DEFINING THE BOUNDARIES BETWEEN TRAIT EMOTIONAL INTELLIGENCE AND ABILITY EMOTIONAL INTELLIGENCE:

An assessment of the relationship between emotional intelligence and cognitive thinking styles within the occupational environment

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ABSTRACT

Emotional intelligence has attracted a considerable amount of attention over the past few years specifically with regard to the nature of the underlying construct and the reliability and validity of the psychometric tools used to measure the construct. The present study explored the reliability and validity of a trait measure of EI in relation to an ability measure in order to determine whether the tools can be considered as measuring conceptually valid constructs within an occupational environment. The study also examined the overlap with a trait measure of cognitive thinking styles to determine the potential for separating the trait and ability EI into two unique and distinguishable constructs. Participants included 308 employees from four different workforces within a diverse South African consulting firm. The results of the study identified a number of psychometric concerns regarding the structural fidelity of the instruments as well as concerns about the cultural bias evident in both measurement instruments. Evidence for the discriminant and incremental validity of the two instruments was, however, provided and recommendations are made for the reconceptualisation of trait EI as an emotional competence and ability EI as an emotional intelligence.

Key terms:

Emotional intelligence, thinking styles, trait EI, ability EI, emotional competence, reliability, construct validity, discriminant validity, incremental validity, confirmatory factor analysis, Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), Schutte Self-Report Emotional Intelligence Test (SSREIT), Thinking Styles Inventory (TSI), occupational environment, job satisfaction

Declaration

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I declare that “Defining the boundaries between trait emotional intelligence and ability emotional intelligence: An assessment of the relationship between emotional intelligence and cognitive thinking styles within the occupational environment” is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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SIGNATURE **DATE**

(MISS A MURPHY)

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CHAPTER 1
GENERAL OVERVIEW

1.1. INTRODUCTION

In the modern world there is growing emphasis on finding characteristics that can moderate effective functioning within increasingly complex workplaces. Career environments are extending across global borders to include teams that routinely work across time zones and cultures within completely virtual environments. More and more organisations globally are moving towards mobile workforces and home based employment, resulting in decreased face-to-face contact with colleagues and superiors and greater isolation. The advent of social networking and new technological developments such as Web 2.0 (Carter, 2007) has also placed pressure on traditional conceptions of relationships between people and norms surrounding social interaction. People of the 21st century interact differently with each other, work differently and have different values to generations of the past. As a result, these changes may impact on traditional theories of human and social psychology, raising demands for methods that can facilitate coping of individuals within changing societal boundaries (Jones & Holton, 2006; Ellison, 2004).

Emotional intelligence or EI is one of these facets that has been acclaimed as mediating functioning in a number of life dimensions, and has received attention due to the possibility that emotions may moderate intelligence behaviour by influencing an individual's reaction to, and interpretation of information (Salovey & Mayer, 1990). EI has been credited as the reason for why some people are more successful than others in positions of leadership (Day, Newsome & Catano, 2002) or aspects of workplace functioning, such as coping in high pressure work environments (Caruso, 1999).

The interaction between emotions and intelligence has previously been investigated in part by theories of social and personal intelligence, however, Salovey and Mayer (1990) were the first theorists to attempt to concentrate on the ability to use and manage emotions within a hierarchical psychometric model of intelligence. The earliest concept of EI was defined as “the ability to perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge and to reflectively regulate emotions so as to promote emotional and intellectual growth” (Mayer & Salovey, 1997, p. 10).

From the earliest conception, Salovey and Mayer (1990) have insisted that El qualifies as a form of intelligence that will broaden the traditional conceptualisation of intelligence. They further argued that it is a form of intelligence that may be learned or taught and may account for individual differences in many important human facets such as psychological well-being, occupational and academic success, life satisfaction and the quality of interpersonal relationships (Palmer, 2003, p. 1). With the immense interest generated by El and the plethora of alternative El tools and theories that followed on Salovey and Mayer's model, this conceptualisation soon became the source of endless debate and confusion regarding the nature of El and the best way to measure it (Roberts, Zeidner & Matthews, 2001).

Debate rages about the definition, nature, measurement and application of El. Controversy exists not only between El researchers and their critics who doubt the value of the concept, but also among El researchers themselves, who differ in their views of the nature and the measurement of El. Exaggerated claims for the importance of El in job performance, leadership and other areas of organizational life have assisted in fuelling scepticism towards the entire concept of EI. Much of the debate has to do with the face validity of El as emotions have traditionally been viewed as indicative of irrational thought processes and disruptive to mental activity. Additional criticism arises from the difficulty in objectively measuring a construct as complicated as emotions. It has been argued that there are no right or wrong ways to feel in any given situation and, therefore, to determine truly right and wrong answers for tests of El in the same way that intelligence would be measured, is a problematic ideal (Landy, 2005; Matthews, Zeidner & Roberts, 2003).

There are a number of definitions and models of El and research has indicated that EI may have interesting and valuable relationships with a number of important interpersonal success factors, such as social network size and quality (Ciarrochi, Chan, & Bajgar, 2001), positive relations with others (Lopes, Salovey & Straus, 2003) and life satisfaction (Palmer, Donaldson, & Stough, 2002; Saklofske, Austin, & Minski, 2003). The concept of El however, is still in its infancy and debate regarding the actual existence of a distinction from either personality or intelligence is still rife. Additional work is required to explore the foundations on which the El construct rests by determining the space that El occupies distinctly from both personality and intelligence.

The world has become a swiftly changing and complex place and there is pressure to respond with alternative tools and ways of thinking, to support adaptation within changing occupational, social and environmental spheres of life. Trends such as virtual workplaces and transformative social networking, mobile or home based working, trans-nationalisation, and global citizenship, are escalating challenges that require the development of innovative solutions to facilitate coping within changing times. As much promising research has been conducted that divulges the potential for El to facilitate success in many life spheres, clarifying the boundaries of theories of El has the potential to facilitate the empowerment of

organisations, social institutions and individuals in succeeding within the complex boundaries of the modern world.

1.1.1. Personality, intelligence and emotion

A question that has always been central to the study of individual differences is whether or not personality traits and intellectual abilities are related and how they are related. This question has been debated by many of the original theorists involved in the study of personality and intelligence (see for instance Cattell, 1941; Spearman, 1927; Wechsler, 1940, 1943, 1950; Whipple, 1922), however, in the last few years interest in the personality-intelligence interface has intensified due to increased emphasis on the interaction of emotions with personality and intelligence in theories such as those of Damasio (1997).

Personality is explained in the context of this study as a hierarchical trait model, made up of a number of behavioural tendencies, dispositions or characteristics which impart consistency to behaviour (Eysench, 1994; Sternberg, 1998). The most widely accepted core traits identified in personality are referred to as extraversion, neuroticism, openness, agreeableness and conscientiousness (Eysench, 1994; Sternberg, 1998). This theory of personality is referred to as the Big Five theory of personality traits. Traits are defined as “stable sources of individual differences that characterize a persona and that may originate in the person's nature (heredity characteristics) or the person's nurture (environmental influences)” (Sternberg, 1998, p. 583).

Contemporary theories maintain that the term intelligence consists of three major meanings: biological intelligence, psychometric intelligence and social intelligence (Eysench, 1994). Biological intelligence refers to the neural networks and physiological processes of the brain. Psychometric intelligence refers to cognitive ability and constitutes factors such as Spearman's g (general intelligence) which can be measured by intelligence tests (IQ). Social or practical intelligence is defined as the application of IQ to adaptation in life and includes aspects such as the use of emotion in facilitating success and the role of personality in mediating the use of cognitive intelligence (Eysench, 1994). Current thinking about intelligence theories is elaborated on in Chapter 2.

Humans are innately predisposed to experience emotions which are mediated by neural structures such as the amygdala in the brain (Damasio, 1994). The association between emotions and environmental situations or reactions is further strengthened during social development. Emotions have been described as an evolutionary adaptive function, which assists humans in adapting to changing environments both in

terms of their needs and circumstances. Emotions are a crucial aspect of social interaction that allows people to communicate feelings and regulate interactions in social situations (Sternberg, 1998).

Emotions are theorised to be capable of influencing and directing thinking activity (Smirnov, 1994). Differences in emotional expression have been related to variations in intelligence and thinking, for example, emotion has been directly related to the solving of intellectual tasks (Tikhomirov cited in Smirnov, 1994, p. 242). The tendency to experience negative emotion over positive emotion has been related to a high performance IQ and a low verbal IQ as measured by the Wechsler scales (Kepalaite cited in Smirnov, 1994, p. 242).

The term social intelligence was first devised by E.L. Thorndike (1920) to refer to the ability that people have to understand and manage other people and engage in adaptive social interactions. Social cognition refers to the thought processes which occur in social situations, specifically with regard to how people perceive and interpret information from themselves and other people whom they are interacting with. Social cognition draws on emotion, motivation, personality and thought processes. Emerging theories on the relationship between cognition and emotion are moving away from the traditional belief that the mind acts like a computer and that logical processing is uninfluenced by emotion. Contemporary theories such as those proposed by Damasio (1994), describe emotions as essential to rational decision-making processes.

Damasio's theories are based on the standard neuroscientific conceptualisation of brain function which maintains that thinking is a function of patterns of nerve cell activation or cognitive representations that are activated in correspondence with patterns in the external world. Damasio suggests that emotions are similarly nerve activation patterns that correspond to the internal world. According to Damasio's (1994, 1999) somatic marker hypothesis (SMH), positive and negative emotional experiences result in the somatic consequences being marked in the mind and then reproduced when that event reoccurs, thus allowing the mind to simulate physiological emotional reactions in split-second decision making. The changes in body states that are elicited by these experiences lead to patterns of nerve cell activation in the brain. Emotions are considered to be cognitive representations of body states that strongly aid future adaptive learning by producing signals to warn against or affirm behavioural options. In effect the body can be bypassed as the brain is exposed to the psychosomatic responses of emotional situations and learns to mimic these responses to aid in the making of speedy decisions in similar situations (Damasio, 1994). Emotions are, therefore, input to the brain from the internal body environment, similarly to visual and auditory stimuli which serve as input to the brain from the external environment (Dunn, Dalgleish & Lawrence, 2006).

This theory is supported by emerging neuroscience evidence that suggests that rational decision making is dependent on prior accurate emotional processing. Research into this theory has reported that the

process of feeling emotions requires the participation of certain brain regions, such as the limbic system and particularly the amygdala (Damasio, Grabowski, Bechara, Damasio, Ponto, Parvizi & Hichwa, 2000) and that there are discernable neural systems responsible for recognising emotions (Adolphs, Tranel & Damasio, 2002). Adolphs et al., (2002) found that the recognition of emotions was controlled by separate brain regions, depending on whether the emotional stimulus which the person was exposed to was static or explicitly conveyed information regarding actions.

Damasio's theory demonstrates that emotion is capable of actively guiding reasoning process, and connects the lower level brain regions such as the hypothalamus and brain stem, which are responsible for the regulation of emotions and feelings, as well as the higher level prefrontal cortices responsible for language and abstract intellectual skills (Dunn et al., 2006). For example Bechara and Damasio (2005) identified that people with damage to the ventro-medial part of the pre-frontal cortex may be able to perform to a high level on most language and intelligence tests, but they display gross defects of planning, judgement and social appropriateness. They argued that the defects identified were due to the inability to use emotion-based signals or somatic markers generated from the body when appraising different response options.

The purpose of the SMH is to refute the popular assumption that the mind and body are separate entities and to postulate instead that the two combine to interact with the environment as a whole. The somatic marker mechanism is seen as the way in which cognitive representations of the external world interact with cognitive representations of the internal world. Decision making is, therefore, viewed as a combination of cognitive reasoning such as a logical cost-benefit analysis of a given action, and signals from somatic markers that provide the individual with an indication of how advantaged or disadvantageous a situation may be in complex or uncertain situations where a complete logical decision making process may not be possible (Dunn et al., 2006).

El has been endorsed as the link between emotion and intelligence which facilitates success within a number of life domains including work, study and personal relationships (Goleman, 1995; Mayer, Salovey & Caruso, 2000a). El is viewed as the reason why individuals differ in the extent to which they attend to, process and use emotional information from within themselves and from others during interaction (Petrides & Furnham, 2003). Theories of El were thus developed to explain some of the non-cognitive contributions to intelligence (Salovey & Mayer, 1990) and to fill some of the gaps in contemporary understanding of intelligence.

Arising from Damasio's SMH theory is the argument that the capacity to be emotional is synonymous with being socially intelligent and provides powerful evidence that thinking and feelings are components of similar neural processes. Damasio's SMH theory offers neuroscientific evidence of the interaction between emotions and reasoning in modifying social responses. Theories of emotional intelligence are

seen as relating to a specific set of emotional abilities and the potential for social functioning or behaviour. EI theories could result in an explanation for individual differences in successfully interpreting or applying decisions to circumstances based on emotional responses. If we were to integrate the perspective that Damasio's theory provides a neurological basis for the link between thought and emotion, emotional intelligence could be viewed as the ability of the individual to translate somatic messages into successful adaptive responses to environmental stimuli.

1.2. PROBLEM STATEMENT AND RESEARCH AIMS

1.2.1. Distinguishing emotional intelligence as a trait from emotional intelligence as an ability

Early models (see Goleman, 1995; Bar-On, 1997) that followed Salovey and Mayer's (1990) theory of EI as an intelligence were not sufficiently detailed and did not distinguish adequately between personality factors and cognitive processes. Early research on EI failed to draw a distinction between the measurement of EI as a component of personality and as a form of intelligence, resulting in a great deal of misunderstanding about the impact of EI on everyday life and how the concept should be measured. The models that integrated elements of personality elicited much criticism because firstly, incorporating personality aspects is contrary to purist traditional cognitive definitions of intelligence, and secondly because there was not enough conceptual overlap observed between the different instruments used to measure this construct (Matthews et al., 2003).

In order to move beyond the problems with measurement consistency, a number of theorists sought to separate the different types of theories into different taxonomies. Mayer, Caruso and Salovey (1999) firstly separated the models by distinguishing between mixed and ability EI. According to Mayer et al., (1999) mixed models incorporate a wide variety of personality variables along with cognitive abilities, as opposed to Mayer and Salovey's (1997) ability model which is a purely cognitive definition of EI. Petrides and Furnham (2000a), however, established an alternative model of EI that distinguishes between trait EI and information-processing EI, which takes into account the different measurement approaches and operational definitions adopted by mixed and ability model theorists. Trait EI is concerned with cross-situational consistencies that are present in specific traits or behaviours, such as empathy, assertiveness

and optimism, thereby drawing heavily on personality variables (e.g., Bar-On, 1997; Goleman, 2000) as opposed to information-processing EI, which concerns abilities such as being able to identify, express and label emotions, and includes models that have attempted to incorporate EI into the overall psychometric structure of intelligence (e.g. Mayer, et al., 1999; Palmer, 2003).

Trait EI, referred to by Petrides and Furnham (2001) as emotional self-efficacy, is defined for the purposes of this research as a constellation of emotion-related self-perceptions and dispositions relating to the ability to recognise, express, understand and evaluate one's own emotions, as well as the emotions of others, to use emotions to direct reasoning and to manage one's own emotions and the emotions of others, in order to guide thinking and action to assist with successful adaptation to environmental demands and pressures (Palmer, 2003; Van Rooy & Viswesvaran, 2004). Trait measures are distinct from ability measures due to the emphasis on self-perceived abilities, rather than objective assessment, and are assessed through self-report inventories that measure typical behaviour (e.g. Bar-On, 1997; Salovey, Mayer, Goldman, Turvey & Palfai, 1995; Schutte, Malouff, Hall, Haggerty, Cooper, Golden, & Dornheim, 1998). The precise composition of these self-perceptions and dispositions varies across different conceptualizations, with some being broader than others. This approach to EI research includes various dispositions from the personality domain, such as motivation, assertiveness (Goleman, 1995), elements of social intelligence (Thorndike, 1920) as well as emotional intelligence as an ability (Salovey & Mayer, 1990), which is distinct from concepts of cognitive ability.

The information-processing approach referred to as cognitive-emotional ability by Petrides and Furnham (2001) is more focused on the constituent parts of EI and its relationship to traditional intelligence. Ability EI is therefore defined for the purposes of this research as the capacity to perceive emotions, assimilate emotion-related feelings, understand the information of those emotions and manage them (Mayer & Salovey, 1997). Existing measures of ability EI have attempted to assess EI levels, using measures of maximal performance, however, the development of objectively correct responses to test items is a difficult task and there are only three instruments that have been developed, each a new version of the previous one.

The development of various models and measures of EI has provided a number of alternatives to measuring and conceptualising the construct. This has, however, resulted in confusion regarding the nature of EI, resulting in EI being described as a badly defined construct with diffuse boundaries (Palmer, 2003). Variables that fall both within the domains of personality theory and cognitive abilities have been incorporated in theories of EI, resulting in difficulties establishing the distinct space occupied by the construct. A number of critics have even claimed that EI as a concept does not exist, and that the measures that have been developed are merely identifying constructs that belong within the sphere of personality or mental ability and which are measured more appropriately by established methods within these domains (Landy, 2005).

In order to systematically validate the distinction between trait and ability EI, the discriminant validity of the two different measures of EI needs to be established within the framework in which the measures were developed (Petrides & Furnham, 2000a). Research regarding the relation between ability and trait measures of EI has yielded low correlations between the two types of instruments (Brackett & Mayer, 2003; Mayer, Salovey & Caruso, 2002; Lopes et al., 2003) however, the lack of relationships between these self-report and ability instruments is consistent with findings in relation to the assessment of intelligence in general (Goldenberg, Matheson & Mantler, 2006).

Goldenberg et al., (2006) state that due to the extent that these measures tap into common constructs, their patterns of convergent validity should be similar. The validity of trait versus ability measures of EI therefore needs to be confirmed by examining relationships with established measurements of personality traits and intelligence or cognitive abilities. Validating one speculative measure of trait EI against another trait EI measure will only result in inflated correlations between variables, due to the similar semantic content of the instruments (Petrides & Furnham, 2000a). This study therefore aims at examining the degree of convergence between the trait and ability EI models, by establishing potential overlap or relationship between a self-report (SSREIT) and a performance based measure of EI (MSCEIT).

1.2.2. Relations between emotional intelligence and thinking styles

Theories on cognitive thinking styles were developed to explain why people differ in their approaches to solving problems. A 'cognitive thinking style' can be defined as a person's preference for a certain thinking process (Sternberg, 1997). Thinking styles are seen in the context of this study as specific reasoning and problem solving strategies that help to elucidate why people respond in different ways to problems that need to be solved in the context of studies or work, or respond differently in social interactions with other people.

Theories of cognitive thinking styles have been developed as a link between personality trait theory and cognitive ability. Sternberg (1997) defines thinking styles as preferred ways of thinking, which are not considered to represent actual cognitive abilities, but rather a method for using and expressing thinking abilities or processes. Theories of thinking styles attempt to explain why people approach solving problems in different ways, and to provide an understanding of individual preferences for different thinking styles (Sternberg, 1997). Cognitive thinking styles are therefore seen as traits rather than abilities and are as a result partially related to personality (Balkis & Isiker, 2005; Zhang & Huang, 2001).

From this perspective there should be predictable relationships between trait EI and cognitive thinking styles. There has only been one study conducted to date which examines the relationship between EI and cognitive thinking styles, by comparing a self-report measure of trait EI (SSREIT) to a self-report measure of thinking styles (TSI) (Murphy, 2006). The research reported a number of significant correlations between the overall scales and subscales of thinking styles and trait EI. Specific findings revealed that high EI was correlated with complex thinking styles, suggesting that people with high EI are generally able to juggle multiple tasks without losing sight of priorities, solve problems and deal with situations in new and creative ways that require complex thought, and are group oriented, preferring to work with other people. Low EI was found to correlate with conservative thinking styles, suggesting that people with low EI prefer conventions and approach tasks according to standard ways of doing things. In light of the association found between trait EI and thinking styles, the validity of ability measure versus trait measures of EI can be further examined by exploring the relationships between these two measurement approaches and thinking styles. In this way the study aims at imparting greater clarity to the boundaries between trait and ability EI.

