African cultures have lower levels of this type of social sensitivity (RMET), compensation can be made by increasing communication in groups. This also links to what we know about the cultural dimensions: collectivism versus individualism, and high versus low context. Collectivist and high context cultures often emphasise fewer non-verbal cues. Therefore, to improve group performance and collaboration in diverse cultural groups, verbal communication should be encouraged – especially for teams containing individuals from African cultures. Increased verbal communication may, however, be a hindrance in timed tasks, and it may not be possible where there are language barriers. Therefore, there are advantages to using the RME skill – particularly as it saves time often used up by verbal communication, and there is not a need for substantial language skills. In a fast-paced and global world these advantages prove invaluable, and it is unsurprising that this type of

social sensitivity is proving to be an important predictor of collective intelligence. In support of this, Kim et al. (2015) measured collective intelligence of teams playing a fast-paced, competitive video game. Their results showed that social sensitivity is a significant predictor of collective intelligence. This implies that in a fast-paced environment, such as competitive video games – where quick decisions and coordination are important to achieve team goals – it is increasingly important to be able to interpret team member's emotions, feelings and behaviour without excessive communication. There is also acknowledgement in more general contexts for groups to exercise more tacit coordination as opposed to explicit discussions (Wittenbaum, Stasser & Merry, 1996) – especially in fast paced environments (Kim et al., 2015).

A relevant question arises from the research of collective intelligence and social sensitivity in online environments (Engel et al., 2014a; Kim et al., 2015). That question relates to the importance of facial cues. The social sensitivity measure used in collective intelligence studies relies on one's interpretation of visual cues around the eyes. However, in the studies done using online media, you are unable to see other team members' facial cues. This implies that one's social sensitivity is not reliant on facial or physical metrics. This is supported by Study 1, where it was found that regardless of racial stimuli, differences in social sensitivity were still observed between Western and African cultures. Although the RMET measure uses facial stimuli, it also measures an underlying skill of perceiving interpersonal cues rather than facial cues. This then explains why the social sensitivity variable is still manifesting as a key predictor of collective intelligence in online environments. The ability to perceive subtle interpersonal cues appears to be even more important in less rich, online chat-based environments (Engel et al., 2014a).

Meslec et al. (2016) supported the relationship between social sensitivity and collective intelligence. Their study tests this relationship in a European context using a Dutch sample, and found there was a significant correlation between social sensitivity and collective intelligence at a ninety nine percent confidence interval. They do, however, suggest that this is mainly determined by the minimum social sensitivity score in the group. So, if one group member has extremely poor social sensitivity, this will adversely affect the group – even if other group members have high social sensitivity. This suggests that all team members need to be skilled at perceiving interpersonal cues in a group in order to improve performance, and a group cannot be compensated by adding members of high social sensitivity. All the above studies provide strong

support for the impact of social sensitivity on collective intelligence in many different formats (face-to-face and online) and contexts.

Only one published paper (where a collective intelligence factor emerges), contradicts these findings. Bates and Gupta (2017) ran three studies, and in only one of the three did social sensitivity prove to be a significant predictor of collective intelligence. Their studies, as discussed earlier, show strong correlations between average individual intelligence and collective intelligence. This led them to argue that average individual intelligence is the strongest predictor of collective intelligence – to the point of becoming indistinguishable from each other. This is in stark contrast to the literature on collective intelligence where average individual intelligence is portrayed as a relatively weak predictor of collective intelligence. Therefore, although an interesting and alternative finding, Bates and Gupta's (2017) results are against the 'grain' and are an outlier.

The current study does not support this alternative finding, but rather the findings of Woolley et al. (2010) – that average individual intelligence is a non-significant predictor of collective intelligence and social sensitivity is a strong predictor of collective intelligence. It is acknowledged that the current results lack statistical power due to the small sample. However, enough similarities exist in the literature and the current results to achieve the main aim of this study – to test if social sensitivity is a predictor of collective intelligence in the current context.

Social sensitivity appears to be a predictor of collective intelligence in the current context. This implies that, although social sensitivity means and manifests differently across cultures (see Studies 1 & 2), the ability to perceive interpersonal cues is still important to collective intelligence in the current cultural context. Although some cultures may not practise this type of social sensitivity, it appears that for team performance to thrive, such social sensitivity is advantageous and desirable. In addition to social sensitivity, other variables were tested as possible predictors of group performance in order to inform future research.

9.4 SUB-HYPOTHESES

Average intelligence, maximum intelligence, percentage of female group members, trait EI and personality traits were tested as additional predictors of collective intelligence, but none reached significance at a ninety five percent confidence interval in bivariate and multivariate tests. The only variable to approach significance in bivariate tests was average individual intelligence. In multivariate tests, however, average individual intelligence's significance decreased – suggesting that its effect weakens when other cognitive variables come into play in group dynamics. Similarly, Woolley et al. (2010) also find average individual intelligence and maximum intelligence to not be significantly correlated with collective intelligence.

The authors did, however, find a significant correlation between percentage of female group members and collective intelligence, although the current study did not replicate this result. This is possibly because this relationship is mediated by social sensitivity (Woolley et al., 2010). The small sample in this study may have prevented this relationship from emerging – thus explaining the non-significant result found.

In the literature, no study has attempted to test the relationship between EI and the collective intelligence factor, even though there has been acknowledgement of the importance of EI in group performance (Elfenbein, 2013; Elfenbein, Polzer & Ambady, 2007). Contrary to expectations, trait EI did not correlate with collective intelligence, and this may be due to the self-report nature of trait EI. Participants may have believed they have a certain emotional intelligence ability, but when it comes to practicing this in a group setting, they are under- or over-performing in terms of ability. Thus, future research should investigate ability EI. Ability EI is conceptualised as an intelligence that involves the ability to reason about one's emotions, and then include this in the individual's own reasoning process (Mayer et al., 2008). This EI is measured using a series of emotion-based problem-solving items (Mayer, Salovey, Caruso & Sitarenios, 2003). Therefore, this type of measurement is less influenced by self-perceived emotional ability and more by actual ability and emotional reasoning.

Personality traits were the last variables to be tested. None of the personality traits significantly correlated with collective intelligence. This replicates the findings of Engel et al. (2014a), and suggests that no single personality trait improves collective intelligence.

The above results suggest future research should investigate new areas of enquiry such as ability EI. Personality seems to play a minimal role in group dynamics. This helps to inform future research

9.5 CONCLUSION

Study 3 set out to answer the question: “Is social sensitivity a predictor of collective intelligence in the current context?”

First, it was established through statistical and literature support that the collective intelligence factor emerged in the current context. Bivariate tests then revealed that social sensitivity significantly correlated with collective intelligence. This finding, along with a thorough analysis of literature, led to the conclusion that social sensitivity is possibly a predictor of collective intelligence in the current context. This assertion should however be treated with caution due to the sample size. A strong argument, however, is provided to support this conclusion. Other sub-hypotheses were tested to inform future research. None of these were significant, but they provide guidance on where future research should focus.

The next chapter will conclude the current research.

CHAPTER 10: CONCLUSIONS AND RECOMMENDATIONS

10 CONCLUSIONS AND RECOMMENDATIONS

10.1 INTRODUCTION

This chapter concludes the current research. The main aims of this research are restated. To assert the achievement of these aims, the derived research questions are answered in relation to the study findings. Based on the research's success in answering these questions, implications for both theory and practice are discussed, followed by recommendations. The limitations of this research are then discussed to inform future research. Emphasis on this research's knowledge contribution is presented as a valuable move forward for academia and practitioners.

10.2 SUMMARY OF RESEARCH AIMS

This research set out to contribute knowledge to the current body of literature. To achieve this goal, a few aims were derived by identifying gaps in literature. These aims are summarised below.

Overarching Aim:

The aim of the overall research was to add knowledge to social sensitivity literature to further understand the concept of collective intelligence in humans.

Sub-Aims:

1. Develop and test an African social sensitivity instrument.
2. Develop and test an 'Other culture' social sensitivity instrument.
3. Compare social sensitivity across cultures and across the three different cultural instruments: Caucasian, African and 'Other cultures'.
4. Develop a shortened, multicultural social sensitivity instrument.
5. Test antecedents of social sensitivity.
6. Determine if social sensitivity is a predictor of collective intelligence in the current context.

The achievement of each sub-aim contributes unique knowledge to the literature, with each sub-aim supporting the other in achieving the main aim of this study. Together it is argued that they

achieve the overarching aim of this research, by adding knowledge to the field of social sensitivity and collective intelligence.

Details of the achievement of these aims are first presented by considering the development of the new instruments (sub-aims 1,2,4). Once the newly tested instruments were developed, sub-aims 3,5,6 were assessed by answering the following research questions:

1. Are there differences between cultures' ToM when they are presented with eye regions that are from either the same ethnic group or an alternative ethnic group?
2. Is there a female advantage in ToM performance, and is this consistent across different cultures and instruments?
3. What determines social sensitivity?
4. Is social sensitivity a predictor of collective intelligence in the current context?

Through the systematic evaluation of each sub-aim and related research questions, evidence is provided that the over-arching aim of this research has been achieved. Evidence regarding the development of new social sensitivity instruments is presented first

10.3 DEVELOPMENT OF INSTRUMENTS

There has been a clear gap in the literature for more culturally inclusive ToM instruments. This call has been made by multiple authors in the field (Yilidrim et al., 2011; Franklin et al., 2015; Hallerback et al., 2009; Monique et al., 2013; Tahiroglu et al., 2014). Such a need has arisen due to tension in the literature relating to the uncertainty of cultural influence on emotion recognition – particularly whether emotion recognition skills are universal or culturally dependent and to what extent (Bradford et al., 2018; Yilidrim et al., 2011).

Consensus seems to suggest emotion recognitions is universal, but there seem to be variations between cultures (Elfenbein & Ambady, 2003b; Izard, 1971). This issue has been further complicated by the suggestion of an intra-cultural advantage. It has been suggested that assessing the emotions of someone of the same culture increases your chances of correctly recognising their mental state (Adams Jr et al., 2010; Elfenbein & Ambady, 2003a; Franklin et al., 2015). These suggested cultural differences and intra-cultural advantages, can only be fully explored with the development and testing of culturally diverse instruments.

To date, there are only Caucasian and Japanese stimuli instruments for measuring this ability (recognising of mental states) in the ToM literature (Adams Jr et al., 2010; Baron-Cohen et al., 2001). Therefore, there is a need for an African RMET instrument, and an 'Other culture' RMET instrument that captures some of the minority cultures from Asia. The concerns that arise from an intra-cultural advantage points to a gap in the literature in relation to a multicultural RMET instrument to avoid cultural bias. There has been a call for a shorter and more practical instrument for measuring ToM (Olderbak et al., 2015; Redondo & Herrero-Fernández, 2018). Thus, three instruments were needed to advance the current literature and to open doors to answer key cultural questions that to date remain unresolved. The section below details this research's success in developing and testing these instruments.

In addition, the next section also summarises how the research questions presented at the start of the chapter have been answered by the current results.

10.4 SUMMARY OF RESULTS

The first instrument created was the African instrument. A 36-item instrument was produced following the guidelines for item selection set out by Baron-Cohen et al. (2001) (see Appendix A). This 36-item selection was then tested on 459 students. Once collected, data analysis procedure dictated that only 21 items continued to meet the criteria for item selection. Thus, a context-validated 21-item African stimuli instrument was created, which can be used in literature to measure social sensitivity using African stimuli (see Appendix F).

The second instrument created was the 'Other culture' instrument. A 36-item instrument was produced following the guidelines for item selection set out by Baron-Cohen et al. (2001) (see Appendix B). This 36-item selection was then tested on 404 students. Once collected, the data analysis procedure dictated that only 26 items continued to meet the criteria for item selection. Thus, a context-validated 26 item 'Other culture' stimuli instrument was created, which can be used in the literature to measure social sensitivity using 'Other cultural' stimuli (see Appendix H).

Although a pool of 72 new stimuli items for RMET instruments are provided by the current research, 47 were found to be stable in a larger sample in the current context. The items that failed to meet the criteria in a larger sample may however still be applicable in another context.

Thus, there is an opportunity to further test these items to prove or disprove their validity, especially for items that marginally missed the selection criterion. However, the 47 stable items are argued, based on the current statistical evidence, to be valid and therefore applicable to literature. The last instrument developed was a shortened multicultural instrument.

As mentioned earlier, context dictates, to a certain extent, the validity of social sensitivity items (Hallerback et al., 2009; Monique et al., 2013; Prevost et al., 2013; Vellante et al., 2013). Therefore, although the Caucasian items have been tested and found to be stable in a large sample (Baron-Cohen et al., 2001), it is important to replicate this validity in the current context before creating a multicultural instrument.

When testing the Caucasian questionnaire on a sample of 443 students, as expected, only 30 items (see Appendix J) of the 36 items met the selection criterion. Thus, a pool of 77 stable items consisting of multiple cultures were available to develop a new multicultural social sensitivity instrument. Following an objective criterion of selection, a new 21-item multicultural instrument was created, which is both shorter than the original RMET instrument and culturally inclusive. Therefore, three new instruments, each addressing shortfalls and scarcity in the literature, were produced in this research.

With this contribution, academics can now begin to study cultural differences and intra-cultural advantages of social sensitivity across a broader spectrum of cultures. They can now do this with a more comprehensive and inclusive pool of multicultural RMET items that was previously unavailable. In addition, a shorter, more practical multicultural RMET is now available, making more time-constrained research possible, and thus helping the field of social sensitivity to grow.

The value of these instruments is now demonstrated by the answering of research questions derived from the literature, that, previously, lacked the appropriate instruments to provide statistically grounded answers:

10.4.1 Research Question 1 (Study 1): What differences exist between cultures' ToM ability when they are presented with eye regions that are from either the same ethnic group or an alternative ethnic group?

This question was derived due to a lack of knowledge surrounding the differences of ToM across different cultures. To date, many authors have suggested that the reason is because the current RMET contains only Caucasian stimuli (Adams Jr et al., 2010; Dehning et al., 2012; Franklin et al., 2015; Lazarus, 2009; Loftus & Noordien, 2011). These differences have been particularly large in African samples (Dehning et al., 2012; Lazarus, 2009; Loftus & Noordien, 2011). To date, only Adams Jr et al. (2010) created an alternate RMET instrument with Japanese stimuli and concluded that differences may be due to an intra-cultural advantage. This advantage, however, cannot be generalised beyond the Japanese-Caucasian population. Thus, a test of ToM differences based on different stimuli needs to be tested with other cultures such as African and other Asian cultures. Until now, this could not be explored due to the lack of appropriate instruments.

The results of testing the new different cultural instruments show that there are differences between cultures' ToM when they are presented with eye regions that are from either the same ethnic group or an alternative ethnic group. However, results do not support an intra-cultural advantage. Regardless of ethnic stimuli, White or English home language participants score higher than Black or African home language participants. 'Other culture' participants (e.g. Asian, Indian, Middle Eastern) also failed to score higher than White participants, even on the 'Other culture' instrument – thus suggesting an intra-cultural advantage is not present. Therefore, ToM differences exist regardless of racial stimuli, particularly prominent, is the lower RMET scores for African participants across all cultural RMET. The literature suggests this may be related to cultural norms such as collectivism, *ubuntu* and cultural views on eye contact.

10.4.1.1 Implications for theory

Theoretically, this implies that ToM is influenced by culture. This influence is strongest among African cultures, especially with the RMET. This suggests that African cultures tend to have lower ToM scores on the RMET. This is the first clear indication that this cultural influence is independent of the visual representation of race. This suggests that theoretical understandings of ToM need further development in a cultural context. Much focus has been directed to ToM deficits in clinical areas such as Autism (Baron-Cohen et al., 1997; Baron-Cohen et al., 2001). However, with the significant differences observed in the current research, culture and ToM are

clearly linked, and thus requires theoretical attention. A cultural behaviour or norm is thus intertwined with ToM proficiency.

A framework and understanding of ToM and culture dependence needs to be developed to avoid misrepresentation across cultures. Theoretical understanding in this area is imperative, especially as the world is no longer defined by borders, and cross-cultural social interaction is inevitable.

10.4.1.2 Implications for practice

Teams are becoming increasingly diverse for tapping into multiple world viewpoints to improve creativity, decision-making and information provision. With a global market, different perspectives give teams a clear advantage in creating products and solutions that appeal to multiple consumers. Diverse teams provide improved financial performance for companies (Hayton, Layton & Price, 2015) and a greater chance generating new innovations (Nathan & Lee, 2013). Although diverse teams have desirable benefits, the achievement of these are often hindered by lack of cohesion and communication, increased conflict and reduced willingness to interact with the team – all of which are by-products of increased diversity (Srikanth et al., 2016).

It is suggested that these negative effects of diversity stem from identifiable demographic variables such as nationality, gender, race and status affecting an individual's ability to identify with team members (Chatman, 2010; Srikanth et al., 2016; Tajfel, 1979; Watson, Kumar & Michaelsen, 1993). This implies that a key ingredient for accessing the benefits of diversity lies in team members' abilities to identify with each other. Social sensitivity is the ability to identify the mental states of others.

To identify with one another beyond outward appearances, individuals must first identify the other person's mental state in order to connect at an emotional level. This especially is important as emotional conflict is seen a bigger threat to team performance than task conflict (Pelled et al., 1991). This presents the overlap where ToM can improve group performance in diverse groups. However, current research suggests that ToM proficiency is different across cultures. Such a finding informs as to why diverse teams can suffer from issues such as communication and cohesion. This implies that in the implementation of diverse teams, education and training on ToM skills is important for improving the performance of diverse teams. Another area of diversity that has differing levels of ToM, is gender.

10.4.2 Research Question 2 (Study 1): What gender differences exist in one's ToM performance across different cultures and instruments?

One of the most replicated findings in social sensitivity research is a ToM advantage for women (Vellante et al., 2013). Such a female advantage has however rarely been considered in different cultural paradigms (Franklin et al., 2015; Monique et al., 2013). This is a gap in the literature. With the new instruments created in this research, a multicultural perspective on a proposed female advantage can be examined – informing on the universality of such an advantage.

The results of testing the female advantage across different cultural instruments replicates the results of a female advantage in ToM proficiency. This result is stable across different cultural groups. However, the extent of proficiency seems to be moderated by culture in two of the tested instruments. Gender and culture in some aspects appear to interact in the 'Other culture' and Caucasian instruments – specifically between African and Caucasian cultures.

Upon examination, it is argued that this does not affect the female advantage overall, but reflects that there is greater female advantage among African cultures in the 'Other culture' and Caucasian instruments relative to Caucasian cultures. Thus, African women observe a higher female advantage compared to their male counterparts. However, 'Other culture' and Caucasian women are still scoring higher than African women. Although, like African cultures, 'Other culture' and Caucasian women are scoring higher than their male counterparts in social sensitivity – this difference appears less than in African cultures. Thus, a female advantage in ToM exists across cultures and different cultural instruments. The extent of this advantage could be reduced in non-African cultures. This again points to the cultural differences in African and Caucasian cultures being an important differentiator in ToM scores. Nevertheless, even with this difference, a female advantage is consistent.

10.4.2.1 Implications for theory

This result adds to theory by suggesting that the female advantage in social sensitivity is universal. Regardless of cultural orientation, on average, a female advantage is evident in ToM. The extent of the advantage could be influenced by culture under certain conditions – such as the appraising target culture. Theory should further consider this degree of influence that culture has on this female advantage. Such an enquiry will build a stronger theory on ToM and gender. This

study has provided the first account of differing female advantage levels across different cultures and instruments. These findings provide guidance on how to further improve teams.

10.4.2.2 Implications for practice

As with ethnicity/culture (Research Question 1), gender is seen as an identifiable demographic variable that can invoke the negative effects of diversity (Chatman, 2010). This again is closely related to one's ability to identify with other team members (Tajfel, 1979). Interestingly, Randel (2002) suggests that gender identity salience moderates the relationship between group composition and group conflict. Identity salience is the likelihood that identity would be invoked in diverse groups (Hogg, Terry & White, 1995). Randel (2002) found that increasing the numerical distinctiveness of gender diversity in a group increased the gender identity salience of men – thus leading to more conflict. Therefore, gender identity salience is more prominent in men. This concept is extended to other areas of diversification, where social majority members show higher levels of identity salience (Tsui et al., 1992). Thus, reducing identity salience will reduce the negative effects of diversification (Randel, 2002). Based on this evidence, practitioners can achieve the benefits of diversification by reducing the number of men, and, by extension, other social majority groups in teams. This, however, has the opposite desired effect, as the result will be a less diverse group. Here lies the issue for practitioners who want to harness the benefits of diversity – but at the same time reduce the negative effects that arise from identity salience. Thus, Randel (2002) has called for research into how to reduce identity salience. Although the current research does not directly answer this call, overlaps exist that can inform both theory and practitioners in this area.

The current research concluded a female advantage in social sensitivity. This increased level of social sensitivity is argued to help individuals identify with one another at a deeper, emotional level. This identification will then put less importance on surface level categorisation – ultimately leading to reduced levels of identity salience in areas such as gender. This provides a possible alternative explanation for the differing identity salience levels between genders. Women have higher levels of social sensitivity than men, and thus can identify with team members on an emotional level, making surface area levels of identity salience less important and in turn reducing the negative effects of diversity such as conflict.

Practitioners may reduce men in teams to reduce identity salience. However, the cost is reduced diversification. Two options are available to practitioners. The first is to keep group gender composition equal. Randel (2002) suggested that gender identity salience increases for men the more uneven the gender composition of the group. Thus, keeping the team gender composition equal, mitigates this effect. This option, however, only reduces gender identity salience. Therefore, the ideal action is to improve men's social sensitivity, in order to reduce overall identity salience. Improved social sensitivity therefore can help mitigate identity salience in other areas beyond gender. To improve social sensitivity, one must understand its determinants – which leads to the next research question.

10.4.3 Research Question 3 (Study 2): What is the relationship between individual contextual factors, EI, personality and social sensitivity?

Little research has been done to understand what leads to higher ToM – especially in adults (Kidd & Castano, 2013). This lack of research has created a gap in the literature that needs to be addressed, even more so given the results of Study 1. With observed cultural and gender differences in ToM, potential underlying aspects of ToM need to be investigated to inform on these differences. To do this, a shortened multicultural instrument was created from Study 1, allowing for a culturally unbiased, shortened ToM instrument that can be administered along with other variable instruments. This instrument proves invaluable for this research and future research in both its practicality and validity. With this instrument, researchers can test determinants of ToM, while addressing concerns regarding time, non-response bias, participant fatigue, and cultural bias; all issues that arise with the longer, single cultural instruments currently available. Equipped with this new social sensitivity instrument – trait EI, personality, and individual contextual factors variables were tested to see if they are determinants of social sensitivity.

The results suggest that gender, home language and field of study are significant determinants of social sensitivity. However, further investigation reveals that home language, argued as a cultural indicator, significantly moderates the relationship between trait EI and social sensitivity. More specifically, trait EI becomes a significant positive predictor of ToM for English home language speakers. In contrast, trait EI becomes a significant negative predictor of ToM for African home

language speakers. This proves to be an interesting finding. It is argued this finding goes a long way in explaining ToM differences observed across cultures, specifically between African and Caucasian cultures. Trait EI is one's self appraisal of emotional intelligence (Petrides & Furnham, 2001).

With this definition in mind, English home language speakers who self-report they are more emotionally intelligent, score higher on ToM. On the other hand, African home language speakers who self-report they are more emotionally intelligent score lower on ToM. This clearly shows that there is a cultural difference in the definition of emotional intelligence, and, by implication, social sensitivity. These differences are suggested in literature (Gunkel, Schlaegel, et al., 2014a, 2014b; Matsumoto, 1989; Taras et al., 2010). It appears from the literature that, in African cultures, having a lower ToM is a greater act of emotional intelligence. The literature links this to concepts such as collectivism, *ubuntu* and respectful use of eye contact. This study is the first to provide empirical support for differing views on both emotional intelligence and social sensitivity between African and Western cultures.

The finding on gender and home language as significant individual contextual factor predictors also verify the results produced in Study 1. The other significant predictor was field of study. Field of study shows that Engineering and Built Environment students were significantly more socially sensitive than other students in the study. Most of the other students in this study were Science students. Thus, the comparison was between Engineering and Built Environment versus Science students. Science students are argued to be more systemising – focusing more on systems and variables, as opposed to empathising, than Engineering students. This is possibly because more focus in Engineering courses is being directed to teamwork, collaboration and communication (Walther et al., 2017), which could help improve Engineering students' empathising and social skills. This could explain the reason that the field of study being engineering, emerged as a significant positive predictor in this sample. These results on determinants of social sensitivity have important implications for theory.