1.2.3. The potential influence of emotional intelligence and thinking styles on job satisfaction within the workplace

An important criterion for establishing the validity of a measure of EI is whether it is able to predict life success in various domains related to emotional functioning (Goldenberg, et al., 2006). A major postulate of EI models is that EI is primarily associated with effective regulation of emotions in stressful situations and resultant adaptive coping (Zeidner, Matthews & Roberts, 2000). It is credited with providing the individual with an advantage within an occupational environment, as people with high EI have been found to be more self aware and more likely to monitor their emotions and reactions (Schutte, Malouff, Bobik, Coston, Greeson, Jedlicka, Rhodes & Wendorf, 2001), and therefore better equipped to adapt to complicated environments. Mayer, Salovey and Caruso (2000b) have found that individuals who are high in EI are expert at identifying and responding appropriately to the emotions of co-workers, customers and superiors. Research has reported that both trait and ability EI is related to life satisfaction after controlling for other aspects such as personality or IQ (Martinez-Pons, 1997; Ciarrochi, Chan & Caputi, 2000). As a consequence of the relationship with life satisfaction and the described benefits for succeeding in occupational environments, it is expected that both ability and trait EI should be able to mediate job satisfaction. A further aim of this research is therefore to examine the predictive validity of a trait versus an ability measure of EI, by examining the relationships of these measures with job satisfaction.

The study also includes an exploratory dimension that seeks to facilitate the relationships between thinking styles and job functions within the workplace. Work environments differ in terms of the information processing requirements that are placed on individuals and research has suggested that people within many groups in organisations will share similar cognitive styles which are related to the information-processing requirements of their work (Hayes & Allinson, 1998). Previous research has reported that analytical thinkers prefer to work in well-defined, stable, structured, ordered, and relatively impersonal situations, where they can function within existing rules and procedures and prevailing structures. People with a more intuitive style on the other hand have been found to favour unstructured, changing, highly involving, innovative, flexible, dynamic, and relatively personalised environments, where they can work autonomously and in freedom from rules and regulations (Cools & Van Den Broeck, 2007). The following study examines the thinking styles of employees in three groups separated according to the cognitive climate of their occupations according to the typology identified by Cools and Van Den Broeck (2007) which encompasses a *knowing-oriented cognitive climate* that includes employees involved in finance, outsourced business processes, application management and information technology, and research functions, a *planning-oriented cognitive climate* such as administrative and technical or IT development staff who are responsible for applying technical skills and capabilities to build and maintain technology solutions, and a *creating-oriented cognitive climate* which incorporates functions such as consulting, sales and marketing.

Research into the relationship between various careers and EI is limited, although there are a number of careers or study fields that have been found to correlate with high levels of EI. Van Staaden (2001), for example, reported that psychology students exhibited higher levels of EI than engineering students and Caruso (1999) reported that high levels of EI was related to people with intensive career fields such as the mental health field as well as management. The present study examines difference in emotional intelligence for different job functions by comparing employees who are considered as working in job functions requiring greater emotional problem solving such as consulting, creative services or human resources divisions, to employees who are considered as working in occupations such as IT development that deal primarily with technical information required for building and maintaining technology solutions.

In addition, the study will explore differences between generations, genders and ethnic groups within the workplace in order to examine whether there are differences in EI and thinking styles between these groups. A further component that will be examined will be the differences between management levels compared to non-management staff, to determine the potential relationship between EI and thinking styles with levels of leadership.

1.3. MOTIVATION FOR CONDUCTING THE STUDY

Research shows that the number of virtual workers continues to increase and the percentage of companies that define themselves as virtual workplaces has increased from 57% in 2006 to 83% in 2007 (Johnson, 2007). The impact of this is a major change in the complexity of corporate workplaces and demands for effective employee profiles that are no longer solely focused on a set of narrowly defined skills suited specifically to an occupation, such as analytical abilities, knowledge of the content domain and the ability to carry out the function of the position. Rather, more and more employers are demanding a greater range of interpersonal and adaptive skills such as team work, communication and critical thinking. Performance and innovation have become leading goals in modern organisations and employees are expected to develop innovative solutions to projects, interact effectively in complex virtual teams and perform optimally in high pressure environments (Bar-On, Brown, Kirkcaldy & Thome, 2000). Accompanying these situations is an increasing need for employees to have good social skills, to be able to manage conflict effectively and to cope with stress and tension appropriately in the workplace. Organisations and learning institutions are as a result faced with an increased challenge to impart these skills to employees globally (Cilliers & Sternberg, 2001; Horak & Du Toit, 2002; Sternberg, 1997).

For a person to have a high El means that the person knows how to manipulate his or her own emotions adaptively or in such a way as to avoid counter-productive outcomes to situations (Salovey, Mayer & Caruso, 2002). It is also alleged that El is a construct that can be learnt or taught (Palmer, 2003) which suggests that an improved understanding of the processes underlying El could facilitate the development of training programs aimed at enhancing the El skills of individuals. The debates surrounding El and its key assumptions thus have implications for many areas of daily life, including those of educational styles, academic achievement, life satisfaction, personal happiness and career and occupational success.

With increasing emphasis being placed on the importance of emotional health, employee satisfaction and interpersonal interaction both within and outside the company, there is a greater need to provide people with the skills required to function adaptively within their chosen career environment. El has been widely advertised as a self-help tool with a number of websites and El organizations offering El testing and workshops to measure and improve El.

Similarly to personality theory, El is a construct that is difficult to measure and define due to the variability involved in defining subjective abilities (Pérez, Petrides & Furnham, 2005). Although studies have obtained correlations between El and real life criteria, these correlations have been found to be moderate (Petrides, Furnham & Frederickson, 2004b), and media hype often results in a distorted picture of the true influence of El. Before extreme claims can be made regarding the influence of El on occupational and

academic success, additional research is required to confirm the validity of the measurement instruments as well as the core definitions of the underlying constructs.

According to Petrides and Furnham in 2000 (2000a), the existence of a coherent research domain of EI had not yet been demonstrated and this holds true still today. Few studies have examined both trait and ability-based EI measures to examine the extent of the overlap between these constructs (Conte, 2005). In general, both types of EI measures have demonstrated adequate reliability, Conte and Dean (2006) however, argue that these findings provide no indication about whether EI measures are simply measuring constructs already measured by other, more established psychological constructs.

EI defined as an ability appears to be the most comprehensive and empirically valid measure of EI (Ashkanasy & Daus, 2005), on the other hand EI defined as a trait has been shown to relate strongly to important life criteria, and has potential value as the concept is based on a recognition of the importance of multiple aspects of personality that relate to emotion (Goldenberg et al., 2006). Petrides et al., (2004b) argue that as trait EI encompasses behavioural tendencies and self-perceived abilities rather than actual cognitive abilities, it belongs in the realm of personality. Ability EI, on the other hand, should be considered as belonging primarily in the domain of cognitive ability as it is allegedly encompasses actual abilities surrounding the use, understanding, management and perception of emotions. In Chapter 2 and 3, the difference between EI conceptualised as an ability compared to EI conceptualised as a trait will be explored, based on the postulation that the two models should rather be separated and conceptualised as an emotional intelligence versus an emotional competence. It is therefore important to validate the proposed taxonomy regarding the nature of EI.

Establishing the reliability and validity of a taxonomy of emotional intelligence is important to both realise the potential value of EI in contributing towards predicting aspects of life success, as well as ensuring the sustainability of the construct itself. With the looming skills crisis in many countries across the world caused by aging populations and migration of skilled workers (Gundling & Zanchettin, 2007), development of reliable and valid measures of EI could aid in the understanding of the nature and cause of individual differences in EI, and possibly assist in enhancing workplace productivity and satisfaction by targeted training and remedial programs aimed at improving interpersonal interaction between people functioning in complex working environments.

Research on the value of EI with respect to work-related behaviour is also an area of research that has been neglected. A review conducted by Landy (2005) indicated that research done on EI over the past decade has predominantly occurred with children, adolescents and college students as participants and very few research studies have been conducted with non-U.S. participants. The same is true of research about thinking styles. Given the importance placed on employee satisfaction in improving attraction, recruitment, motivation and retention of high quality employees, this study further investigates whether

people who have a higher level of EI will show higher levels of job satisfaction and lower levels of actual resignation behaviour. This study therefore provides additional research into the impact of El and thinking styles within workplace environments.

Further understanding is required regarding the relationship that El has to emotions and thought. The way in which people think has been reported to be a crucial determinant of personal success especially with regard to career choice and occupational satisfaction (Sternberg, 1997). An investigation into the interaction between styles of thought and the ability to adaptively use and respond to emotions could offer insight into the relationship between thought and emotion, as well as assist in explaining the relationship between flexibility in thinking styles and El.

This study expands on previous research into the validity of trait El and thinking styles. This study also examines differences in ability, trait El and thinking styles within occupational environments. Although this study does not address the relationship between El and work performance, it may stimulate further research into issues such as whether training in El and flexibility of thinking styles could assist employees in attaining high performance. This would provide beneficial information to guide the implementation of skills enhancement programs.

1.4. OUTLINE OF CHAPTERS

This study is reported in six chapters:

Chapter 1: General overview

The purpose of the present study is to examine how measurement formats affect the psychometric and theoretical property of the El construct. The introductory chapter begins with a brief overview of the origin, nature and controversy surrounding emotional intelligence and the potential place for EI in the modern working world. Thereafter the nature of personality, intelligence and emotion and the possibilities for interrelationships between these constructs are briefly discussed. Following this section, the aims and research problem is examined. The primary aim of the study is identified as an exploration of the potential for separating El measured with self-report instruments from El measured with ability tools into two

unique and distinguishable constructs or facets of El. A secondary aim of the study is identified as providing evidence of discriminant validity, by comparing a measure of trait and ability El to a measure of cognitive thinking styles, which is also defined as a trait. The third and final aim of the study is to provide predicative validity of El in the workplace, by determining the extent to which ability or trait El can predict job satisfaction. The chapter concludes with a discussion of the significance and motivation for conducting the study.

Chapter 2: The theoretical framework underlying emotional intelligence and cognitive thinking styles

The chapter begins with a review of the origins of intelligence theory and the potential for intelligence in emotions. Thereafter the emergence of El and the conceptualisation of the construct are discussed. The body of the chapter reviews the features that distinguish emotional intelligence as an ability versus emotional intelligence as a trait. The chapter concludes with an overview of nature and theoretical properties of cognitive thinking styles.

Chapter 3: Reliability and validity issues in relation to the emotional intelligence and cognitive style measurement instruments

The aim of this chapter is to review and discuss issues with reliability and validity that have been identified in previous research studies with measures of trait and ability EI. The chapter will focus on the most prominent measures of EI specifically the measurement instruments that are used in the present study. The properties of performance versus self-report measures that define this distinction are examined in light of corresponding research findings to date. In addition, a critical review is presented of previous research that supports or refutes the hypothesis that self-report and ability El instruments are able to measure El constructs beyond that which is explained by existing measures of personality and intelligence. The chapter concludes with the research questions and hypotheses to be tested.

Chapter 4: Methodology

The purpose of this chapter is to describe the empirical research study. The chapter begins by reviewing the aims of the research. Following this is a discussion of the research design and reasons for the choice of the design, the sample, the measuring instruments, method of data-collection and the statistical methods used. This chapter provides a comparative analysis of evidence provided by previous research

studies, regarding the reliability and validity of the instruments used and provides justification for the research procedure and methods employed.

Chapter 5: Analysis of results

The analysis of results chapter reports the results of the study, arrived at through analysis of the data. The chapter commences with a description of the demographic profile of the sample. The validity and reliability of the measures are reported thereafter, followed by the results of the research hypotheses identified in Chapter 3.

Chapter 6: Discussion of the results and conclusion

The final chapter provides a discussion of the study findings, with regard to the hypothesis examined and the implication for properties of the El construct. The implication of results for application in the workplace is also discussed. The chapter concludes by discussing some limitations of the present study and recommendations for future research.

1.5. CHAPTER SUMMARY

This chapter provided background to the research and an overview of the relevant constructs. The purpose of this study is to provide construct validity for the distinction between the two proposed dimensions of EI, as well as discriminant validity, by examining the relationships with a trait measure of cognitive thinking styles and predictive validity, by examining the extent to which El can predict job satisfaction. The chapter concluded with significance and motivation for conducting the study and an outline of the chapters to follow.

CHAPTER 2

THE THEORETICAL FRAMEWORK UNDERLYING EMOTIONAL INTELLIGENCE AND COGNITIVE THINKING STYLES

Research findings are frequently reported suggesting that EI is a distinct construct that can be reliably measured (Mayer et al., 1999; Petrides, & Furnham, 2003; Brackett & Mayer, 2003; Saklofske et al., 2003) yet critical questions remain about the concept, theory and measurement of EI. There is still insufficient research that addresses the distinction between trait and ability EI, and researchers do not adequately conceptualise the distinct space between intelligence and personality in which these constructs operate. If trait and ability EI measure two distinct constructs, the differences between the two theories need to be clarified, and the domains they address should be distinguished clearly.

The roots of the EI model can be traced back to the theory of social intelligence, developed by E.L. Thorndike in 1920 and Gardner's (1983; 1993) interpersonal and intrapersonal intelligences. The abundance with which EI models and methodology were released after the first formal definition of the term EI by Salovey and Mayer in 1990, led to a haphazard development of the construct and numerous conflicting findings (Petrides et al., 2004b). Petrides et al., (2004b) argue that the lack of coherence and ambiguity stems from a failure to take into account the fundamental difference between self-report measurement and measurement using behavioural performance, and to consider the implications of these types of measurements in demarcating the boundaries of EI. Self-report measurement results in the operationalisation of a construct as a personality trait whereas behavioural or maximum-performance measurement would lead to the operationalisation of a construct as a cognitive ability (Furnham, 2006). Furnham (2006) contends therefore, that it is important to realise that these are two different constructs because the procedures used in the operational definitions of trait EI and ability EI are fundamentally different, even though the theoretical domains on which the definitions are based may overlap. A concern continually expressed by a number of researchers is that training and measurement tools are being developed and sold in educational, social and workplace contexts before satisfactory definitions, reliability and validity of the underlying models have been recorded (Ashkanasy & Daus, 2005; Landy 2005).

Petrides and Furnham (2000a) first conceptualised the distinction between trait and ability EI, and although there has been some research done on establishing the structure of EI in this regard (Petrides & Furnham, 2001; Petrides et al., 2004b), additional research studies are required that use both a measure of trait EI and a measure of ability EI, to determine how these measures overlap with instruments that have previously been shown to share theoretical space with one or both of these instruments. Petrides and Furnham consider ability and trait EI to be two conceptually different theories which measure distinct

constructs, and predict very different facets of life. By obtaining an increased understanding of the relationship between measures of ability El and trait El, and the potential for shared variance in predicting life space criteria such as cognitive thinking styles, additional evidence can be gathered which will demonstrate either the distinctiveness or interrelationship between these two constructs.

The purpose of the present study is to explore how the impact of the self-report versus ability procedures by which EI is measured impacts on the psychometric and theoretical properties of the El construct. Trait EI is hypothesised to be orthogonal to ability EI, and should therefore be unrelated to proxies of cognitive ability (Furnham, 2006). As a result, trait EI is considered to be oblique to personality constructs as it is partially determined by several personality dimensions and therefore lies at the lower level of personality hierarchies (Petrides, Pita, & Kokkinaki, 2007b). Ability EI, however, is expected to be related to general intelligence as well as specific personality dimensions that reflect basic differences in human emotionality such as neuroticism (Furnham, 2006), as ability EI concerns emotion-related cognitive abilities measured via performance-based tests (Petrides et al., 2007b). This chapter outlines the theoretical basis for the distinction between trait and ability EI within the context of intelligence research. The chapter also provides an overview of the nature and theoretical properties of cognitive thinking styles.

2.1. A BROADER VIEW OF INTELLIGENCE

2.1.1 The historical development and theoretical conceptualisation of intelligence

Speculation about the relationship between thought and emotion is an age old topic. Classical theory from the 1900's focused on the argument that thought and emotions are relatively separate. In this era intelligence theory emerged, and intelligence tests were conceptualised and developed. From 1970 onwards however, more and more theorists began to research the interrelationship between intelligence and emotion, and the field of cognition and affect was developed (Sternberg, 1998).

Intelligence has been conceptualised in a number of different ways, and there is as yet little consensus on a general definition of intelligence. Intelligence is considered to be the reason for individual differences in the ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning and to overcome obstacles using thought (Neisser,

Boodoo, Bouchard, Boykin, Brody, Ceci, Halpern, Loehlin, Perloff, Sternberg, Urbina, 1996). Theorists are generally in agreement that intelligence consists of a hierarchy of abilities needed to solve abstract reasoning problems (Brody, 2000), and is referred to by a number of terms including cognitive ability, intelligence, general mental ability (GMA) and general intelligence (g). In general, cognitive ability has been reported to be the best predictor of overall performance and task performance across different careers as well as a number of important life outcomes such as years of education, social status and occupational income (Neisser et al., 1996).

The dominant theory of intelligence is the psychometric approach, which is the theory of intelligence that has been chiefly researched as well as used most widely in practical settings (Neisser et al., 1996). Tests to measure Intelligence Quotient (I.Q) were developed during the initial part of the 20th century as one of the primary measures of intelligence. Since the development of the first test of intelligence by French psychologist, Alfred Binet, many tests have been developed to measure some aspect of individual differences in cognitive functioning (Roberts et al., 2001). Spearman argued for the existence of a primary general factor, g, that was evident in the positive nature of the correlations measured across a number ability factors (Brody, 2006). Spearman maintained that there was a structure to intelligence, and that the structure could be captured in a single number (Hubey, 2002). The foundation for existence of the g construct is based on research findings that performance on any one test of cognitive ability is positively related to performance on any other test of ability. The psychometric approach is therefore based on the occurrence of a common element that is present in all tests of cognitive ability (Brody, 2006) that were not specifically designed to measure intelligence, but rather closely related constructs such as scholastic aptitude, school achievement and specific abilities that were developed primarily for selection purposes (Neisser et al., 1996).

The psychometric approach is seen as the most influential yet controversial of all the theories of intelligence. A number of contemporary researchers believe that general intelligence does not explain all of the relationships among different abilities and that g is an unstable construct whose composition varies with the items in a test battery (Brody, 2006). Additional criticism levied against the general psychometric measures of intelligence relates to the lack of consideration for situational factors, such as environment or cultural setting when predicting achievement. One of the predominant concerns arises from group differences reported in general intelligence mean scores especially across different ethnic groups (Van Rooy, Dilchert, Viswesvaran, & Ones, 2006).

A primary hypothesis of critics of the psychometric approach is that cognitive intelligence as measured by g does not fully explain intelligence in its entirety and that there is potential for several types of intelligences to co-exist within one person (Stys & Brown, 2004). Theories such as Gardner's theory of multiple intelligences, Sternberg's triarchic theory of intelligence and even the different versions of

emotional intelligence theory (Brody, 2006) were all developed to emphasise that general intelligence may not be the primary component in explaining individual differences in cognitive ability.

As early as in 1920, E.L. Thorndike proposed that intelligence may consist of three facets: abstract, mechanical and social intelligence (Landy, 2006). Thorndike described social intelligence as a form of intelligence that is distinct from abstract or academic intelligence and defined social intelligence as 'the ability to manage and understand men and women, boys and girls, to act wisely in human relations' (Thorndike in Landy, 2006, p.85). Thorndike's suggestion in 1920 that there may be three facets of intelligence: abstract, mechanical and social, arose in an attempt to caution against the narrowness of the psychometric instruments used to measure intelligence by demonstrating that intelligence could be measured in a number of different ways and revealed in a number of different venues (Landy, 2006). Social intelligence was considered to be distinct from abstract or academic intelligence as it was proposed to include the comprehension of social behaviour and norms and the regulation of social conduct, whereas abstract intelligence involved the ability to understand ideas and symbolic principles, and mechanical intelligence involved the ability to learn to understand and manage things and mechanisms (Landy, 2006).