10.4.3.1 Implications for theory

The above study suggests that culture shapes a person's views on EI and the skill of reading the mind in the eyes. Theory related to each topic needs to include cultural considerations. Without its inclusion, results would be biased and a misrepresentation of the theoretical concepts. Mayer

et al. (2016) began this adjustment by adding 'understand how emotions are displayed depending on context and culture', as a type of reasoning to their perceiving emotion dimension in their popular four branch theoretical EI model. Beyond this understanding, more theoretical work needs to be done on the underlying norms and behaviours determining social sensitivity in different cultures and regions such as Africa. Based on the literature, it is suggested that collectivism and eye contact norms are potential areas of future exploration for theoretical growth in this area. If academia can identify the underlying concepts driving differing cultural perspectives on EI and social sensitivity, practitioners can then equip themselves to improve these abilities across all cultural contexts

10.4.3.2 Implications for practice

EI has an important role to play in an organisation's effectiveness (Cherniss, 2001; Goleman, 1998). A literature review by Abraham (2005), showed that EI influences multiple areas of organisational success. These include areas such as personnel selection, leadership abilities, workgroup cohesion, improved work performance, increased organisational commitment and citizenship, improved employee job control, as well as improved employee self-esteem – to name a few. One of the dimensions of EI is perceiving emotions (Mayer, Caruso & Salovey, 1999; Mayer et al., 2016).

Social sensitivity is a skill that involves perceiving emotions. This skill is shown to be important to a group's or team's collective intelligence (Engel et al., 2014a; Kim et al., 2015; Woolley et al., 2010). Higher levels of collective intelligence in organisational groups and teams will ultimately lead to higher levels performance for the organisation. This indicates that for optimal organisational performance, employees will need to have both high levels of EI and social sensitivity. However, cultural differences appear to challenge and, in some cases, prohibit this desired paradigm.

African cultures, in this current study, show that lower levels of social sensitivity are associated with higher levels of trait EI. In African cultures, this appears to be a positive paradigm – as it shows characteristics of *ubuntu*, collectivism and respectful eye contact. These characteristics appear to be valued in African cultures and therefore represent high emotional intelligence. The values of *ubuntu*, collectivism and respectful eye contact have benefits for team performance. *Ubuntu* and collectivism characteristics will help team members put the group performance

above individual interests, and respectful eye contact will help reduce conflict. These factors are important, but appear to lead to lower social sensitivity. High social sensitivity, as argued throughout this research, also has benefits to team performance. Therefore, all things equal, attempts to increase the one variable, will decrease the other in African cultures – thus making the achievement of high social sensitivity and trait EI unlikely. In Western cultures, higher levels of social sensitivity are associated with higher levels of trait EI, and with this relationship it is possible to improve both social sensitivity and trait EI at the same time. This has implications for organisational training and education across cultures. Equipped with the knowledge that social sensitivity in the form of RME is emphasised less in African cultures, organisations can tailor programmes to improve this skill, while at the same time educating African cultures that, in Western contexts, this skill is important for developing Western views of EI.

In the same way, programmes can be tailored for Western cultures, to provide an understanding of the norms and behaviours of African cultures, so as to improve their characteristics of *ubuntu*, collectivism and respect – thus improving EI through an African lens. For example, material can include education on cultural views on eye contact, non-verbal cues and the different ways of sharing emotions. With effective training and education, employees will have a higher self-appraisal of their EI across not only their culture – but other cultures as well (thus higher trait EI). Self-appraisal is seen as the most important factor for EI development (Cherniss, 2001). With an understanding of what it means to be emotionally intelligent in different cultures, employees can improve and adapt the way interact in groups based on the social context they find themselves in – thereby improving social cohesion and understanding in their environment (and thus higher social sensitivity).

The current study provides important empirical evidence that EI and social sensitivity training and education need to be culturally inclusive, and a one-model-fits-all approach is not ideal. The education of different cultural norms and emotional cues will help each individual act in an appropriate manner when managing conflict to produce better team performance. Organisations are built on teams. The management of conflict is seen as an important factor in team performance and thus organisational performance (De Dreu & Weingart, 2003; Lovelace, Shapiro & Weingart, 2001; Simons & Peterson, 2000). The findings of the current study therefore provide valuable insights on how to better manage conflict in diverse teams.

In African cultures, with less emphasis put on social sensitivity through the RMET, the next research question considered whether, in an African context, social sensitivity is an important predictor of collective intelligence.

10.4.4 Research Question 4 (Study 3): Is social sensitivity a predictor of collective intelligence in the current context?

The collective intelligence factor has important implications for measuring team intelligence and applying this measurement to impact team performance. The concept is however still very much in its infancy. It is, therefore, increasingly important that more research is dedicated to replicating the emergence of the collective factor under different conditions (Barlow & Dennis, 2016; Bates & Gupta, 2017; Engel et al., 2015; Woolley, Aggarwal & Malone, 2015; Woolley et al., 2018) – especially in different cultural contexts, where the effect of social sensitivity may impact the collective intelligence factor (Engel et al., 2015). It is upon this statement that the current study was built.

Studies 1 and 2 showed clear differences in social sensitivity across cultures in the current context, and thus Study 3 investigates the emergence of the collective intelligence factor and its relationship with social sensitivity in this context.

The results revealed the emergence of a single dominate factor. However, the second factor showed strength higher than that observed in more Western contexts. None of the statistical methods used could support a single factor model – and thus offer clear support for the emergence of a collective intelligence factor. However, this could be because of the small sampling, the low number of tasks or poor operationalisation of tasks – each of which are consider later under limitations. An alternative explanation, and the reason argued in this research, is the culture setting. Statistical comparisons of current study factors and literature factors show sufficient similarities to suggest that the single dominant factor identified in the current study is the collective intelligence factor found in literature. It is acknowledged that this may be due to common method bias. However, this is unlikely according to the Harman's single factor test (Harman, 1960). The Harman's single factor test uses exploratory factor analysis to load all variables on a single factor with no rotation (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). If the first factor then explains more than 50% variance, common method bias is probable.

When exploring the Harman's single factor test in the current study, only 33% of the variance is explained by the first factor. Therefore, common method bias is unlikely given the results of the Harman's single factor test.

Based on this identified collective intelligence factor, social sensitivity was found to be the only significant predictor of this factor. Not only does this result provide tentative support that the first factor in the current study is the collective intelligence factor, but it supports the notion that social sensitivity is a predictor of collective intelligence in the current context.

Thus, the reason that the collective intelligence factor does not clearly emerge in the current study may be due to the cultural social sensitivity differences observed in the previous two studies of the current research. Therefore, this study suggests that social sensitivity has an important role to play in both the emergence and prediction of the collective intelligence factor. The cultural differences in social sensitivity are therefore an important topic in collective intelligence research.

10.4.4.1 Implications for theory

Study 3 results prove insightful in terms of how cultural differences in social sensitivity possibly affect collective intelligence. Theoretically, the results suggest the emergence of a collective intelligence factor that may be linked to social sensitivity. This is further supported by observations in the literature. Wherever a collective intelligence factor emerges, and it is not correlated with individual intelligence, social sensitivity was found to be a significant predictor (Engel et al., 2015; Engel et al., 2014a; Kim et al., 2015; Meslec et al., 2016; Woolley et al., 2010). In contrast, where social sensitivity lacked a significant positive relationship with group tasks, a collective intelligence factor failed to emerge (Barlow & Dennis, 2016). Theoretically, this suggests that when team participants are not using the RME social sensitivity skill, the ability to detect the collective intelligence factor is reduced. This may indicate that collective intelligence is triggered and magnified using the RME skill.

Where this trigger is not activated, individual intelligence or other factors may play a more prominent role in task performance – thus affecting correlations between tasks. This could explain why Bates and Gupta's (2017) results suggest that the collective intelligence factor is just the average intelligence factor of groups. Their participants may have focused more on their individual abilities in driving performance – rather than harnessing RME, to connect with team

members and to activate a collective intelligence factor. By implication, this suggests that teams or groups in African and non-Western cultural contexts, such as the one in this research, will struggle to depict a clear collective intelligence factor based on lower social sensitivity in the form of RME. This does not mean that non-Western cultures are not working well in groups, but to the contrary, they are showing greater commitment to the group through collectivism and *ubuntu* – which may even lead to improved performance. However, this lack of using the RME skill means that the collective intelligence factor is less likely to appear, as the variance in task performance is being affected by other factors such as collectivism and *ubuntu*. Therefore, it is worth noting that although this type of social sensitivity may be important to collective intelligence, cultural norms shape one's view of social sensitivity. Therefore, practitioners should approach collective intelligence with a multicultural view.

10.4.4.2 Implications for practice

There are a few key implications practitioners can draw from the above study and insights. Practitioners can encourage team or group members to use the RME skill, and, in so doing, allow for an increased chance to measure collective intelligence. They can then use this measure to identify aspects in order to improve team performance. However, practitioners need to be aware that, culturally, in this context, there are benefits to having low RME skills. Such benefits stem from a greater focus on the group's performance, instead of individual performance. This implies that African cultures may be more accepting of group diversity – thus avoiding conflict for the sake of overall group dynamics. In adopting this stance, they make less use of the RME, a social sensitivity skill, with the purpose of putting group interests above the interests of individuals of the group. Therefore, practitioners need to educate team members on the benefits of the RME skill, but, at the same time, inform on when the use of the skill is culturally appropriate and beneficial to groups. Training and understanding of a multicultural social skill set can then be used in different contexts to improve group cohesion.

Study 3 reinforces the importance of social sensitivity to teams and groups for practitioners across all cultures. However, consideration of how it manifests and is applied in different contexts, is needed in order to help understand collective intelligence. Studies 1 and 2 provide the tools (social sensitivity instruments) and educational insights (cultural differences and views on social sensitivity) that allow practitioners to harness social sensitivity to improve team or

group performance in a multicultural world. This research has added knowledge to the social sensitivity literature – particularly addressing cultural social sensitivity. With this added knowledge, the relationship between social sensitivity and collective intelligence can now be viewed through a cultural lens – thus allowing for a better understanding of how to improve both variables for the benefit of teams or groups and ultimately organisations and society.

Although this research is a move forward for both academia and practitioners, there are limitations that are an opportunity for further research.

10.5 LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Disclosure of potential limitations for each study carried out in this research is presented below.

10.5.1 Study 1

The stimuli sourced for the new instruments were taken from a professional travel photographer's Flickr account, after being granted permission to use them for research purposes. Inherent to this approach, picture quality was limited to the resolution of the originally published photograph. Photographs were also subject to different lighting environments and angles that may have affected the ability to identify the correct facial expression, and thereby the correct emotion. To rectify this, where applicable, brightness was adjusted to allow for clearer stimuli. Stimuli, although available in colour (as seen in the Appendices), were presented to participants in black and white. This may have affected the results; however, black and white was chosen to keep the precedent set in literature (Baron-Cohen et al., 2001) so that comparisons could be made. Future research can test these stimuli in colour to see if it affects the results.

Although 36-item instruments exist after testing on eight judges (Appendix A & B), it is suggested that the items that passed the full-scale study (Appendix F & H) be used and tested in future research and contexts – as a larger sample gives greater confidence in the instruments validity and reliability. Future research should further test the items that did not reach a clear majority in the final sample. Therefore, a limitation exists in that shorter instruments are produced for the African and 'Other culture' stimuli. However, it is worth noting that the Caucasian instrument also reduced in size – due to validity issues in the current context. Item-to-item comparisons between instruments are therefore difficult, as the instruments, although

similar in nature, will have some item differences. Nevertheless, this does not affect each instrument's ability and sensitivity to measure social sensitivity.

10.5.2 Study 2

The main limitation of Study 2 is the sample's profile. As discussed in previous chapters, the sample was skewed toward students in the Engineering and Built Environment faculty and the Science faculty, thus affecting its generalisation power. This was unintentional, as the sampling strategy used was random sampling. Inherent to this, a large first year Science course and a large second year Engineering course were randomly selected. However, this led to an interesting comparison between the two groups, and added a significant social sensitivity distinction between the two that had not been previously explored. Literature categorises and considers Engineering and Science as having a similar cognitive style (Billington et al., 2007). The current study does not support this, but rather suggests that Science degree students have a more extreme systemising cognitive style compared to Engineering students. Future research should look to confirm this distinction in emotion-related studies, with variables such as social sensitivity and empathy. This distinction can then inform practitioners in terms of training and recruiting from different fields of study.

An interesting dialogue that was revealed in Study 2, is the cultural impact and views of social sensitivity and EI. This study considered trait EI, which is a self-report measure of EI. This EI shows culture affects whether self-report EI has a positive (Western) or negative (African) relationship on social sensitivity. Ability EI is a measure of actual ability measured by emotional problem-solving and reasoning. Future research should consider whether this diverging cultural relationship is replicated when measuring ability EI – as opposed to trait EI. This will allow one to confirm whether this diverging cultural view on this type of social sensitivity and its importance to trait EI, translates to actual EI ability. So, for example, does a high ability EI translate to lower levels of social sensitivity as a measure by RMET in African cultures? This will further support the notion put forward in this study that African cultures of high EI make less use of the RME to show greater levels of emotional correctness and sensitivity in the current context.

Another consideration for future research is to investigate social-cognitive ToM. Social-cognitive ToM deals with one's mental state reasoning – as opposed to the rapid interpretations

of non-verbal cues known as social-perceptual ToM (Tager-Flusberg & Sullivan, 2000). Social-perceptual ToM was used in this study. This consideration can then further confirm the impact of culture between EI on ToM and whether the results in the current study are replicable across different ToM components that do not rely on non-verbal cues such as eye-contact.

The investigation into different components of EI and ToM may prove fruitful in identifying underlying cultural patterns for both – for example whether social-perceptual ToM is less emphasised in African cultures than social-cognitive ToM. Is this due to trait EI or/and ability EI? Are different components equally important across cultures?

This will ultimately lead to a clearer definition of EI and social sensitivity in different cultures, which will help practitioners design culturally effective training and educational programmes.

10.5.3 Study 3

Study 3, due to its post-hoc and experimental nature, had a few limitations. The main limitation was the small sample size. Non-response bias, time constraints and resource limitations were all contributors to the small final sample size of this study.

Research on collective intelligence has however previously been performed with a relatively small sample size (Engel et al., 2015). In addition, it is also noted that experimental psychology research is often performed on small samples (Anderson, Kelley & Maxwell, 2017; Marszalek, Barber, Kohlhart & Cooper, 2011).

It is acknowledged that this small sample size significantly limits generalisation of the current study. However, the current study factor structure and relational trends closely match those found in the literature, and thus the results prove promising and suggest that future research could be fruitful. This study also highlighted that social sensitivity may be important to collective intelligence in the current context, thereby serving its purpose by reinforcing the importance of the findings in Studies 1 and 2.

The second limitation to the study is related to the tasks and how they were operationalised. The study used five tasks. Four were used to cover the McGrath Task Circumplex (McGrath, 1984), and one to act as a criterion task. This method followed Woolley et al. (2010). When operationalised, two tasks had to be adapted as the use of the original tasks was constrained by available resources. The one task, the puzzle task, required intervention in the analysis stage to

stabilise the resultant variances. Originally, a penalty of -5 was used in the task, and this was subsequently reduced to -2. Although there is chance this post-experiment change may have affected results – it is argued that both situations would still have had the same desired effect on participants, and it would have encouraged collaboration on the puzzle. Thus, all the change did was stabilise variances to avoid extreme negative values and allow for comparisons with other tasks. The other adapted task, the shopping list task, did not require any intervention. The criterion task subsequently was dropped due to extreme variances that intervention could not resolve.

However, the relative stability of the four tasks covering the McGrath Task Circumplex allowed the study to achieve its main aims of testing for the collective intelligence factor and subsequently its relationship with social sensitivity. Overall, although measures were put in place to avoid researcher influence on tasks and participant results, such as instruction sheets, random group selection, and use of material and methods provided in literature – situational and resource constraints may have caused such an influence to be present. Therefore, tasks and the operationalisation of these tasks is a limitation to this study.

The last study limitation is that of participants were attracted to participate in the experiment. Participation was voluntary, with a R500 raffle granted to one participant after the research was completed. This may have attracted a certain type of demographic or person. This method of inviting participants was unavoidable due to ethical and resource constraints placed on this research. The use of money to stimulate participation in a collective intelligence experiment was also used in Woolley and colleagues' (2010) studies.

10.5.4 Common limitations

Across all three studies, a student sample was used. This obviously influences generalisability of the research results. However, it has been noted that student samples are more homogenous than non-student samples and therefore have the advantage of easier cross-country comparisons (Van de Vijver, Leung & Leung, 1997). This is important consideration in culturally driven research (Gunkel, Schlaegel, et al., 2014a, 2014b).

This research relies on a cultural theme, and therefore the student sample may be ideal in terms of comparisons across cultures – especially for future research in other countries. Another attractive benefit of a student sample is the culturally diverse student population, thus allowing

for access to a wide range of cultures. With regard to Study 3, student samples are also seen as appropriate for testing theories on phenomena that are predicted to hold true across the population (Compeau, Marcolin, Kelley & Higgins, 2012). Therefore, if the tests conducted in the current research did not reveal the expected results, it could be concluded that collective intelligence does not always act and emerge in the same way in the broader population. Although there are some benefits to a student sample as mentioned above, a student sample limits the power of this research in explaining organisational behaviour. The inferences that can be made about the potential impact of social sensitivity and collective intelligence in an organisational environment are limited. Applying the tools and methods in this research to a sample drawn from organisations is a potentially important contribution for future research. Future research within an organisation setting can help confirm the importance of these tools and methods to organisational performance. Response rate data was not available to guide future research. Unfortunately, this information was not available for several reasons. The nature of data collection meant the following problems:

- Information on how many students were registered for the course was not always available to the researcher.
- Not all registered students attended lectures where data collection took place
- Because multiple students (sometimes >100) were invited at once through a general announcement, the researcher was not able to count how many students stayed behind or left the lecture venue after the announcement.
- Generally, response rates from students at the lecture venue appeared high due to lecturer support and introduction but there was no way to accurately track this information.

Lastly, across the studies, especially for studies 1 and 2, culture was identified through the proxies of ethnicity/race and home language. This may not be fully representative and an accurate representation of the populations cultural orientation and proves a limitation to this research. However, it was identified as the most appropriate approach given the scope and aims of the research.

10.6 MAJOR CONTRIBUTIONS TO KNOWLEDGE

The main contributions of the current research are highlighted below:

Instrument contributions

- A **new** 36-item African social sensitivity instrument based on the testing done on eight judges – Appendix A.
- A **new** 36-item 'Other culture' social sensitivity instrument based on the testing done on eight judges – Appendix B.
- A **new validated** 21-item African social sensitivity instrument based on a sample of 459 students– Appendix F.
- A **new validated** 26-item 'Other culture' social sensitivity instrument based on a sample of 404 students– Appendix H.
- A 30-item **context-validated** Caucasian social sensitivity instrument based on a sample of 443 student sample – Appendix J.
- A pool of 72 (47 validated on a large sample) **new** social sensitivity items that can be used for future research.
- A total pool of 77 **context-validated** social sensitivity items that can be used for future research.
- A **new** 21-item multicultural social sensitivity instrument – Appendix M.

Theory contributions

- **Further empirical support** for both cultural and gender differences in social sensitivity:
    - **Further empirical support** for significantly large differences in social sensitivity observed between African and Western cultures.
    - **First documentation** that there is no intra-cultural advantage for African cultures in the RMET
    - **First documentation** of significant differences in cultural and gender social sensitivity, which is consistent across multiple cultural social sensitivity instruments.

- **Further empirical support** for gender, home language, and field of study as significant predictors of social sensitivity:
    - **First documentation** of differences between Science and Engineering students' social sensitivity.
- **First documentation** that trait EI's relationship with social sensitivity is moderated by home language – this relationship is negative for African home languages and positive for English home language speakers:
    - African home language speakers with high levels of social sensitivity have lower levels of trait EI.
    - English home language speakers with high levels of social sensitivity have higher levels of trait EI.
    - The differing relationships between trait EI and social sensitivity between the two cultures is a **novel** finding – which is argued to inform on the differences in social sensitivity between African and Western cultures.
    - This finding is important and opens a new area of enquiry that could potentially change the way we understand different cultures' perspectives on both EI and social sensitivity.
- There was a **first attempt** at validating the emergence of a collective intelligence factor in an African context:
    - Tentative conclusion of a culturally influenced emergence of a collective intelligence factor in the current context.
    - Tentative evidence that social sensitivity is an important predictor of collective intelligence in the current context.

The above summarise the major contributions this research has made to the literature. In addition, there are more minor contributions that are not mentioned above. These are mostly non-significant relationships that were hypothesised, based on theory, to be significant. These were discussed in earlier chapters.

The major contributions are seen to both equip (with instruments) and inform (based on theoretical findings) academia to better develop and understand social sensitivity theory across

different cultures, and, in so doing, help society perform better collectively in today's increasingly inclusive environment

10.7 CONCLUSION

The aim of the overall research was to add knowledge to the social sensitivity literature to further understand the concept of collective intelligence in humans. The research has achieved, if not surpassed, this aim. The research added both tools and cultural knowledge to the social sensitivity literature. In so doing, social sensitivity is shown to be dependent on culture. Any consideration of social sensitivity needs to be assessed in a cultural paradigm with inclusive tools. The research provides inclusive tools and starts to consider the different cultural paradigms of social sensitivity – particularly highlighting the culturally divergent views on social sensitivities importance to EI in African and Western cultures. In understanding these paradigms, these results suggest that it is now possible to adjust how humans interact with each other in a diverse world, in order to ultimately enhance collective intelligence to the benefit of society and organisations.

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APPENDICES

APPENDIX A: STUDY 1 AFRICAN QUESTIONNAIRE

Questionnaire

Please record answers on the provided answer sheet and not on this booklet.

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APPENDIX B: STUDY 1 'OTHER CULTURE' QUESTIONNAIRE

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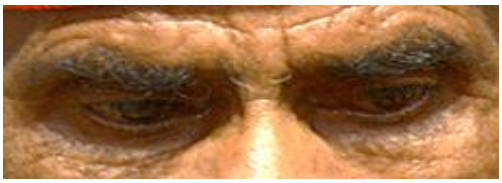
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APPENDIX C: STUDY 1 CAUCASIAN QUESTIONNAIRE

Questionnaire

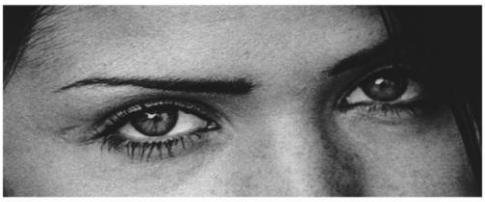
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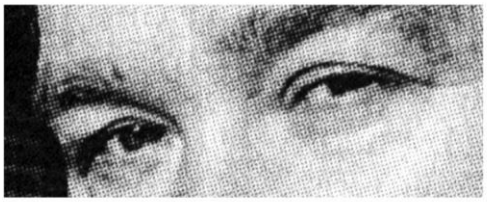
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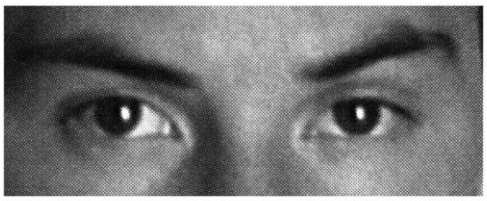
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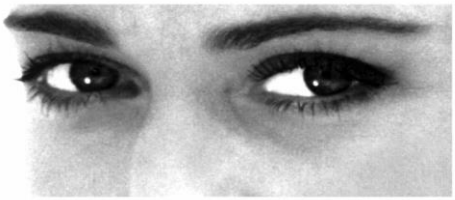
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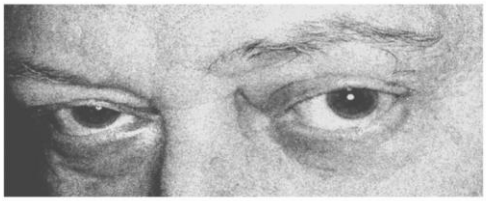
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APPENDIX D: STUDY 1 ANSWER SHEET - appended to each cultural questionnaire

Instructions: For each set of eyes, choose and **circle** which word best describes what the person in the picture is thinking or feeling. You may feel that more than one word is applicable but please choose just one word, the word which you consider to be most suitable. Before making your choice, make sure that you have read all 4 words. You should try to do the task as quickly as possible but you will not be timed. **If you really don't know what a word means you can look it up in the definition handout (Attached at the back of the questionnaire booklet).**

Answer sheet

1	playful	comforting	irritated	bored
2	terrified	upset	arrogant	annoyed
3	joking	flustered	desire	convinced
4	joking	insisting	amused	relaxed
5	irritated	sarcastic	worried	friendly
6	aghast	fantasizing	impatient	alarmed
7	apologetic	friendly	uneasy	dispirited
8	despondent	relieved	shy	excited
9	annoyed	hostile	horrified	preoccupied
10	cautious	insisting	bored	aghast
11	terrified	amused	regretful	flirtatious
12	indifferent	embarrassed	sceptical	dispirited
13	decisive	anticipating	threatening	shy
14	irritated	disappointed	depressed	accusing
15	contemplative	flustered	encouraging	amused
16	irritated	thoughtful	encouraging	sympathetic
17	doubtful	affectionate	playful	aghast
18	decisive	amused	aghast	bored
19	arrogant	grateful	sarcastic	tentative
20	dominant	friendly	guilty	horrified
21	embarrassed	fantasizing	confused	panicked
22	preoccupied	grateful	insisting	imploring
23	contented	apologetic	defiant	curious
24	pensive	irritated	excited	hostile
25	panicked	incredulous	despondent	interested
26	alarmed	shy	hostile	anxious
27	joking	cautious	arrogant	reassuring
28	interested	joking	affectionate	contented
29	impatient	aghast	irritated	reflective
30	grateful	flirtatious	hostile	disappointed
31	ashamed	confident	joking	dispirited
32	serious	ashamed	bewildered	alarmed
33	embarrassed	guilty	fantasizing	concerned
34	aghast	baffled	distrustful	terrified
35	puzzled	nervous	insisting	contemplative
36	ashamed	nervous	suspicious	indecisive

Please turn over

Demographics

Instructions: Please tick the appropriate box

1. Gender: ❑ Male ❑ Female

2. Years (Age): _____

3. Which of the following do you most identify yourself with?

   ❑ Black ❑ Coloured ❑ Asian ❑ Indian ❑ White

   ❑ Other (please specify) _____ ❑ Prefer not to say

4. In which faculty are you currently registered?

   ❑ Commerce, Law & Management ❑ Humanities ❑ Engineering and Built Environment
   ❑ Health Sciences ❑ Science

5. What is your level of study?

   ❑ 1st ❑ 2nd ❑ 3rd ❑ 4th /Honours ❑ Masters ❑PHD

6. What are your parents/guardian's highest level of education (**years**)? Please tick

   A) Mom/Guardian1:

	Primary							High School							Undergraduate/Honours					Masters/PHD			
0	1	2	3	4	5	6		7	8	9	10	11	12		13	14	15	16		17	18	19	20

   B) Dad/Guardian2:

	Primary							High School							Undergraduate/Honours					Masters/PHD			
0	1	2	3	4	5	6		7	8	9	10	11	12		13	14	15	16		17	18	19	20

7. What is your home language?

   ❑ Zulu ❑ Setswana ❑ Sesotho ❑ Xhosa ❑ Afrikaans ❑ English

   ❑ Other (please specify) _____

   Thank you for participating

APPENDIX E: FULL QUESTIONNAIRE ANSWERS

Males=19

Females=17

Question	Option 1	Option 2	Option 3	Option 4	Gender
1	**playful**	comforting	irritated	bored	M
2	terrified	**upset**	arrogant	annoyed	M
3	joking	flustered	**desire**	convinced	F
4	joking	**insisting**	amused	relaxed	M
5	irritated	sarcastic	**worried**	friendly	M
6	aghast	**fantasizing**	impatient	alarmed	F
7	apologetic	friendly	**uneasy**	dispirited	M
8	**despondent**	relieved	shy	excited	M
9	annoyed	hostile	horrified	**preoccupied**	F
10	**cautious**	insisting	bored	aghast	M
11	terrified	amused	**regretful**	flirtatious	M
12	indifferent	embarrassed	**sceptical**	dispirited	M
13	decisive	**anticipating**	threatening	shy	M
14	irritated	disappointed	depressed	**accusing**	M
15	**contemplative**	flustered	encouraging	amused	F
16	irritated	**thoughtful**	encouraging	sympathetic	M
17	**doubtful**	affectionate	playful	aghast	F
18	**decisive**	amused	aghast	bored	F
19	arrogant	grateful	sarcastic	**tentative**	F
20	dominant	**friendly**	guilty	horrified	M
21	embarrassed	**fantasizing**	confused	panicked	F
22	**preoccupied**	grateful	insisting	imploring	F
23	contented	apologetic	**defiant**	curious	M
24	**pensive**	irritated	excited	hostile	M
25	panicked	incredulous	despondent	**interested**	F
26	alarmed	shy	**hostile**	anxious	M
27	joking	**cautious**	arrogant	reassuring	F
28	**interested**	joking	affectionate	contented	F
29	impatient	aghast	irritated	**reflective**	F
30	grateful	**flirtatious**	hostile	disappointed	F
31	ashamed	**confident**	joking	dispirited	F
32	**serious**	ashamed	bewildered	alarmed	M
33	embarrassed	guilty	fantasizing	**concerned**	M
34	aghast	baffled	**distrustful**	terrified	F
35	puzzled	**nervous**	insisting	contemplative	F
36	ashamed	nervous	**suspicious**	indecisive	M

APPENDIX F: FINAL AFRICAN QUESTIONNAIRE

African Questionnaire

Please record answers on the provided answer sheet and not on this booklet.

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APPENDIX G: FINAL AFRICAN QUESTIONNAIRE ANSWERS

Males=11

Females=10

Question	Option 1	Option 2	Option 3	Option 4	Gender
1	joking	flustered	**desire**	convinced	F
2	joking	**insisting**	amused	relaxed	M
3	aghast	**fantasizing**	impatient	alarmed	F
4	**despondent**	relieved	shy	excited	M
5	annoyed	hostile	horrified	**preoccupied**	F
6	**cautious**	insisting	bored	aghast	M
7	terrified	amused	**regretful**	flirtatious	M
8	indifferent	embarrassed	**sceptical**	dispirited	M
9	irritated	disappointed	depressed	**accusing**	M
10	**contemplative**	flustered	encouraging	amused	F
11	irritated	**thoughtful**	encouraging	sympathetic	M
12	dominant	**friendly**	guilty	horrified	M
13	joking	**cautious**	arrogant	reassuring	F
14	impatient	aghast	irritated	**reflective**	F
15	grateful	**flirtatious**	hostile	disappointed	F
16	ashamed	**confident**	joking	dispirited	F
17	**serious**	ashamed	bewildered	alarmed	M
18	embarrassed	guilty	fantasizing	**concerned**	M
19	aghast	baffled	**distrustful**	terrified	F
20	puzzled	**nervous**	insisting	contemplative	F
21	ashamed	nervous	**suspicious**	indecisive	M

APPENDIX H: FINAL 'OTHER CULTURE' QUESTIONNAIRE

Questionnaire

Please record answers on the provided answer sheet and not on this booklet.

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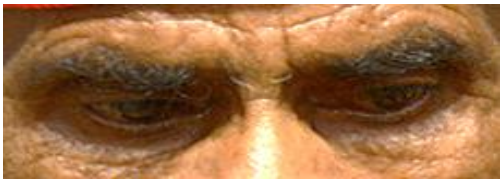
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APPENDIX I: FINAL 'OTHER CULTURE' QUESTIONNAIRE ANSWERS

Males=17

Females=9

Question	Option 1	Option 2	Option 3	Option 4	Gender
1	**playful**	comforting	irritated	bored	M
2	joking	flustered	**desire**	convinced	F
3	joking	**insisting**	amused	relaxed	M
4	irritated	sarcastic	**worried**	friendly	M
5	aghast	**fantasizing**	impatient	alarmed	F
6	apologetic	friendly	**uneasy**	dispirited	M
7	**despondent**	relieved	shy	excited	M
8	annoyed	hostile	horrified	**preoccupied**	F
9	**cautious**	insisting	bored	aghast	M
10	terrified	amused	**regretful**	flirtatious	M
11	indifferent	embarrassed	**sceptical**	dispirited	M
12	decisive	**anticipating**	threatening	shy	M
13	irritated	disappointed	depressed	**accusing**	M
14	irritated	**thoughtful**	encouraging	sympathetic	M
15	**doubtful**	affectionate	playful	aghast	F
16	arrogant	grateful	sarcastic	**tentative**	F
17	dominant	**friendly**	guilty	horrified	M
18	**preoccupied**	grateful	insisting	imploring	F
19	**pensive**	irritated	excited	hostile	M
20	alarmed	shy	**hostile**	anxious	M
21	joking	**cautious**	arrogant	reassuring	F
22	grateful	**flirtatious**	hostile	disappointed	F
23	**serious**	ashamed	bewildered	alarmed	M
24	embarrassed	guilty	fantasizing	**concerned**	M
25	aghast	baffled	**distrustful**	terrified	F
26	ashamed	nervous	**suspicious**	indecisive	M

APPENDIX J: FINAL CAUCASIAN QUESTIONNAIRE

Questionnaire

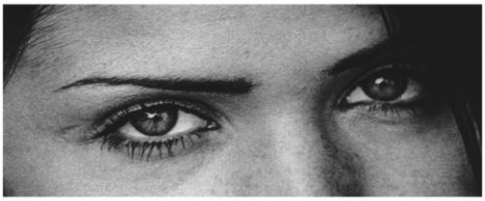
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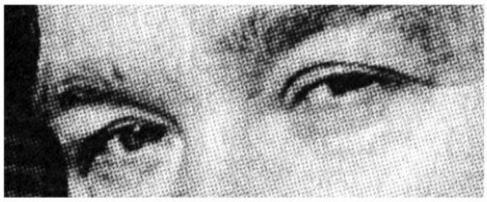
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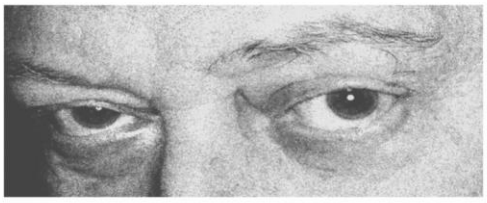
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APPENDIX K: FINAL CAUCASIAN QUESTIONNAIRE ANSWERS

Males=17

Females=13

Question	Option 1	Option 2	Option 3	Option 4	Gender
1	**playful**	comforting	irritated	bored	M
2	terrified	**upset**	arrogant	annoyed	M
3	joking	flustered	**desire**	convinced	F
4	joking	**insisting**	amused	relaxed	M
5	irritated	sarcastic	**worried**	friendly	M
6	aghast	**fantasizing**	impatient	alarmed	F
7	apologetic	friendly	**uneasy**	dispirited	M
8	**despondent**	relieved	shy	excited	M
9	annoyed	hostile	horrified	**preoccupied**	F
10	terrified	amused	**regretful**	flirtatious	M
11	indifferent	embarrassed	**sceptical**	dispirited	M
12	decisive	**anticipating**	threatening	shy	M
13	irritated	disappointed	depressed	**accusing**	M
14	**contemplative**	flustered	encouraging	amused	F
15	irritated	**thoughtful**	encouraging	sympathetic	M
16	**doubtful**	affectionate	playful	aghast	F
17	arrogant	grateful	sarcastic	**tentative**	F
18	dominant	**friendly**	guilty	horrified	M
19	embarrassed	**fantasizing**	confused	panicked	F
20	**preoccupied**	grateful	insisting	imploring	F
21	**pensive**	irritated	excited	hostile	M
22	alarmed	shy	**hostile**	anxious	M
23	joking	**cautious**	arrogant	reassuring	F
24	**interested**	joking	affectionate	contented	F
25	grateful	**flirtatious**	hostile	disappointed	F
26	ashamed	**confident**	joking	dispirited	F
27	**serious**	ashamed	bewildered	alarmed	M
28	embarrassed	guilty	fantasizing	**concerned**	M
29	puzzled	**nervous**	insisting	contemplative	F
30	ashamed	nervous	**suspicious**	indecisive	M

APPENDIX L: SHORTENED MULTICULTURAL EYE TEST DEVELOPMENT

To create this shortened multicultural instrument the following, objective method, was used to select eyes from the valid pool of items from Study 1 (Appendix F, H, J) for the new instrument:

- The new 21-item instrument is split evenly amongst the three culture groups divided into 7 items each (African, 'Other culture', Caucasian).
- Of the 7 items, 2 groups will consist of 4 males and 3 females, and one group 4 females and 3 males. This will be randomly allocated. The reason for an extra male item is because there are more male items to choose from.
- The 7 items will be split into three categories to ensure balanced difficulty of identifying the underlying mental states (guided by the percentage of times correctly chosen in study 1). These categories are:
    - 2 items=50-59%
    - 2 items=60-69%
    - 2 items=70-79%
    - 1 item=80=%
- Items will then be chosen in that category, if there are multiple items, by identifying which is closest to the category midpoint except for the 80%+ category. In this category, the closest to 80% will be chosen to avoid overly obvious items.
- If it is a tie, the item with the lowest closest foil will be chosen.
- If there is no item in the category, the lowest item in the next category will be chosen.
- No target emotion may be repeated in same category.
- The same question may only appear twice, once, in the entire instrument to maintain a good spread of emotions and avoid respondent learning.

The final shortened multicultural instrument is shown in Appendix M. This instrument is then used/tested in Studies 2 and 3.

APPENDIX M: SHORTENED MULTICULTURAL SOCIAL SENSITIVITY INSTRUMENT

Questionnaire

Please record answers on the provided answer sheet



1.



2.



3.



4.



5.

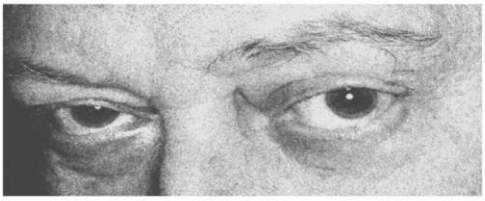


6.





7.



8.



9.



10.



11.



12.



13.



14.



15.

16.



17.



18.



19.



20.



21.

APPENDIX N: MULTICULTURAL INSTRUMENT ANSWERS

Males=11

Females=10

Question	Option 1	Option 2	Option 3	Option 4	Gender
1	irritated	**thoughtful**	encouraging	sympathetic	M
2	**preoccupied**	grateful	insisting	imploring	F
3	terrified	**upset**	arrogant	annoyed	M
4	**contemplative**	flustered	encouraging	amused	F
5	irritated	sarcastic	**worried**	friendly	M
6	ashamed	**confident**	joking	dispirited	F
7	**cautious**	insisting	bored	aghast	M
8	joking	flustered	**desire**	convinced	F
9	alarmed	shy	**hostile**	anxious	M
10	aghast	baffled	**distrustful**	terrified	F
11	irritated	disappointed	depressed	**accusing**	M
12	**preoccupied**	grateful	insisting	imploring	F
13	joking	**insisting**	amused	relaxed	M
14	joking	**cautious**	arrogant	reassuring	F
15	**playful**	comforting	irritated	bored	M
16	annoyed	hostile	horrified	**preoccupied**	F
17	**despondent**	relieved	shy	excited	M
18	grateful	**flirtatious**	hostile	disappointed	F
19	terrified	amused	**regretful**	flirtatious	M
20	**doubtful**	affectionate	playful	aghast	F
21	indifferent	embarrassed	**sceptical**	dispirited	M

APPENDIX O: STUDY 2 ANSWER SHEET - **appended to multicultural questionnaire**

Instructions: For each set of eyes, choose and circle which word best describes what the person in the picture is thinking or feeling. You may feel that more than one word is applicable but please choose just one word, the word which you consider to be most suitable. Before making your choice, make sure that you have read all 4 words. You should try to do the task as quickly as possible, but you will not be timed. If you really don't know what a word means you can look it up in the definition handout.

1	irritated	thoughtful	encouraging	sympathetic
2	preoccupied	grateful	insisting	imploring
3	terrified	upset	arrogant	annoyed
4	contemplative	flustered	encouraging	amused
5	irritated	sarcastic	worried	friendly
6	ashamed	confident	joking	dispirited
7	cautious	insisting	bored	aghast
8	joking	flustered	desire	convinced
9	alarmed	shy	hostile	anxious
10	aghast	baffled	distrustful	terrified
11	irritated	disappointed	depressed	accusing
12	preoccupied	grateful	insisting	imploring
13	joking	insisting	amused	relaxed
14	joking	cautious	arrogant	reassuring
15	playful	comforting	irritated	bored
16	annoyed	hostile	horrified	preoccupied
17	despondent	relieved	shy	excited
18	grateful	flirtatious	hostile	disappointed
19	terrified	amused	regretful	flirtatious
20	doubtful	affectionate	playful	aghast
21	indifferent	embarrassed	sceptical	dispirited

Instructions: Please answer each statement below by putting a circle around the number that best reflects your degree of agreement or disagreement with that statement. Do not think too long about the exact meaning of the statements. Work quickly and try to answer as accurately as possible. There are no right or wrong answers. There are seven possible responses to each statement ranging from 'Strongly Disagree' (number 1) to 'Strongly Agree' (number 7).

1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . 6 7

Completely Disagree **Completely Agree**

1. Expressing my emotions with words is not a problem for me.	1	2	3	4	5	6	7
2. I often find it difficult to see things from another person's viewpoint.	1	2	3	4	5	6	7
3. On the whole, I'm a highly motivated person.	1	2	3	4	5	6	7
4. I usually find it difficult to regulate my emotions.	1	2	3	4	5	6	7
5. I generally don't find life enjoyable.	1	2	3	4	5	6	7
6. I can deal effectively with people.	1	2	3	4	5	6	7
7. I tend to change my mind frequently.	1	2	3	4	5	6	7
8. Many times, I can't Figure out what emotion I'm feeling.	1	2	3	4	5	6	7
9. I feel that I have a number of good qualities.	1	2	3	4	5	6	7
10. I often find it difficult to stand up for my rights.	1	2	3	4	5	6	7
11. I'm usually able to influence the way other people feel.	1	2	3	4	5	6	7
12. On the whole, I have a gloomy perspective on most things.	1	2	3	4	5	6	7
13. Those close to me often complain that I don't treat them right.	1	2	3	4	5	6	7
14. I often find it difficult to adjust my life according to the circumstances.	1	2	3	4	5	6	7
15. On the whole, I'm able to deal with stress.	1	2	3	4	5	6	7
16. I often find it difficult to show my affection to those close to me.	1	2	3	4	5	6	7
17. I'm normally able to "get into someone's shoes" and experience their emotions.	1	2	3	4	5	6	7
18. I normally find it difficult to keep myself motivated.	1	2	3	4	5	6	7
19. I'm usually able to find ways to control my emotions when I want to.	1	2	3	4	5	6	7
20. On the whole, I'm pleased with my life.	1	2	3	4	5	6	7
21. I would describe myself as a good negotiator.	1	2	3	4	5	6	7
22. I tend to get involved in things I later wish I could get out of.	1	2	3	4	5	6	7
23. I often pause and think about my feelings.	1	2	3	4	5	6	7
24. I believe I'm full of personal strengths.	1	2	3	4	5	6	7
25. I tend to "back down" even if I know I'm right.	1	2	3	4	5	6	7
26. I don't seem to have any power at all over other people's feelings.	1	2	3	4	5	6	7
27. I generally believe that things will work out fine in my life.	1	2	3	4	5	6	7
28. I find it difficult to bond well even with those close to me.	1	2	3	4	5	6	7
29. Generally, I'm able to adapt to new environments.	1	2	3	4	5	6	7
30. Others admire me for being relaxed.	1	2	3	4	5	6	7
31. I'm usually able to settle disputes	1	2	3	4	5	6	7
32. On the whole, I'm able to deal with stress	1	2	3	4	5	6	7
33. I often indulge without considering all the consequences	1	2	3	4	5	6	7
34. When I disagree with someone, I usually find it easy to say so	1	2	3	4	5	6	7
35. Understanding the needs and desires of others is not a problem for me	1	2	3	4	5	6	7
36. I can identify an emotion from the moment it starts to develop in me	1	2	3	4	5	6	7
37. I tend to get "carried away" easily	1	2	3	4	5	6	7

Instructions: Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please choose a **number** for each statement to indicate the extent to which you agree or disagree with that statement.

1=Disagree strongly	**2**=Disagree a little	**3**=Neither agree nor disagree	**4**=Agree a little	**5**=Agree strongly

I see myself as someone who….

1. is talkative _____
2. tends to find fault with others _____
3. does a thorough job _____
4. is depressed, blue _____
5. is original, comes up with new ideas _____
6. is reserved _____
7. is helpful and unselfish with others _____
8. can be somewhat careless _____
9. is relaxed, handles stress well _____
10. is curious about many different things _____
11. is full of energy _____
12. starts quarrels with others _____
13. is a reliable worker _____
14. can be tense _____
15. is ingenious, a deep thinker _____
16. generates a lot of enthusiasm _____
17. has a forgiving nature _____
18. tends to be disorganized _____
19. worries a lot _____
20. has an active imagination _____
21. tends to be quiet _____
22. is generally trusting _____
23. tends to be lazy _____
24. is emotionally stable, not easily upset _____
25. is inventive _____
26. has an assertive personality _____
27. can be cold and aloof _____
28. perseveres until the task is finished
29. can be moody _____
30. values artistic, aesthetic experiences _____
31. is sometimes shy, inhibited _____
32. is considerate and kind to almost everyone _____
33. does things efficiently _____
34. remains calm in tense situations _____
35. prefers work that is routine _____
36. is outgoing, sociable _____
37. is sometimes rude to others _____
38. makes plans and follows through with them _____
39. gets nervous easily _____
40. likes to reflect, play with ideas _____
41. has few artistic interests _____
42. likes to cooperate with others _____
43. is easily distracted _____
44. is sophisticated in art, music or literature _____

Please check: Did you write a number next to each statement?

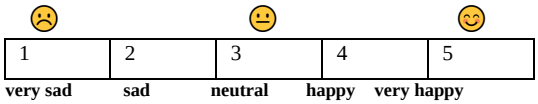
Demographics

Instructions: Please tick the appropriate box

8. Gender: ❑ Male ❑ Female

9. Years (Age): _____

10. How do you feel at this moment?



11. Which of the following do you most identify yourself with?

❑ Black ❑ Coloured ❑ Asian ❑ Indian ❑ White

❑ Other (please specify) _____ ❑ Prefer not to say

12. In which faculty are you currently registered?

❑ Commerce, Law & Management ❑ Humanities ❑ Engineering and Built Environment
❑ Health Sciences ❑ Science

13. What is your level of study?

❑ 1st ❑ 2nd ❑ 3rd ❑ 4th /Honours ❑ Masters ❑PHD

14. How are your studies funded?

❑ Personal ❑ Parents ❑ Sponsored ❑ Loan ❑ NSFAS (National Student Financial Aid Scheme)

15. What are your parents/guardian's highest level of education (**years**)? Please tick

C) Mother/Guardian1:

Primary High School Undergraduate/Honours Masters/PHD

0	1	2	3	4	5	6		7	8	9	10	11	12		13	14	15	16		17	18	19	20

YEARS

D) Father/Guardian2:

Primary High School Undergraduate/Honours Masters/PHD

0	1	2	3	4	5	6		7	8	9	10	11	12		13	14	15	16		17	18	19	20

YEARS

16. What is your home language?

❑ Zulu ❑ Tswana ❑ Xhosa ❑ Sotho ❑ Northern Sotho ❑ Tsonga ❑ Ndebele
❑ Swazi ❑ Venda ❑ Afrikaans ❑ English ❑ Other (please specify) _____

Thank you for participating

APPENDIX P: DEFINITION HANDOUT 1 (GLOSSARY) - appended to full social sensitivity questionnaire

WORD DEFINITIONS

ACCUSING- blaming
The policeman was accusing the man of stealing a wallet.
AFFECTIONATE- showing fondness towards someone
Most mothers are affectionate to their babies by giving them lots of kisses and cuddles.
AGHAST- horrified, astonished, alarmed
Jane was aghast when she discovered her house had been burgled.
ALARMED- fearful, worried, filled with anxiety
Claire was alarmed when she thought she was being followed home.
AMUSED- finding something funny
I was amused by a funny joke someone told me.
ANNOYED- irritated, displeased
Jack was annoyed when he found out he had missed the last bus home.
ANTICIPATING- expecting
At the start of the football match, the fans were anticipating a quick goal.
ANXIOUS- worried, tense, uneasy
The student was feeling anxious before taking her final exams.
APOLOGETIC- feeling sorry
The waiter was very apologetic when he spilt soup all over the customer.
ARROGANT- conceited, self-important, having a big opinion of one self
The arrogant man thought he knew more about politics than everyone else in the room.
ASHAMED- overcome with shame or guilt
The boy felt ashamed when his mother discovered him stealing money from her purse.
ASSERTIVE- confident, dominant, sure of oneself
The assertive woman demanded that the shop give her a refund.
BAFFLED- confused, puzzled, dumbfounded
The detectives were completely baffled by the murder case.
BEWILDERED- utterly confused, puzzled, dazed
The child was bewildered when visiting the big city for the first time.
CAUTIOUS- careful, wary
Sarah was always a bit cautious when talking to someone she did not know.
COMFORTING- consoling, compassionate
The nurse was comforting the wounded soldier.
CONCERNED- worried, troubled
The doctor was concerned when his patient took a turn for the worse.
CONFIDENT- self-assured, believing in oneself
The tennis player was feeling very confident about winning his match.
CONFUSED- puzzled, perplexed
Lizzie was so confused by the directions given to her, she got lost.