Howard Gardner argued that standard tests of intelligence focus extensively on tasks that are not relevant to real-life accomplishments (Brody, 2006). Gardner developed a theory of multiple intelligences that consisted of six different and independent intelligences: linguistic intelligence, logical mathematical intelligence, spatial intelligence, bodily-kinaesthetic intelligence and two forms of personal intelligence: interpersonal and intrapersonal intelligence (Brody, 2006). Gardner viewed intelligence as consisting of the ability to adapt and solve problems within a large number of contexts, and maintained that human intelligence should be defined as a set of abilities rather than as a single construct (Gardner, 1983).

Gardner's concepts of personal intelligence laid the foundation for later theories of EI. Gardner described intrapersonal intelligence as "access to one's own feeling life" (Gardner, 1983, p. 239) which refers to a person's ability to access his or her own range of emotions, to discriminate between these feelings, label them and to transform them into symbolism. In this way a person would be able to understand and guide his or her own behaviour, thereby effectively regulating his or her life. Gardner also described interpersonal intelligence as one's "ability to notice and make distinctions among other individuals" (Gardner, 1983, p. 239). This involves the ability to interpret the intentions, motivations and desires of others and to react accordingly by using this knowledge to work effectively with them. Gardner's multiple intelligence theory has been supported by findings in neuroscience through the identification of many specific neural systems mediating capacities such as theory of mind, recognition of natural kinds, understanding of self and understanding of others (Gardner & Moran, 2006).

The theorisation of intelligence as a process is a more modern perception piloted by Sternberg who in his book, “Beyond IQ: A triarchic theory of human intelligence” (1985), maintains that there are three aspects of human information processing: our sensory organs that convert real world occurrences into interpretable forms for the brain, the classifying of real world problems into groups or schemes and the use of these schemes to live and be successful in the world by adapting to the environment, shaping the environment or selecting a new environment. Although Sternberg accepts the evidence for the importance of a general intelligence, he believes that standard tests used to assess intelligence fail to sample the entire range of human abilities (Brody, 2006). Sternberg’s triarchic theory suggests the need for a balance between three fundamental abilities: analytical ability, which is synonymous with the conventional measures of cognitive ability, practical intelligence and creative intelligence which are perceived to be independent of general intelligence (Brody, 2006).

Landy (2005, 2006) argues that although Thorndike has been credited with first using the phrase ‘social intelligence’, his intention was not to separate intelligence into multiple frames of references, which is the way in which the theory has been interpreted in previous research on EI, but rather to discourage the use of only one type of intelligence test as a base for making inferences about the intelligence of an individual. Garner also never intended that multiple intelligence theory should represent the definitive description of cognitive capacity, but rather that independent yet interacting intelligences provide a better understanding of the variety and scope of human adaptability than a singular cognitive intelligence (Gardner & Moran, 2006). Gardner’s opinion was that traditional theories of intelligence are too narrow in scope and he was trying to develop an alternative, broader conceptualisation rather than just addressing criticisms of ‘general intelligence’ (Thingujam, 2002).

Two common themes run through all definitions of intelligence, the ability to learn from experience and the ability to adapt to the environment (Sternberg, 1998). Contemporary definitions, however, also include aspects of metacognition which refers to the individual's own understanding and control of their thinking processes during problem solving, reasoning and decision making, which is lacking in more classical definitions.

Thingujam (2002, p. 55) cites Spinoza (1677), who stated that "both emotion and intellect together contribute to the ultimate cognitive tool" and Ellis (1962), who maintains that "human emotion and thinking are not separate processes, but that they significantly overlap and can never be viewed as completely apart from each other". What these classical theorists refer to, is one reason why theorists are cautious about the nature of emotional intelligence, as it is possibly only another venue through which the actual intelligence of an individual is manifested rather than a unique concept on its own. What makes IQ testing in the form of verbal, perceptual speed, number, word fluency, space or visualization and mechanical acumen so desirable, is that these abilities are easy to test experimentally. The dominant criticisms against theories of intelligence that move beyond simply including cognitive factors, is that the

emphasis placed on personal skills and emotional issues clouds the definition of intelligence and blurs the distinction between intelligence and other human characteristics such as personality (Hubey, 2002).

The apparent complexity of intelligence, if seen as more than just cognitive factors, brings into question the legitimacy of measuring intelligence in a singular objective manner. Mayer et al., (1999) maintain that for emotional intelligence to be considered as an intelligence, the testing of EI should meet certain objective criteria similar to that which is imposed on measures of traditional intelligence. Nevertheless, there are theorists who maintain that the psychometric criteria developed in studies of cognitive ability may not be applicable to other domains of intelligence, such as managing emotion (Roberts et al., 2001). Considering the limitations of traditional testing methods in explaining the neurological and psychological complexity of intelligence, the criteria imposed on measures of EI may be premature and potentially restrict the true complexity of the construct. For that reason, the question arises with regard to whether EI should be measured as a single construct that exists in its own space, or whether the construct is merely too integrated within either intelligence or personality, and existing measures are simply tapping into that space. This is, however, a difficult question to examine or demonstrate, primarily due to the identified limitations of existing objective ability measures of intelligence, and the difficulty in developing measures of EI that can be said to reliably and conclusively predict the existence of the construct (Matthews, et al., 2003).

The challenge for research is to determine whether there is value in continuing to work with measures of EI, or whether the overlap with existing measures is so great that the concept becomes redundant. An additional question is whether the field of EI is not simply rephrasing the theories of Social Intelligence developed by Thorndike, or Multiple Intelligences, developed by Gardner, and thereby just 'old wine in new bottles' (Landy & Mayer, 2005, para. 19). Sternberg (1988) maintains that intellectual abilities cannot be fully understood unless there is also an understanding of how individuals apply them in adapting to the demands of their environment. Present research with EI, therefore, still has a role in facilitating the understanding of human adaptation and interaction. More work, however, needs to be done with the trait-ability distinction, in order to understand whether research into intelligence can be supplemented by EI or whether the constructs overlap too extensively with existing personality or trait measures.

2.1.2 Can emotions be intelligent?

Emotions form a very powerful part of our lives as they mediate not only our interactions, but constitute the frame of reference through which we perceive our daily lives and manage interactions from the very stressful to the highly mundane. Emotions provide the means with which we coordinate the diverse mental and physical components required to respond coherently to the world (Gratch & Marsella, 2004). Emotions are a mental and physiological state associated with a wide variety of feelings, thoughts and behaviours (Sternberg, 1998).

There are many definitions of emotions, and similarly to intelligence, there is much controversy concerning how emotions should be defined and classified. Oatley (2004) argues that the key to understanding emotion and similar constructs does not lie in defining them, but in understanding them and their implications for everyday life. Premature narrowing and simplifying of emotions will lead to the same complications experienced in the field of intelligence, such as the belief that “intelligence is what intelligence tests measure” (Boring, cited in Bartholomew, 2004, p. 30). Far greater value can be obtained from research into emotions and emotional intelligence, by using research findings to obtain an understanding of emotions and intelligence about emotions, in terms of skills that can be put to everyday use.

Emotions are regarded as consisting of two components: a physiological component which results in distinctive physical reactions to emotions, and a cognitive component that involves interpretation of emotions (Sternberg, 1998). Classical philosophers such as Plato viewed emotions as disorganized and disruptive to mental activity. Rationalistic values linger in today's cultural beliefs and values, influencing social norms and the way in which we communicate and understand emotions (Goleman, 1995).

Leeper in 1984 was one of the first voices to challenge these restrictive views by theorising that emotions are organised responses that interact with cognition in a meaningful way, and constitute an essential part of people's lives (Sternberg, 1998). Leeper paved the way for psychologists to examine the interaction between emotions and cognitions, specifically with regard to the manner in which emotions underlie and guide thought. Leeper's view (as cited in Salovey & Mayer, 1990) influenced present impressions of emotions as an organizing response that adaptively focuses cognitive activities and subsequent feelings. This position ties into Salovey and Mayer's standpoint that emotions are intrinsic to intelligence. They view emotions as organized responses which cross the boundaries of many psychological subsystems, including the physiological, cognitive, motivational and experiential systems (Salovey & Mayer, 1990). Later approaches therefore agree that emotion and cognition are closely linked, yet theorists still disagree with regard to which comes first and the exact nature of the interaction between them (Sternberg, 1998).

There is no universally accepted consensus concerning the underlying processes that constitute emotion. The primary argument revolves around the question of whether emotions arise from physiological processes in the body that impact on cognition (e.g. the James-Lange theory), or whether physiological processes result in emotions (e.g. Lazarus, 1991). More contemporary theorists such as Damasio (1994) maintain that emotions are the result of a combination of physiological and cognitive processes (Gratch & Marsella, 2004). Researchers such as Damasio (1997) and Adolphs et al., (2002) hypothesise that there is a close relationship between the somatic ability to reconstruct what emotions would feel like and the ability to retrieve knowledge about the emotion.

El is one way to reconceptualise the relationship between cognition and emotion. The theory put forward by Gratch and Marsella (2004) argues that emotional behaviour is the result of appraisal mechanisms which evaluates the individual's present circumstances and coping mechanisms. These appraisal mechanisms play the role of associating emotion-relevant information with cognitive operators, which use this information to guide responses to the assessment, and bias processing. Emotion is therefore seen as playing an essential role in informing cognition in ways not taken into account by traditional intelligence models.

This model ties in with Salovey and Mayer's (1990) view of emotions as adaptive and organized responses to internal and external events that have positive or negative consequences for the individual. Mayer, Salovey and Caruso (2004) conceptualise the relationship between emotion and intelligence in terms of five key assumptions:

a) Emotions share certain essential features that are biologically based.
b) Simpler emotion may combine to form more complex emotions.
c) Emotion may be regulated but not fundamentally altered by display rules.
d) Emotions have the functional purpose of signalling relationships and changes in relationships, real or imagined, between people and their environments.
e) Emotions and cognitions represent different functions of the mind, but interact and are expressed in an integrated form.

The biological basis of emotions is being increasingly investigated and accepted by researchers due to neurological studies such as those carried out by LeDoux (1996) on the brain activity in rats and other animals when experiencing basic and physiologically detectable emotions such as fear. Earlier research on the neural basis of emotions was dominated by the theory that the limbic system, a specific circuit centred upon the hippocampus, cingulated cortex, prefrontal cortex, septum, amygdala and hypothalamus, underpinned emotional behaviour and emotional experience. LeDoux (1996) maintains, however, that the limbic system does not in fact exist as there are no formal criteria for identifying it and no clear evidence in support of its operation as a system specialised for emotional processing.

LeDoux (1996) asserts that different emotions have evolved for different purposes, such as defending against danger or caring for offspring, and each emotional function is dependent on different neural systems. Research by LeDoux has identified that the amygdala is primarily involved in mediating the brain's fear system, receiving sensory information about the outside world via the thalamus and sensory cortex, and projecting to the hypothalamus and brainstem through which behavioural, endocrine and autonomic responses are coordinated. At the neurophysiological level, emotion may also influence the storage and recall of memories through the interaction between the Amygdala and the hippocampus. Both memory and emotion, therefore, seem to be involved in different but interrelated cycles of brain activity (Phelps, 2004).

The interactive nature of cognition and emotion has been suggested by previous research which has identified that changes in emotional state can alter patterns and styles of thinking. A slight positive mood has been found to moderate a tendency towards flexibility in problem solving, as well as improved efficiency and thoroughness in decision making. Emotions, such as fear, anger, joy and sadness, have also been found to show up in the brain as different patterns of blood flow (Picard, Papert, Bender, Blumberg, Breazeal, Cavallo, Machover, Resnick, Roy & Strohecker, 2004). Evidence was provided by Adolphs et al., (2002) of dissociable neural systems involved in the knowledge and recognition of emotions which are both key factors in the Mayer and Salovey (1997) definition of emotional intelligence.

Adolphs et al., (2002) explored the ability of a patient with brain lesions resulting in severe anterograde and retrograde amnesia. The patient was unable to acquire any new declarative knowledge. All language and basic functions however, that did not require declarative long term memory were found to be intact. The study reported that the patient could use visual information about movements or events relevant to the emotional concept to recognise emotion, but was unable to recognise or name emotions from static stimuli. This provides evidence that different types of knowledge about emotions draw from different neural systems. The study concluded that temporal and limbic-related structures may be the most fundamental for retrieving information about emotions signalled by static emotions, but the parietal and frontal lobes are primarily responsible for retrieving knowledge about emotions that unfold in real time. Studies such as these assist in clarifying the particular neural structures that are involved in reasoning about and with emotions.

These findings imply that emotions and cognitions do represent different functions of the mind, however, the exact nature of the interaction and the biological nature of the neural pathways involved still need to be identified. Averill (2004) raises concerns about the assumption that emotions and cognitive are separate processes by pointing out that the same mental and neurological processes may enter into both emotional and cognitive behaviours.

A finding emanating from the research conducted by LeDoux (1996) is that the connectivity of the amygdala with the neo-cortex is not symmetrical. The ability of the amygdala to control the cortex is greater than the ability of the cortex to control the amygdale, which implies that emotional reactions can be elicited by the brain independently of conscious thought processes. Emotions are probably mostly processed at an unconscious level and thus we may have limited cognitive control over emotions, consequently, LeDoux maintains that emotions are computational functions of the nervous system rather than conscious feelings. These types of findings impact on the theoretical assumptions of emotional intelligence research especially with regard to assumptions that EI can be learned or consciously altered in situations of social bias.

A point of some controversy is that LeDoux's theories do not address emotions in general, but are focused on fear. This is acknowledged in LeDoux (1995, p.222) who anticipates that the understanding of the neural basis of fear will generalise to other emotions, or indicate how best to study them. At present there is limited understanding of the neural basis of other emotions such as happiness or contentment, as well as the nature of the conscious experience of emotions (Everitt, 1997). Although the findings of neuroscientific research into emotion will facilitate the exploration of emotion and similar factors such as self, personality, and social behaviour that have been previously neglected by cognitive science, there is still limited understanding of the relationship between conscious feelings and emotions as well as cognitive-emotional interactions.

2.2. EMOTIONAL INTELLIGENCE

Theories of emotional intelligence overlap with Gardner's (1983) personal intelligences and expand on theories of social intelligence by recognizing emotions as an integral part of human experience and intelligence (Van Staaden, 2001). Emotional intelligence represents an ability to reason with emotions and to use emotions to enhance thought. El is considered to be a general framework that allows for the identification of specific skills needed for an individual to signal and respond to changes in relationships within the environment in which he or she functions, rather than a disorganized response. The assumption that El researchers make is that an enhanced awareness and understanding of emotional states and the reasons for emotional reactions, result in more effective problem solving. As a result, emotionally intelligent people may be more adaptable in complex social and interpersonal situations (Austin, Saklofske & Egan, 2005) and could therefore be better equipped to function optimally in

demanding environments. High levels of EI have been credited with enhancing a person's likelihood of succeeding both occupationally and interpersonally (Caruso, 1999) in a number of environments. EI could therefore be a large contributor to a person's ability to adapt their goals and thinking styles to the requirements of the environment, especially within a study or occupational environment.

Emotional intelligence is a construct first formulated by Salovey and Mayer (1990) as an umbrella concept comprising of three distinct concepts namely, the appraisal and expression of emotions, regulation of emotions, and utilisation of emotional information in thinking and acting. This model of EI was initially defined as a subset of social intelligence, but was subsequently altered (Mayer & Salovey, 1997) to include thinking about feelings and give more emphasis on cognitive processes. The inclusion of a fourth branch resulted in a hierarchy of mental abilities that included firstly the perception, appraisal and expression of emotion, secondly the emotional facilitation of thinking, thirdly understanding, analysing and employing emotional knowledge, and finally the reflective regulation of emotions to promote further emotional and intellectual growth (Van der Zee, Thijs & Schakel, 2002).

Daniel Goleman was responsible for the popularisation of EI in 1995 with the publication of a best selling book “Emotional Intelligence: Why it can matter more than IQ”, that made a number of extraordinary claims regarding the capacity of EI to predict success over and above cognitive ability. Since then EI has been the focus of numerous articles and debates both within the popular and academic press. A number of commercial tests have been developed and sold on the basis of these theories, and the concept has been taken up in businesses and education with consultation services developed to teach and consult on EI (Matthews, Roberts & Zeidner, 2004). The controversy that surrounds EI is centred on three core concerns: the nature and definition of the construct, whether the construct is sufficiently distinct from existing personality and ability theories, and the true importance and unique relevance of EI (Matthews et al., 2004).

The first disagreement is centred on the definition of EI and what EI really means, which has resulted in controversies about how EI should be measured. EI is perceived by some researchers to be an ability involving cognitive processing of emotional information, whereas other theorists view EI as a dispositional tendency such as personality. There is not only a lack of consensus surrounding the true nature of EI, but theorists also disagree on how the differences between EI theories should be classified. Mayer et al., (2000a) drew a distinction between mixed models, which include a range of personality variables and ability models, which define EI solely on a cognitive basis. Mixed models of EI were described as defining the construct as a complex interaction of cognition, metacognition, mood, emotions and personality that is applied in both interpersonal and intrapersonal contexts (Matthews et al., 2003). For example, in mixed models, EI was described as an ability, but accompanying personality characteristics such as warmth, outgoingness and persistence (Mayer et al., 2000a), were often included in the definition of the construct.

Petrides and Furnham (2000a, 2003) opposed the distinction between ability and mixed models and argued that the EI theory should distinguish between El models on a functional basis, as the theoretical perspectives of the two domains overlap. Petrides and Furnham differentiate between trait El which can be measured by a self-report questionnaire, and ability El which requires a performance test with correct and incorrect answers. They propose that it is the type of measurement that determines the nature of the model, rather than the underlying theory.

Petrides and Furnham (2000a) view trait El as cross-situational consistencies in behaviour that are part of personality and assessed with self-report inventories that measure typical behaviour. Trait El, otherwise known as emotional self-efficacy, is defined as "a constellation of behavioural dispositions and self-perceptions concerning one's ability to recognize, process, and utilise emotion-laden information" (Petrides, Frederickson & Furnham, 2004a, p. 278). Trait El is therefore seen as combining elements of personality theory such as empathy, impulsivity and assertiveness as well as combining elements of Thorndike's social intelligence and Gardner's personal intelligences (Petrides et al., 2004a). Self-report based measures are differentiated from performance measures as these scales simply ask test takers their self-reported beliefs about their own emotional intelligence, and thereby rely solely on an internal appraisal of performance that measures typical behaviour (Matthews et al., 2003; Petrides & Furnham, 2001). These measures seem to be more related to well-established personality traits, largely due to the tendency for personality measures to be based on self-report techniques (Zeng & Miller, 2003).

Ability El is seen as a cognitive-emotional ability (Petrides & Furnham, 2003), or a form of information-processing El that is related more to traditional intelligence, and thereby measures maximal behaviour using performance tests (Petrides & Furnham, 2000a). Ability El is defined as "one's actual ability to recognize, process, and utilise emotion-laden information" (Petrides et al., 2004a, p. 278). The information-processing model views emotions as a source of information about the world, the self and others that the mind can process and utilise to construct adaptive emotional responses, thought and behaviour. This distinction has far-reaching implications for the operationalisation of the construct, for example asking a respondent whether they believe they are good at identifying emotions, is very different from observing their ability to correctly identify emotions.

The second controversy is a result of bold claims about the importance and relevance of El. Evidence is accumulating that El is a widely influential and valuable construct in modern day psychology in both individual and occupational realms. Concerns regarding the application of El centre mainly on the difficulty in accurately defining and assessing the measurement, largely because of the varying definitions of the construct and the difficulty inherent in attempting to measure subjective abilities (Petrides & Furnham, 2003).