CONTEMPLATIVE- reflective, thoughtful, considering
John was in a contemplative mood on the eve of his 60th birthday.
CONTENTED- satisfied
After a nice walk and a good meal, David felt very contented.
CONVINCED- certain, absolutely positive
Richard was convinced he had come to the right decision.
CURIOUS- inquisitive, inquiring, prying
Louise was curious about the strange shaped parcel.
DECIDING- making your mind up
The man was deciding whom to vote for in the election.
DECISIVE- already made your mind up
Jane looked very decisive as she walked into the polling station.
DEFIANT- insolent, bold, don't care what anyone else thinks
The animal protester remained defiant even after being sent to prison.
DEPRESSED- miserable
George was depressed when he didn't receive any birthday cards.
DESIRE passion, lust, longing for
Kate had a strong desire for chocolate.
DESPONDENT- gloomy, despairing, without hope
Gary was despondent when he did not get the job he wanted.
DISAPPOINTED- displeased, disgruntled
Manchester United fans were disappointed not to win the Championship.
DISPIRITED- glum, miserable, low
Adam was dispirited when he failed his exams.
DISTRUSTFUL- suspicious, doubtful, wary
The old woman was distrustful of the stranger at her door.
DOMINANT- commanding, bossy
The sergeant major looked dominant as he inspected the new recruits.
DOUBTFUL- dubious, suspicious, not really believing
Mary was doubtful that her son was telling the truth.
DUBIOUS- doubtful, suspicious
Peter was dubious when offered a surprisingly cheap television in a pub.
EAGER- keen
On Christmas morning, the children were eager to open their presents.
EARNEST- having a serious intention
Harry was very earnest about his religious beliefs.
EMBARRASSED- ashamed
After forgetting a colleague's name, Jenny felt very embarrassed.
ENCOURAGING- hopeful, heartening, supporting
All the parents were encouraging their children in the school sports day.
ENTERTAINED- absorbed and amused or pleased by something
I was very entertained by the magician.
ENTHUSIASTIC- very eager, keen
Susan felt very enthusiastic about her new fitness plan.

FANTASIZING- daydreaming
Emma was fantasizing about being a film star.
FASCINATED- captivated, really interested
At the seaside, the children were fascinated by the creatures in the rock pools.
FEARFUL- terrified, worried
In the dark streets, the women felt fearful.
FLIRTATIOUS- brazen, saucy, teasing, playful
Connie was accused of being flirtatious when she winked at a stranger at a party.
FLUSTERED- confused, nervous and upset
Sarah felt a bit flustered when she realised how late she was for the meeting and that she had forgotten an important document.
FRIENDLY- sociable, amiable
The friendly girl showed the tourists the way to the town centre.
GRATEFUL- thankful
Kelly was very grateful for the kindness shown by the stranger.
GUILTY- feeling sorry for doing something wrong
Charlie felt guilty about having an affair.
HATEFUL- showing intense dislike
The two sisters were hateful to each other and always fighting.
HOPEFUL- optimistic
Larry was hopeful that the post would bring good news.
HORRIFIED- terrified, appalled
The man was horrified to discover that his new wife was already married.
HOSTILE- unfriendly
The two neighbours were hostile towards each other because of an argument about loud music.
IMPATIENT- restless, wanting something to happen soon
Jane grew increasingly impatient as she waited for her friend who was already 20 minutes late.
IMPLORING- begging, pleading
Nicola looked imploring as she tried to persuade her dad to lend her the car.
INCREDULOUS- not believing
Simon was incredulous when he heard that he had won the lottery.
INDECISIVE- unsure, hesitant, unable to make your mind up
Tammy was so indecisive that she couldn't even decide what to have for lunch.
INDIFFERENT- disinterested, unresponsive, don't care
Terry was completely indifferent as to whether they went to the cinema or the pub.
INSISTING- demanding, persisting, maintaining
After a work outing, Frank was insisting he paid the bill for everyone.
INSULTING- rude, offensive
The football crowd was insulting the referee after he gave a penalty.
INTERESTED- inquiring, curious
After seeing Jurassic Park, Hugh grew very interested in dinosaurs.
INTRIGUED- very curious, very interested
A mystery phone call intrigued Zoe.
IRRITATED- exasperated, annoyed

Frances was irritated by all the junk mail she received.
JEALOUS- envious
Tony was jealous of all the taller, better-looking boys in his class.
JOKING- being funny, playful
Gary was always joking with his friends.
NERVOUS- apprehensive, tense, worried
Just before her job interview, Alice felt very nervous.
OFFENDED- insulted, wounded, having hurt feelings
When someone made a joke about her weight, Martha felt very offended.
PANICKED- distraught, feeling of terror or anxiety
On waking to find the house on fire, the whole family was panicked.
PENSIVE- thinking about something slightly worrying
Susie looked pensive on the way to meeting her boyfriend's parents for the first time.
PERPLEXED- bewildered, puzzled, confused
Frank was perplexed by the disappearance of his garden gnomes.
PLAYFUL- full of high spirits and fun
Neil was feeling playful at his birthday party.
PREOCCUPIED- absorbed, engrossed in one's own thoughts
Worrying about her mother's illness made Debbie preoccupied at work
PUZZLED- perplexed, bewildered, confused
After doing the crossword for an hour, June was still puzzled by one clue.
REASSURING- supporting, encouraging, giving someone confidence
Andy tried to look reassuring as he told his wife that her new dress did suit her.
REFLECTIVE- contemplative, thoughtful
George was in a reflective mood as he thought about what he'd done with his life.
REGRETFUL- sorry
Lee was always regretful that he had never travelled when he was younger.
RELAXED- taking it easy, calm, carefree
On holiday, Pam felt happy and relaxed.
RELIEVED- freed from worry or anxiety
At the restaurant, Ray was relieved to find that he had not forgotten his wallet.
RESENTFUL- bitter, hostile
The businessman felt very resentful towards his younger colleague who had been promoted above him.
SARCASTIC- cynical, mocking, scornful
The comedian made a sarcastic comment when someone came into the theatre late.
SATISFIED- content, fulfilled
Steve felt very satisfied after he had got his new flat just how he wanted it.
SCEPTICAL- doubtful, suspicious, mistrusting
Patrick looked sceptical as someone read out his horoscope to him.
SERIOUS- solemn, grave
The bank manager looked serious as he refused Nigel an overdraft.
STERN- severe, strict, firm
The teacher looked very stern as he told the class off.
SUSPICIOUS- disbelieving, suspecting, doubting

After Sam had lost his wallet for the second time at work, he grew suspicious of one of his colleagues.
SYMPATHETIC- kind, compassionate
The nurse looked sympathetic as she told the patient the bad news.
TENTATIVE- hesitant, uncertain, cautious
Andrew felt a bit tentative as he went into the room full of strangers.
TERRIFIED- alarmed, fearful
The boy was terrified when he thought he saw a ghost.
THOUGHTFUL- thinking about something
Phil looked thoughtful as he sat waiting for his girlfriend to arrive.
THREATENING- menacing, intimidating
The large, drunken man was acting in a very threatening way.
UNEASY- unsettled, apprehensive, troubled
Karen felt slightly uneasy about accepting a lift from the man she had only met that day.
UPSET- agitated, worried, uneasy
The man was very upset when his mother died.
WORRIED- anxious, fretful, troubled
When her cat went missing, the girl was very worried.

APPENDIX Q: DEFINITION HANDOUT 2 (GLOSSARY) - appended to shortened social sensitivity questionnaire

WORD DEFINITIONS

ACCUSING- blaming
The policeman was accusing the man of stealing a wallet.
AFFECTIONATE- showing fondness towards someone
Most mothers are affectionate to their babies by giving them lots of kisses and cuddles.
AGHAST- horrified, astonished, alarmed
Jane was aghast when she discovered her house had been burgled.
ALARMED- fearful, worried, filled with anxiety
Claire was alarmed when she thought she was being followed home.
AMUSED- finding something funny
I was amused by a funny joke someone told me.
ANNOYED- irritated, displeased
Jack was annoyed when he found out he had missed the last bus home.
ANXIOUS- worried, tense, uneasy
The student was feeling anxious before taking her final exams.
ARROGANT- conceited, self-important, having a big opinion of one self
The arrogant man thought he knew more about politics than everyone else in the room.
ASHAMED- overcome with shame or guilt
The boy felt ashamed when his mother discovered him stealing money from her purse.
BAFFLED- confused, puzzled, dumbfounded
The detectives were completely baffled by the murder case.
CAUTIOUS- careful, wary
Sarah was always a bit cautious when talking to someone she did not know.
COMFORTING- consoling, compassionate
The nurse was comforting the wounded soldier.
CONFIDENT- self-assured, believing in oneself
The tennis player was feeling very confident about winning his match.
CONTEMPLATIVE- reflective, thoughtful, considering
John was in a contemplative mood on the eve of his 60th birthday.
CONVINCED- certain, absolutely positive
Richard was convinced he had come to the right decision.
DECISIVE- already made your mind up
Jane looked very decisive as she walked into the polling station.
DEPRESSED- miserable
George was depressed when he didn't receive any birthday cards.
DESIRE passion, lust, longing for
Kate had a strong desire for chocolate.
DESPONDENT- gloomy, despairing, without hope
Gary was despondent when he did not get the job he wanted.
DISAPPOINTED- displeased, disgruntled

Manchester United fans were disappointed not to win the Championship.
DISPIRITED- glum, miserable, low
Adam was dispirited when he failed his exams.
DISTRUSTFUL- suspicious, doubtful, wary
The old woman was distrustful of the stranger at her door.
DOUBTFUL- dubious, suspicious, not really believing
Mary was doubtful that her son was telling the truth.
EMBARRASSED- ashamed
After forgetting a colleague's name, Jenny felt very embarrassed.
ENCOURAGING- hopeful, heartening, supporting
All the parents were encouraging their children in the school sports day.
FLIRTATIOUS- brazen, saucy, teasing, playful
Connie was accused of being flirtatious when she winked at a stranger at a party.
FLUSTERED- confused, nervous and upset
Sarah felt a bit flustered when she realised how late she was for the meeting and that she had forgotten an important document.
FRIENDLY- sociable, amiable
The friendly girl showed the tourists the way to the town centre.
GRATEFUL- thankful
Kelly was very grateful for the kindness shown by the stranger.
HORRIFIED- terrified, appalled
The man was horrified to discover that his new wife was already married.
HOSTILE- unfriendly
The two neighbours were hostile towards each other because of an argument about loud music.
IMPLORING- begging, pleading
Nicola looked imploring as she tried to persuade her dad to lend her the car.
INDIFFERENT- disinterested, unresponsive, don't care
Terry was completely indifferent as to whether they went to the cinema or the pub.
INSISTING- demanding, persisting, maintaining
After a work outing, Frank was insisting he paid the bill for everyone.
IRRITATED- exasperated, annoyed
Frances was irritated by all the junk mail she received.
JOKING- being funny, playful
Gary was always joking with his friends.
PLAYFUL- full of high spirits and fun
Neil was feeling playful at his birthday party.
PREOCCUPIED- absorbed, engrossed in one's own thoughts
Worrying about her mother's illness made Debbie preoccupied at work
REASSURING- supporting, encouraging, giving someone confidence
Andy tried to look reassuring as he told his wife that her new dress did suit her.
REGRETFUL- sorry
Lee was always regretful that he had never travelled when he was younger.
RELAXED- taking it easy, calm, carefree
On holiday, Pam felt happy and relaxed.

RELIEVED- freed from worry or anxiety
At the restaurant, Ray was relieved to find that he had not forgotten his wallet.
SARCASTIC- cynical, mocking, scornful
The comedian made a sarcastic comment when someone came into the theatre late.
SCEPTICAL- doubtful, suspicious, mistrusting
Patrick looked sceptical as someone read out his horoscope to him.
SYMPATHETIC- kind, compassionate
The nurse looked sympathetic as she told the patient the bad news.
TERRIFIED- alarmed, fearful
The boy was terrified when he thought he saw a ghost.
THOUGHTFUL- thinking about something
Phil looked thoughtful as he sat waiting for his girlfriend to arrive.
UPSET- agitated, worried, uneasy
The man was very upset when his mother died.
WORRIED- anxious, fretful, troubled
When her cat went missing, the girl was very worried.

APPENDIX R: BREAKDOWN OF GROUP TASKS TO BE PERFORMED IN STUDY 3

Adapted from: Woolley et al. (2010)

Category 1- Generate Task:

Groups will partake in a brainstorming exercise. They will be given 10 minutes to generate ideas of how one can use a brick. They will be scored 1 point for each non-redundant idea documented, regardless of its quality.

Category 2- Choose task:

This task will require groups to complete the even number questions of the RAPM matrix. A point will be awarded for each question answered correctly.

Category 3- Negotiate task:

This task requires groups to plan a shopping trip. Each individual of the group must try and get as many items as possible, preferably of high quality, from their individual shopping lists. Different stores will be provided on a map, listing each item in the store with its price, quality and time to get there (these will vary at different stores). The group has one hypothetical car, and limited time to get these items. Group members will then need to negotiate which items to retrieve, and in what order. Solutions will be scored as follows: each item purchased earns 1 point, an extra point for a high-quality item, two extra points if the lowest priced item is purchased and finally a disqualification of item points for a frozen item, if it is in the car for more than 30 minutes. Resources for this task were not freely available (e.g. shopping map, travel times, items in each shop etc. Thus, the researcher created material for this task. This can be seen in Appendix T.

Category 4- Execute task (adapted task):

This task requires group members to complete a traditional puzzle. A point would be awarded for each piece connected. However, a penalty of 5 (subsequently reduced to -2 in analysis phase, see chapter 10 limitations for reasoning) points would be incurred if groups of connected puzzle pieces where present (representing individual work rather than collaboration). This penalty

would encourage careful coordination while completing the puzzle, as to avoid any fragmentation of the holistic puzzle. This task is different to the one used by Woolley et al. (2010). However, it should achieve the same result as the shared text document task used by Woolley et al. (2010). The adapted task replicates the coordination skills needed for shared text document task but is more resource efficient in terms of the cost and resources required.

Criterion task:

This task will require the group to sit and complete a complex architectural design task. This task was developed by Woolley (2009) and requires the group to build a house, garage and pool with limited set of blocks (Lego). The final buildings will be scored as follows if the stated rules are met - adapted from Woolley (2009):

House

Square footage (each "knob" is equal to one square foot):

- R10 per square foot on the ground floor.
- R20 per square foot on the second floor.
- R50 per square foot on subsequent floors.

Quality: assessed using the "lift, flip, and drop test":

- No value added for buildings that cannot be lifted without any pieces falling off.
- R1,000 bonus for buildings that can be lifted.
- R1,500 bonus for buildings that can be lifted and flipped over.
- R2,000 bonus for buildings that can be lifted, flipped over, and dropped.

Aesthetics: the attractiveness of your building will be assessed according to the following criteria:

- No value added for buildings that are a total eyesore.
- R1,000 bonus for good use of colour.
- R1,500 bonus for good use of colour and symmetry.
- R2,000 bonus for a "work of art".

Additional Rules:

- The walls separating the individual stories of the house must be least two (2) blocks high.
- Each story of the house must be completely enclosed by a floor and a ceiling for it to count toward the point total. The ceiling of one story can also be considered the floor of the next story.

- The walls around the outside of the house must be two knobs thick.
- There must be a cement foundation (a layer of white Lego bricks) between the house and the ground, though it does not need to be directly touching the ground. This should be the same dimension as the first story of the house and can, but is not required to, serve as the floor of the first story as well.
- There must be a solid layer of blue blocks between the top of the house and the sky. This should be the same dimension as the top story of the house and can, but is not required to, serve as the roof of the house.

Garage

Square footage (each "knob" is equal to one square foot):

- R20 per square foot.

Quality: assessed using the "lift, flip, and drop test":

- No value added for buildings that cannot be lifted without any pieces falling off.
- R1,000 bonus for buildings that can be lifted.
- R1,500 bonus for buildings that can be lifted and flipped over.
- R2,000 bonus for buildings that can be lifted, flipped over, and dropped.

Aesthetics: the attractiveness of your building will be assessed according to the following criteria:

- No value added for buildings that are a total eyesore.
- R1,000 bonus for good use of colour.
- R1,500 bonus for good use of colour and symmetry.
- R2,000 bonus for a "work of art".

Car spaces: R2,000 for each individual parking space in the garage:

- Parking spaces must be completely enclosed and at least 20 square feet (e.g., exposed knobs) in size and have a door opening that is at least 4 knobs wide and 2 blocks high to qualify for this bonus.

Additional Rules:

- The walls of the garage can be either one knob or two knobs thick.
- There must be a cement foundation (a layer of white Lego bricks) between the garage and the ground, though it does not need to be directly touching the ground. This can, but is not required to, serve as the floor of the garage as well.
- There must be a solid layer of blue blocks between the top of the garage and the sky. This should be the same dimension as the top of the garage and can, but is not required to, serve as the roof of the garage.

- The garage must be completely enclosed on the top, bottom, and sides, except for specified doors.

Pool

Square footage (each "knob" is equal to one square foot):

- R50 per square foot.

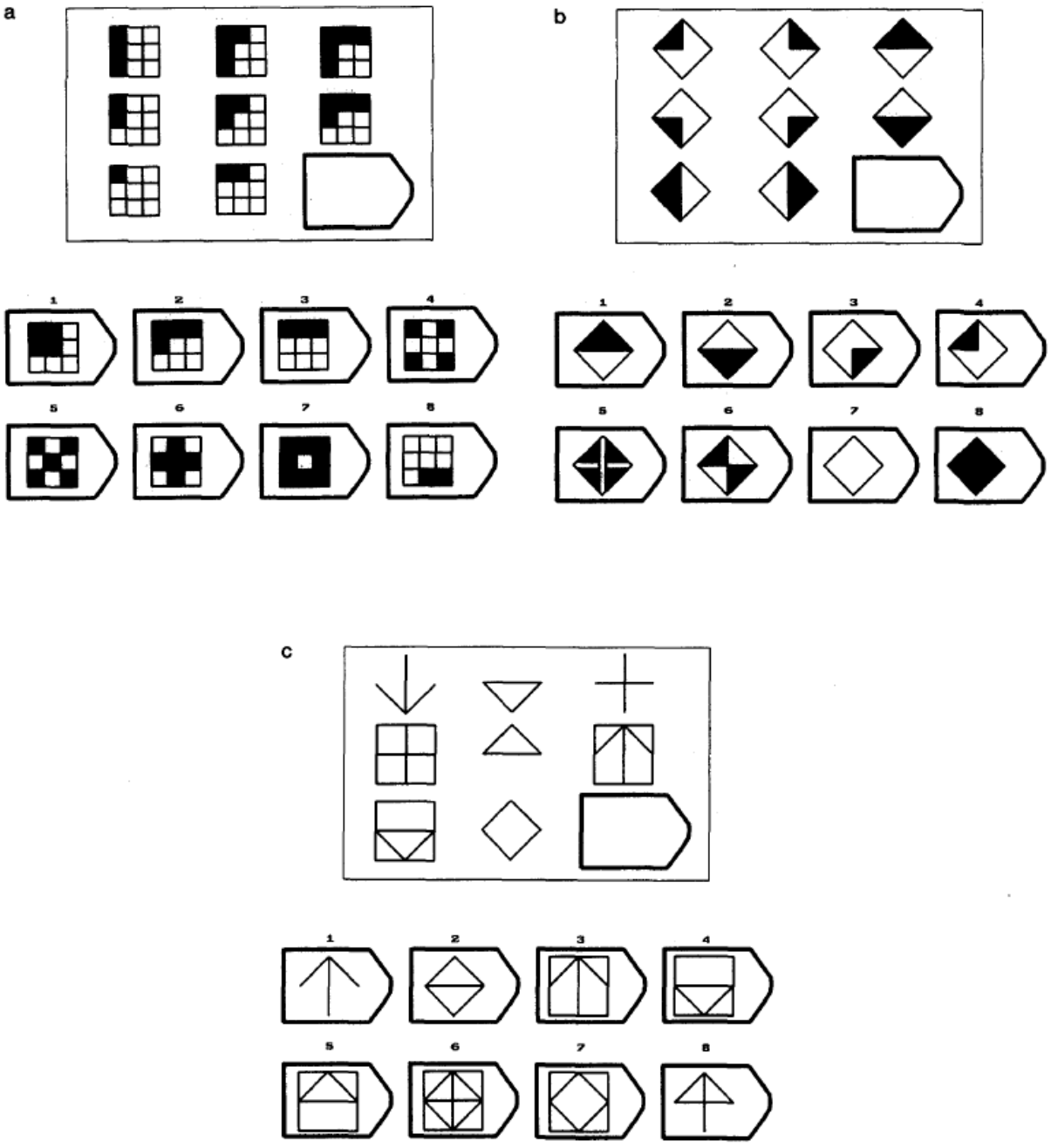
Aesthetics: the attractiveness of your pool will be assessed according to the following criteria:

- No value added for pools that are a total eyesore.
- R1,000 bonus for good use of colour.
- R1,500 bonus for good use of colour and symmetry.
- R2,000 bonus for a "work of art".

Additional Rules:

- There must be a diving board included.
- The floor of the pool must be blue.
- The walls around the edge of the pool should be only one knob thick and three. blocks high and should be one solid colour (of the designer's choice) all the way around.

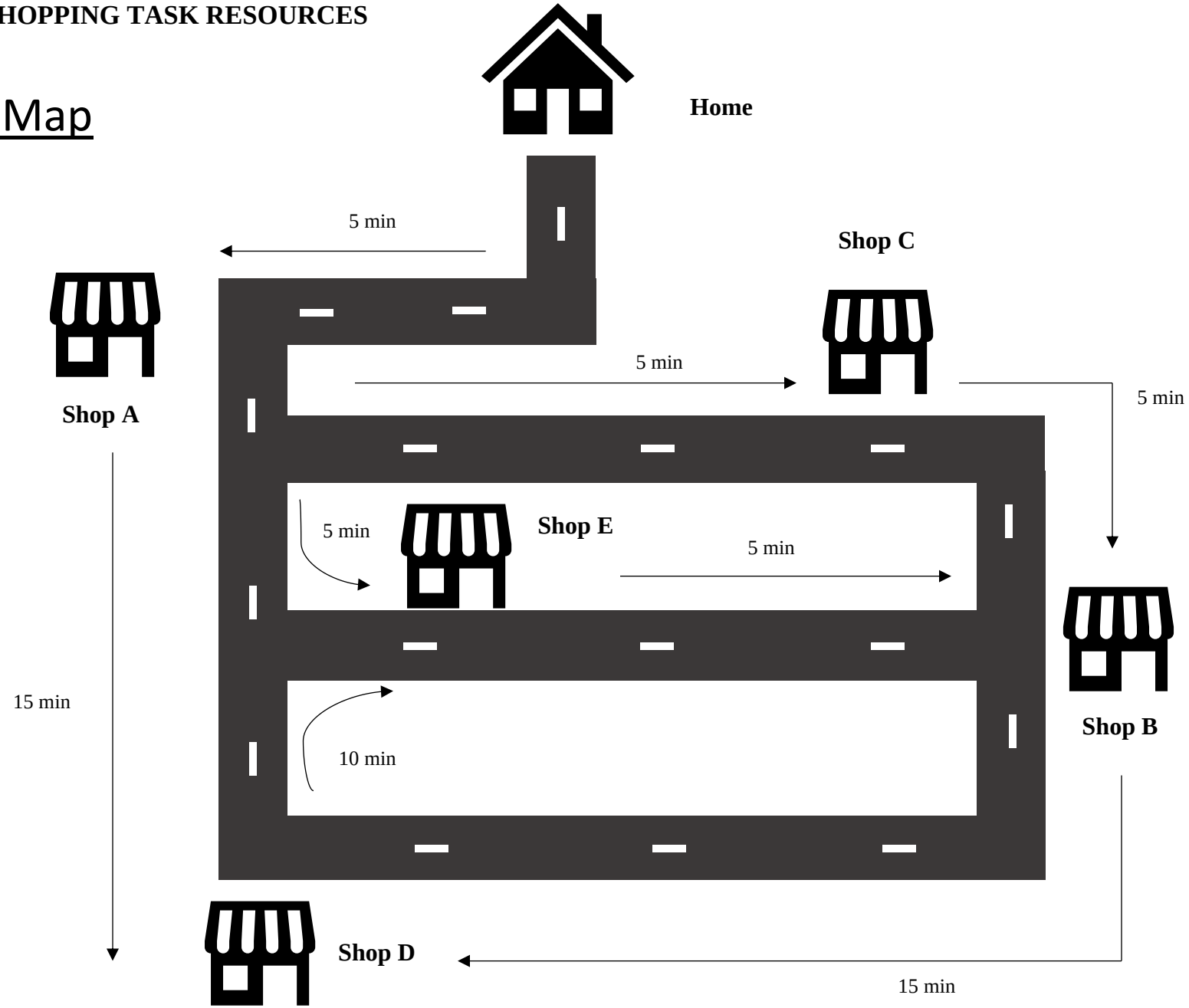
APPENDIX S: RAVENS ADVANCED PROGRESSIVE MATRICES EXAMPLES



Note. Adapted From: What One Intelligence Test Measures: A Theoretical Account of the Processing in the Raven Progressive Matrices Test, by P.A Carpenter, M.A. Just & P. Shell,1990, Psychological Review, 97, p. 409. Copyright 1990 by American Psychology Association

APPENDIX T: SHOPPING TASK RESOURCES

Shopping Map



Start Destination	Finish Destination	Travel Time
Home	Shop A	5 min
Shop A	Shop D	15 min
Shop A	Shop C	5 min
Shop A	Shop E	5 min
Shop B	Shop E	5 min
Shop C	Shop B	5 min
Shop B	Shop D	15 min
Shop D	Shop E	10 min

Shop A:

- Eggs=R30
- Bread=R15
- Chips=R7
- Milk=R10
- Ice cream=R20
- Sugar=R10
- Coffee=R8
- Butter=R13
- Washing powder=R20

Shop B:

- Eggs=R30 (HQ)
- Mince=R50
- Chicken=R40 (HQ)
- Ice cream=R25 (HQ)
- Fresh fruit=R15 (HQ)
- Fish=R40
- Chips=R5 (HQ)
- Washing powder=R15

Shop C:

- Fresh fruit=R10
- Frozen veg=R20 (HQ)
- Tinned veg=R15 (HQ)
- Sugar=R13 (HQ)
- Coffee=R15 (HQ)
- Bread=R20
- Milk=R8
- Butter=R10 (HQ)

Shop D:

- Frozen veg=R25
- Eggs=R25
- Bread=R16 (HQ)
- Tinned veg=R15 (HQ)
- Butter=R10 (HQ)
- Ice cream=R15
- Sugar=R11
- Coffee=R10
- Washing powder=R5
- Chips=R3

Shop E:

- Mince=R40 (HQ)
- Chicken=R35
- Fish=R45 (HQ)

Key

HQ= High quality item

F= Frozen Item (indicated on shopping lists **only**)

Overall shopping list

- Eggs
- Mince (F)
- Chicken (F)
- Milk
- Chips
- Ice-cream (F)
- Tinned vegetables
- Fresh fruit
- Sugar
- Frozen Vegetables (F)
- Butter (F)
- Washing powder
- Bread
- Coffee
- Fish (F)

Group of 2

Shopping List:	**Shopping List:**
• Eggs • Mince (F) • Chicken (F) • Milk • Chips • Ice-cream (F) • Tinned vegetables • Fresh fruit	• Sugar • Frozen vegetable (F) • Butter (F) • Washing powder • Bread • Coffee • Fish (F)

Group of 3

Shopping List:	**Shopping List:**	**Shopping List:**
• Eggs • Mince (F) • Chicken (F) • Milk • Chips	• Ice-cream (F) • Tinned vegetables • Fresh fruit • Sugar • Frozen vegetable (F)	• Butter (F) • Washing powder • Bread • Coffee • Fish (F)

Group of 4

Shopping List:	**Shopping List:**
• Eggs • Mince (F) • Chicken (F) • Coffee	• Sugar • Frozen vegetable (F) • Butter (F) • Washing powder

Shopping List:	**Shopping List:**
• Milk • Chips • Ice-cream (F)	• Tinned vegetables • Fresh fruit • Bread • Fish (F)

Group of 5

Shopping List:	**Shopping List:**
• Eggs • Mince (F) • Chicken (F)	• Sugar • Butter (F) • Washing powder
Shopping List:	**Shopping List:**
• Milk • Chips • Ice-cream (F)	• Tinned vegetables • Fresh fruit • Frozen vegetable (F)

Shopping List:

- Bread
- Coffee
- Fish (F)

Group Task 1-Group Brainstorming Task:

- Time allowed= 10 mins
- ***Instructions***:
    - **Brainstorm & write** as many ideas as you can of how you can **use a brick**
- Scoring:
    - 1 point= one no-redundant idea
- Reminder:
    - Write your group number on your answer sheet

Group Task 2-Group Reasoning Task:

- Time allowed= 10 mins
- ***Instructions***:
    - Complete **even number** questions
- Scoring:
    - 1 point=correct answer
- Reminder:
    - Write your group number on your answer sheet

Group Task 3-Group Shopping List Task:

- Time allowed= 15 mins
- ***Instructions***:
    - Plan a shopping trip to get all items on the your individual shopping lists.
    - Get as many high value items as possible
- Rules:
    - You all stay at the same house and only have one car
- Scoring:
    - 1 point= Item purchased
        - +1point= high quality item
        - +2 point=lowest price
    - 0 points if frozen item in car for more than 30 minutes
- Reminder:
    - Write your group number on your answer sheet

Group Task 4-Group Puzzle:

- Time allowed= 15 mins
- ***Instructions***:
    - Complete as much of the puzzle as you can
- Scoring:
    - 1 point= each piece connected
    - -5 points for each **separate section** of connected pieces

Group Task 5: Scoring and Rules

House

Square footage (each "knob" is equal to one square foot):

- R10 per square foot on the ground floor.
- R20 per square foot on the second floor.
- R50 per square foot on subsequent floors.

Quality: assessed using the "lift, flip, and drop test":

- No value added for buildings that cannot be lifted without any pieces falling off.
- R1,000 bonus for buildings that can be lifted.
- R1,500 bonus for buildings that can be lifted and flipped over.
- R2,000 bonus for buildings that can be lifted, flipped over, and dropped.

Aesthetics: the attractiveness of your building will be assessed according to the following criteria:

- No value added for buildings that are a total eyesore.
- R1,000 bonus for good use of colour.
- R1,500 bonus for good use of colour and symmetry.
- R2,000 bonus for a "work of art".

Additional Rules:

- The walls separating the individual stories of the house must be least two (2) blocks high.
- Each story of the house must be completely enclosed by a floor and a ceiling for it to count toward the point total. The ceiling of one story can also be considered the floor of the next story.
- The walls around the outside of the house must be two knobs thick.
- There must be a cement foundation (a layer of white Lego bricks) between the house and the ground, though it does not need to be directly touching the ground. This should be the same dimension as the first story of the house and can, but is not required to, serve as the floor of the first story as well.
- There must be a solid layer of blue blocks between the top of the house and the sky. This should be the same dimension as the top story of the house and can, but is not required to, serve as the roof of the house.

Garage

Square footage (each "knob" is equal to one square foot):

- R20 per square foot.

Quality: assessed using the "lift, flip, and drop test":

- No value added for buildings that cannot be lifted without any pieces falling off.
- R1,000 bonus for buildings that can be lifted.
- R1,500 bonus for buildings that can be lifted and flipped over.
- R2,000 bonus for buildings that can be lifted, flipped over, and dropped.

Aesthetics: the attractiveness of your building will be assessed according to the following criteria:

- No value added for buildings that are a total eyesore.
- R1,000 bonus for good use of colour.
- R1,500 bonus for good use of colour and symmetry.
- R2,000 bonus for a “work of art”.

Car spaces: R2,000 for each individual parking space in the garage:

- Parking spaces must be completely enclosed and at least 20 square feet (e.g., exposed knobs) in size and have a door opening that is at least 4 knobs wide and 2 blocks high to qualify for this bonus.

Additional Rules:

- The walls of the garage can be either one knob or two knobs thick.
- There must be a cement foundation (a layer of white Lego bricks) between the garage and the ground, though it does not need to be directly touching the ground. This can, but is not required to, serve as the floor of the garage as well.
- There must be a solid layer of blue blocks between the top of the garage and the sky. This should be the same dimension as the top of the garage and can, but is not required to, serve as the roof of the garage.
- The garage must be completely enclosed on the top, bottom, and sides, except for specified doors.

<u>Pool</u>

Square footage (each “knob” is equal to one square foot):

- R50 per square foot.

Aesthetics: the attractiveness of your pool will be assessed according to the following criteria:

- No value added for pools that are a total eyesore.
- R1,000 bonus for good use of colour.
- R1,500 bonus for good use of colour and symmetry.
- R2,000 bonus for a “work of art”.

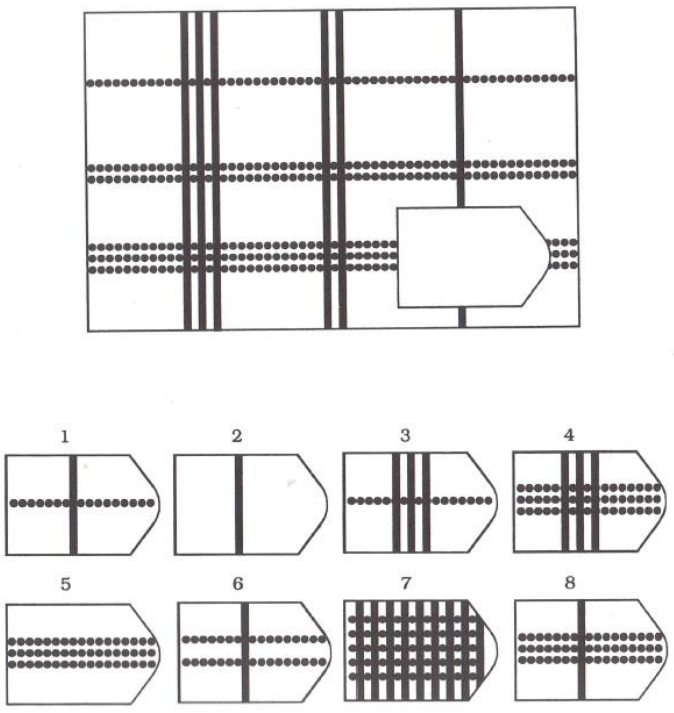
Additional Rules:

- There must be a diving board included.
- The floor of the pool must be blue.
- The walls around the edge of the pool should be only one knob thick and two blocks high and should be one solid colour (of the designer’s choice) all the way around.

Individual Ravens Task:

- Time allowed= 10 mins
- ***Instructions***:
    - **Answer** as many questions as you can
    - Indicate the correct answer by putting the number of missing shape
- Scoring:
    - 1 point= one correct answer
- Reminder:
    - Write your participant number on your answer sheet

Example:



Answer: **8**

APPENDIX V: EXPERIMENT ANSWER/SCORING SHEETS

Answer Sheet-Group Task 1

Date: _____

Time: _____

Group no: _____

Brainstorm & **write** as many ideas as you can of how you can **use a brick**

Answer Sheet-Group Task 2

Date: _____

Time: _____

Group no: _____

Question	Answer
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	

Answer Sheet-Group Task 3

Date: _____

Time: _____

Group no: _____

Start	Destination Shop	Items purchased
Home		

Answer Sheet-Individual Task 2

Date: _____

Time: _____

Participant no: _____

Question	Answer
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	

Group Scoring Sheet

Date: _____

Time: _____

Group no: _____

Participants: _____

Task 1-Brainstorming:

Unique ideas	Total points

Redundant ideas: _____

Task 2-RAPM:

Correct Answers	Total points

Incorrect Answers: _____

Task 3-Shopping list:

Item purchased	High quality bonus? (+1)	Lowest price bonus? (+2)	Frozen item disqualification?	Item points

Total points				

Task 4-Puzzle:

		Points
No of connected pieces		
No of silos		
Total points		

Task 5-Architectural Design:

House

Meets Rule requirements? _____

	Square footage (1 knob)	Description	Value increase
Ground floor			
Second floor			
Subsequent floors			
Quality test			
Aesthetics and attractiveness			
Total value			

Garage

Meets Rule requirements? _____

	Square footage (1 knob)	Description/Quantity	Value increase
Ground floor			
Quality test			
Aesthetics and attractiveness			
Car spaces			
Total value			

Pool

Meets Rule requirements? _____

	Square footage (1 knob)	Description	Value increase
Ground floor			
Aesthetics and attractiveness			
Total value			

Total House Value: _____

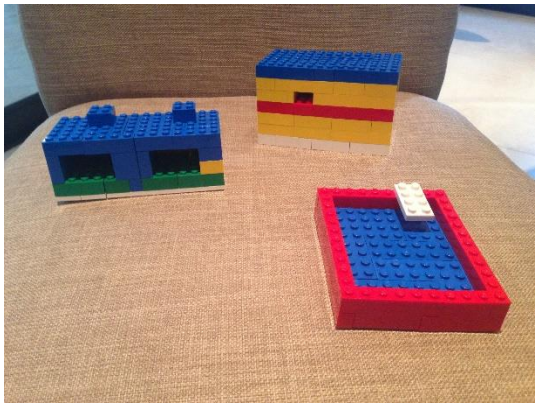
(R) + (R) + (R)

House Garage Pool

Total Experiment Score: _____

APPENDIX W: EXPERIMENT PICTURES

Architectural design example for explanation purposes:

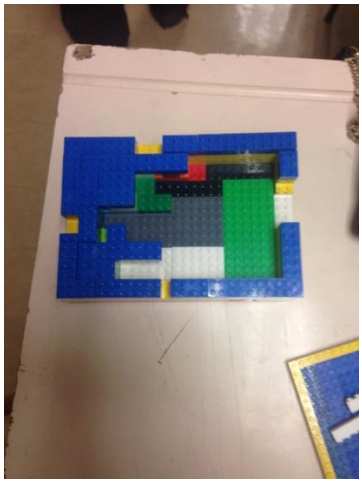


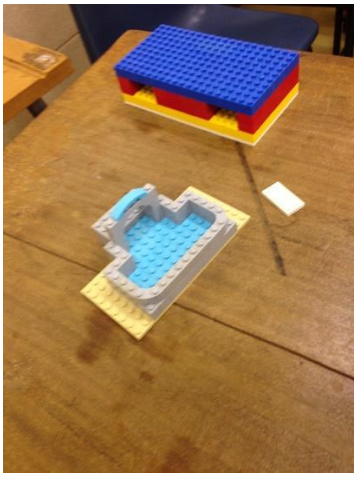
Participant examples:













APPENDIX X: PARTICIPATION INFORMATION SHEETS

Study 1

Doctor of Philosophy (Management) Research Project

Participation Information Sheet

Good Day

My name is Jason Van Staden and I am a PhD student at the School of Economics and Business Science at the University of the Witwatersrand, Johannesburg. I am conducting research on social sensitivity. Social sensitivity refers to one's ability to infer the mental states of others. I am specifically looking at how to measure social sensitivity. To do this, I am creating a multicultural questionnaire that measures social sensitivity.

As a potential individual who has this social sensitivity ability, you are **invited** to take part in this survey. The purpose of this survey is to test the questionnaire items. You were selected as a potential participant as you are attending a lecture for a course code that was selected at random.

There are no right or wrong answers. This survey is both confidential and anonymous. You do not need to enter your name on the questionnaire. If you complete the questionnaire; you will not be able to be identified based on your responses. Your participation is completely voluntary and involves no risk, penalty, or loss of benefits whether or not you participate. You may withdraw from the survey at any stage.

The questionnaire booklet presents 36 pictures. Please choose the closest word that best describes the emotion you see in the picture on the separate answer sheet. The last section on the answer sheet captures some information about you. Please tick whichever boxes are applicable. The entire survey should take between 10-15 minutes to complete. This survey was approved unconditionally by the Wits University Research Ethics Committee (Non-Medical), Protocol Number: H15/08/45.

If you at any stage feel as if you require emotional support or someone to talk to about the questionnaire or personal issues please contact the University of Witwatersrand CCDU. They offer free counselling services to Wits students. You may contact them on the number below:

CCDU telephone no: 0117179140

Thank you for considering participating. Should you have any questions, or should you wish to obtain a copy of the results of the survey, please contact myself as per my details below.

My contact details: 528443@students.wits.ac.za (E-mail) – Cell number: 0799515580
My supervisor's name and contact details: Chris Callaghan – Chris.Callaghan@wits.ac.za (E-mail)-Tel number: 0117178066



Kind regards
Jason Van Staden
PhD Student: Division of Management
School of Economic and Business Sciences
University of the Witwatersrand, Johannesburg

Study 2

Doctor of Philosophy (Management) Research Project

Participation Information Sheet

Good Day

My name is Jason Van Staden and I am a PhD student at the School of Economics and Business Science at the University of the Witwatersrand, Johannesburg. I am conducting research on collective intelligence. Collective intelligence refers to the intelligence of a group or team. I am specifically looking at how social sensitivity, often called mind reading, improves the intelligence of groups. To do this, I am investigating what determines the social sensitivity of individuals.

As a potential individual who has this social sensitivity ability, you are **invited** to take part in this survey. The purpose of this survey is to find out the extent that individual contextual factors, emotional intelligence and personality affect your social sensitivity. You were selected as potential participant as you are attending a lecture for a course code that was selected at random.

There are no right or wrong answers. This survey is both confidential and anonymous. You do not need to enter your name on the questionnaire. If you complete the questionnaire; you will not be able to be identified based on your responses. Your participation is completely voluntary and involves no risk, penalty, or loss of benefits whether or not you participate. You may withdraw from the survey at any stage.

The first part of the survey presents 21 pictures. Please choose the closest word that best describes the emotion you see in the picture. The second part of the survey lists 30 statements. The third part lists 44 statements. Please show how much you agree with each statement, by ticking in the appropriate box or indicating next to the applicable statement. The last part of the survey captures some information about you. Please tick whichever boxes are applicable. The entire survey should take between 15-20 minutes to complete. This survey was approved unconditionally by the Wits University Research Ethics Committee (Non-Medical), Protocol Number: H15/08/45.

If you at any stage feel as if you require emotional support or someone to talk to about the questionnaire or personal issues please contact the University of Witwatersrand CCDU. They offer free counselling services to Wits students. You may contact them on the number below:

CCDU telephone no: 0117179140

Thank you for considering participating. Should you have any questions, or should you wish to obtain a copy of the results of the survey, please contact myself as per my details below.

My contact details: 528443@students.wits.ac.za (E-mail) – Cell number: 0799515580
My supervisor's name and contact details: Chris Callaghan – Chris.Callaghan@wits.ac.za (E-mail)-Tel number: 0117178066



Kind regards
Jason Van Staden
PhD Student: Division of Management
School of Economic and Business Sciences
University of the Witwatersrand, Johannesburg

Study 3

Doctor of Philosophy (Management) Research Project

Participation Information Sheet

Good Day

My name is Jason Van Staden and I am a PhD student at the School of Economics and Business Science at the University of the Witwatersrand, Johannesburg. I am conducting research on collective intelligence. Collective intelligence refers to the intelligence of a group or team. I am looking to run an experiment that measures how intelligent groups are, and see what determines this intelligence.

As a potential participant, you are **invited** to take part in this experiment. You were selected as potential participant as you are attending a lecture for a course code that was selected at random.

Your participation is completely voluntary and involves no risk, penalty, or loss of benefits whether or not you participate. You may withdraw from the experiment at any stage. Due to the group nature of the experiment, full anonymity cannot be guaranteed. However, as a potential participant you will remain anonymous in the recording of experiment results. All audio recordings will also be destroyed after analysis. Participation does not require you to provide your name.

In this experiment, you will be requested to complete a series of individual and group tasks. The entire experiment should take between 2- 3 hours to complete and refreshments will be served afterwards. This experiment was approved unconditionally by the Wits University Research Ethics Committee (Non-Medical), Protocol Number: H15/08/45.

If you at any stage feel as if you require emotional support or someone to talk to about the experiment or personal issues please contact the University of Witwatersrand CCDU. They offer free counselling services to Wits students. You may contact them on the number below:

CCDU telephone no: 0117179140

Thank you for considering participating.

If you wish to participate please **email me** at: 528443@students.wits.ac.za

Should you have any questions, or should you wish to obtain a copy of the results of the survey, please contact myself as per my details below.

My contact details: 528443@students.wits.ac.za (E-mail) – Cell number: 0799515580
My supervisor's name and contact details: Chris Callaghan – Chris.Callaghan@wits.ac.za (E-mail)-Tel number: 0117178066



Kind regards
Jason Van Staden
PhD Student: Division of Management
School of Economic and Business Sciences
University of the Witwatersrand, Johannesburg

APPENDIX Y: ETHICS CLEARANCE CERTIFICATE

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Van Staden

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H15/08/45**
PROJECT TITLE	Collective intelligence and social sensitivity amongst students at the University of the Witwatersrand
INVESTIGATOR(S)	Mr J Van Staden
SCHOOL/DEPARTMENT	Economics and Business Sciences/
DATE CONSIDERED	21 August 2015
DECISION OF THE COMMITTEE	Approved unconditionally
EXPIRY DATE	03 July 2019

DATE 04 July 2016 **CHAIRPERSON** _____
(Professor J Knight)

cc: Supervisor : Professor C Callaghan

APPENDIX Z: SELECTED CROSS TABULATIONS OF ITEMS FOR STUDY 1

African questionnaire items

Item differences across different ethnicities:

Due to the nature of this study, particularly in creating multi-ethnic questionnaires. It is important to consider the possible differences in respondents' choices based on their own ethnicity and how this would have affected the instrument. Items where there is a substantial difference (20%+) between select ethnic groups' mental state choice and how it would have affected the instrument is considered below.

Item 3

			Black	Coloured	Asian	Indian	White	Total
Question 3	Foil 1	Count	19	0	1	2	0	27
		% within Question 3	70.4%	0.0%	3.7%	7.4%	0.0%	100.0%
		% within Ethnicity	6.5%	0.0%	16.7%	5.0%	0.0%	5.9%
		% of Total	4.1%	0.0%	0.2%	0.4%	0.0%	5.9%
	Foil 2	Count	23	0	0	1	1	28
		% within Question 3	82.1%	0.0%	0.0%	3.6%	3.6%	100.0%
		% within Ethnicity	7.9%	0.0%	0.0%	2.5%	1.5%	6.1%
		% of Total	5.0%	0.0%	0.0%	0.2%	0.2%	6.1%
	Target	Count	168	12	4	31	53	288
		% within Question 3	58.3%	4.2%	1.4%	10.8%	18.4%	100.0%
		% within Ethnicity	57.5%	92.3%	66.7%	77.5%	77.9%	62.7%
		% of Total	36.6%	2.6%	0.9%	6.8%	11.5%	62.7%
	Foil 3	Count	79	1	1	6	14	112
		% within Question 3	70.5%	0.9%	0.9%	5.4%	12.5%	100.0%
		% within Ethnicity	27.1%	7.7%	16.7%	15.0%	20.6%	24.4%
		% of Total	17.2%	0.2%	0.2%	1.3%	3.1%	24.4%
Total		Count	292	13	6	40	68	459
		% within Question 3	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%

With item 3, where the target word is desire, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. If the study were to remove other ethnic results and re-assess the criteria, this item would not have met the criterion as foil 3 (convinced) is above 25%.

Item 5

			Black	Coloured	Asian	Indian	White	Total
Question 5	Foil 1	Count	113	3	0	9	8	141
		% within Question 5	80.1%	2.1%	0.0%	6.4%	5.7%	100.0%
		% within Ethnicity	38.7%	23.1%	0.0%	22.5%	11.8%	30.7%
		% of Total	24.6%	0.7%	0.0%	2.0%	1.7%	30.7%
	Foil 2	Count	21	0	0	1	0	23
		% within Question 5	91.3%	0.0%	0.0%	4.3%	0.0%	100.0%
		% within Ethnicity	7.2%	0.0%	0.0%	2.5%	0.0%	5.0%
		% of Total	4.6%	0.0%	0.0%	0.2%	0.0%	5.0%
	Target	Count	148	9	6	27	59	279
		% within Question 5	53.0%	3.2%	2.2%	9.7%	21.1%	100.0%
		% within Ethnicity	50.7%	69.2%	100.0%	67.5%	86.8%	60.8%
		% of Total	32.2%	2.0%	1.3%	5.9%	12.9%	60.8%
	Foil 3	Count	5	0	0	1	1	7
		% within Question 5	71.4%	0.0%	0.0%	14.3%	14.3%	100.0%
		% within Ethnicity	1.7%	0.0%	0.0%	2.5%	1.5%	1.5%
		% of Total	1.1%	0.0%	0.0%	0.2%	0.2%	1.5%
Total		Count	292	13	6	40	68	459
		% within Question 5	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%

With item 5, where the target word is worried, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. Instead 38.7% of respondents who were of Black ethnicity choose foil 1 (irritated), which ultimately led the item to be drop. If Black ethnic respondents were not considered, the item would not have been dropped.

Item 12

			Black	Coloured	Asian	Indian	White	Total
Question 12	Foil 1	Count	48	2	1	3	12	73
		% within Question 12	65.8%	2.7%	1.4%	4.1%	16.4%	100.0%
		% within Ethnicity	16.4%	15.4%	16.7%	7.5%	17.6%	15.9%
		% of Total	10.5%	0.4%	0.2%	0.7%	2.6%	15.9%
	Foil 2	Count	42	1	0	3	2	52
		% within Question 12	80.8%	1.9%	0.0%	5.8%	3.8%	100.0%
		% within Ethnicity	14.4%	7.7%	0.0%	7.5%	2.9%	11.3%
		% of Total	9.2%	0.2%	0.0%	0.7%	0.4%	11.3%
	Target	Count	129	7	3	26	46	233
		% within Question 12	55.4%	3.0%	1.3%	11.2%	19.7%	100.0%
		% within Ethnicity	44.2%	53.8%	50.0%	65.0%	67.6%	50.8%
		% of Total	28.1%	1.5%	0.7%	5.7%	10.0%	50.8%
	Foil 3	Count	69	2	2	8	8	96
		% within Question 12	71.9%	2.1%	2.1%	8.3%	8.3%	100.0%
		% within Ethnicity	23.6%	15.4%	33.3%	20.0%	11.8%	20.9%
		% of Total	15.0%	0.4%	0.4%	1.7%	1.7%	20.9%
Total		Count	292	13	6	40	68	459
		% within Question 12	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%

With item 12, where the target word is sceptical, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. If the study were to remove other ethnic results and re-assess the criteria, this item would not have met the criterion as the target word is not 50+%.