A reason for these concerns is that many of the models and arguments employed, especially with regard to predictive validity, have ignored the conceptual differences between trait and ability EI (Pérez et al., 2005). Previous research has investigated trait EI and ability EI as if they were the same construct and researchers were previously evaluating a personality trait as if it were a cognitive ability which according to Petrides et al., (2004b) is erroneous. As a result researchers attempted to force trait EI, measured through self-report instruments, into complying with the strict objective rules held by intelligence measurement. Trait EI according to Petrides et al., (2004b) is by nature not a construct that can be measured objectively due to the interpersonal components. People's internal emotional states cannot be measured objectively as they are dependent on the individual's personal experiences and perceptions. Consequently, research has revealed very low correlations between measures of ability and trait EI (O'Connor & Little, 2003; Warwick & Nettelbeck, 2004), and therefore, the two areas need to be seen as two different measurement trends that should be studied and assessed differently.

Harsh criticism has been levelled against the construct of EI (Matthews et al., 2003). One potential reason for this is the attention that more popular mixed models have received from the media, and the corresponding exaggerated and unscientific claims concerning what EI actually is, and the extent of its influence on everyday life. An example is the claim made by Goleman (1995, 1998), a chief proponent of the mixed model conception of EI, who maintained that if IQ tests are known to predict 20% of the variance in performance, then EI must account for the remaining 80%. A major critique of Goleman's model of EI, however, is that it includes an extensive list of personality traits, such as 'getting along with others', self-motivation, persistence, controlling impulses, empathizing and mood regulation (Markin, 2005).

The third disagreement involves whether EI is simply a new name for existing constructs that are better defined and measured through well established theories. The question that remains to be answered is whether EI is simply a theory about personality, a form of intelligence, or a combination of both. Research focussed on contributing towards defining the relationship between trait and ability EI would therefore facilitate either the acceptance of the usefulness of the constructs in predicting important facets of everyday life, or possibly contribute to rising arguments on whether or not to redefine the construct or abandon it completely (Landy, 2005).

2.2.1. Emotional intelligence as an ability

Mayer and Salovey revised their ability model of EI in 1997, placing more emphasis on cognitive components and re-interpreting EI in terms of potential for intellectual and emotional growth. This model

views EI as a form of a cognitive ability, which is subjected to the same laws that govern traditional conceptions of intelligence (Matthews et al., 2003). EI is treated as a new form of intelligence consisting of a group of underlying intelligence factors that are necessary to develop EI skills such as the ability to understand and to reason with emotional information and to combine thought and emotion to effectively perform in specific situations (Wakeman, 2006; Mayer & Salovey, 1997).

This view of EI as an intelligence is unique to the ability model and focuses on measuring EI through actual mental performance rather than self-reported personality traits, behaviour observed by others, or competency levels that a person may or may not actually possess. The model states that in the same way as traditional intelligence, mental problems have right or wrong answers, measured skills correlate with other measures of mental ability and ability level increases with age (Mayer et al., 2000a). Although Salovey and Mayer (1990) originally defined EI as a trait, these theorists later argued that other ideas of EI are misleading and that the use of the term implies an intelligence that processes and benefits from emotions (Mayer et al., 2000a). This model of EI, on the other hand, views emotions as working together with thinking rather than as working in opposition to thinking. Emotions are recognized as containing data and information that can be used to optimize decisions (Markin, 2005). Mayer et al., (2000a) view EI as an ability to recognise the meanings of emotional patterns in social interactions and to reason and solve problems on the basis of them.

The model of ability EI is hierarchical with the levels being seen as a series of conceptually related developmental stages, from the most basic psychological processes to the more psychologically complex and integrated processes that a person passes through successively, including (1) the ability to perceive emotions, (2) the ability to utilise emotion to facilitate reasoning, (3) the capacity to understand the meaning of emotions and the information they convey and (4) the ability to effectively regulate and manage emotion (Mayer et al., 2000a). The perception, appraisal and expression of emotions are viewed as the most basic processes consisting of core capacities that include identifying feelings and thoughts through proper and appropriate words in self and others. The reflective regulation of emotions is seen as the highest developmental stage that requires the most complex processing and involves a more integrated ability to consciously and reflectively regulate emotion to promote emotional and intellectual growth (Mayer et al., 2000a). Within each of the components, abilities build on each other through development (Mayer et al., 1999; Mayer & Salovey, 1997).

2.2.1.1. The four branches of emotional intelligence

Branch 1: Perception and identification of emotions

The first branch reflects the ability to accurately perceive or recognize emotions in the self and in the facial features or postural expressions of other people as well as in pictures, voices and cultural artefacts (Salovey & Grewal, 2005). This branch of emotional intelligence includes both verbal and non-verbal cues and involves recognition of emotion as it happens and an ability to label those emotions correctly (Jopie van Rooyen & Partners [JVR], 2007). This is the lowest level of emotional intelligence and supports the assumption that emotional intelligence improves with age, as evidence was reported in previous research that children from the age of four can accurately identify the emotions suggested by about half the faces they see, and from six years of age children are 75% correct (Profyt & Whissel, cited in Salovey, Hsee & Mayer, 1993).

Emotional intelligence at this level has been inversely related with Alexithymia, which is a condition that prevents people from verbally expressing emotions supposedly because they have difficulty identifying those feelings (Salovey, Woolery, & Mayer, 2001). People who suffer from Alexithymia have difficulty distinguishing emotions and realising that some physical sensations are the manifestation of emotions. They thus have a deficit in emotional information processing and the conscious expression of emotion (Salovey et al., 2001), which lends credibility to the construct validity of the subscale in measuring emotion processing abilities.

Accurate appraisal of emotions in others is important to adaptive social interaction and the ability to respond flexibly to social environments, and build supportive social networks (Salovey et al., 2001). It is at this level that an individual begins to understand how others might feel in a particular circumstance and appreciate different points of view. People with a low score on this branch are said to possibly overanalyse emotions in faces and struggle with attending to non-verbal cues. These people are therefore more likely to resist ascribing negative emotions to people (JVR, 2007).

Branch 2: Using emotion to facilitate reasoning

This branch involves the capacity of emotions to assist in intellectual processing and is reflected in the ability of emotions to direct positive action. Salovey and Mayer maintain that part of intelligence involves developing a knowledge base about experiences on which intelligences can draw. The utilisation of

emotion-based knowledge deals with the advantage that people who possess this ability have, in solving problems adaptively (Salovey & Mayer, 1990).

This branch acknowledges that emotions generally influence problem-solving outcomes (Salovey & Mayer, 1990). Firstly, emotional fluctuations may influence the generation of future plans. Secondly, positive emotions may facilitate the organization of cognitive material so that diverse ideas are seen as more related and better integrated. Thirdly, emotion interrupts complex systems, labelling them and focussing them on needs of higher priority. Lastly, emotions and moods are seen as motivational sources in performing complex intellectual tasks (Salovey & Mayer, 1990). This ability also allows the shifting of emotion from optimistic to pessimistic, allowing the individual to consider multiple perspectives and the role emotions play in the encouragement of problem-solving (Mayer & Salovey, 1997).

At this level an individual begins to understand how others might feel in a particular circumstance and see different points of view. As a result people high in this branch are able to harness their own emotions in order to focus on problem solving and assist with planning (JVR, 2007). People with a low score on this branch struggle to feel empathy with other people as well as have low levels of creativity (JVR, 2007).

Branch 3: Understanding emotion

The third branch involves the capacity to analyse emotions, understand their probable trends over time as well as understand outcomes. The development of this branch is associated with the growth of language and prepositional thought. This branch firstly involves the ability to label emotions and to recognize the relationship between emotions and words, secondly it involves the ability to see the meaning that emotions convey about relationships of various intensity and similarity, thirdly the ability allows the understanding of complex feelings, and lastly it involves the understanding of transitions between emotions, such as from anger to shame (Mayer & Salovey, 1997; JVR, 2007). It is at this level that individuals recognise the variations of each emotion. People who have low scores on this ability may have problems with understanding another's point of view and may have little insight into people.

Table 1: Mayer & Salovey's (1997) ability model of emotional intelligence

Branch Name	Brief description of abilities
Perception & expression of emotion	Involves the verbal and non-verbal perception of emotion in self and others: × Ability to identify emotion in oneself × Ability to identify emotion in other people and objects, art, stories, music and other stimuli × Ability to express emotions accurately, and to express needs related to those feelings × Ability to discriminate between accurate and inaccurate, or honest and dishonest expressions of feelings
Assimilating emotions in thought	Involves the capacity of emotions to assist thinking: × Ability to generate emotions to solve problems and facilitate creativity × Ability to prioritise thinking based on feelings × Ability to generate or emulate vivid emotions to facilitate judgements and memories concerning feelings × Ability to capitalize on mood swings to consider multiple points of view and integrate with reasoning
Understanding of emotions	Involves the capacity to analyse emotions, understand their trends and predict outcomes: × Ability to understand how different emotions are related with regard to intensity and similarity × Ability to perceive the causes and consequences of feelings × Ability to interpret complex feelings, such as emotional blends and contradictory feeling states × Ability to understand and predict likely transitions between emotions
Regulation or management of emotions	Involves the management of emotion in relation to individual goals, self-knowledge and social awareness and therefore related to personality: × Ability to monitor and reflect on emotions × Ability to be open to pleasant and unpleasant feelings × Reflectively engage, prolong, or detach from an emotional state at appropriate times × Ability to understand emotions without exaggerating or minimising importance × Ability to manage emotion in oneself and others

Branch 4: Adaptive regulation of emotion in the self and others

The fourth branch reflects the management of emotions which involves the rest of personality. Emotions are managed in the context of an individual's personal environment such as goals, self-knowledge and social awareness (JVR, 2007). This domain engages firstly the ability to regulate one's own emotions: that is, the ability to soothe oneself, to shake off rampant anxiety, gloom or irritability. People who excel in this domain bounce back quicker from life's setbacks and upsets, while those who fare poorly in this area are constantly battling feelings of distress (Goleman, 1995; Salovey et al., 1993). Secondly, it involves the ability to manage emotions in others.

The highest level concerns the ability to recognize and appreciate both pleasant and unpleasant feelings in the self and in others. Judging emotion truthfully for what it is and using the information to grow intellectually expresses the essence of this level. High scores on this branch is firstly reflected in the ability to stay open to emotion and, secondly, in the ability to reflectively engage and detach from an emotion. Thirdly, it involves the ability to monitor one's own emotion in relation to oneself and others and, lastly, the ability to manage emotion in oneself and others by recognizing the information they convey and moderating negative emotion whilst enhancing pleasant ones (Mayer & Salovey, 1997; Mayer et al., 1999). People with a low ability to manage emotions are considered to be overly emotional, are controlled by their own emotions and become overwhelmed by situations (JVR, 2007).

According to Salovey and Mayer (1990), the regulation of emotion was included in the construct of emotional intelligence because it is necessary to account for awareness and control over emotional processes. Positive, emotionally intelligent individuals are thus able to control their own and others' moods and even manage emotions to motivate others to productive ends (Salovey & Mayer, 1990).

2.2.2. Emotional intelligence as a trait

There is an overabundance of different theories and models of El as a trait which are too many to discuss in this review. A number of the models, such as the EI model developed by Schutte et al., (1998), are based on the same theoretical basis as the ability model developed by Mayer and Salovey (1997), with the main difference being that the abilities discussed are measured through self-report rather than objective measures. The psychometric properties of trait measurement instruments such as the Schutte Self-Report Emotional Intelligence Test (SSREIT) are discussed in more detail in Chapter 3. Other measures such as those developed by Reuven Bar-On and Daniel Goleman include a variety of other

characteristics such as motivation, states of consciousness and social ability as a part of EI (Mayer et al., 2000a). The trait models of EI are summarised in Table 2.

Bar-On views EI as "an array of non-cognitive capabilities, competencies and skills that influence one's ability to succeed in coping with environmental demands and pressures" (Bar-On cited in Matthews et al., 2003, p. 15). This model includes clusters of well-established personality traits with a mental ability conception of EI. Bar-On developed the Emotional Quotient Inventory (EQ-i) that measures self-reported abilities and the potential for performance (Matthews et al., 2003). Critique of Bar-On's definition of EI is that the construct is too broad and contains too many aspects of personality (Zeng & Miller, 2003). Mayer et al., (2000a) have criticised this theory for lacking internal consistency and being difficult to evaluate.

Goleman (1995) defines EI as including "abilities such as being able to motivate oneself and persist in the face of frustrations, to control impulse and delay gratification, to regulate one's moods and keep distress from swamping the ability to think, to empathise and to hope" (Goleman 1995, p. 34). This theory is described by Goleman as a theory of performance (Goleman 1998) and defined as being directly applicable to the domain of work and organisational effectiveness. The Emotional Competence Inventory (ECI) was developed in order to measure his version of EI. Goleman has been criticised for being overly inclusive and incorporating many of the well-established aspects of personality such as empathy, motivation, warmth and social skills (Matthews et al., 2003). The definition and the categories have been criticised for not being related to each other, problematic and as "simply being a journalist distilling scientific information for the consumption of the populist rather than a legitimate scientific theory" (Matthews et al., 2003, p. 14).

Table 2: Core trait models and corresponding measures of emotional intelligence

<table>
<tr><th>Salovey & Mayer (1990)</th><th>Mayer & Salovey (1997)</th></tr>
<tr><td>3 Levels:
- Monitor emotions
- Discriminate between emotions
- Use emotions to guide thinking and actions</td><td>4 Hierarchical levels:
- Appraisal
- Understanding
- Regulation
- Utilisation</td></tr>
<tr><td colspan="2">Instrument: TMMS (Salovey et al., 1995), SSREIT (Schutte et al., 1998)</td></tr>
<tr><th colspan="2">Emotional Quotient, Bar-On (1997)</th></tr>
<tr><td colspan="2">5 Broad areas of functioning and 15 factors:
- Intrapersonal intelligence (Emotional self-awareness, Assertiveness, Self-regard, Self-actualisation, Independence)
- Interpersonal intelligence (Empathy, Interpersonal relationships, Social responsibility)
- Adaptability (Problem solving, Reality testing, Flexibility)
- Stress management (Stress tolerance, Impulse control)
- General mood (Happiness, Optimism)
Instrument: EQ-i (Bar-On, 1997)</td></tr>
<tr><th colspan="2">Emotional Competence Inventory, Goleman (1995)</th></tr>
<tr><td colspan="2">5 Competencies:
- Self-Awareness
- Self-Control
- Motivation
- Empathy
- Social Skills
Instrument: ECI (Goleman, 1995)</td></tr>
</table>

2.3. EMOTIONAL INTELLIGENCE AND COGNITIVE THINKING STYLES

Theories of cognitive thinking styles were developed as a component of personality trait theory to facilitate the understanding of the interaction between cognitive abilities and styles of thinking or thinking traits (Sternberg, 1994a, 1997). Theorists have established that personality is moderated by cognitive thinking styles in the effect on behaviour (Riding & Wigley, 1997) and as a result, styles can be defined as higher-order personality traits which assist in explaining trends displayed by people when dealing with and solving cognitive problems for example, consideration of cognitive style differences may give insight into why people in similar situations use different decision making processes as variation in strategic choices may reflect alternative style preferences. Thinking styles are distinguished from personality traits, as personality traits influence daily actions compared to cognitive styles, which influence the manner in which people approach and solve cognitive problems (Fjell & Walhovd, 2004) both academically and in other facets of everyday functioning.

The potential relationship between thinking styles and emotional intelligence is an avenue through which the validity of the delineation between trait and ability EI could be assessed. One of the only studies to date to assess the relations between EI and thinking styles, examined the degree to which a measure of trait EI overlaps with a measure of cognitive thinking styles, and evidence was reported for the predicted relations between these two constructs (Murphy, 2006). If both measures of EI are found to correlate in similar directions with a measure of thinking styles then these measures can be considered as measuring the same construct, however, if the pattern of relationships is different then it can be inferred that they are measuring different aspects of EI or different constructs altogether. The present study further examines the relationships of both ability and trait EI with thinking styles, as well as the incremental validity of these measures over thinking styles in predicting job satisfaction.

2.3.1. The foundation of thinking styles: The theory of mental self-government

The theory of thinking styles was formed by Sternberg in 1988 and was based on the theory of mental self-government which attempts to explain how individuals use their patterns of thought to adapt to their environment and select the type of environment that best suits their abilities and needs. Sternberg's theory was motivated primarily by a need to develop the limited theories of thinking styles available (Zhang, 2001b) and to combine the different threads of research on styles into one comprehensive theory

(Sternberg & Grigorenko, 1995b). Thinking styles are defined as a personality attribute that guides the utilisation of abilities (Sternberg, 1994a). People vary in the ways that they prefer to use their abilities and are often more comfortable using a certain style or strategy across a variation of situations (Sternberg, 1990), therefore, a style of thinking is a preference for a certain way of cognitive processing, or the process used to solve a problem (Sternberg, 1990).

The theory of mental self-government maintains that cognitive styles are an interface between intelligence and personality, and that success in life does not just depend on how well we think, but also on how we think (Sternberg, 1997). Theories of cognitive thinking styles pair certain styles of thinking with certain methods of communicating information and the theory proposes thirteen thinking styles that fall along five dimensions. These are *functions* (including the legislative, executive and judicial thinking styles), *forms* (including the hierarchical, oligarchic, monarchic and anarchic styles), *levels* (including the local and global styles), *scopes* (including the internal and external styles) and *leaning*s, (including the liberal and conservative styles). Table 3 outlines the thirteen thinking style categories and provides explanations of each style.

Thinking styles are seen as largely flexible traits that can be learned and people can alternate styles of thinking to adapt to varying contexts or problems (Sternberg, 1994a, 1997). Similarly to El, styles are also seen as differing with age and experience. Contrary to El however, styles are not considered as hierarchical or right or wrong, rather the effectiveness of a style is determined by the match between the style and the situation to which it is being applied (Sternberg, 1997; Cilliers & Sternberg, 2001; Sternberg & Grigorenko, 1995a).

2.3.2. Explanation of the categories of thinking styles

A brief overview of the categories of each of the thinking styles follows (Sternberg, 1997):

2.3.2.1. Functions of thinking styles

The *legislative style* characterises people who enjoy creating and formulating new ideas. Individuals who prefer the legislative style like to do things their own way and make their own rules. These people prefer problems that are not pre-structured for them, but rather that they can structure for themselves. Legislative people also prefer creative and constructive planning-based activities, such as writing papers, designing projects and creating new business or educational systems. In many environments legislative people are often viewed as not fitting in as they want to do things in their own way and therefore do not do very well in environments that have a fixed way of doing things.

The *executive style* characterises people who are implementers. Executive people prefer to follow rules and prefer to be given guidance and structure. Executive people also like to enforce rules and laws and rely on existing methods to complete tasks or master a situation. Executive people will tend to be valued by organisations that want people to do things in a way that appeals to a set of rules or guidelines.

The *judicial style* characterises people who like to evaluate rules and procedures and to judge things. Judicial people prefer problems in which they can analyse and evaluate existing rules, ways and ideas. Types of activities that judicial people prefer include delivering critiques, giving opinions, judging people and their work and evaluating programs.

Table 3: Thinking styles categories and explanations

FUNCTIONS	
Legislative style	The person prefers tasks requiring creative strategies.
Executive style	The person is more concerned with the implementation of tasks with set guidelines.
Judicial style	The person focuses attention on evaluating the products of other's activities.
FORMS	
Monarchic style	The person prefers tasks that allow complete focus on one thing at a time.
Hierarchical style	The person prefers to distribute attention across several tasks that are prioritised.
Oligarchic style	The person prefers to work toward multiple objectives during the same period of time, but without setting clear priorities.
Anarchic style	The person prefers working on tasks that require no system at all.
LEVELS	
Local style	The person prefers tasks requiring working with details.
Global style	The person pays more attention to abstract ideas and the overall picture regarding an issue.
SCOPE	
Internal style	The person prefers being engaged in tasks that allow working independently.
External style	The person prefers being engaged in tasks that provide opportunities for developing interpersonal relationships.
LEANINGS	
Liberal style	The person prefers novelty and ambiguity.
Conservative style	The person adheres to existing rules and procedures in performing tasks.