Item 13

			Black	Coloured	Asian	Indian	White	Total
Question 13	Foil 1	Count	45	0	1	5	6	66
		% within Question 13	68.2%	0.0%	1.5%	7.6%	9.1%	100.0%
		% within Ethnicity	15.4%	0.0%	16.7%	12.5%	8.8%	14.4%
		% of Total	9.8%	0.0%	0.2%	1.1%	1.3%	14.4%
	Target	Count	126	8	5	18	41	212
		% within Question 13	59.4%	3.8%	2.4%	8.5%	19.3%	100.0%
		% within Ethnicity	43.2%	61.5%	83.3%	45.0%	60.3%	46.2%
		% of Total	27.5%	1.7%	1.1%	3.9%	8.9%	46.2%
	Foil 2	Count	83	1	0	9	7	111
		% within Question 13	74.8%	0.9%	0.0%	8.1%	6.3%	100.0%
		% within Ethnicity	28.4%	7.7%	0.0%	22.5%	10.3%	24.2%
		% of Total	18.1%	0.2%	0.0%	2.0%	1.5%	24.2%
	Foil 3	Count	37	4	0	8	14	69
		% within Question 13	53.6%	5.8%	0.0%	11.6%	20.3%	100.0%
		% within Ethnicity	12.7%	30.8%	0.0%	20.0%	20.6%	15.0%
		% of Total	8.1%	0.9%	0.0%	1.7%	3.1%	15.0%
Total		Count	292	13	6	40	68	459
		% within Question 13	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%

With item 13, where the target word is anticipating, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. Instead 28.4% of respondents of who were of Black ethnicity choose foil 2 (threatening), which ultimately led the item to drop. If Black ethnic respondents were not considered, the item would not have been dropped.

Item 19

			Black	Coloured	Asian	Indian	White	Total
Question 19	Foil 1	Count	95	3	1	4	12	122
		% within Question 19	77.9%	2.5%	0.8%	3.3%	9.8%	100.0%
		% within Ethnicity	32.5%	23.1%	16.7%	10.0%	17.6%	26.6%
		% of Total	20.7%	0.7%	0.2%	0.9%	2.6%	26.6%
	Foil 2	Count	15	1	1	5	9	33
		% within Question 19	45.5%	3.0%	3.0%	15.2%	27.3%	100.0%
		% within Ethnicity	5.1%	7.7%	16.7%	12.5%	13.2%	7.2%
		% of Total	3.3%	0.2%	0.2%	1.1%	2.0%	7.2%
	Foil 3	Count	77	2	2	9	11	109
		% within Question 19	70.6%	1.8%	1.8%	8.3%	10.1%	100.0%
		% within Ethnicity	26.4%	15.4%	33.3%	22.5%	16.2%	23.7%
		% of Total	16.8%	0.4%	0.4%	2.0%	2.4%	23.7%
	Target	Count	101	7	2	22	36	191
		% within Question 19	52.9%	3.7%	1.0%	11.5%	18.8%	100.0%
		% within Ethnicity	34.6%	53.8%	33.3%	55.0%	52.9%	41.6%
		% of Total	22.0%	1.5%	0.4%	4.8%	7.8%	41.6%
Total		Count	292	13	6	40	68	459
		% within Question 19	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%

With item 19, where the target word is tentative, respondents who associated themselves with black ethnicity chose the target word much less when compared to other ethnicities. Instead 32.5% of respondents who were of Black ethnicity choose foil 1 (arrogant), which ultimately led the item to drop. If Black ethnic respondents were not considered, the item would not have been dropped.

Item 23

			Black	Coloured	Asian	Indian	White	Total
Question 23	Foil 1	Count	32	0	0	4	5	46
		% within Question 23	69.6%	0.0%	0.0%	8.7%	10.9%	100.0%
		% within Ethnicity	11.0%	0.0%	0.0%	10.0%	7.4%	10.0%
		% of Total	7.0%	0.0%	0.0%	0.9%	1.1%	10.0%
	Foil 2	Count	37	0	1	2	5	48
		% within Question 23	77.1%	0.0%	2.1%	4.2%	10.4%	100.0%
		% within Ethnicity	12.7%	0.0%	16.7%	5.0%	7.4%	10.5%
		% of Total	8.1%	0.0%	0.2%	0.4%	1.1%	10.5%
	Target	Count	96	9	1	27	48	199
		% within Question 23	48.2%	4.5%	0.5%	13.6%	24.1%	100.0%
		% within Ethnicity	32.9%	69.2%	16.7%	67.5%	70.6%	43.4%
		% of Total	20.9%	2.0%	0.2%	5.9%	10.5%	43.4%
	Foil 3	Count	122	3	3	7	10	159
		% within Question 23	76.7%	1.9%	1.9%	4.4%	6.3%	100.0%
		% within Ethnicity	41.8%	23.1%	50.0%	17.5%	14.7%	34.6%
		% of Total	26.6%	0.7%	0.7%	1.5%	2.2%	34.6%
Total		Count	292	13	6	40	68	459
		% within Question 23	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%

With item 23, where the target word is defiant, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. Instead 41.8% of respondents who were of Black ethnicity choose foil 3 (curious), which ultimately led the item to drop. If Black ethnic respondents were not considered, the item would not have been dropped.

Item 24

			Black	Coloured	Asian	Indian	White	Total
Question 24	Target	Count	104	7	3	21	38	190
		% within Question 24	54.7%	3.7%	1.6%	11.1%	20.0%	100.0%
		% within Ethnicity	35.6%	53.8%	50.0%	52.5%	55.9%	41.4%
		% of Total	22.7%	1.5%	0.7%	4.6%	8.3%	41.4%
	Foil 1	Count	57	1	0	7	14	87
		% within Question 24	65.5%	1.1%	0.0%	8.0%	16.1%	100.0%
		% within Ethnicity	19.5%	7.7%	0.0%	17.5%	20.6%	19.0%
		% of Total	12.4%	0.2%	0.0%	1.5%	3.1%	19.0%
	Foil 2	Count	10	1	1	0	1	16
		% within Question 24	62.5%	6.3%	6.3%	0.0%	6.3%	100.0%
		% within Ethnicity	3.4%	7.7%	16.7%	0.0%	1.5%	3.5%
		% of Total	2.2%	0.2%	0.2%	0.0%	0.2%	3.5%
	Foil 3	Count	114	4	2	10	15	156
		% within Question 24	73.1%	2.6%	1.3%	6.4%	9.6%	100.0%
		% within Ethnicity	39.0%	30.8%	33.3%	25.0%	22.1%	34.0%
		% of Total	24.8%	0.9%	0.4%	2.2%	3.3%	34.0%
Total		Count	292	13	6	40	68	459
		% within Question 24	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%

With item 24, where the target word is pensive, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. Instead 39% of respondents who were of Black ethnicity choose foil 3 (excited), which ultimately led the item to drop. If Black ethnic respondents were not considered, the item would not have been dropped.

Item 26

			Black	Coloured	Asian	Indian	White	Total
Question 26	Foil 1	Count	67	1	1	7	4	87
		% within Question 26	77.0%	1.1%	1.1%	8.0%	4.6%	100.0%
		% within Ethnicity	22.9%	7.7%	16.7%	17.5%	5.9%	19.0%
		% of Total	14.6%	0.2%	0.2%	1.5%	0.9%	19.0%
	Foil 2	Count	19	1	1	3	3	29
		% within Question 26	65.5%	3.4%	3.4%	10.3%	10.3%	100.0%
		% within Ethnicity	6.5%	7.7%	16.7%	7.5%	4.4%	6.3%
		% of Total	4.1%	0.2%	0.2%	0.7%	0.7%	6.3%
	Target	Count	112	10	2	19	53	215
		% within Question 26	52.1%	4.7%	0.9%	8.8%	24.7%	100.0%
		% within Ethnicity	38.4%	76.9%	33.3%	47.5%	77.9%	46.8%
		% of Total	24.4%	2.2%	0.4%	4.1%	11.5%	46.8%
	Foil 3	Count	90	1	2	11	8	124
		% within Question 26	72.6%	0.8%	1.6%	8.9%	6.5%	100.0%
		% within Ethnicity	30.8%	7.7%	33.3%	27.5%	11.8%	27.0%
		% of Total	19.6%	0.2%	0.4%	2.4%	1.7%	27.0%
Total		Count	292	13	6	40	68	459
		% within Question 26	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	63.6%	2.8%	1.3%	8.7%	14.8%	100.0%

With item 24, where the target word is hostile, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. Instead 30.8% of respondents who were of Black ethnicity choose foil 3 (anxious), which ultimately led the item to drop. If Black ethnic respondents were not considered, the item would not have been dropped.

‘Other culture’ questionnaire items

Item 8

			Black	Coloured	Asian	Indian	White	Total
Question 8	Target	Count	141	9	2	35	94	299
		% within Question 8	47.2%	3.0%	0.7%	11.7%	31.4%	100.0%
		% within Ethnicity	66.5%	100.0%	100.0%	89.7%	81.7%	74.0%
		% of Total	34.9%	2.2%	0.5%	8.7%	23.3%	74.0%
	Foil 1	Count	10	0	0	1	1	14
		% within Question 8	71.4%	0.0%	0.0%	7.1%	7.1%	100.0%
		% within Ethnicity	4.7%	0.0%	0.0%	2.6%	0.9%	3.5%
		% of Total	2.5%	0.0%	0.0%	0.2%	0.2%	3.5%
	Foil 2	Count	57	0	0	3	20	86
		% within Question 8	66.3%	0.0%	0.0%	3.5%	23.3%	100.0%
		% within Ethnicity	26.9%	0.0%	0.0%	7.7%	17.4%	21.3%
		% of Total	14.1%	0.0%	0.0%	0.7%	5.0%	21.3%
	Foil 3	Count	2	0	0	0	0	2
		% within Question 8	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
		% within Ethnicity	0.9%	0.0%	0.0%	0.0%	0.0%	0.5%
		% of Total	0.5%	0.0%	0.0%	0.0%	0.0%	0.5%
Total		Count	212	9	2	39	115	404
		% within Question 8	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%

With item 8, where the target word is despondent, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. If the study were to remove other ethnic results and re-assess the criteria, this item would not have met the criterion as foil 2(shy) is above 25%, but only by a **small** margin.

Item 10

			Black	Coloured	Asian	Indian	White	Total
Question 10	Target	Count	119	7	1	25	83	247
		% within Question 10	48.2%	2.8%	0.4%	10.1%	33.6%	100.0%
		% within Ethnicity	56.1%	77.8%	50.0%	64.1%	72.2%	61.1%
		% of Total	29.5%	1.7%	0.2%	6.2%	20.5%	61.1%
	Foil 1	Count	22	0	1	3	11	40
		% within Question 10	55.0%	0.0%	2.5%	7.5%	27.5%	100.0%
		% within Ethnicity	10.4%	0.0%	50.0%	7.7%	9.6%	9.9%
		% of Total	5.4%	0.0%	0.2%	0.7%	2.7%	9.9%
	Foil 2	Count	56	2	0	8	14	90
		% within Question 10	62.2%	2.2%	0.0%	8.9%	15.6%	100.0%
		% within Ethnicity	26.4%	22.2%	0.0%	20.5%	12.2%	22.3%
		% of Total	13.9%	0.5%	0.0%	2.0%	3.5%	22.3%
	Foil 3	Count	12	0	0	3	6	23
		% within Question 10	52.2%	0.0%	0.0%	13.0%	26.1%	100.0%
		% within Ethnicity	5.7%	0.0%	0.0%	7.7%	5.2%	5.7%
		% of Total	3.0%	0.0%	0.0%	0.7%	1.5%	5.7%
Total		Count	212	9	2	39	115	404
		% within Question 10	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%

With item 10, where the target word is cautious, respondents who associated themselves with Black ethnicity chose the target word less when compared to other ethnicities. If the study were to remove other ethnic results and re-assess the criteria, this item would not have met the criterion as foil 2 (insisting) is above 25%, but only by a **small** margin.

Item 13

			Black	Coloured	Asian	Indian	White	Total
Question 13	Foil 1	Count	59	3	0	8	20	95
		% within Question 13	62.1%	3.2%	0.0%	8.4%	21.1%	100.0%
		% within Ethnicity	27.8%	33.3%	0.0%	20.5%	17.4%	23.5%
		% of Total	14.6%	0.7%	0.0%	2.0%	5.0%	23.5%
	Target	Count	120	2	1	23	73	236
		% within Question 13	50.8%	0.8%	0.4%	9.7%	30.9%	100.0%
		% within Ethnicity	56.6%	22.2%	50.0%	59.0%	63.5%	58.4%
		% of Total	29.7%	0.5%	0.2%	5.7%	18.1%	58.4%
	Foil 2	Count	27	2	0	3	10	43
		% within Question 13	62.8%	4.7%	0.0%	7.0%	23.3%	100.0%
		% within Ethnicity	12.7%	22.2%	0.0%	7.7%	8.7%	10.6%
		% of Total	6.7%	0.5%	0.0%	0.7%	2.5%	10.6%
	Foil 3	Count	6	2	1	3	12	28
		% within Question 13	21.4%	7.1%	3.6%	10.7%	42.9%	100.0%
		% within Ethnicity	2.8%	22.2%	50.0%	7.7%	10.4%	6.9%
		% of Total	1.5%	0.5%	0.2%	0.7%	3.0%	6.9%
Total		Count	212	9	2	39	115	404
		% within Question 13	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%

With item 13, where the target word is anticipating, respondents who associated themselves with Black ethnicity chose foil 2 (threatening), so that is was **slightly** higher than 25%. If the study were to remove other ethnic results and re-assess the criteria, this item would not have met the criterion.

Item 18

			Black	Coloured	Asian	Indian	White	Total
Question 18	Target	Count	86	4	2	20	69	196
		% within Question 18	43.9%	2.0%	1.0%	10.2%	35.2%	100.0%
		% within Ethnicity	40.6%	44.4%	100.0%	51.3%	60.0%	48.5%
		% of Total	21.3%	1.0%	0.5%	5.0%	17.1%	48.5%
	Foil 1	Count	29	0	0	1	5	36
		% within Question 18	80.6%	0.0%	0.0%	2.8%	13.9%	100.0%
		% within Ethnicity	13.7%	0.0%	0.0%	2.6%	4.3%	8.9%
		% of Total	7.2%	0.0%	0.0%	0.2%	1.2%	8.9%
	Foil 2	Count	47	2	0	9	18	81
		% within Question 18	58.0%	2.5%	0.0%	11.1%	22.2%	100.0%
		% within Ethnicity	22.2%	22.2%	0.0%	23.1%	15.7%	20.0%
		% of Total	11.6%	0.5%	0.0%	2.2%	4.5%	20.0%
	Foil 3	Count	49	3	0	9	23	89
		% within Question 18	55.1%	3.4%	0.0%	10.1%	25.8%	100.0%
		% within Ethnicity	23.1%	33.3%	0.0%	23.1%	20.0%	22.0%
		% of Total	12.1%	0.7%	0.0%	2.2%	5.7%	22.0%
Total		Count	212	9	2	39	115	404
		% within Question 18	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%

With item 18, where the target word is decisive, respondents who associated themselves with Black ethnicity chose the target word less when compared to other ethnicities. If the study were to remove Black ethnic respondents, this item would not have dropped.

Item 19

			Black	Coloured	Asian	Indian	White	Total
Question 19	Foil 1	Count	49	4	1	13	25	101
		% within Question 19	48.5%	4.0%	1.0%	12.9%	24.8%	100.0%
		% within Ethnicity	23.1%	44.4%	50.0%	33.3%	21.7%	25.0%
		% of Total	12.1%	1.0%	0.2%	3.2%	6.2%	25.0%
	Foil 2	Count	20	0	0	3	6	29
		% within Question 19	69.0%	0.0%	0.0%	10.3%	20.7%	100.0%
		% within Ethnicity	9.4%	0.0%	0.0%	7.7%	5.2%	7.2%
		% of Total	5.0%	0.0%	0.0%	0.7%	1.5%	7.2%
	Foil 3	Count	41	1	0	5	14	65
		% within Question 19	63.1%	1.5%	0.0%	7.7%	21.5%	100.0%
		% within Ethnicity	19.3%	11.1%	0.0%	12.8%	12.2%	16.1%
		% of Total	10.1%	0.2%	0.0%	1.2%	3.5%	16.1%
	Target	Count	101	4	1	18	70	207
		% within Question 19	48.8%	1.9%	0.5%	8.7%	33.8%	100.0%
		% within Ethnicity	47.6%	44.4%	50.0%	46.2%	60.9%	51.2%
		% of Total	25.0%	1.0%	0.2%	4.5%	17.3%	51.2%
Total		Count	212	9	2	39	115	404
		% within Question 19	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%

With item 19, where the target word is tentative, respondents who associated themselves with White ethnicity chose the target word more when compared to other ethnicities. If the study were to remove White ethnic respondents, this item would have dropped.

Item 24

			Black	Coloured	Asian	Indian	White	Total
Question 24	Target	Count	96	6	0	25	83	231
		% within Question 24	41.6%	2.6%	0.0%	10.8%	35.9%	100.0%
		% within Ethnicity	45.3%	66.7%	0.0%	64.1%	72.2%	57.2%
		% of Total	23.8%	1.5%	0.0%	6.2%	20.5%	57.2%
	Foil 1	Count	46	1	0	3	11	63
		% within Question 24	73.0%	1.6%	0.0%	4.8%	17.5%	100.0%
		% within Ethnicity	21.7%	11.1%	0.0%	7.7%	9.6%	15.6%
		% of Total	11.4%	0.2%	0.0%	0.7%	2.7%	15.6%
	Foil 2	Count	13	0	0	0	1	14
		% within Question 24	92.9%	0.0%	0.0%	0.0%	7.1%	100.0%
		% within Ethnicity	6.1%	0.0%	0.0%	0.0%	0.9%	3.5%
		% of Total	3.2%	0.0%	0.0%	0.0%	0.2%	3.5%
	Foil 3	Count	53	2	2	11	20	92
		% within Question 24	57.6%	2.2%	2.2%	12.0%	21.7%	100.0%
		% within Ethnicity	25.0%	22.2%	100.0%	28.2%	17.4%	22.8%
		% of Total	13.1%	0.5%	0.5%	2.7%	5.0%	22.8%
Total		Count	212	9	2	39	115	404
		% within Question 24	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%

With item 24, where the target word is pensive, respondents who associated themselves with Black ethnicity chose the target word less when compared to other ethnicities. If the study were to remove other ethnic respondents, this item would have been dropped.

Item 25

			Black	Coloured	Asian	Indian	White	Total
Question 25	Foil 1	Count	11	0	0	0	1	12
		% within Question 25	91.7%	0.0%	0.0%	0.0%	8.3%	100.0%
		% within Ethnicity	5.2%	0.0%	0.0%	0.0%	0.9%	3.0%
		% of Total	2.7%	0.0%	0.0%	0.0%	0.2%	3.0%
	Foil 2	Count	45	2	1	13	43	115
		% within Question 25	39.1%	1.7%	0.9%	11.3%	37.4%	100.0%
		% within Ethnicity	21.2%	22.2%	50.0%	33.3%	37.4%	28.5%
		% of Total	11.1%	0.5%	0.2%	3.2%	10.6%	28.5%
	Foil 3	Count	27	0	0	6	11	48
		% within Question 25	56.3%	0.0%	0.0%	12.5%	22.9%	100.0%
		% within Ethnicity	12.7%	0.0%	0.0%	15.4%	9.6%	11.9%
		% of Total	6.7%	0.0%	0.0%	1.5%	2.7%	11.9%
	Target	Count	127	7	1	20	60	226
		% within Question 25	56.2%	3.1%	0.4%	8.8%	26.5%	100.0%
		% within Ethnicity	59.9%	77.8%	50.0%	51.3%	52.2%	55.9%
		% of Total	31.4%	1.7%	0.2%	5.0%	14.9%	55.9%
Total		Count	212	9	2	39	115	404
		% within Question 25	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%

With item 25, where the target word is interested, respondents who associated themselves with White, Indian and Asian ethnicity chose foil 2 (incredulous), so that is was higher than 25% which ultimately led to the item being dropped. If the study were to remove these ethnic results and re-assess the criteria, this item would have met the criterion.

Item 27

			Black	Coloured	Asian	Indian	White	Total
Question 27	Foil 1	Count	2	0	0	1	2	5
		% within Question 27	40.0%	0.0%	0.0%	20.0%	40.0%	100.0%
		% within Ethnicity	0.9%	0.0%	0.0%	2.6%	1.7%	1.2%
		% of Total	0.5%	0.0%	0.0%	0.2%	0.5%	1.2%
	Target	Count	101	8	2	23	73	220
		% within Question 27	45.9%	3.6%	0.9%	10.5%	33.2%	100.0%
		% within Ethnicity	47.6%	88.9%	100.0%	59.0%	63.5%	54.5%
		% of Total	25.0%	2.0%	0.5%	5.7%	18.1%	54.5%
	Foil 2	Count	44	1	0	9	23	86
		% within Question 27	51.2%	1.2%	0.0%	10.5%	26.7%	100.0%
		% within Ethnicity	20.8%	11.1%	0.0%	23.1%	20.0%	21.3%
		% of Total	10.9%	0.2%	0.0%	2.2%	5.7%	21.3%
	Foil 3	Count	60	0	0	6	16	86
		% within Question 27	69.8%	0.0%	0.0%	7.0%	18.6%	100.0%
		% within Ethnicity	28.3%	0.0%	0.0%	15.4%	13.9%	21.3%
		% of Total	14.9%	0.0%	0.0%	1.5%	4.0%	21.3%
Total		Count	212	9	2	39	115	404
		% within Question 27	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	52.5%	2.2%	0.5%	9.7%	28.5%	100.0%

With item 27, where the target word is cautious, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. If the study were to remove other ethnic results and re-assess the criteria, this item would not have met the criterion as the target word is not 50+% and foil 3 (reassuring) is above 25%.

Caucasian questionnaire items

Item 2

			Black	Coloured	Asian	Indian	White	Total
Question 2	Foil 1	Count	58	0	1	14	9	89
		% within Question 2	65.2%	0.0%	1.1%	15.7%	10.1%	100.0%
		% within Ethnicity	24.4%	0.0%	20.0%	21.5%	11.1%	20.1%
		% of Total	13.1%	0.0%	0.2%	3.2%	2.0%	20.1%
	Target	Count	113	7	3	38	61	241
		% within Question 2	46.9%	2.9%	1.2%	15.8%	25.3%	100.0%
		% within Ethnicity	47.5%	41.2%	60.0%	58.5%	75.3%	54.4%
		% of Total	25.5%	1.6%	0.7%	8.6%	13.8%	54.4%
	Foil 2	Count	15	1	0	1	3	23
		% within Question 2	65.2%	4.3%	0.0%	4.3%	13.0%	100.0%
		% within Ethnicity	6.3%	5.9%	0.0%	1.5%	3.7%	5.2%
		% of Total	3.4%	0.2%	0.0%	0.2%	0.7%	5.2%
	Foil 3	Count	52	9	1	12	8	89
		% within Question 2	58.4%	10.1%	1.1%	13.5%	9.0%	100.0%
		% within Ethnicity	21.8%	52.9%	20.0%	18.5%	9.9%	20.1%
		% of Total	11.7%	2.0%	0.2%	2.7%	1.8%	20.1%
Total		Count	238	17	5	65	81	443
		% within Question 2	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%

With item 2, where the target word is upset, respondents who associated themselves with Black ethnicity chose the target word less when compared to other ethnicities. If the study were to remove other ethnic respondents, this item would have been dropped as it would not have passed the 50%+ criterion.

Item 10

			Black	Coloured	Asian	Indian	White	Total
Question 10	Target	Count	111	9	2	34	42	215
		% within Question 10	51.6%	4.2%	0.9%	15.8%	19.5%	100.0%
		% within Ethnicity	46.6%	52.9%	40.0%	52.3%	51.9%	48.5%
		% of Total	25.1%	2.0%	0.5%	7.7%	9.5%	48.5%
	Foil 1	Count	61	6	2	12	17	106
		% within Question 10	57.5%	5.7%	1.9%	11.3%	16.0%	100.0%
		% within Ethnicity	25.6%	35.3%	40.0%	18.5%	21.0%	23.9%
		% of Total	13.8%	1.4%	0.5%	2.7%	3.8%	23.9%
	Foil 2	Count	45	2	0	14	18	88
		% within Question 10	51.1%	2.3%	0.0%	15.9%	20.5%	100.0%
		% within Ethnicity	18.9%	11.8%	0.0%	21.5%	22.2%	19.9%
		% of Total	10.2%	0.5%	0.0%	3.2%	4.1%	19.9%
	Foil 3	Count	17	0	1	5	3	29
		% within Question 10	58.6%	0.0%	3.4%	17.2%	10.3%	100.0%
		% within Ethnicity	7.1%	0.0%	20.0%	7.7%	3.7%	6.5%
		% of Total	3.8%	0.0%	0.2%	1.1%	0.7%	6.5%
Total		Count	238	17	5	65	81	443
		% within Question 10	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%

With item 10, where the target word is cautious, respondents who associated themselves with Black ethnicity chose the target word **marginally** less when compared to other ethnicities. If the study were to remove other ethnic results and re-assess the criteria, this item would not have met the criterion as the target word is not 50+% and foil 1 (insisting) is above 25%.

Item 17

			Black	Coloured	Asian	Indian	White	Total
Question 17	Target	Count	129	10	3	42	57	260
		% within Question 17	49.6%	3.8%	1.2%	16.2%	21.9%	100.0%
		% within Ethnicity	54.2%	58.8%	60.0%	64.6%	70.4%	58.7%
		% of Total	29.1%	2.3%	0.7%	9.5%	12.9%	58.7%
	Foil 1	Count	62	5	2	7	8	93
		% within Question 17	66.7%	5.4%	2.2%	7.5%	8.6%	100.0%
		% within Ethnicity	26.1%	29.4%	40.0%	10.8%	9.9%	21.0%
		% of Total	14.0%	1.1%	0.5%	1.6%	1.8%	21.0%
	Foil 2	Count	27	1	0	11	8	52
		% within Question 17	51.9%	1.9%	0.0%	21.2%	15.4%	100.0%
		% within Ethnicity	11.3%	5.9%	0.0%	16.9%	9.9%	11.7%
		% of Total	6.1%	0.2%	0.0%	2.5%	1.8%	11.7%
	Foil 3	Count	17	1	0	5	7	32
		% within Question 17	53.1%	3.1%	0.0%	15.6%	21.9%	100.0%
		% within Ethnicity	7.1%	5.9%	0.0%	7.7%	8.6%	7.2%
		% of Total	3.8%	0.2%	0.0%	1.1%	1.6%	7.2%
Total		Count	238	17	5	65	81	443
		% within Question 17	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%

With item 17, where the target word is doubtful, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. If the study were to remove other ethnic results and re-assess the criteria, this item would not have met the criterion as foil 1 is **marginally** above 25% (affectionate).

Item 18

			Black	Coloured	Asian	Indian	White	Total
Question 18	Target	Count	115	10	4	42	49	236
		% within Question 18	48.7%	4.2%	1.7%	17.8%	20.8%	100.0%
		% within Ethnicity	48.3%	58.8%	80.0%	64.6%	60.5%	53.3%
		% of Total	26.0%	2.3%	0.9%	9.5%	11.1%	53.3%
	Foil 1	Count	32	1	0	4	6	47
		% within Question 18	68.1%	2.1%	0.0%	8.5%	12.8%	100.0%
		% within Ethnicity	13.4%	5.9%	0.0%	6.2%	7.4%	10.6%
		% of Total	7.2%	0.2%	0.0%	0.9%	1.4%	10.6%
	Foil 2	Count	26	2	0	2	6	42
		% within Question 18	61.9%	4.8%	0.0%	4.8%	14.3%	100.0%
		% within Ethnicity	10.9%	11.8%	0.0%	3.1%	7.4%	9.5%
		% of Total	5.9%	0.5%	0.0%	0.5%	1.4%	9.5%
	Foil 3	Count	65	4	1	16	20	116
		% within Question 18	56.0%	3.4%	0.9%	13.8%	17.2%	100.0%
		% within Ethnicity	27.3%	23.5%	20.0%	24.6%	24.7%	26.2%
		% of Total	14.7%	0.9%	0.2%	3.6%	4.5%	26.2%
Total		Count	238	17	5	65	81	443
		% within Question 18	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%

With item 18, where the target word is decisive, respondents who associated themselves with Black ethnicity chose the target word less when compared to other ethnicities. The Black ethnic respondents also chose foil 3 (aghast) **marginally** more, which ultimately led to the item being dropped. If the study were to remove other Black ethnic results and re-assess the criteria, this item would not have dropped.

Item 23

			Black	Coloured	Asian	Indian	White	Total
Question 23	Foil 1	Count	8	0	0	0	3	11
		% within Question 23	72.7%	0.0%	0.0%	0.0%	27.3%	100.0%
		% within Ethnicity	3.4%	0.0%	0.0%	0.0%	3.7%	2.5%
		% of Total	1.8%	0.0%	0.0%	0.0%	0.7%	2.5%
	Foil 2	Count	33	0	0	4	8	50
		% within Question 23	66.0%	0.0%	0.0%	8.0%	16.0%	100.0%
		% within Ethnicity	13.9%	0.0%	0.0%	6.2%	9.9%	11.3%
		% of Total	7.4%	0.0%	0.0%	0.9%	1.8%	11.3%
	Target	Count	108	13	2	47	53	247
		% within Question 23	43.7%	5.3%	0.8%	19.0%	21.5%	100.0%
		% within Ethnicity	45.4%	76.5%	40.0%	72.3%	65.4%	55.8%
		% of Total	24.4%	2.9%	0.5%	10.6%	12.0%	55.8%
	Foil 3	Count	85	4	3	14	17	129
		% within Question 23	65.9%	3.1%	2.3%	10.9%	13.2%	100.0%
		% within Ethnicity	35.7%	23.5%	60.0%	21.5%	21.0%	29.1%
		% of Total	19.2%	0.9%	0.7%	3.2%	3.8%	29.1%
Total		Count	238	17	5	65	81	443
		% within Question 23	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%

With item 23 where the target word is defiant, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. Instead 35.7% of respondents of Black ethnicity choose foil 3 (curious), which ultimately led the item to drop. If Black ethnic respondents were not considered, the item would not have been dropped.

Item 24

			Black	Coloured	Asian	Indian	White	Total
Question 24	Target	Count	113	10	3	40	66	251
		% within Question 24	45.0%	4.0%	1.2%	15.9%	26.3%	100.0%
		% within Ethnicity	47.5%	58.8%	60.0%	61.5%	81.5%	56.7%
		% of Total	25.5%	2.3%	0.7%	9.0%	14.9%	56.7%
	Foil 1	Count	41	2	1	5	5	62
		% within Question 24	66.1%	3.2%	1.6%	8.1%	8.1%	100.0%
		% within Ethnicity	17.2%	11.8%	20.0%	7.7%	6.2%	14.0%
		% of Total	9.3%	0.5%	0.2%	1.1%	1.1%	14.0%
	Foil 2	Count	16	1	0	2	1	20
		% within Question 24	80.0%	5.0%	0.0%	10.0%	5.0%	100.0%
		% within Ethnicity	6.7%	5.9%	0.0%	3.1%	1.2%	4.5%
		% of Total	3.6%	0.2%	0.0%	0.5%	0.2%	4.5%
	Foil 3	Count	60	4	1	18	9	100
		% within Question 24	60.0%	4.0%	1.0%	18.0%	9.0%	100.0%
		% within Ethnicity	25.2%	23.5%	20.0%	27.7%	11.1%	22.6%
		% of Total	13.5%	0.9%	0.2%	4.1%	2.0%	22.6%
Total		Count	238	17	5	65	81	443
		% within Question 24	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%

With item 24, where the target word is pensive, respondents who associated themselves with Black ethnicity chose the target word less when compared to other ethnicities. If the study were to remove other ethnic results and re-assess the criteria, this item would have dropped as the target word is below 50+% and foil 3 (hostile) is **marginally** above 25%.

Item 28

			Black	Coloured	Asian	Indian	White	Total
Question 28	Target	Count	101	11	2	46	61	234
		% within Question 28	43.2%	4.7%	0.9%	19.7%	26.1%	100.0%
		% within Ethnicity	42.4%	64.7%	40.0%	70.8%	75.3%	52.8%
		% of Total	22.8%	2.5%	0.5%	10.4%	13.8%	52.8%
	Foil 1	Count	7	1	0	1	3	14
		% within Question 28	50.0%	7.1%	0.0%	7.1%	21.4%	100.0%
		% within Ethnicity	2.9%	5.9%	0.0%	1.5%	3.7%	3.2%
		% of Total	1.6%	0.2%	0.0%	0.2%	0.7%	3.2%
	Foil 2	Count	68	3	2	10	5	100
		% within Question 28	68.0%	3.0%	2.0%	10.0%	5.0%	100.0%
		% within Ethnicity	28.6%	17.6%	40.0%	15.4%	6.2%	22.6%
		% of Total	15.3%	0.7%	0.5%	2.3%	1.1%	22.6%
	Foil 3	Count	50	2	1	8	11	79
		% within Question 28	63.3%	2.5%	1.3%	10.1%	13.9%	100.0%
		% within Ethnicity	21.0%	11.8%	20.0%	12.3%	13.6%	17.8%
		% of Total	11.3%	0.5%	0.2%	1.8%	2.5%	17.8%
Total		Count	238	17	5	65	81	443
		% within Question 28	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%

With item, 28 where the target word is interested, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. If the study were to remove other ethnic results and re-assess the criteria, this item would have dropped as the target word is below 50+% and foil 2 (affectionate) is above 25%.

Item 33

			Black	Coloured	Asian	Indian	White	Total
Question 33	Foil 1	Count	7	1	0	1	3	12
		% within Question 33	58.3%	8.3%	0.0%	8.3%	25.0%	100.0%
		% within Ethnicity	2.9%	5.9%	0.0%	1.5%	3.7%	2.7%
		% of Total	1.6%	0.2%	0.0%	0.2%	0.7%	2.7%
	Foil 2	Count	61	4	1	9	13	96
		% within Question 33	63.5%	4.2%	1.0%	9.4%	13.5%	100.0%
		% within Ethnicity	25.6%	23.5%	20.0%	13.8%	16.0%	21.7%
		% of Total	13.8%	0.9%	0.2%	2.0%	2.9%	21.7%
	Foil 3	Count	28	3	1	7	4	46
		% within Question 33	60.9%	6.5%	2.2%	15.2%	8.7%	100.0%
		% within Ethnicity	11.8%	17.6%	20.0%	10.8%	4.9%	10.4%
		% of Total	6.3%	0.7%	0.2%	1.6%	0.9%	10.4%
	Target	Count	129	9	3	48	60	272
		% within Question 33	47.4%	3.3%	1.1%	17.6%	22.1%	100.0%
		% within Ethnicity	54.2%	52.9%	60.0%	73.8%	74.1%	61.4%
		% of Total	29.1%	2.0%	0.7%	10.8%	13.5%	61.4%
Total		Count	238	17	5	65	81	443
		% within Question 33	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%

With item 33, where the target word is concerned, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. If the study were to remove other ethnic results and re-assess the criteria, this item would not have met the criterion as foil 2 (guilty). is **marginally** above 25%.

Item 35

			Black	Coloured	Asian	Indian	White	Total
Question 35	Foil 1	Count	34	2	2	7	7	58
		% within Question 35	58.6%	3.4%	3.4%	12.1%	12.1%	100.0%
		% within Ethnicity	14.3%	11.8%	40.0%	10.8%	8.6%	13.1%
		% of Total	7.7%	0.5%	0.5%	1.6%	1.6%	13.1%
	Target	Count	114	8	2	40	51	233
		% within Question 35	48.9%	3.4%	0.9%	17.2%	21.9%	100.0%
		% within Ethnicity	47.9%	47.1%	40.0%	61.5%	63.0%	52.6%
		% of Total	25.7%	1.8%	0.5%	9.0%	11.5%	52.6%
	Foil 2	Count	37	4	1	8	11	66
		% within Question 35	56.1%	6.1%	1.5%	12.1%	16.7%	100.0%
		% within Ethnicity	15.5%	23.5%	20.0%	12.3%	13.6%	14.9%
		% of Total	8.4%	0.9%	0.2%	1.8%	2.5%	14.9%
	Foil 3	Count	45	3	0	9	11	73
		% within Question 35	61.6%	4.1%	0.0%	12.3%	15.1%	100.0%
		% within Ethnicity	18.9%	17.6%	0.0%	13.8%	13.6%	16.5%
		% of Total	10.2%	0.7%	0.0%	2.0%	2.5%	16.5%
Total		Count	238	17	5	65	81	443
		% within Question 35	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%

With item 35, where the target word is nervous, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. If the study were to remove other ethnic respondents, this item would have dropped.

Item 20

			Black	Coloured	Asian	Indian	White	Total
Question 20	Foil 1	Count	56	2	1	9	10	85
		% within Question 20	65.9%	2.4%	1.2%	10.6%	11.8%	100.0%
		% within Ethnicity	23.5%	11.8%	20.0%	13.8%	12.3%	19.2%
		% of Total	12.6%	0.5%	0.2%	2.0%	2.3%	19.2%
	Target	Count	119	13	3	47	62	265
		% within Question 20	44.9%	4.9%	1.1%	17.7%	23.4%	100.0%
		% within Ethnicity	50.0%	76.5%	60.0%	72.3%	76.5%	59.8%
		% of Total	26.9%	2.9%	0.7%	10.6%	14.0%	59.8%
	Foil 2	Count	58	2	1	8	9	85
		% within Question 20	68.2%	2.4%	1.2%	9.4%	10.6%	100.0%
		% within Ethnicity	24.4%	11.8%	20.0%	12.3%	11.1%	19.2%
		% of Total	13.1%	0.5%	0.2%	1.8%	2.0%	19.2%
	Foil 3	Count	2	0	0	1	0	5
		% within Question 20	40.0%	0.0%	0.0%	20.0%	0.0%	100.0%
		% within Ethnicity	0.8%	0.0%	0.0%	1.5%	0.0%	1.1%
		% of Total	0.5%	0.0%	0.0%	0.2%	0.0%	1.1%
Total		Count	238	17	5	65	81	443
		% within Question 20	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	53.7%	3.8%	1.1%	14.7%	18.3%	100.0%

With item 20, where the target word is friendly, respondents who associated themselves with Black ethnicity chose the target word much less when compared to other ethnicities. While removing other ethnicities would not have dropped the item, it is worth highlighting that other ethnic groups choose the target word approximately 20+% more, whereas Black ethnic respondents tended to choose foil 1 (dominant) and foil 2 (guilty) more frequently.

APPENDIX AA: REPORTING OF FURTHER STATISTICAL RESULTS-STUDY 2

Additional statistical tests were performed on the data collected to test its representation of the underlying theoretical concepts. The following sections detail the testing on the factor structure of trait EI and the factor analysis of BFI. Lastly, testing on the assumptions of multiple regression analysis is performed.

1. TRAIT EI FACTOR ANALYSIS

TEIQue-SF follows a higher order structure with multifaceted constructs (Cooper & Petrides, 2010; Petrides, 2009). Consequently, cross loadings and factor overlap is to be expected, hence, focus should be on trait EI as the dominant factor (Cooper & Petrides, 2010; Petrides, 2009). Using previous research as precedent (Cooper & Petrides, 2010), this study assesses the dimensionality of TEIQue-SF using exploratory factor analysis, specifically, extracting factors using principal axis factoring. The Kaiser–Meyer–Olkin measure of sampling adequacy was 0.816, supporting exploratory factor analysis as an appropriate method for this sample. The Kaiser's eigen-greater-than one-rule suggests the extraction of 9 factors. However, this is not an appropriate method for exploratory factor analysis (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Moreover, it has been identified as the poorest performing method when deciding which factors to retain (Courtney & Gordon, 2013). Therefore, the preferred method for assessing TEIQue-SF, and whether it is unidimensional in this study, was a visual inspection of the scree plot and the factor matrix. The scree plot (Figure 43) suggests a single dominant factor is present. The first five eigenvalues are 6.378, 2.982, 2.297, 1.857 and 1.527. The first eigenvalue explained 17.718% of the variance with the second accounting for 8.282%. An inspection of the factor matrix (Table 108) shows considerable loadings on the first factor, with 75% of items loading with coefficients above 0.30. Only two items loaded less than 0.20. This occurred for trait EI23 ("I often pause and think about my feelings") and trait EI33 ("I often indulge without considering all the consequences"). Low factor loadings have been reported for trait IE23 (Cooper & Petrides, 2010). Trait EI33 was an additional item added after piloting. Thus, a visual inspection of the scree plot and factor matrix strongly suggest TEIQue-SF is predominately measuring a strong unidimensional trait EI factor.

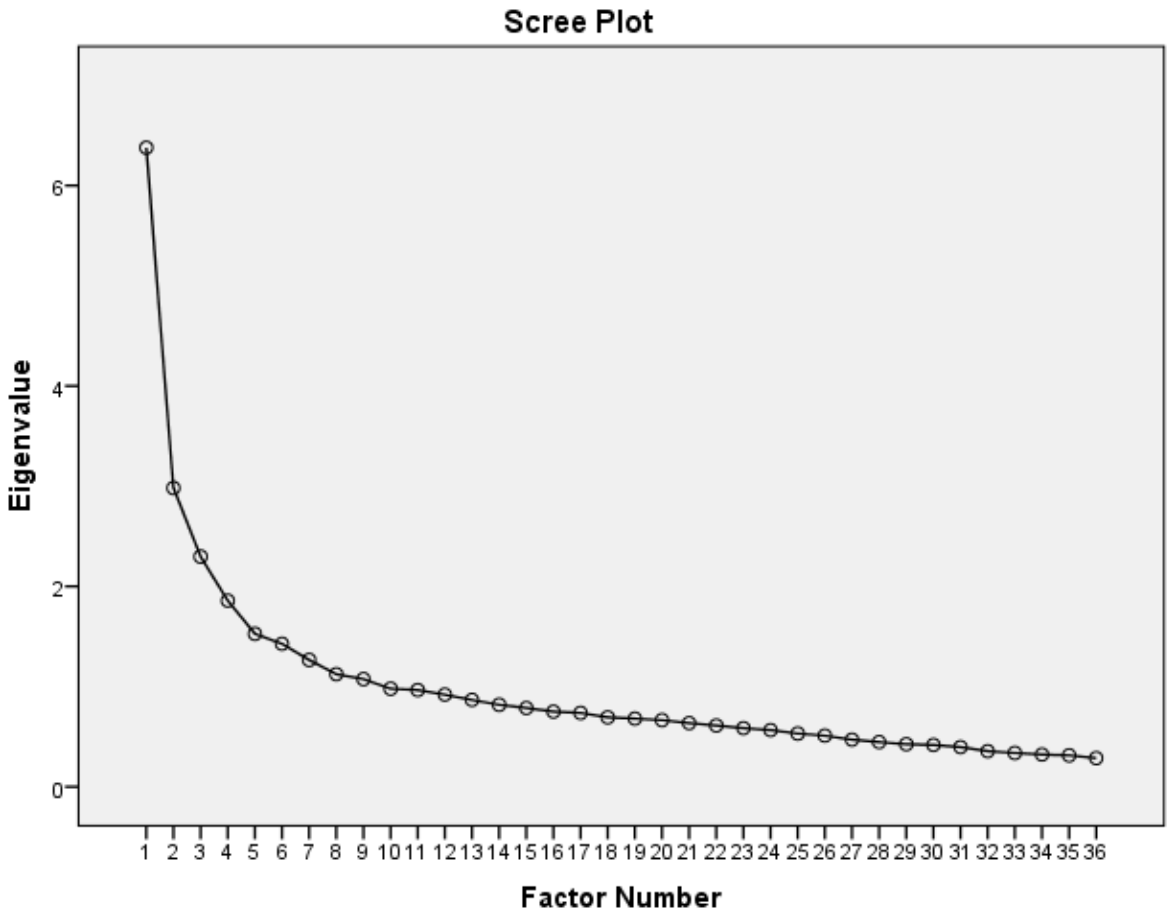


Figure 43. Trait EI scree plot

Table 108. Factor matrix: Trait EI

Factor Matrix[a]	
	Factor 1 (trait EI)
Trait EI1	**.350**
Trait EI2	.259
Trait EI3	**.507**
Trait EI4	**.375**
Trait EI5	**.468**
Trait EI6	**.381**
Trait EI7	.249
Trait EI8	**.419**
Trait EI9	**.481**
Trait EI10	**.352**
Trait EI11	**.383**
Trait EI12	**.318**
Trait EI13	.246
Trait EI14	**.492**
Trait EI16	**.332**
Trait EI17	.235
Trait EI18	**.437**
Trait EI19	**.424**
Trait EI20	**.547**
Trait EI21	**.387**
Trait EI22	.275
Trait EI23	.150
Trait EI24	**.506**
Trait EI25	.218
Trait EI26	**.360**
Trait EI27	**.481**
Trait EI28	**.467**
Trait EI29	**.522**
Trait EI30	**.476**
Trait EI31	**.428**
Trait EI32	**.591**
Trait EI33	.159
Trait EI34	**.316**
Trait EI35	**.427**
Trait EI36	**.345**
Trait EI37	.237
Extraction Method: Principal Axis Factoring.	
a. 1 factors extracted. 4 iterations required.	

2. BFI FACTOR ANALYSIS

The BFI is used to efficiently measure the five dimensions of personality (John & Srivastava, 1999). Factor analysis was used to test that the instrument's items reflected this underlying five factor structure. In performing such an analysis, one can also ensure each individual item is correctly measuring its desired component and not other components, thus showing discriminant validity. The Kaiser–Meyer–Olkin measure of sampling adequacy was 0.818, supporting factor analysis as an appropriate method for this sample. The factor analysis results can be seen in Table 109 on the next page. The following conclusions can be drawn from the factor analysis:

i. Items BFI35 and BFI41 didn't load on any component.
ii. Item BFI2 and BFI12 did not load on the expected component agreeableness.
iii. Item BFI16 loaded better on openness to experience than it did on its targeted dimension extraversion.

These items failed to show construct or discriminant validity thus were dropped from future analysis. All other items loaded highest on their desired construct.

Table 109. BFI rotated factor matrix

Rotated Component Matrix[a]					
	Component				
	Neuroticism	Conscientiousness	Openness to experience	Extraversion	Agreeableness
BFI1				**.699**	
BFI2	-.459				?
BFI3		**.616**			
BFI4	**.561**				
BFI5			**.597**		
BFI6				**.705**	
BFI7					**.570**
BFI8		**.542**			
BFI9	**.428**		-.356		
BFI10			**.519**		
BFI11			.334	**.447**	
BFI12	-.301			-.317	?
BFI13		**.637**			
BFI14	**.654**				
BFI15			**.499**		
BFI16			.426	**.394**	
BFI17					**.584**
BFI18		**.733**			
BFI19	**.562**				
BFI20			**.552**		
BFI21				**.808**	
BFI22					**.514**
BFI23		**.632**			
BFI24	**.577**				
BFI25	-.332		**.611**		
BFI26			.313	**.352**	
BFI27	-.498				**.443**
BFI28		**.522**			
BFI29	**.708**				
BFI30			**.430**		
BFI31				**.635**	
BFI32					**.675**
BFI33		**.564**	.301		.339
BFI34	**.338**		-.423		
BFI35					
BFI36				**.711**	
BFI37	-.573				**.359**
BFI38		**.482**			
BFI39	**.486**				
BFI40			**.492**		
BFI41					
BFI42					**.374**
BFI43		**.576**			
BFI44			**.368**		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.
b. Coefficients under 0.30 were supressed

3. TESTS OF ASSUMPTIONS-STUDY 2

To perform multiple regression analysis with confidence, certain assumptions needed to be met, namely: normality, linear regression and heteroscedasticity (Mertler & Reinhart, 2016). In this section, multicollinearity assumptions are also considered. Tests for these assumptions were carried out and a decision on the use of bootstrapping was made to ensure the correct conclusions can be inferred regarding the tested hypotheses. The tests for these assumptions are now presented and discussed.

Multicollinearity

Table 110. Study 2: Multicollinearity statistics

Dependent Variable=Social sensitivity	Collinearity Statistics	
	Tolerance	VIF
Trait EI	.448	2.234
Extraversion	.854	1.171
Agreeableness	.739	1.353
Conscientiousness	.755	1.324
Neuroticism	.579	1.728
Openness to experience	.845	1.183

Multicollinearity occurs when the independent variables are highly correlated with each other. This is identifiable by high VIF values and low tolerance values. VIF values should be approaching zero and tolerance scores should be approaching one. A VIF value below five is considered acceptable.

Table 110 suggests independent variables are below the maximum VIF score of five and show adequate scores of tolerances. Therefore, multicollinearity assumptions have been adequately met.