2.3.2.2. Forms of thinking styles

The m*onarchic style* characterises people who tend to be motivated by a single goal or need at a time. Monarchic people focus single-mindedly on one task or aspect of a task until it is completed. People who prefer this style perform better in areas that match their interests but less well in areas that do not.

The *hierarchical style* characterises people who tend to be motivated by a hierarchy of goals, with the recognition that not all of the goals can be fulfilled equally well and that some goals are more important than others. Hierarchical people tend to be priority setters who allocate resources carefully. They tend to be systematic and organised in their solutions to problems and in their decision making.

The *oligarchic style* characterises people who tend to be motivated by several, often competitive goals of equally perceived importance. Oligarchic people have trouble deciding which goals to give priority to. The result is that they may have trouble allocating resources. When there is sufficient time to complete tasks this may not show through, however, if there is a lack of resources these people often need guidance or assistance to effectively complete tasks. Oligarchic people are often flexible and can adapt quickly to changing circumstances.

The *anarchic style* characterises people who tend to be motivated by a wide assortment of needs and goals and do not like to be tied down to systems, rules, or particular approaches to problems. They tend to be not so much asystematic as antisystematic. Anarchic people often challenge systems, not on principle, but for the sake of challenging authority figures. People who prefer this style use a random approach to solving problems and have trouble setting priorities because they do not have firm sets of rules upon which to base these priorities. Anarchic people have a potential for creativity that is rare in others as they are not constrained by boundaries of thought and action that people usually succumb to.

2.3.2.3. Levels of thinking styles

The *global style* characterises people who prefer to deal with general problems and often abstract issues or the big picture. Global people tend to conceptualise and work in the world of ideas. People who prefer this style struggle to deal with tasks that involve fine detail.

The *local style* characterises people who prefer to deal with specific, concrete details that often require precision to complete.

2.3.2.4. Scope of thinking styles

The *internal style* characterises people who prefer tasks that allow them to work independently of others. People with an internal style tend to be introverted, task-oriented, sometimes aloof and socially less sensitive than other people. At times they also lack interpersonal awareness, if only because they do not focus on it. Internal people do not like group work.

The *external style* characterises people who prefer tasks that allow them to work with people through interaction. External people tend to be more extroverted, people-oriented, outgoing, socially more sensitive and interpersonally more aware.

2.3.2.5. Leanings of thinking styles

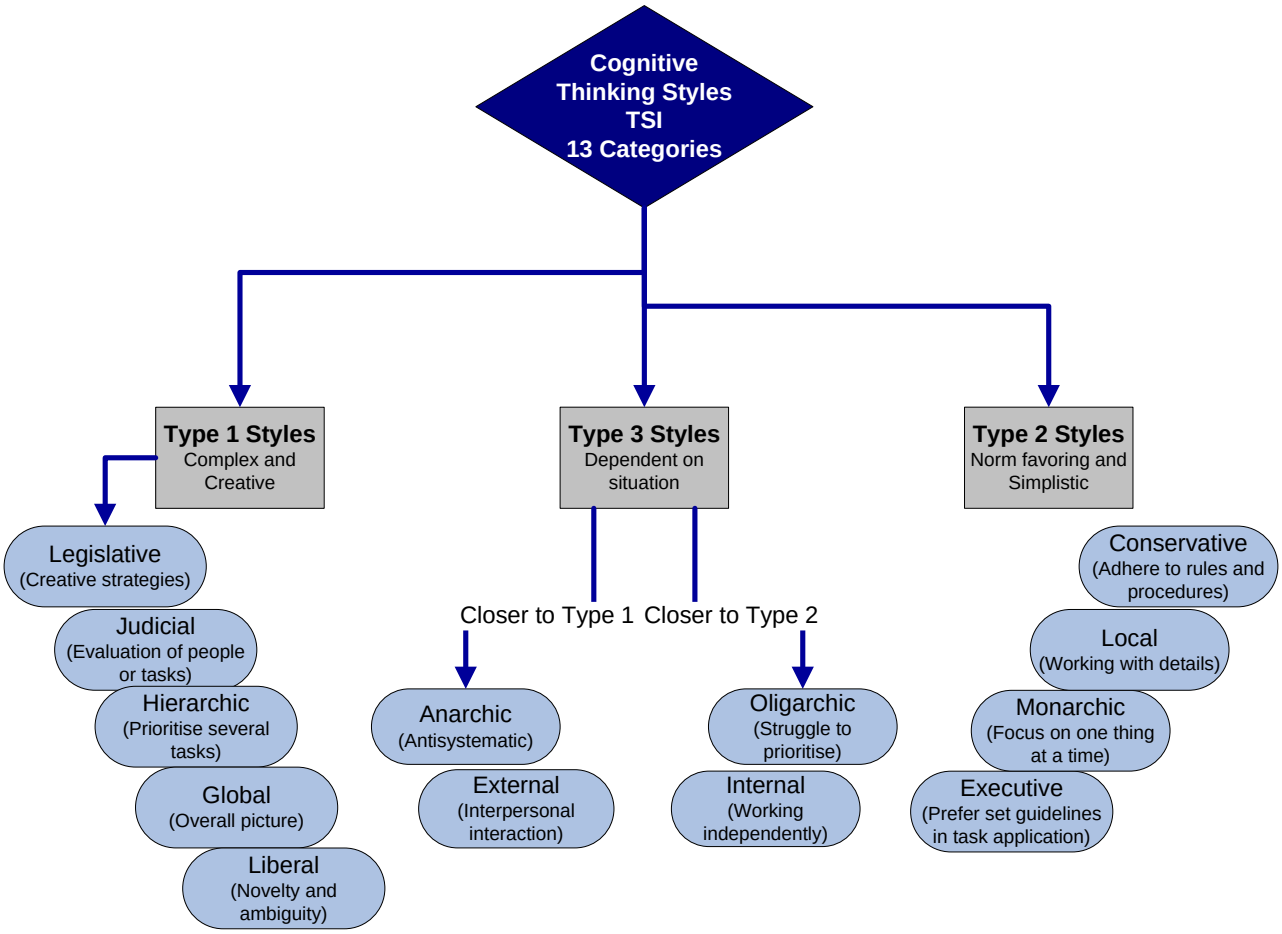
The *liberal style* characterises individuals who like to go beyond existing rules and procedures and seek to maximise change. Liberal people seek or are comfortable with ambiguous situations and prefer some degree of unfamiliarity in life and work. They tend to be receptive to new ways of thinking.

The *conservative style* characterises individuals who prefer to adhere to existing rules and procedures, minimise change, avoid ambiguous situations where possible and prefer familiarity in life and work. Conservative people follow traditions and although they may come up with their own ideas these ideas are grounded in existing and accepted customs. They tend to resist new ways of doing things.

2.3.3. The properties and application of thinking styles

The basis of the theory of mental self-government is that people choose styles of managing themselves and their everyday interactions within which they are most comfortable. People are seen as flexible and will intrinsically attempt to adapt their styles of thinking to the demands of the situations in which they find themselves (Sternberg, 1988, 1990, 1994a, 1997). Similarly to EI, styles are seen as a form of social conformity and can therefore be influenced or modified by the social or cultural environment (Zhang, 2005a), often changing with time and life demands. Styles are defined as continuous rather than dichotomous and are not considered as good or bad, rather the effectiveness of the style depends on the task and the situation in which the task is being performed (Sternberg, 1994a).

Figure 1: The grouping of thinking styles categories into the three classes



Research into thinking styles has indicated that they can be categorised into three classes (Zhang, 2000, 2001a, 2002a, 2002b; Zhang & Sternberg, 2000). The first class (type I thinking styles) involves thinking styles that generate creativity and utilise higher levels of cognitive complexity. The styles in this group include the legislative, judicial, hierarchical, global and liberal styles. The second class (type II thinking styles) includes styles that are norm-favouring and simplistic. The styles in this group are the executive, local, monarchic and conservative styles. The third combination of styles (type III thinking styles) draws on characteristics of both of the previous two types depending on the situation wherein the styles are used. These styles include the anarchic, oligarchic, internal and external styles.

Research into the applicability of thinking styles has mostly taken place in school or university settings and few studies have been conducted which examine thinking styles within occupational contexts. There have been several examples provided of the relationship between thinking styles and academic success. In spite of this, similar confirmation within occupational contexts is somewhat lacking. Sternberg emphasises that styles are as important as abilities and although abilities indicate whether a student has the potential to succeed in a career, his or her thinking style is indicative of whether the student will be able to adapt to the resulting career environment (Sternberg, 1990, 1997, 2003a).

A number of studies have provided support for the validity of the theory of mental self-government in real life contexts. Evidence has been provided of the predictive validity of thinking styles in mediating school success amongst scholars (Sternberg & Grigorenko, 1995a). Park, Park and Choe (2005) in addition identified that students who were defined as gifted had a preference towards using legislative, global, judicial and liberal thinking styles (type I styles), whereas students that were not defined as gifted were more inclined to use executive, oligarchic and conservative thinking styles (type II styles). Thinking styles that were found to be positively associated with academic achievement included conservative, hierarchal and internal styles. Styles such as legislative, liberal and external styles on the other hand, were found to be negatively associated with academic achievement (Zhang & Sternberg, 1998).

Zhang and Sternberg (2000) investigated the relationship between thinking styles and the theory of learning styles proposed by Biggs (1995) and realised that students who utilise mainly a deep approach to learning or attempt to employ a real understanding of study material, use type I thinking styles, and that students who use mainly a surface approach or the use of rote-learning approaches to learning use predominantly type II thinking styles. Zhang (2002a, 2002b) also found that there is a significant relationship between thinking styles that are more norm-conforming and simplistic, and analytical modes of thinking. They also identified that styles which are more creativity-generating and complex are related to holistic modes of thinking. The reliability and validity of thinking styles are discussed extensively in Chapter 3.

2.4. CHAPTER SUMMARY

This chapter provided an overview of the purpose of the study as well as a review of the origins of intelligence theory and the potential for intelligence in emotions. The distinction between trait and ability EI was discussed specifically regarding the nature of the differences in theoretical properties that result in the distinction between the two constructs and the practical implication of this distinction. The chapter further investigated the nature and properties of thinking styles, and the rationale for the potential relationship with ability and trait models of emotional intelligence was introduced.

CHAPTER 3
RELIABILITY AND VALIDITY ISSUES OF THE INSTRUMENTS USED TO MEASURE EMOTIONAL INTELLIGENCE AND COGNITIVE THINKING STYLES

As discussed in Chapter 2, the theoretical and methodological differences that underlie ability and trait EI have resulted in a number of difficulties in conclusively defining the nature of the EI construct as either an intelligence or a personality trait. The aim of this chapter is to review and discuss issues with reliability and validity that has been identified by previous research studies with the most prominent measures of trait and ability EI, particularly regarding the measurement instruments that are examined in the present study. The chapter will also focus on examining how the self-report instruments within the trait model and the objective performance instruments within the ability model of EI have correlated with personality factors and cognitive abilities. Previous research that supports or refutes the hypothesis that self-report and ability EI instruments measure EI constructs beyond that explained by existing measures of personality and intelligence, will be reviewed. This chapter will also examine the reliability and validity of the measure of cognitive thinking styles used in the research. The chapter concludes with the research questions and hypotheses to be tested.

3.1. MEASURES OF EMOTIONAL INTELLIGENCE

3.1.1. Performance based measures of emotional intelligence

Ability models of EI are concerned with the abilities to identify, express, label and manage emotions and are therefore based primarily on external appraisals of performance (Matthews et al., 2003; Petrides & Furnham, 2001). It has been argued that ability-based scales involving items, for which there are more or less correct answers, will provide the most valid assessment of EI (Mayer et al., 2000a). The ability model maintains that for EI to be justified as an intelligence, it must be measured based on an individual's performance, rather than through self-reported questionnaires (Matthews et al., 2003).

This model contains the only measures available that claim to measure EI in such an objective fashion. The Multifactor Emotional Intelligence Scale (MEIS) is the original instrument created by Mayer and Salovey (1997) to measure how well people solve emotional problems on performance tasks rather than relying on people's subjective assessment of their emotional skills. The MEIS consisted of 402 items and 12 ability measures divided into the four dimensions of EI (Mayer et al., 2000a). The dimensions include identifying emotions, facilitating emotions, understanding emotions and managing emotions. Analysis of the data provided five scores, one for each branch and one for total EI. Some of the subscales had low reliability scores and problems with scoring procedures (Mayer & Salovey, 1997).

The test was later revised into the MSCEIT V1.0 (Mayer et al., 2002) and the MSCEIT V2.0 (Mayer, Salovey, Caruso & Sitarenios, 2003). These measures differ from the MEIS in that certain items and subtests have been revised and replaced and the subtests are comprised of fewer items. As the MSCEIT V2.0 is an improvement on the earlier MSCEIT V1.0 and MEIS rather than a different instrument, the validity and reliability of the MEIS measure will only be referred to briefly in this chapter to highlight the improvement from the original measure to the latest version.

As the tests are considered to be tests of performance there are two key approaches to identify the correct answers: consensus scoring and expert scoring. Consensus scoring involves determining the correct answer by combining the answers of a large group of test-takers. The authors maintain that this method is the most acceptable, as emotions are a socially constructed concept and developed in relation with everyday social communication between people. A major drawback to this method is that the criterion is mostly based on North American samples and therefore representative of social scenarios unique to North American participants. Although studies have been done in countries such as Australia, the UK and South Africa, the number of studies in these and other non-Western countries are limited (Matthews et al., 2003; JVR, 2007).

Expert scoring involves determining the correct answer by pooling the judgments of 21 so-called international emotion experts who were asked to provide answers to all the test items. Members of the expert sample were drawn from the International Society for Research in Emotions (ISRE) who attended a meeting in 2002. The expert sample consisted of 10 men and 11 women aged 20 to 52 years with a mean age of 39.4 (JVR, 2007). This type of scoring technique is most similar to that used in cognitive ability tests but is considered to be a highly controversial method. The expert scoring method utilised for the MEIS consisted of the judgement of the test authors as to which questions were right or wrong, therefore the expert panel of the MSCEIT was updated to lend greater credibility to the reliability of the instrument.

The ability model and corresponding performance measures of EI are considered by a large number of researchers to be the superior model in measuring and explaining EI (Ashkanasy & Daus, 2005; Conte,

2005; Brackett & Mayer, 2003), largely due to the objective scoring of the instrument and low overlap with existing personality or other trait measurement instruments. These measures have been theoretically related to several important life criteria that ability measures may be expected to predict such as psychological well-being, life satisfaction, empathy, the quality of interpersonal relationships, success in occupations and positive workplace outcomes, as well as academic success (Palmer, 2003; Mayer et al., 2000b; 2003; Mayer & Geher, 1996; Ciarrochi et al., 2000; Roberts et al., 2001; Lopes, Grewal, Kadis, Gall & Salovey, 2006). These findings have also in most cases been found to remain statistically significant after controlling for other predictors such as personality traits.

3.1.1.1. Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT V2.0)

Mayer and Salovey's (1997) ability model of EI encompasses four conceptually related abilities that are arranged hierarchically from the most basic to the more psychologically complex (Palmer, 2003). The MSCEIT assesses this four-branch model of EI including the ability to perceive emotions, the ability to use emotions to facilitate reasoning, the capacity to understand the meaning of emotions and the ability to regulate and manage emotions.

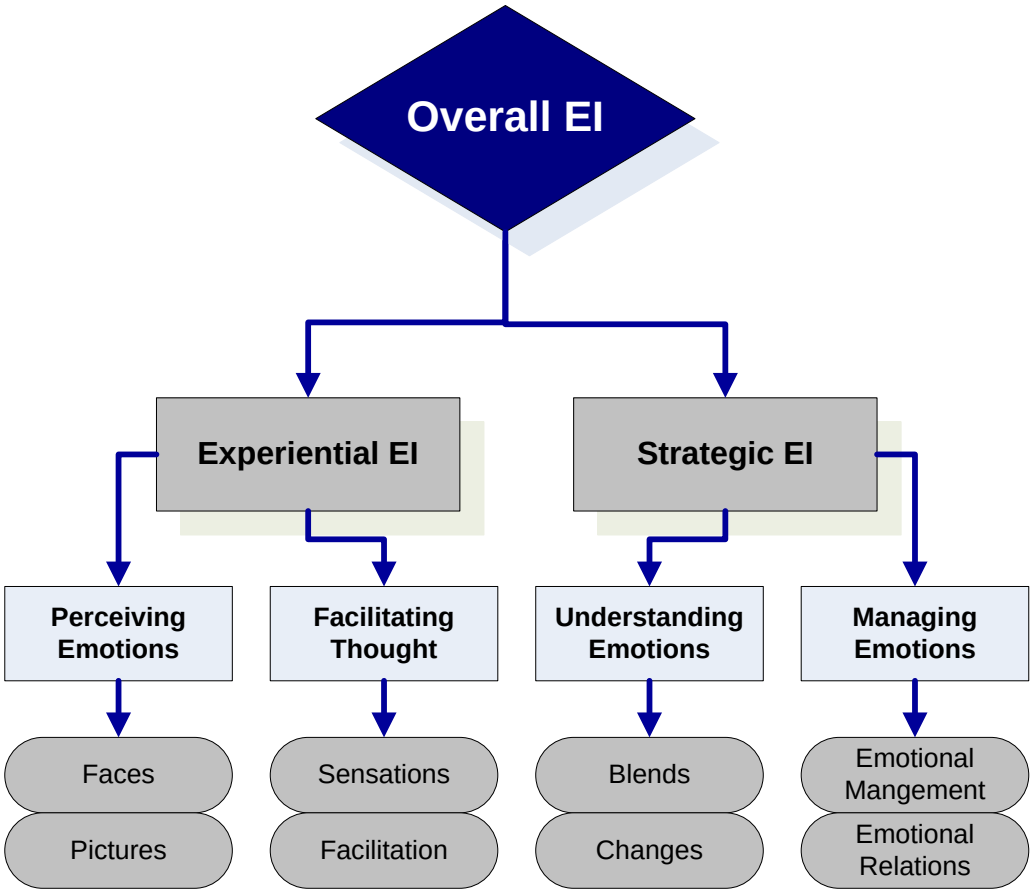
The MSCEIT also examines overall EI areas which represent *experiential emotional intelligence* and *strategic emotional intelligence*. The experiential emotional intelligence score is calculated using the first two branch scores: *perceiving emotions* and *facilitating thought*. Strategic emotional intelligence is a combination of the third and fourth branch scores: *understanding emotions* and *managing emotions* (JVR, 2007).

Each of the four branches consists of eight tasks with two tasks for each branch. *Faces* and *pictures* combine to form the *perceiving emotions score*; *sensations* and *facilitation* combine to form the *facilitating thought* score. *Blends* and *changes* combine to make the *understanding emotions* score, and *emotional management* and *emotional relations* combine to form the *managing emotions* score (JVR, 2007).

The MSCEIT measures perceptions of emotions using the faces and pictures tasks by requiring respondents to rate how much of a particular emotion is expressed in photographs of people's faces as well as in a picture of a design or a landscape. Emotional facilitation of thought is measured in the sensations task by tasking respondents with drawing emotional parallels with different sensations including colours, light, and temperature, and in the facilitation task by requiring respondents to demonstrate their understanding of emotions and identify the feelings that might facilitate or interfere with the successful performance of various cognitive and behavioural tasks. Understanding emotions is

measured in the blends task by asking respondents how emotions blend to form more complex emotions and requires the respondent to construct and deconstruct complex emotions that consist of more than one underlying emotion. This is also assessed using the changes task which examines the transition of emotions. This task assesses the respondents' understanding of how emotional reactions change over time or how they follow upon one another. Emotional management is examined by having respondents rate the effectiveness of alternative actions in an emotional situation thereby examining how a person would regulate his or her own emotions. The emotional relations or social management task requires respondents to read a short story about another person, and then determine how effective several different courses of action would be in coping with emotions in the story (Mayer et al., 1999; 2003) to obtain an understanding of the respondent's ability to manage the emotions of others.