Linear relationships, heteroscedasticity and the normality of the residual distribution:

Figure 44. Study 2: normal probability plots of residuals

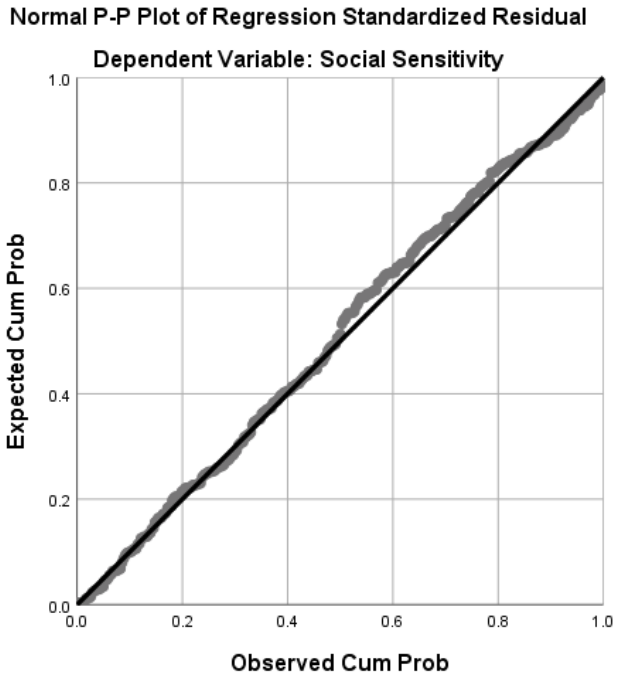


Figure 45. Study 2: histogram of residuals

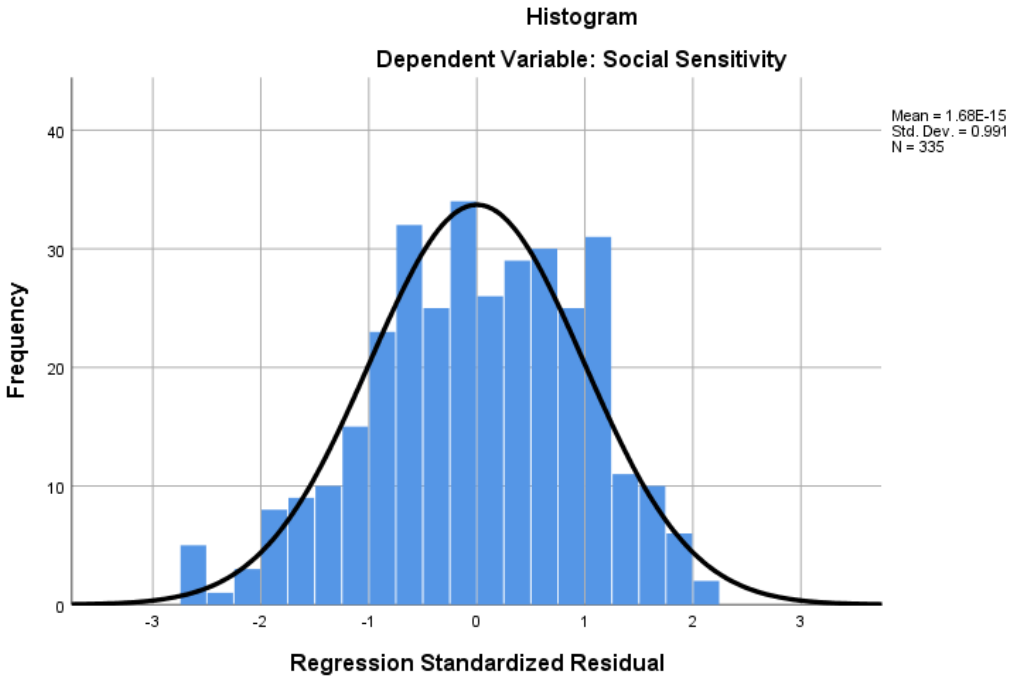


Figure 46. Study 2: scatter plot of standardized residuals

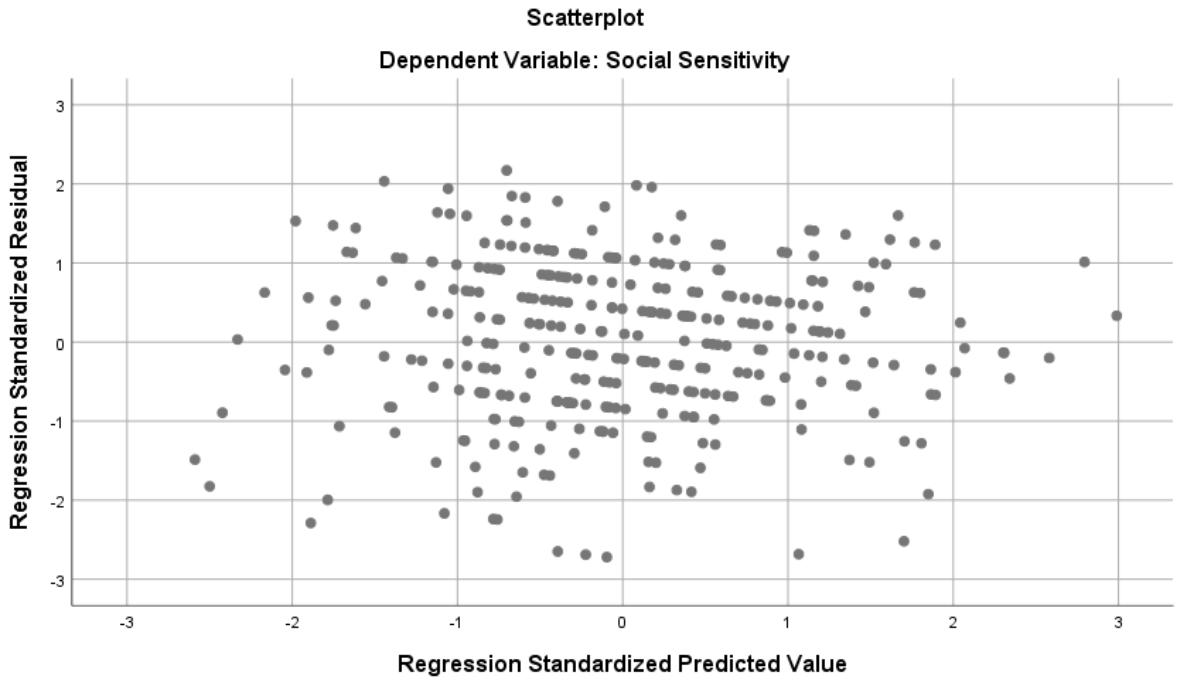


Figure 44 and 45 show the probability plot and histograms of the residuals, these were used to test the residuals, more specifically, whether they are normally distributed. The probability plot suggests that the data points hug the line and does not roller coast around it, thus one can assume the residuals are normally distributed. This conclusion is also supported by the histogram.

Figure 46 is another scatter plot, but this time it plots the standardised residuals. This plot helps to test the heteroscedasticity and linearity assumptions of multiple regression. The plot does not follow an obvious curved pattern; therefore, the assumption of linearity has not been violated. The plot does not have an obvious fan-shaped pattern, thus the assumption of heteroscedasticity has not been violated (Osborne & Waters, 2002).

The above tested the assumptions of multicollinearity, linearity, heteroscedasticity and the normality of residual distribution. The tests indicate that there have been no obvious violations of these assumptions. However, bootstrapping is used to help interpret the data.

APPENDIX AB: REPORTING OF FURTHER STATISTICAL RESULTS- STUDY 3

Additional statistical tests were performed on the data collected to tests its representation of the underlying theoretical concepts. The following section details the testing on the factor structure of the collective intelligence tasks. This is then followed by the testing of the assumptions of multiple regression for Study 3.

1. COLLECTIVE INTELLIGENCE FACTOR ANALYSIS

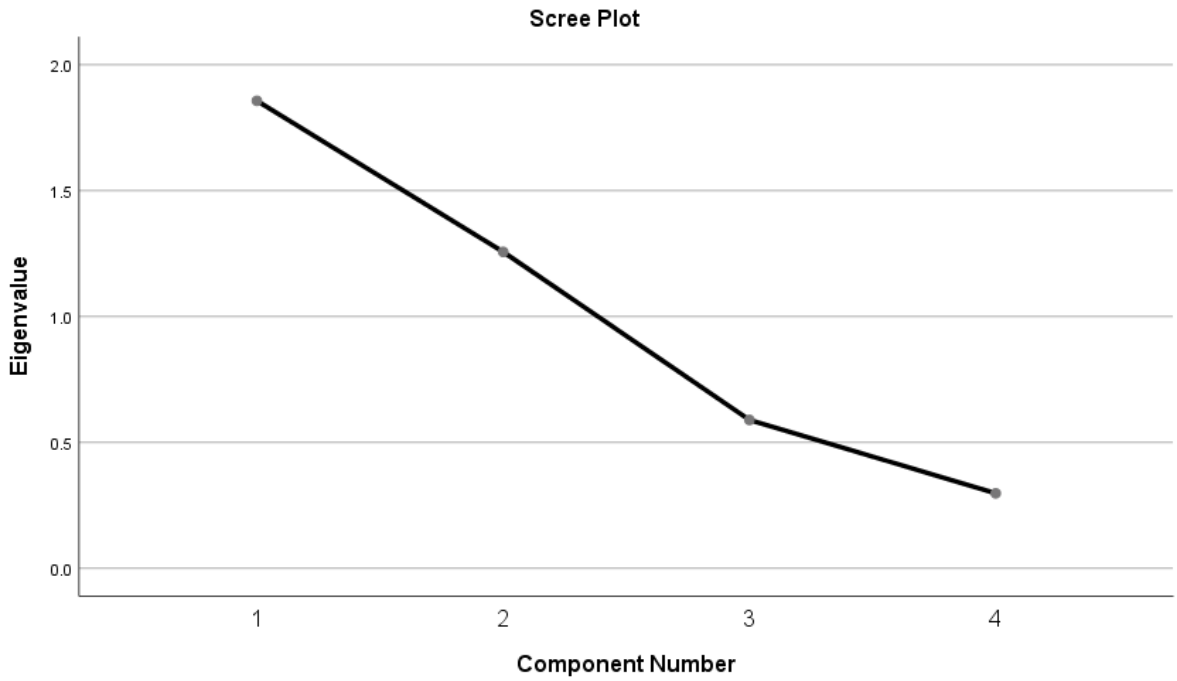
To determine whether a collective intelligence factor emerges in the current study, multiple factor retention tests were performed to determine if only a single factor should be retained, thus reflecting the collective intelligence factor. These tests are shown below:

Table 111. Collective intelligence principal component analysis

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.857	46.413	46.413	1.857	46.413	46.413	1.727	43.166	43.166
2	1.257	31.416	77.829	1.257	31.416	77.829	1.387	34.664	77.829
3	.589	14.729	92.558						
4	.298	7.442	100.000						
Extraction Method: Principal Component Analysis.									

The Kaiser criterion for determining which factors to retain is the most popular and default rule in many statistical packages (Henson & Roberts, 2006). The Kaiser criterion suggests that factors should only be retained if their eigenvalue is above 1 (Ruscio & Roche, 2012). According to this rule, and referring to Table 111, two factors should be retained in the current study. However, this method has been suggested as unreliable and tends to overestimate the number of factors to retain (Courtney & Gordon, 2013; Fabrigar et al., 1999; Ruscio & Roche, 2012). Ruscio and Roche's (2012) simulation study indicates the Kaiser criterion rule is only correct 8.77% of the time.

Figure 47. Collective intelligence scree plot



The Cattell (1966) scree plot is a graphical technique where the eigenvalues are plotted in descending order (Ruscio & Roche, 2012). The number factors to be retained is then determined by identifying a clear 'elbow' in the plot (Courtney & Gordon, 2013). An elbow appears after the third factor in Figure 47, thus suggesting the retention of three factors. This method has been criticised for ambiguity and subjectivity therefore making it susceptible to incorrect factor retention (Courtney & Gordon, 2013; Ruscio & Roche, 2012).

Table 112. Collective intelligence parallel analysis

Eigenvalues	Raw Data	Means	Percentyle
1	1.856515	1.682080	2.078045
2	1.256659	1.142747	1.376331
3	0.589163	0.765916	0.975676
4	0.297663	0.409257	0.646624
Based on 5000 data sets and 95% confidence interval			

Horn's parallel analysis is one of the most strongly recommended techniques when determining how many factors to retain (Fabrigar et al., 1999; Garrido, Abad, & Ponsoda, 2013; Hayton, Allen, & Scarpello, 2004; Henson & Roberts, 2006; Peres-Neto, Jackson, & Somers, 2005; Ruscio & Roche, 2012; Velicer, Eaton, & Fava, 2000; Zwick & Velicer, 1986). The major benefit of Horn's (1965) parallel analysis technique is that it considers sampling error as opposed to the Kaiser rule which is based on population statistics (Courtney

& Gordon, 2013). Parallel analysis draws from multiple random datasets to calculate reference eigenvalues that account for sampling error (Ruscio & Roche, 2012). If the raw eigenvalues exceed the reference eigenvalues, the factor should be retained. Table 112 suggests that none of the factors should be retained at a 95% confidence interval.

The above tests show a lack of consensus regarding the emergence of a collective intelligence factor in the current study. However, as seen in the analyses to follow, the factor loadings and general eigenvalue patterns compare favourably with the studies done by Woolley et al. (2010).

Table 113. Comparison of principal component analysis

Component	Current study		Woolley 2010- Study 1		Woolley 2010- Study 2		Woolley 2010- Study 2 extended	
	Total	% of Variance	Total	% of Variance	Total	% of Variance	Total	% of Variance
1	1.857	46.413	2.17	43.39	2.20	44.07	2.79	27.86
2	1.257	31.416	0.91	18.18	1.03	20.54	1.33	13.35
3	.589	14.729	0.85	16.93	0.78	15.57	1.24	12.40
4	.298	7.442	0.62	12.46	0.62	12.44	1.01	10.08

Table 113 compares the current study's eigenvalues and % of variance explained by each to the three studies by Woolley et al. (2010). Across the studies, the first eigenvalue is close to 2 and explains about 45% of the variance, except for Woolley and colleague's extended study which is near to 3 and explains 27.86% of the variance. The second eigenvalue across the studies are all around 1, but the variance explained for the second eigenvalue is much higher for the current study. Given that the sample size for the current study is much smaller than Woolley and colleagues' studies, an increase in general variance and sampling error is to be expected. However, a general pattern between the eigenvalues and % of variance explained between the four studies is identifiable, with a standout first eigenvalue explaining a substantial amount of the variance. This suggests the current study is showing a factor structure that is consistent with a single dominant factor which, in this case, represents the collective intelligence factor. In addition to the above comparison, a principal axis analysis was performed to compare how each task in the current study loaded in comparison to the same quadrant tasks from Woolley and colleagues' first study. This comparison is shown in Table 114.

Table 114. Comparison of principal axis analysis

Factor loadings on first Factor	Current Study	Woolley 2010-Study 1
	1	1
Brainstorming	.288	0.33
RAPM	.810	0.74
Shopping list	.702	0.57
Puzzle task alternative/Group typing	.507	0.68
Extraction Method: Principal Axis Analysis.		
a. 2 components extracted.		

The above table further suggests that the current study's factor structure is like that of Woolley et al. (2010), as the strength of the task factor loadings on the first factor are similar. The brainstorming task loaded the lowest in both studies while the group reasoning task (RAPM) loaded the highest. The shopping list task and puzzle/group typing task both loaded adequately.

Although initial tests on factor retention proved inconclusive as to whether a single dominant factor emerged representing the collective intelligence factor, a comparison of the current study's factor structure with Woolley and colleagues' studies' factor structure suggests there is a collective intelligence factor present in the current study, but a lack of sample size is constraining the inferences one can make using the current statistical tests. Nevertheless, as a post-hoc study, the aim to investigate social sensitivity as a predictor of collective intelligence is still possible, as a dominant factor is suggested by the above comparisons.

2. TESTS OF ASSUMPTIONS- STUDY 3

To perform multiple regression analysis with confidence, certain assumptions needed to be met, namely: normality, linear regression and heteroscedasticity (Mertler & Reinhart, 2016). In this section, multicollinearity assumptions are also considered. Tests for these assumptions were carried out and a decision on the use of bootstrapping was made to ensure the correct conclusions can be inferred regarding the tested hypotheses. The tests for these assumptions are now presented and discussed.

Multicollinearity

Table 115. Study 3: Multicollinearity statistics

Dependent Variable=Collective intelligence	Collinearity Statistics	
	Tolerance	VIF
Avg member intelligence	.098	10.181
Max member intelligence	.078	12.858
Percentage of female group members	.172	5.830
Social sensitivity	.164	6.109
Avg trait EI	.100	9.981
Avg Extraversion	.110	9.085
Avg Agreeableness	.253	3.950
Avg Conscientiousness	.279	3.589
Avg Neuroticism	.207	4.831
Avg Openness to experience	.292	3.428

Table 116. Study 3: Multicollinearity statistics (after adjustments)

Dependent Variable=Collective intelligence	Collinearity Statistics	
	Tolerance	VIF
Percentage of female group members	.714	1.401
Social sensitivity	.556	1.798
Avg Extraversion	.765	1.308
Avg Agreeableness	.390	2.561
Avg Conscientiousness	.454	2.204
Avg Neuroticism	.504	1.985
Avg Openness to experience	.589	1.699

Multicollinearity occurs when the independent variables are highly correlated with each other. This is identifiable by high VIF values and low tolerance values. VIF values should be approaching zero and tolerance scores should be approaching one. A VIF value below five is considered acceptable.

Table 115 suggests multiple independent variables are above the maximum VIF score of five and show poor scores of tolerances. Therefore, multicollinearity assumptions have not been adequately met. Therefore, to improve stability, the item with the highest VIF was dropped and re-run. This process was repeated till all VIF values were below five and multicollinearity assumptions were met. The final set of independent variables is shown in Table 116.

Linear relationships, heteroscedasticity and the normality of the residual distribution:

Figure 48. Study 3: normal probability plots of residuals

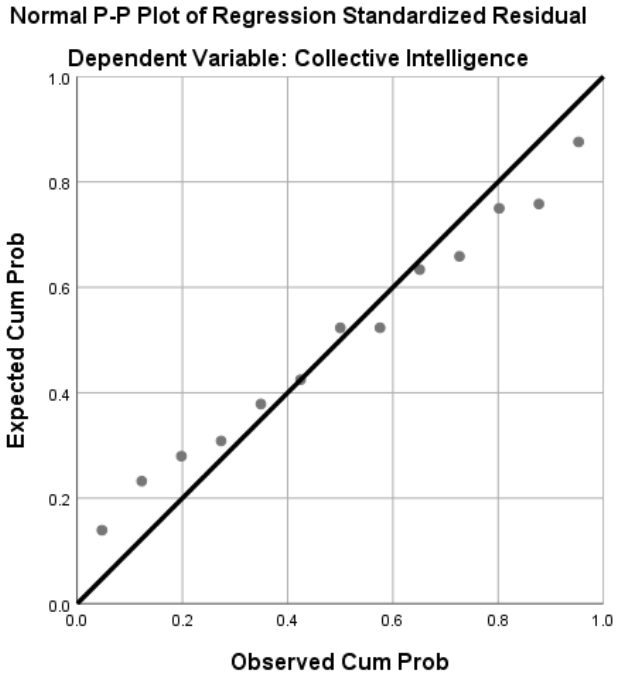


Figure 49. Study 3: histogram of residuals

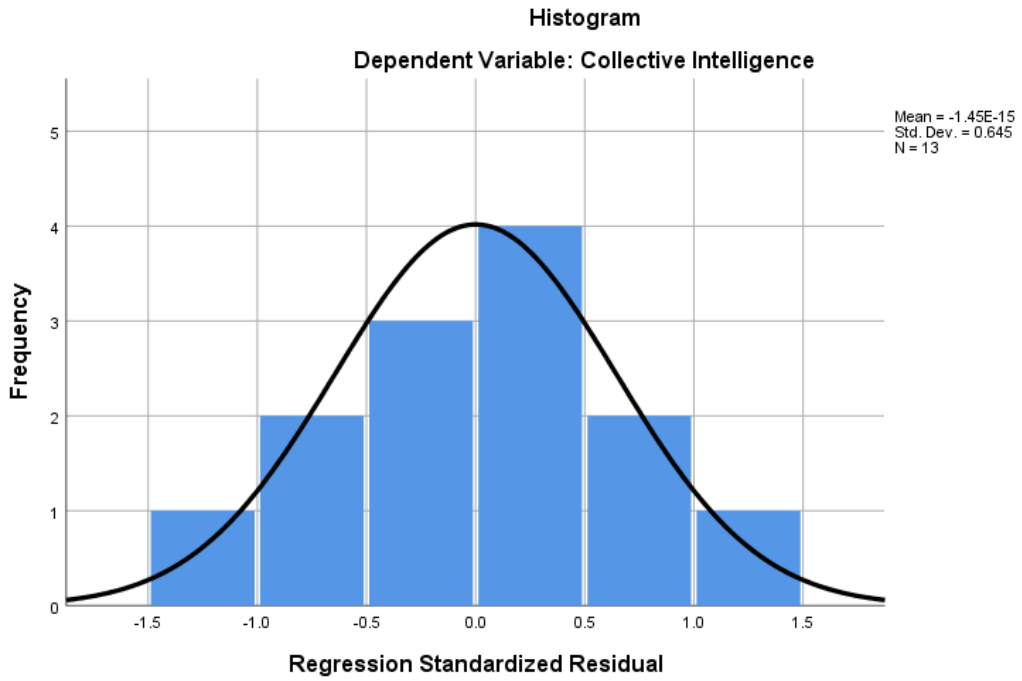


Figure 50. Study 3: scatter plot of standardized residuals

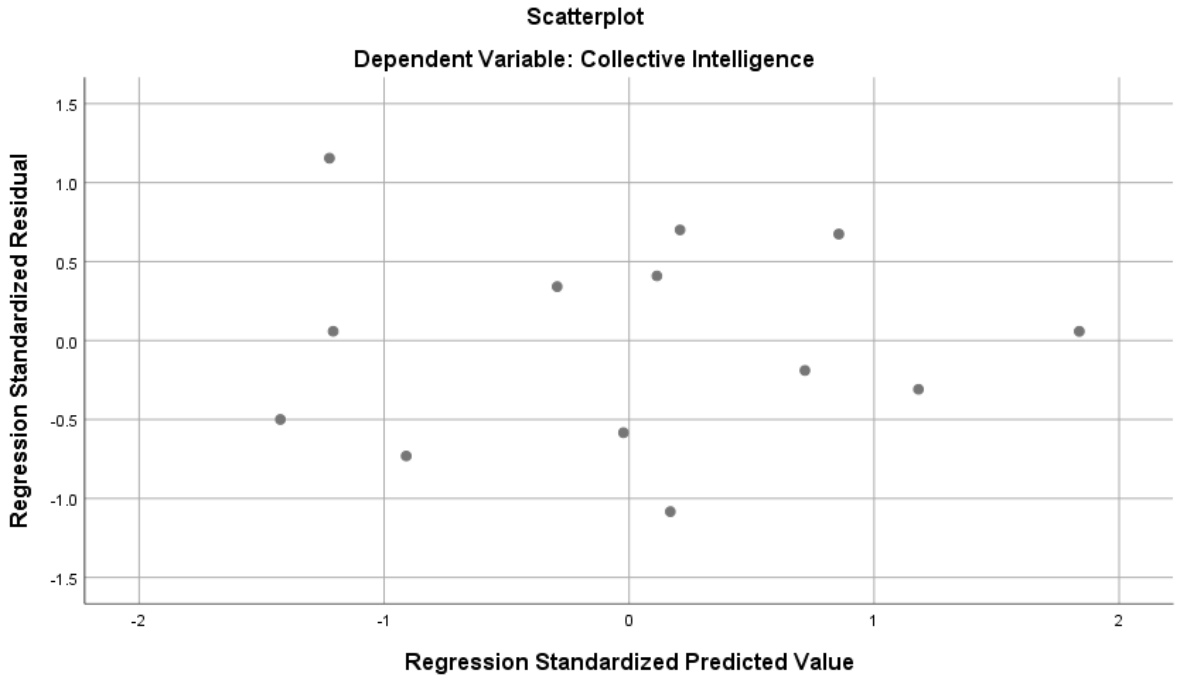


Figure 48 and 49 show the probability plot and histograms of the residuals, these were used to test the residuals, more specifically, whether they are normally distributed. The probability plot suggests that the data points don not hug the line and it appears to roller coast around it, thus one cannot conclude the residuals are normally distributed. The histogram appears to support a normal distribution of the residuals.

Figure 50 is another scatter plot, but this time it plots the standardised residuals. This plot helps to test the heteroscedasticity and linearity assumptions of multiple regression. The plot does not follow an obvious curved pattern; therefore, the assumption of linearity has not been violated. The plot also does not have an obvious fan-shaped pattern, thus the assumption of heteroscedasticity has not been violated (Osborne & Waters, 2002).

The above tested the assumptions of multicollinearity, linearity, heteroscedasticity and the normality of residual distribution. The tests indicate that there are some violations of these assumptions. Therefore, bootstrapping is used to help interpret the data.