Figure 2: The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT V2.0) scales and subtasks



3.1.1.2. Predominant criticisms of performance based measures of emotional intelligence

Despite the advantages of using performance based measures of EI, there appear to be a number of concerns about their psychometric properties which still need to be resolved (Matthews et al., 2004). Several researchers have expressed concerns about the absence of scientific standards for determining the accuracy of consensus and expert scores for the MEIS and the MSCEIT V2.0 (Conte, 2005; Matthews et al., 2003). Pérez et al., (2005) state that the greatest problem with ability tests is the difficulty in measuring the inherent subjectivity of emotional experience through objective scoring and at the same time addressing the uncertainty over how to achieve genuinely objective item scoring. Averill (2004) contends that the Mayer, Salovey viewpoint of EI is too simplistic as emotions are a complex pattern of responses and no single component such as a facial expression or image such as those utilised by the MSCEIT contain sufficient information for the attribution of emotion. Furthermore, these measures appear to be unable to do more than measure semantic knowledge about emotions, and a more relevant measure would need to place respondents in an environment where they can experience the emotions they are asked to respond to (Ashkanasy & Daus, 2005).

The second dominant criticism is that a performance test requires responses that can be evaluated against objective, predetermined scoring criteria. Consensus scoring techniques are therefore in direct contrast to traditional measures of intelligence where formal objective measures of correct or incorrect answers are used (Matthews et al., 2003). Items that were used in early IQ tests that depended on subjective judgment, such as deciding which of several faces was most attractive, have been largely removed from tests, due, in part, to the risk of cultural bias. The measurement of EI as a cognitive ability is largely dependent on the assumption that answers to stimuli that supposedly presents various facets of emotion, can be categorised as correct or incorrect. If this is not possible, no scoring method would be capable of meeting the basic psychometric criterion for ability tests, namely that there exists a true and undisputable standard against which to judge responses (Roberts et al., 2001).

A third major criticism of consensus scoring arises from the implication that standards of emotional success are relatively independent of individuals and culture, and therefore consensus scoring methods guarantee a uniformity of response (Averill, 2004). As emotional intelligence is considered by the authors of the model to be an intelligence (Mayer, Salovey, Caruso & Sitarenios, 2001) and is therefore expected to abide by the rules of traditional intelligence testing, the standards of success should apply across individuals and even cultures. This assumption hints at a biological conception of emotion that is perceived to be only moderately affected by socialisation and cultural norms (Averill, 2004). Although there is increasing indications of the biological basis of emotion (LeDoux, 1996), there is still much ambiguity regarding the nature of the neural relationship between cognition and emotion.

The apparent grounding of Mayer, Salovey and Caruso's (2004) assertion that emotions arise exclusively from a biological basis is in contrast to more traditional constructionist viewpoints such as those expressed by Averill (2004). Averill contends that social rules rather than genetic programming are the main principles by which emotional reactions are organised. A criticism levied often against all performance based measures and scoring methods is that these tests are easily influenced by the values and trends relative to certain cultures, genders, time periods or contexts. As a result of the multicultural nature of modern society, social norms do not only vary across countries but across settings as well, therefore the impact of context may be a significant confounding variable. The use of experts could also be detrimental to people from cultures and subgroups that the experts do not represent. It is therefore difficult to generalise the analysis of the results and corresponding implications across all settings (Van Rooy & Viswesvaran, 2004) and the nature of the MSCEIT testing, therefore, does not sufficiently accommodate the effects of cultural, social or situational influences.

A further criticism of consensus scoring is that, by definition, this scoring procedure evaluates convergence in emotional intelligence rather than superior abilities in emotional intelligence and, therefore, tends to devalue unusual and idiosyncratic emotional responses (Averill, 2004). The existence of correct answers to cognitive ability items imply that it is possible for a person who has unusually high cognitive abilities to provide correct answers, however, a person who has an unusually high EI may not be recognised as they do not conform to the normative results (Matthews et al., 2003; Brody 2004).

A criticism targeted specifically against expert scoring is the selection procedure for determining who is an 'expert' in emotions. Although the authors counteract that there is a high degree of agreement between consensus and expert scoring methods (Mayer, et al., 2001), no objective methods are used to positively identify a true 'expert' or genius in EI (Roberts et al., 2001). Averill (2004) argues that expert scoring based on smaller diverse groups of judges further suggests that emotions can be identified by necessary and sufficient conditions and therefore hints again at a biological origin.

Practical concerns that accompany the use of these measures include the time taken to administer them (between 45 and 60 minutes to complete), the high costs and the strict controls on the scoring methods and data of these tests by the test publishers (Goldenberg et al., 2006). The propriety nature of the databases also makes meta-analysis of results problematic (Conte, 2005).

Conte (2005) maintains that much of the research conducted using the MEIS should be re-evaluated using the MSCEIT V2.0, due to the large difference between the measures and the lack of studies that have examined the correlations between them. Conte predicts that the MSCEIT V2.0 will demonstrate discriminant validity from personality measures, but that the measure will be lacking in incremental validity in predicting performance outcomes. In support of this argument, neither Barchard (2003) nor

Brackett and Mayer (2003) found that the MSCEIT demonstrated incremental validity for predicting academic success over and above cognitive ability and personality.

3.1.2. Self-report measures of emotional intelligence

Self-report measures are designed to assess beliefs and perceptions about an individual's competencies in specific domains of EI (Salovey et al., 2001). These indexes generally ask a person to rate their abilities on a series of descriptive statements such as "I know why my emotions change," or "I expect good things to happen". A number of researchers have attempted to develop accurate self-report measures of EI or EI related constructs. There are numerous additional self-report measures available based on Salovey and Mayer's (1990) model, the models developed by Goleman (1995) and Bar-On (1997) and a host of similar theories such as the Levels of Emotional Awareness Scale (LEAS, Lane, Quinlan, Schwartz, Walker, & Zeitlin, 1990), the TEIQue (Petrides & Furnham, 2003) and the SUEIT (Palmer & Stough, 2001). The Schutte Self-Report Emotional Intelligence Test or SSREIT developed by Schutte et al., (1998) and the Trait-Meta-Mood Scale or TMMS developed by Salovey et al., (1995) are both based on Salovey and Mayer's (1990) original model of EI.

Due to the large number of instruments that claim to measure trait EI, this review will focus predominantly on the SSREIT (Schutte et al., 1998) which is the instrument that has been used in the present study to measure the trait EI model developed by Salovey and Mayer (1990). Additional reference will be made to the Goleman's Emotional Competence Inventory (ECI; Goleman, 1995) and Bar-On's Emotional Quotient (*EQ-i*; Bar-On, 1997) where relevant, in order to provide a frame of reference against which the reliability and validity of the SSREIT can be evaluated.

3.1.2.1. Brief overview of the Emotional Competence Inventory and Bar-On's Emotional Quotient

The Emotional Quotient Inventory (EQ-i) and the Emotional Competence Inventory (ECI) are measures that attempt to assess not only emotional abilities but also a number of non-ability characteristics that relate to personality, chronic mood and character and have therefore been previously referred to as mixed models (Mayer et al., 2000a). The EQ-i was developed by Bar-On and is a commercially sold 133-

item inventory that yields an overall EQ score as well as scores for five composite scales: (1) intrapersonal, (2) interpersonal, (3) adaptability, (4) general mood and (5) stress management. The instrument also provides 15 clinical subscales and two validity subscales. The clinical subscales measure emotional self-awareness, assertiveness, self-regard, self-actualisation, independence, empathy, interpersonal relationships, social responsibility, problem solving, reality testing, flexibility, stress tolerance, impulse control, happiness and optimism. The scale is nevertheless criticised due to the lack of clarity regarding how each of these composites is related conceptually to EI (Matthews et al., 2003), and the definition does not make an obvious distinction between the intelligence factors that provide the scope for developing emotional competencies and the skills and abilities that an emotionally competent person is expected to possess (Wakeman, 2006). The validity subscales are referred to as positive impression and negative impression (Schutte & Malouff, 1999), and measure the extent to which people respond randomly, or distort their responses in order to appear favourably or unfavourably. In spite of this, the response bias indexes are considered to be insufficient as these scales have been found to be unreliable in ascertaining whether a respondent is distorting his or her responses because of false perceptions regarding their own emotional abilities (Matthews et al., 2003).

Goleman (1995) developed the ECI, to measure the components of his theory of EI. The original ECI model (version 1) had 110 items on a seven point Likert scale measuring 25 competencies arranged in 5 higher-order clusters: self-awareness, self-regulation, motivation, empathy and social skills. After further factor analysis, the scale was collapsed into 20 competencies and four domains: self-awareness, self-management (a mix of self-regulation and motivation), social awareness (a combination of motivation and empathy) and social skills (a combination of motivation, empathy and social skills) (Matthews et al., 2003; Wolff, 2006). This version (version 2) consisted of 72 items measured on a six point Likert scale (Pérez et al., 2005). Matthews et al., (2003) criticise Goleman's updated version of the ECI for not measuring the same competence-based model described in his published theoretical framework. Pérez et al., (2005) express concerns that although the ECI has been promoted as a human resource tool, there is little information about the psychometric properties in scientific literature.

3.1.2.2. The Schutte Self-Report Emotional Intelligence Test (SSREIT)

The SSREIT is a self-report measure of EI that was developed by Schutte, et al., (1998) in an attempt to measure the extent to which respondents are able to identify, understand, harness and regulate emotions in themselves and in others. The SSREIT is the measure that has been chosen to evaluate trait EI in the present study and will therefore be the primary focus for the discussion of the reliability and validity of trait EI.

The SSREIT, otherwise known by labels such as the EIS (Emotional Intelligence Scale), the SEI (Self-Report Emotional Intelligence) and the Schutte Emotional Intelligence Scale (SEIS), assesses EI based on self-report responses. The scale, which according to the authors was constructed to sample relatively evenly from the three primary content domains of the Salovey and Mayer (1990) model, has a single factor with 33 items that assesses the appraisal and expression of emotion in the self and others, regulation of emotion in the self and others and utilisation of emotion in solving problems (Chapman & Hayslip, 2005). These components, along with emotional knowledge, also form the core of Mayer and Salovey's (1997) revised ability model and are central pieces in Goleman's (1995) and Bar-On's (1997) EI models. The SSREIT is therefore considered as tapping into a construct adopted by several conceptions of EI (Chapman & Hayslip, 2005).

The SSREIT was developed by generating 62 items from Salovey and Mayer's (1990) model of EI with each item selected for the pool reflecting an adaptive tendency towards emotional intelligence within the framework of the model. Using a principal component factor analysis followed by a varimax rotation on the 62 items, four components were extracted but only one strong factor was retained. On the basis of the 33 scale items, which were the items with the highest loading on the first factor, were selected. These items, according to the authors, represented all dimensions of the original Salovey and Mayer model (Schutte & Malouff, 1999). This method utilised by Schutte and colleagues has been criticised by researchers such as Petrides and Furnham (2000a) who maintain that as the components of the EI model are considered to be hierarchical and therefore conceptually related, an oblique rather than an orthogonal rotation should have been used to develop the items utilised in the instrument. These issues are discussed more extensively in the section pertaining to the validity of the SSREIT.

The reason why the SSREIT was chosen instead of the better know ECI (Goleman, 1995) or EQ-i (Bar-On, 1997) is because the SSREIT was based on Salovey and Mayer's initial (1990) definition of emotional intelligence and would therefore allow meaningful comparison with the MSCEIT. As better known measures such as the ECI and EQ-i incorporate personality dimensions in the model, they are expected to show greater discriminant validity from the MSCEIT. The SSREIT has also emerged as the leading brief scale for assessing EI, not only because it is in the public domain (Chapman & Hayslip, 2005) but also because it is considerably shorter than the major trait EI scales such as the EQ-i and the ECI.

3.1.2.3. Predominant criticisms of self-report measures of emotional intelligence

A number of concerns have been expressed about the validity and reliability of many of the self-report measures of El (Ciarrochi et al., 2000) and a number of problems and serious omissions currently plague El research findings based on self-report methodologies. Critics state that self-report measures are not good indicators of actual ability, but rather present only an indication of a person's perception of their abilities and are therefore highly reliant on the test-taker's honesty and accurate self-knowledge (Ciarrochi et al., 2000). Critics question firstly whether people are sufficiently aware of their own emotional abilities to report upon them accurately. If the self-reports are inaccurate, these measures consequently yield information only about the person's self-perception, rather than his or her actual level of El. Self-perceptions may not even be available to conscious interpretation (Roberts et al., 2001).

The second question asked by critics is whether people are answering the questions truthfully instead of reporting in a socially desirable manner (Salovey & Grewal, 2005; Roberts et al., 2001). Self-report tests are sensitive to response bias as very few of these instruments have measures built in to detect this. These measures have therefore been criticised as being filtered through a person's self-concept and impression management motives (Mayer et al., 2000a). The EQ-i (Bar-On, 1997) has scales called ‘fake good’ and ‘fake bad’ which are used to adjust the EQ-i content scales based on social desirability results, however, independent research by Hemmati, Mills and Kroner, (2004) has found a strong correlation of 0.50 with the EQ-i total score and the Balanced Inventory of Desirable Responding. Research with the SSREIT has been less consistent with correlations found between social desirability measures and the SSREIT ranging from 0.12 (Saklofske et al., 2003) to 0.49 (Charbonneau & Nicol, 2002).

In spite of the concerns regarding self-report measurement methods, modern technology and the prevalence of computer testing may have a neutralising effect on social response bias. Research conducted by Richman, Kiesler, Weisb and Drasgow (1999) revealed that social desirability was reduced using computer interviews compared to self-report tests conducted in face to face interviews, they also found that when respondents were assured of anonymity, they scored lower on social desirability measures. In addition, Kluemper (2008) argues that there may even be a complimentary theoretical link between social desirability and EI measured as a trait, as it could be argued that people who are able to manage their own emotions and the emotions of others may have a greater tendency to exhibit impression management or social adjustment behaviour as well as have a higher self esteem or enhanced core-self evaluation capabilities.

Ciarrochi, Deane and Anderson (2002) found that self-reported emotional perception is unrelated to how people actually perform in recognising emotions. Dulewicz and Higgs (1999) have also stated that

measuring self-awareness is especially difficult as most people are unaware of how they are presented to other people. These problems are nevertheless common to all scales based on self-report, including personality assessment.

Alternatively, self-report measures of intelligence are considered by some to be important because people often act on their beliefs about their abilities as opposed to their actual abilities (Bandura, 1977). The perception of emotional intelligence may, therefore, integrate motivation to achieve emotional competencies and certain preferences to act on these competencies. As a result, individuals may be more likely to modify their behaviours based on their beliefs about their abilities rather than their actual abilities (Thingujam, 2002).

Critics further argue that these tests are only new forms of personality testing and do not in actual fact present something new. Research on tests of EI that assess non-cognitive traits (e.g., assertiveness, optimism and impulse control) have found that these tests seem to be tapping dimensions of individual differences that are entirely unlike contemporary notions of what constitutes intelligence (Davies, Stankov, & Roberts, 1998). Scores on self-report tests of emotional intelligence have also been found to be highly correlated with standard personality constructs such as extroversion and neuroticism (Brackett & Mayer, 2003), and therefore contradict the conditions put forward by Mayer and Salovey (1997) that EI represents a traditional form of intelligence. The similarity between EI and Alexithymia has also been remarked on and some researchers have gone as far as to categorise EI as the positive polar end of Alexithymia as it deals with negative emotions whereas EI has a positive slant. Then again, Alexithymia is viewed as a construct of personality and hence a relationship to ability EI is undesirable (Landy, 2005).

Regardless of the criticism these tests have received, self-report measures are still the most popular method used to assess EI in research, as these measures have significant advantages over ability tests. The tests are less complicated to administer and score than the ability measurements because the development principles for these measures follow the structured principles of psychometric test construction. The instruments are also freely available and are not controlled by external corporations which require large fees to use these instruments. Researchers therefore, have more access to these instruments and are not restricted by rigid procedures in the administering of the tests. In addition, the instruments are more straightforward than ability measures and can be administered without supervision (Austin, Saklofske, Huang, & McKenney, 2004). The self-report questionnaires are also less time-consuming than the ability instruments which require a reasonable amount of time to administer. Ability measures however, have an advantage over self-report measures, as they represent an individual's performance level on a task (Mayer et al., 2000a) and are therefore more difficult to fake. Although perceived EI may not yet yield an actual emotional IQ, there is potential for the construct to provide important insight into how an individual perceives emotional competencies which may guide behaviour beyond that of actual ability levels (Thingujam, 2002).

3.2. A CRITICAL EVALUATION OF THE RELIABILITY AND VALIDITY OF EMOTIONAL INTELLIGENCE AND RELATED INSTRUMENTS

Emotional intelligence is not a new concept and the theory has been reproved for its theoretical overlaps with both Thorndike's Social Intelligence and Gardner's Multiple Intelligences. On the other hand, the existence of social intelligence has been profoundly criticised largely due to difficulties in demonstrating the concept empirically and the consequent inability to develop a reliable psychometric instrument (Landy, 2005). Gardner's inability to demonstrate the existence of interpersonal and intrapersonal intelligences psychometrically has also been commented on (Landy, 2005), and consequently there is concern as to whether or not the construct of EI can succeed in developing a reliable and valid assessment of the theoretical model where similar constructs have failed. Contrary to these criticisms however, Ashkanasy and Daus (2005) emphasise that Mayer, Salovey, and Caruso (2000c) have gone to great lengths to distinguish emotional intelligence from social intelligence by arguing that emotional intelligence is about emotion and founded in a modern understanding of the neural basis of emotions in the brain.

Although readily accepted and used in occupational fields such as talent management and personal development, the academic field has been less accepting of emotional intelligence. EI is seen by a number of theorists as media hype and a fad (Matthews et al., 2003) and it is often forgotten that many of the EI measures may be neither reliable nor valid (Ciarrochi et al., 2000). Some critics see EI as a further means of controlling the actions of people and dictating a norm for how emotions should be managed (Landy, 2005). The primary difficulties encountered within the field arises from the lack of consensus in determining whether EI should be considered as a cognitive ability, or as a personality trait, or whether it is distinct enough to be considered a construct at all.

In general EI measures have demonstrated adequate internal consistency and reliability (Matthews et al., 2003). Self-report EI measures have acceptable internal consistency as do the overall scales for ability-based measures, but this data by itself gives no indication about whether EI measures are simply assessing constructs already measured by other, more established constructs such as the Big Five personality dimensions (Conte, 2005). Furthermore, some of the subscales for the ability-based EI measures have indicated less than acceptable internal consistency (Matthews et al., 2003).

Validity evidence for EI measures has been less forthcoming, especially with regard to content validity, which is largely due to the vague theoretical development and variety of definitions of EI (Conte, 2005). Only once a firm taxonomy of EI has been established with clear implications for the nature of the construct, can the content validity of EI be reliably assessed. Evidence of construct validity in the form of

convergent and discriminant validity is also lacking, due to the lack of discrimination between trait and ability in EI literature. As a result, research studies continuously fail to converge on a common construct. Criterion-related and incremental validity of EI measures has also been found to be contradictory. Van Rooy and Viswesvaran (2004) found that the percentage of variance in performance explained by EI was 5 percent, which is much lower than the claims of theorists such as Goleman (1995), who has argued that EI is more important than general mental ability (GMA). In addition neither trait nor ability EI was found to indicate incremental validity above GMA in predicting performance outcomes. Further evidence for the need to separate trait and ability EI into separate constructs is provided by the lack of convergence with regard to predictive validity. Self-report EI measures appear to assess existing personality characteristics or perhaps emotional competencies, but they do not relate closely to existing measure of cognitive intelligence (Mayer et al., 1999; Van Rooy & Viswesvaran, 2004).

The following section offers a review of the reliability of competing measures of EI and focuses on the empirical findings regarding the construct, discriminant and predictive validity of the most well known instruments that claim to measure EI. The focus of this section will be on the tools utilised in the present study and therefore research with other well known tools will only be referred to briefly.

3.2.1. Reliability of competing measures of emotional intelligence

Test of reliability examine the accuracy with which an instrument measures the construct it claims to measure. For a measure of EI to be considered as reliable, the instrument needs to measure a construct accurately and consistently in repeated administrations (Owen, 1996). Anastasi and Urbina (1997) state that desirable or satisfactory reliability coefficients should fall between 0.8 and 0.9 if important decisions have to be made about an individual. Cicchetti (cited in Schutte and Malouff, 1999) states that the minimum acceptable level of reliability is 0.7 for measures that are difficult to concretely define such as personality assessments.

There are several options with which an instrument's reliability can be retrieved, of which the Cronbach's alpha is the most well-known. Cronbach's alpha is a measurement of the degree of homogeneity of the items that comprise a scale. If each item in a test of emotional intelligence is actually measuring that construct, then responses to the items should correlate in a significant and meaningful manner with responses to all other items in the test (Stone, 2004). A second well know measurement is test-retest

reliability or temporal stability, which measures the consistency of test scores over time. These are the primary methods used to compare the reliability of the measurement instruments discussed.

An additional measure which is utilised specifically in the assessment of the reliability of the MSCEIT at the subscale level is the split-half reliability coefficient. This form of analysis involves the dividing of a set of items from a single measure in two subsets, and the correlation between them is compared for consistency (Owen, 1996; Cools, 2007; Brackett & Geher, 2006). Low reliability on these scores indicates that the construct being measured is not an enduring disposition and therefore of questionable value (Stone, 2004).

3.2.1.1. Reliability of ability EI measures: the MEIS and the MSCEIT

The MSCEIT V1.0, V2.0 and MEIS were designed to provide one overall emotional intelligence score as well as four sub scores for each of the branches of emotional intelligence. The test-retest reliability of the overall MEIS over a 2-week period was 0.75 and the test-retest reliability of the MEIS branch scores ranged from 0.60 to 0.68. Conte (2005) maintains that in contrast to these results, reliability coefficients for cognitive ability tests typically range from 0.85 to 0.95. The reliability of the MEIS tasks were found by Ciarrochi et al., (2000) to be low, with only the emotion perception subscales reaching satisfactory levels of reliability.

Mayer et al., (2003) reason that in view of the nonhomogeneous nature of the different item forms within each of the different tasks, the ideal measurement for the reliability of the measure is split-half reliability coefficients rather than coefficient alphas, as they involve the orderly allocation of different item types to the different sections of the test.

Split-half reliability coefficients for the four branches are reported in the technical manual (Mayer et al., 2002) as ranging from 0.80 to 0.91. Using a diverse sample consisting of respondents from a variety of countries, population groups and ages, Mayer et al., (2003) found good full-test split-half reliabilities for the total scale of 0.93 using general scoring and 0.91 using expert scoring. In spite of the high reliability scores of the total scale, the internal consistency estimates established for the subscales were found to range from a low 0.55 to 0.88 and approximately half of the subscales have reliability coefficient's below the 0.7 criterion. The average internal consistency across all scales in the MSCEIT reported was 0.68 for consensus scoring and 0.71 for expert scoring which Conte (2005) asserts is far from optimal given that the instrument is intended to be a measure of cognitive ability.

Van Staaden (2001) reported Cronbach's alpha coefficients from a study conducted on a sample of South African university students that corresponded with the reliability coefficients provided by Mayer et al., (2003) for the overall MSCEIT and all subscales except for the emotional identification in faces, emotional identification in pictures and blends subtasks which were lower than those reported by Mayer et al (2003). The reliability coefficients may, however, be artificially low because Cronbach's alpha coefficients, rather than the recommended split-half method were used to evaluate reliability at the scale and subscale levels. The details of the reliability coefficients made available by Mayer et al (2003) and Van Staaden (2001) are presented in Table 4.

Table 4: Reliability coefficients for the MSCEIT V2.0 using General and Expert scoring reported in previous studies

Area Score / Branch scores & Task scores	Split-half reliability coefficients (Mayer et al., 2003)		Cronbach's alpha coefficients (Van Staaden, 2001)
	General	**Expert**	**General Scoring**
Total MSCEIT V2.0	.93	.91	.90
Experiential EI	.90	.90	-
Identification / Perception	.91	.90	-
Faces (Section A)	.80	.82	.74
Pictures (Section E)	.88	.87	.78
Facilitation	.79	.76	-
Facilitation (Section B)	.64	.63	.60
Sensations (Section F)	.65	.55	.54
Strategic EI	.88	.86	-
Understanding	.80	.77	-
Changes (Section C)	.70	.68	.63
Blends (Section G)	.66	.62	.49
Managing	.83	.81	-
Emotion management (Section D)	.69	.64	.64
Emotional relationships (Section H)	.67	.64	.66

Only one study conducted by Brackett and Mayer (2003) has examined test-retest reliability scores for the MSCEIT, which were described as good, with split-half reliability coefficients after three weeks reaching 0.86. Inter-rater reliabilities have also been established as sufficient by Mayer et al., (2003) who confirmed that task scores obtained using the general consensus method correlated highly with expert ratings (r = .93 to .97). In addition, correlations with external criteria have also been replicated across the

two scoring methods (Brackett & Salovey, 2006). On the other hand, a recent study conducted by Palmer, Gignac, Manocha and Stough (2005) on a sample of Australian respondents revealed that expert-based scores were lower than the consensus-based scores, particularly for the facilitating and managing branch scores which were found to be below r = 0.7. This suggests that research conducted outside of the United States may not benefit from applying expert scoring procedures based on North American expert panels.

An additional concern was raised regarding the reliability of the MSCEIT by MacCann, Matthews, Zeidner and Roberts (2003) who recognised that the inflated number of 'no emotions present' answer options in the measurement instrument resulted in an artificial inflation of reliability scores. The reliability of the measure is therefore dependent on the ability to correctly deduce that there is no emotion present in an item. These researchers found in separate studies that the more people selecting the no emotion option in an item, the more reliable the item was found to be. Furthermore, blindly choosing the 'no emotions present' option resulted in high percentile rankings for most of the tests, for example if a particular person selected the 'no emotion present' option for each question in the pictures test of the MSCEIT, that respondent would score in the ninety-fourth percentile in the pictures test.

MacCann et al., (2003) argue that as the 'no emotions present' option is considered to be the most correct answer option in a number of the test items, the reliability of the test items relate to the ability to deduce a lack of emotion in an item rather than enhanced perceptual sensitivity. As a result, if a test taker answered that there was no emotion present on each of the items, they would still get a fairly high score, despite their inability to recognize emotion. This criticism would also have a negative impact on the reliability of the measure for assessment purposes, during which respondents would have additional incentive to look for the 'correct emotions' within the stimuli. Respondents would need to be informed that the 'no emotions present' answer option is a viable and correct response for many of the answers, which is not done in the test instructions.

3.2.1.2. *Reliability of trait EI measures: the EQ-I, ECI and the SSREIT*

The reliability of the EQ-i and the ECI have been reported in previous studies as being mostly satisfactory at the total scale level, yet low reliability coefficients have been identified on a number of the subscales. Bar-On (1997) reported that the internal consistency of the overall EQ-i, measured using Cronbach's alpha coefficient, was 0.76 and that test-retest reliability after 1 month was 0.85 and after 4 months was 0.75. Although satisfactory, the reliability coefficient for the total scale is lower than would be expected

from a commercially sold measure of emotional intelligence on which people are evaluated and occupational decisions are made.

Independent research with the EQ-i such as the research conducted by Austin et al., (2004) has also revealed a good reliability coefficient at the total scale level of 0.87. The positive impression scale has however been found to have a consistently low Cronbach's alpha coefficient of 0.61 (Austin et al., 2004) and the reliability coefficients of the remaining subscales range from 0.78 to 0.83. Problems have also been reported with the loading of the factors, as Petrides and Furnham (2001) found the questionnaire to be unifactoral and Palmer, Manocha, Gignac and Stough (2003) obtained six factors instead of 15. Significant overlap has also been identified between the EQ-i and the Big Five personality dimensions (Brackett & Mayer, 2003).

Matthews et al., (2003) reported a good Cronbach's alpha coefficient for the total scale of the ECI of 0.82 yet the reliability of the subscales was found to be marginal, with the weakest subscale reaching a coefficient of 0.59. Research with the ECI has also observed extensive overlap with the Big Five personality dimensions (Davies, 1998; Matthews et al., 2003; Van Rooy & Viswesvaran, 2004). These researchers express concern about the reliability of the measure especially considering that the ECI is marketed as a tool for organisational high-stakes decision-making. The test manual (Wolff, 2006) provides reliability scores that range from 0.61 for the self-awareness subscale to 0.92 for the social awareness subscale, which is higher than those reported by Matthews et al., (2003). Nevertheless, Matthews and colleagues argue that only one dimension has sufficient reliability to justify commercial use.

Previous comparisons between Goleman's ECI and Bar-On's EQ-i models have demonstrated that the two models are largely similar and there is some repetition of components (Wakeman, 2006). Criticism aimed at both models includes the overlap with aspects of personality and social competence that are far beyond the bounds of the original definitions provided by Salovey and Mayer (Ashkanasy & Daus, 2005). As a result the models are seen as too broad in scope and some researchers argue that they do not differ much from personality or traditional competency models. Ashkanasy and Daus (2005) go as far as to say that these measures should not even be confused with emotional intelligence. Goleman's model is however granted a degree of pardon due to his preference for the term 'emotional competence' when defining his model as opposed to 'emotional intelligence' (Ashkanasy & Daus, 2005).

The SSREIT which, as discussed previously, was developed to measure the original branches of the EI model developed by Salovey and Mayer (1990), has demonstrated high internal consistency in a number of studies (Ciarrochi, et al., 2001; Petrides & Furnham, 2000a; Austin et al., 2004; Schutte et al., 2001). In a sample made up of community members, the scale was observed to have a Cronbach's alpha of 0.90 and for college students the Cronbach's alpha was observed to be 0.87 (Schutte et al., 1998). In addition,

independent research conducted by Palmer (2003) on an Australian community sample revealed a Cronbach's alpha for the overall EI scale of 0.92, with a mean of 129.16 and a standard deviation of 15.82. The scale has also been reported as having a good two-week test-retest reliability (r = .78) (Schutte et al., 1998) and group differences in scores and correlations with other measures have generally been reported as in accordance with theoretical expectations (Ciarrochi et al., 2001; Saklofske et al., 2003; Schutte et al., 2001). The SSREIT has also been identified as reliable for measuring both adolescents and adults (Ciarrochi et al., 2001; Matthews et al., 2003; Palmer, 2003).

Previous studies with the SSREIT using South African populations have also revealed good reliability scores. Stone (2004) obtained a Cronbach's alpha coefficient of 0.91 with an average score of 127 amongst employees in a South African information technology and software development organisation. Murphy (2006) obtained a similar Cronbach's alpha coefficient of 0.90 with a mean of 128.22 and a standard deviation of 15.36 amongst a sample of South African university students. The Cronbach's alpha coefficients identified in these two studies as well as the original research conducted by Schutte et al., (1998) is documented in Table 5.

Table 5: Cronbach's alpha coefficients for the SSREIT reported in previous studies

Total EI Score	Normative scores	Results from South African studies	
	Schutte et al., (1998) n=346	Stone (2004) n=118	Murphy (2006) n=308
Mean	-	127.74	128.22
Range	-	74-160	-
SD	-	0.97	15.36
α	.87 - .90	.91	.91
Test -retest	.78	-	-

3.2.2. Validity concerns that relate to the measurement of emotional intelligence

Validity is related to non-random measurement error and is considered to be the degree to which an instrument measures what it intends to measure. There are a number of different types of validity which are important to the development of the EI construct, and each type takes a different approach to assess the extent to which a scale measures what it claims to measure. The primary measures of validity that

should be displayed by a valid measure of EI are *content validity*, which implies that the measure should include items that reasonably tap the multiple conceptual facets of the construct, *construct validity,* which involves the relationship with measures of other constructs and criterion-related validity, which involves the ability of a measure to predict real life or behavioural outcomes that are conceptually related to EI (Owen, 1996; Anastasi & Urbina, 1997; Brackett & Geher, 2006).

Content validity is related to item sampling adequacy, which is the extent to which a specific set of items reflects a content domain. A psychometrically valid test of emotional intelligence is required to cover a representative sample of the domain that it was designed to measure. It is not easy to assess the content validity of a scale because there are no well-defined, objective criteria to do so. Content validity or face validity consists of the consensual judgment of researchers and experts in the field regarding which qualities should be assessed as components of emotional intelligence and which qualities should be excluded from the definition of the construct (Stone, 2004; Cools, 2007). Within the model of EI on which both trait and ability measures of EI are based, four conceptually related and hierarchic clusters of abilities or competencies are identified: the appraisal and expression of emotions, utilisation in thought and behaviour, understanding, and management and regulation of emotion. Assessing the test's content validity would involve identifying whether the test contained items that tapped each of these competencies (Mayer & Salovey, 1997).

Construct validity concerns the extent to which the empirical relationships are observed with related constructs is consistent with theory, and specifically pertains to whether a concept of interest is empirically related to other concepts that are theoretically similar to it and is independent from those different to it. There is a distinction at this level between *convergent validity* which involves similarities between measures of theoretically related constructs believed to tap the same or similar constructs and *discriminant validity* which is demonstrated by being either uncorrelated or only modestly correlated with conceptually distinct measures (Anastasi & Urbina, 1997). An EI test should correlate highly with other variables specified by the theoretical framework as relating to the underlying construct. For example the model on which the MSCEIT is based defines EI as a cognitive ability, therefore theoretically it is expected that this measure would be empirically related to other measures of cognitive ability and unrelated to measures that tap into trait elements of personality. Similarly if ability and trait EI are to be considered as measuring the same construct it is expected that the two instruments should be empirically related to each other, as well as to other measures of EI. Construct validity can also be established by examining a measure's factor structure and the extent to which the measure is able to differentiate amongst groups in accordance with theoretical expectations (Anastasi & Urbina, 1997).

Criterion-related validity is divided into *incremental validity* which is established when variability in important outcomes is predicted after the predictive power of established tests has been accounted for and *predictive validity* which indicates the ability of the measure to predict a real life event or behaviour

(Anastasi & Urbina, 1997). To be of value, measures of EI should predict important practical outcomes of emotional life. This is perhaps the most important criterion because it reflects the importance of the measure's ability to depict the relationship between the construct of EI and potential life outcomes (Stone, 2004). For example one would expect that theoretically, a person's self-reported ability to perceive emotion would be related to his or her performance in recognising facial expressions of emotion. Additional variables of interest to the present study are the ability of these constructs to predict performance criteria such as job satisfaction and fit between a person's traits and their chosen career. As all these elements are important for identifying the strength of ability versus trait measures of EI, previous research that highlights relationships between these elements and each of the measures used in the study are reviewed in this section. Due to the extensive amount of research that has been conducted with the different instruments that claim to measure EI, only results pertaining to these specific instruments will be discussed and other tools will only be referred to briefly where relevant to the issues of validity under examination.

3.2.2.1. The content validity of emotional intelligence measurement instruments: are these instruments sufficiently comprehensive to measure the EI domain

Content validity of the MSCEIT V2.0

Content validity of the MSCEIT is difficult to measure through independent research because the questions used in the measurement instrument are the property of Multi-Health Systems Inc (MHS) and are not freely available for public review. The authors report the content validity as being good for the reason that there are two subtasks in the test that are used to measure each of the four branches of the model (Mayer et al., 2002).

In spite of the assurances by the authors, analysis by independent researchers has raised a number of concerns regarding the content validity of the MSCEIT. Van Staaden (2001) asserts that although the MSCEIT draws sufficient items from each of the four branches of the model, the measurement of perception *and* expression of emotion is incompletely expressed as it is technically expensive to do so, therefore the MSCEIT really only measures the perception of emotion. A recent review by McEnrue and Groves (2006) also finds that the ability of the measurement instrument to tap perception, expression, utilisation and management of a person's own emotions as well as the ability to discriminate between accurate and inaccurate or honest and dishonest expressions of feelings is deficient. The authors have attempted to argue against these concerns by countering that other studies have shown that if people

can recognise the feelings of other people, they can generally recognise their own feelings as well (Mayer et al., 2000c).

A further issue that has been raised regarding the content validity of the MSCEIT and specifically the first branch, perception of emotion, is highlighted by MacCann et al., (2003) who emphasise that the MSCEIT only identifies the visual identification of emotion in two dimensional pictures and consequently ignores aspects that are included in the definition of the ability such as expression, and differentiation in language, sound and behaviour. MacCann et al., (2003) stress that the predecessor of the MSCEIT, the MEIS, measured emotional perception with two additional tests that used language and sound and had higher internal consistency estimates than the MSCEIT which insinuates that the previous test may have had greater overall validity. These concerns suggest that there appears to be a gap between the ability EI model and what the MSCEIT actually measures.

The face validity of the measure for use within occupational contexts is further criticised by McEnrue and Groves (2006) on a more conceptual level. They make an important suggestion that the items which required respondents to identify emotions within sensations such as cold, blue or sweet may not contain much relevance to the EI of managers or employees at work and, therefore, careful consideration is required to determine whether the MSCEIT would deliver appropriate conclusions within the specific context and interactive requirements of the occupational environment.

Content validity of the SSREIT

Gignac, Palmer, Manocha and Stough (2005) are among the few researchers who have examined the content validity of the SSREIT by examining the extent to which the measure covers all the facets of the original Salovey and Mayer (1990) model on which the scale is based. As reported by Schutte et al. (1998), Salovey and Mayer's (1990) original model included three categories: the appraisal and expression of emotions, regulation of emotions, and utilisation of emotions in solving problems. Gignac et al., (2005) however, maintain that within these three categories are six primary dimensions. They argue that the first category should be split into three sub categories namely: expression of emotions, appraisal of emotions in the self and appraisal of emotions in others. The regulation of emotions can similarly be separated into the regulation of emotions in the self and regulation of emotions in others.

In spite of their assumptions, the results of the study by Gignac et al., (2005) were unable to confirm the hypothesised six factor model, but a good fit for a nested factors model with a first order general factor, and four nested factors corresponding to 'appraisal of emotions in the self', 'appraisal of emotions in others', 'emotional regulation of the self', and 'utilisation of emotions in problem solving' were identified. These results suggest that although there appears to be some content validity in terms of the dimensions

of the Salovey and Mayer (1990) model, the scale does lack sufficient items for the measurement of the emotional regulation of others and requires items on the management of emotions in order to bring the scale in line with the revised four factor Mayer and Salovey (1997) model. Furthermore, only two items were qualitatively identified as potentially measuring the appraisal of emotions in the self and the two items identified by the researchers as measuring emotional expression did not demonstrate any unique covariance.

Based on the findings of Gignac et al., (2005) the content validity of the SSREIT appears to be lacking and there is room for revising and extending the measure to cover the various components of EI more comprehensively. A concern at this point is, should the trait EI instrument in effect measure an alternative construct to the ability EI instrument, there is reason to question whether or not the measure should be based on the same underlying model as the ability EI measure. Further investigation into the actual nature of the trait EI construct is therefore required.

3.2.2.2. The construct validity of emotional intelligence and the factor structure of the MSCEIT and the SSREIT

Construct validity is the process of determining whether or not a test actually measures a theoretical construct or trait (Anastasi & Urbina, 1997) and is seen as a never-ending process. Matthews et al., (2003) allege that all studies should continue to provide evidence of construct validity and only when studies of a test consistently lead to negative outcomes should the test be rejected. Verification for the construct validity of EI measurement instruments has been sought in previous studies using several methods: by investigating the factor structure of the instrument in relation to the theoretical assumptions, by assessing convergent or discriminant validity specifically with regard to established measures of cognitive ability and personality traits, and by assessing the extent to which the measures are able to differentiate amongst groups.

<u>The factorial validity of the MSCEIT</u>

Factorial validity represents the extent to which a scale structure is empirically and theoretically justified. For a measure to demonstrate construct validity, its factor structure should comprise the theorised number and pattern of factors (Matthews et al., 2003). The factor structure of the MSCEIT consists of four first-order factors (the EI Branches), two second-order factors (the EI Areas) and one-third order factor (overall EI), which are all derived from the eight task scores (Brackett & Salovey, 2006). Research by the

authors as well as independent researchers provided support for the theoretical factor structure of the model, for example research by Mayer et al., (2003) confirmed a satisfactory four factor structure as well as an acceptable fit for a two factor solution and Day and Carroll (2004) have identified that the eight sub-measures could be reliably interpreted as both a two and a four factor structure.

In spite of these confirmations, certain studies, mostly using samples from countries outside of America, have reported contradictory findings with regard to the factor structure of the MSCEIT. Van Staaden (2001), using a sample of South African students, established that although a four factor structure was valid, the items of the MSCEIT did not fit under the four branches indicated by the model and revisions were required. Palmer et al., (2005) obtained similar results with a sample of Australian respondents using a nested model comparison confirmatory analysis technique and reported four first order factors: one overall emotional intelligence factor and three factors corresponding to three of the four emotional intelligence branches. In order to achieve mathematical identification however, Palmer et al., (2005) had to constrain the loading patterns of the nested models, therefore confounding their results with respect to the underlying structure of the data.

Rossen, Kranzler and Algina (2008) replicated the study conducted by Palmer et al., (2005) with a North American sample and also observed that the one, two and four factor models did not provide a good fit for the data. Rode, Mooney, Arthaud-day, Near, Rubin, Baldwin, and Bommer, (2008) further examined the factor structure using multi-group confirmatory factor analysis and provided evidence of a single higher-order general emotional intelligence factor, but could not find support for the four branch, two area and one overall emotional intelligence factor model upon which the MSCEIT is based.

The factorial validity of the SSREIT

Whether the SSREIT is a multidimensional or one-dimensional instrument is an issue of construct validity that extends to the content validity of the measure as well. According to the authors (Schutte et al., 1998) the instrument provides one general measure of EI, however, research with the instrument has revealed the presence of more than one sub factor, which is to be expected as the model on which the measure was based consisted of three or four hierarchical and interrelated constructs.

The debate over the SSREIT's factor structure arose from Schutte et al.'s (1998) conclusion that the SSREIT total score measured a general EI construct, as the items loading on the factors two to four were not conceptually distinct from the items that loaded on the first factor (Schutte et al., 1998), and because a high Cronbach's alpha was obtained. As the EI factors on which the scale was based were defined by Salovey and Mayer (1990) as being conceptually related, the choice of a principal component analysis with a varimax rotation was not the most appropriate form of analysis from which to generate the items of

the scale. Firstly, as the varimax technique is an orthogonal method it assumes that the underlying factors are uncorrelated and, therefore, an oblique rotation method would have been more suitable. Petrides and Furnham (2000a) have also argued that the use of a varimax rotation would distribute variance away from a common factor and across orthogonal factors, and therefore, the solution did not necessarily reflect a general factor. Gignac et al., (2005) further noted that the use of a factor analysis rather than a component analysis would have resulted in greater factor structure accuracy because in contrast to the principal component method, factor loadings are expected to be smaller, rather than larger.

Petrides and Furnham (2000a) tested the assumption that SSREIT measured one general factor using a confirmatory factor analysis procedure. The 33 items in the questionnaire were the indicators of a single latent variable which represented the general EI factor. Model fit indices employed by the study were observed to be wide of the recommended values indices (χ^2_{495} = 1662.36, GFI = .69, AGFI = .65, CFI = .51, RMSEA = .105, RMR = .093) and the χ^2 test was found to be highly significant ($p < .001$) which indicated that the one factor model was unacceptable. They followed the confirmatory analysis with an exploratory factor analysis too seek a more appropriate solution and identified an alternative four factor solution which they identified as *optimism or mood regulation*, *appraisal of emotions*, *emotional utilisation*, and *social skills*.

This revised four factor structure was again identified using an orthogonal varimax rotation rather than an oblique rotation, which they had initially conducted but all factor correlations were observed to be below 0.3. This inability to find an interpretable solution with an oblique method implies that the four factors also do not appropriately measure the theoretically related EI domains identified in the Salovey and Mayer model. Furthermore, the four factor solution established by Petrides and Furnham (2000a) only explained 40.4% of the total variance, leaving a substantial amount of error variance. The researchers therefore cautioned against the instability of the factor structure due to the small amount of items.

Ciarrochi et al., (2002) replicated the factor analysis with varimax rotation method employed by Petrides and Furnham (2000a) and were able to confirm the four factor solution explaining 40% of the total variance. Two items (item 6 and item 33) in this study, however, loaded on alternative factors to those identified previously and the fourth factor was abandoned due to low reliability ($\alpha = .58$). Contrary to the findings by Petrides and Furnham (2000a), Murphy (2006) was able to identify a four factor solution using an obliquely rotated direct oblimin solution. Most of the factor loadings were above 0.3, although a number of the items were not found to load on the same factors as those identified by both the Petrides and Furnham and the Ciarrochi et al studies.

Palmer (2003) examined the factor structure of the SSREIT using a sample representative of an Australian population. Using a confirmatory factor analysis, Palmer tested the fit of four models; a general factor, four orthogonal factors, four oblique factors and a hierarchical model, all based on the item structure identified by Petrides and Furnham (2000a). The study identified a satisfactory fit for all four models according to the CFI and RMSEA statistics, with the oblique four factor model representing best fitting model (CFI = .98, RMSEA = .068). In spite of these findings, the study did not report the significance of the models and as a result it is difficult to assess whether the models provided a satisfactory fit according to the χ^2 test.

Due to the different findings regarding the item structure of the MSCEIT using oblique versus orthogonal factor rotation methods, a more intensive examination of the exact nature of the item structures of the hypothesised four factors is required. Additionally, as all the research studies discussed which examined the factor structure of the SSREIT have involved university student populations, except for the study conducted by Palmer, there is a need for the hypothesised factor structure of the SSREIT to be replicated with larger and more diverse samples.

3.2.2.3. The discriminate and convergent validity of emotional intelligence: the relationship between emotional intelligence, intelligence and personality

Emotional intelligence as a mental ability

Mayer et al., (1999) have argued that there are standard criteria which need to be met before any new form of intelligence can be considered as constituting a scientifically legitimate version of intelligence. The criteria which these authors have focused on have all previously been defined as components of psychometric studies of intelligence (Roberts et al., 2001). The five criteria are as follows (Mayer et al., 1999):

1. The model of EI must be defined and a reliable means of measuring it must be developed.
2. The intelligence must be operationalised as a set of mental abilities and therefore have clearly defined performance components rather than a preferred way of behaving or other non-intellectual attainments.
3. The intelligence should meet certain prescribed correlational criteria, for example the abilities defined by the intelligence should be positively intercorrelated, or related to pre-existing psychometric intelligence tests, while at the same time providing evidence of some unique variance. Measures of EI are therefore expected to reveal positive correlations amongst the

subscales designed to assess the four areas of EI, as well as consistently reveal a factor structure that compromises a general factor of EI and four correlated primary factors.

4. The abilities of the intelligence should develop with age and experience. Abilities should build on each other through development, with individuals reflecting different levels of development at different ages.
5. The intelligence must be shown to predict important practical outcomes of emotional life (Matthews, et al., 2004).

If EI is to be considered as a new type of intelligence according to the criteria established, then tests to measure EI need to meet the aforementioned criteria, as well as have satisfactory reliability coefficients across all scores used to measure the construct. The instruments should also be distinct from existing measures of personality and should therefore show very little or no significant correlations with personality constructs. The EI measure is required to overlap with measures of other intelligences especially verbal intelligence, yet the EI measure should be able to predict some form of social behaviour after controlling for the effects of intelligence, personality and similar instruments that measure behaviour traits (Thingujam, 2004). Intelligence has traditionally been assessed through competence in mathematics, verbal reasoning and non-verbal reasoning (Wakeman, 2006); therefore these three components of intelligence are the regions which need to show comparability to EI.

Mayer et al., (1999) amongst other researchers (Mayer et al., 2001; 2003), have claimed that there is sufficient available evidence that EI in this domain meets all the criteria and, therefore, the ability theories of EI can be considered as a traditional form of intelligence. These arguments have been made on the basis of findings with the MEIS, MSCEIT and MSCEIT V2.0. As evidence, the researchers contend that EI in this domain can be measured as an ability with correct and incorrect answers determined through consensus and expert scoring (Mayer et al., 1999; Mayer et al., 2001). Mayer et al., (1999) also established that correlations between consensus and expert test scores ranged from $r = -0.16$ to $r = 0.95$, with half of the 12 correlations exceeding a correlation of 0.52. Studies with these measures have also been found to exhibit satisfactory levels of internal consistency and reliability (Palmer, 2003; Van Staaden, 2001; Ciarrochi et al., 2000), and earlier concerns regarding the reliability of the MEIS subscales have been reported as improved, with reported subscale reliabilities of the MSCEIT ranging from 0.79 to 0.91, using consensus scoring and 0.77 to 0.90 using expert scoring (Mayer et al., 2003).

As mentioned previously, confirmation of the factor structure of the MSCEIT has been less conclusive. In an attempt to confirm the convergent validity of the MSCEIT, a confirmatory and exploratory factor analysis study was conducted on the MSCEIT as well as emotions and intelligence measures (Roberts, Schulze, O'Brien, MacCann, Reid, & Maul, 2006). Although the study was able to substantiate the relationship between strategic EI and intelligence, the study observed mixed results regarding the factor structure with some support for the distinction between strategic EI and experiential EI, but not for the

four-branch distinction at a lower level of a higher-order EI model. The findings from these research studies suggest that the branches of EI as measured by the MSCEIT may be difficult to distinguish empirically and as a result of these incongruous findings there is additional work required to validate the factor structure of both the branches and areas of the MSCEIT.

Mayer and Salovey (1997) have conceptualised emotional intelligence as a set of mental abilities concerned with emotions and the processing of emotional information and as a result, the validity of the ability model rests on the expectations that these instruments will correlate with established measures of mental ability and be independent from established trait measures of personality components. Research has, however, uncovered contradictory findings with regard to the overlap between the MSCEIT and personality and intelligence measurements.

A number of previous research findings with the MSCEIT have shown that the measure demonstrates statistically nonsignificant to moderate correlations with general cognitive ability (Ciarrochi et al., 2000; O'Connor & Little, 2003), and research studies have thus been unable to establish concrete support for the placement of emotional intelligence within the domain of cognitive ability. In a study using college students, Brackett and Mayer (2003) observed that the MSCEIT area and total scores were only modestly correlated with verbal SAT scores, which are a proxy for verbal intelligence and Lopes et al., (2003) reported that only the understanding emotions branch of the MSCEIT, which relies on knowledge of emotional vocabulary, correlated with verbal SAT scores but not the total score or any of the other branches. Lopes et al., (2003) further established that there was no significant relationship between overall EI and the WAIS-III vocabulary subtest and only a moderate correlation ($r = .45$) has been reported with the Wonderlic Personnel Test (Schulte, Ree, & Carretta, 2004). In spite of this, a potential confirmation of the overlap with cognitive ability was discovered by Livingston and Day (2005), who on further review of the validity of the MSCEIT versus the EQ-i revealed that the emotional understanding subscale was able to account for a statistically significant, although small amount of variance in cognitive ability.

Initial research with the MSCEIT had revealed that the measure tends to have low to insignificant correlations with personality (O'Connor and Little, 2003) and research by Livingston and Day (2005) has shown that personality measures account for very little variance in the four branch scores of the MSCEIT. Conversely, Lopes et al., (2003) have reported moderate yet significant correlations with the Big 5 dimensions of agreeableness, conscientiousness and intellectual curiosity, and Brackett and Mayer (2003) identified significant relationships with the openness to experience ($r = .25$) and agreeableness ($r = .28$) dimensions, but not with conscientiousness. Rode et al., (2008) found that although the MSCEIT did have discriminant validity from personality, the measure correlated more highly with social desirability than general mental ability which substantiates criticism that the MSCEIT is merely a measure of conformity rather than an actual intelligence.

Construct validity for the MSCEIT as a distinct measure of EI as a cognitive ability is supported by the lack of convergence with measures of trait EI because if two measures are assessing the same construct, scores on these measures should be highly correlated. When compared to self-report measures of emotional intelligence, previous research has indicated that the MSCEIT does correlate moderately with the Bar-On Emotion Quotient Inventory (the EQ-i, r = .21) and the Self-Report Emotional Intelligence Test (the SSREIT, r = .18), however, these relationships disappear when personality is controlled, which reinforces the supposition that ability and trait measures are not measuring a common construct.

Research results on the supposed hierarchical development of EI using the MSCEIT has been inconclusive; Mayer et al (1999) examined developmental trends between adolescent and college-age students and identified that college students scored higher than adolescent youth and Van Staaden (2001) identified that 'academic year' has a moderate influence on the management of emotion. On the other hand Palmer et al., (2005) established that there were no significant relationships between overall MSCEIT scores and age and Gohm and Clore (2002) observed no differences in MSCEIT scores across a cross-sectional sample of 400 students, although the age range of the sample was limited.

Some evidence has been identified which indicates that trait El measures do meet some of the criteria stipulated for the validity of the ability model. Petrides et al., (2004a) observed that although trait El did not have any influence on mathematical or scientific performance, it did moderate the effect of IQ on a scholastic measure of English and overall performance. A relationship was indicated between students with low IQ's and high El who performed well, however, no effect was found for children with high IQ's. Petrides et al., (2004a) theorised that the reason for this effect was because high trait El provides a stabilising force before testing through aspects such as positive self-perceptions, in situations where the intellectual demands outweigh the resources of the student. This provided support for the ability of individuals who have high El to convert stress and anxiety into positive performance. There is however a lack of evidence of a relationship between trait EI as measured by the SSREIT and the age of participants (Murphy 2006; Goldenberg et al., 2006) as well as years of education completed, which is considered to be a proxy for intelligence (Goldenberg et al., 2006).

Despite the growing evidence of the conceptual reliability and validity of emotional intelligence, there are a number of theorists and researchers who contest the conceptualisation of El as an intelligence on a number of theoretical and statistical grounds. The implication that IQ is fixed and difficult to change stands in direct conflict with the views of emotional intelligence as changing with age and experience, modifiable by social environments and upbringing and a skill that can be learned or taught (Roberts et al., 2001). Mayer et al., (1999) defend this contention by maintaining that these criticisms are part of a simplistic view of intelligence and intelligence research. Brody (2004) asserts that ability tests of El measure knowledge of emotions but not necessarily the ability to perform tasks that are related to the knowledge that is assessed, and as a consequence a person who has expert knowledge of emotions

may or may not be expert in the actual ability that is allegedly measured by the test. Matthews et al., (2004) do contend that trait models of EI would have potential value for acknowledging the importance of personality traits that may relate to emotion, however, they criticise these models harshly for not appearing to present any new conceptualisation of emotional functioning and accordingly, do not relate specifically to either emotion or intelligence.

Petrides, Furnham and Mavroveli (2007a) present the strongest argument against the conceptualisation of EI as an ability by arguing that the subjectivity of emotional experience undermines the development of items or tasks that can be scored according to truly objective criteria and that can entirely cover the domain of the construct. They maintain that the scoring procedures utilised by ability EI tests in order to objectify emotional experience, produce scores that are psychologically meaningless and emphasise that the conceptualisation of EI as a trait has greater value in bridging the gap between experimental and correlational accounts of emotion. For that reason, Petrides et al., (2007a) conclude that EI is not distinct from personality constructs, but rather is a part of them and occupy factor space at the lower levels of personality hierarchies.

Emotional intelligence as a personality trait

Personality, which is commonly seen as a person's characteristic pattern of thinking, feeling and acting, has been explored using a variety of theories. Trait theory is one of the most predominant and well accepted personality theories, and attempts to explain personality in terms of the dynamics that underlie behaviour (Stys & Brown, 2004). Traits are characteristic patterns of behaviour or dispositions to feel and act in a certain way which distinguish one person from the next. These traits are hypothesized to be consistent and stable across a lifetime, acting as a type of template for an individual's behaviour (Stys & Brown, 2004).

The extent to which a trait measure of EI should correlate with personality is a topic requiring urgent discussion. EI theories that are based on self-report measures have been criticised (Matthews et al., 2003; Mayer et al., 2000a; Petrides & Furnham, 2000a) for not being sufficiently distinct from personality theory, to warrant being recognised as a separate construct and thereby lacking discriminant validity. This area of EI research has been seen as being merely a mirror for the research on the Big five theory of personality which is an empirically derived model of personality based on the early work on traits by Gordon Allport, Raymond Cattell, and Hans and Sybil Eysenck (Stys & Brown, 2004).

Concern has been raised about the predictive validity of self-report measures of EI, especially due to the perceived overlap with personality. It has been suggested that the correlations observed with theoretically related variables are a result of these instruments measuring personality traits known to predict these

criteria, rather than a distinct construct (Matthews et al., 2003; Mayer et al., 2000c; Newsome, Day & Catano, 2000). The SSREIT has been found to correlate moderately to strongly with a number of personality constructs, including Alexithymia, optimism, impulse control and openness to experience (Schutte et al., 1998), as well as the existing personality scales (Brackett & Mayer, 2003; Petrides & Furnham, 2000a). As a result some researchers maintain that the instrument is simply a different type of personality inventory and not a measure of EI (Mayer et al., 2000c; Roberts et al., 2001).

There have been studies conducted that have observed evidence of the validity of trait EI over personality, for example self-report EI was found to be distinct from personality by Saklofske, et al., (2003) who examined the incremental validity of a trait EI measure over personality measures in the prediction of variables such as life satisfaction, happiness, loneliness and depression. Studies conducted by leading researchers, Petrides and Furnham (2003) have provided evidence for the discriminant validity of trait EI by finding that EI is related to mood sensitivity after partialling out variance from the Big Five personality characteristics, thereby providing support for their hypothesis that trait EI is a distinct personality trait. The study provided additional substantiation of the construct validity of trait EI by linking two differing trait EI measures to perceptions of emotions. Previous studies conducted by Petrides and Furnham (2001) have also provided support for the discriminant validity of self-report EI in relation to personality, by locating a distinct EI factor in the factor space of the Eysenckian measure of personality as well as in the Big Five Factor model of personality, in two separate studies using two different samples.

Evidence of convergent validity has been provided by research which has observed significant correlations with theoretically similar constructs. Research with the SSREIT has revealed correlations with variables such as optimism, greater impulse control, lack of depressed affect, less Alexithymia (Schutte et al., 1998), empathic perspective taking, self-monitoring in social situations, closeness and warmth of relationship, marital satisfaction (Schutte et al., 2001), emotional well-being, positive mood states and self-esteem (Saklofske et al., 2003; Schutte, Schuettpelz, & Malouff, 2002). The SSREIT has additionally been found to measure expected elements of the emotional impact on thought. The SSREIT has been associated with cognitive task persistence (Schutte et al., 2002) and academic averages in university students (Schutte et al., 1998). Investigation into the predicative validity of the SSREIT using adolescents observed that the scores on the SSREIT were also meaningfully related to skill at identifying emotional expression, satisfaction with social support and mood management behaviour (Ciarrochi et al., 2001). None of these studies, however, examined the incremental validity of SSREIT in measuring these variables beyond other relevant tests such as measures of cognitive ability or personality traits. In addition the MSCEIT, but not the SSREIT, was observed by Brackett, Rivers, Shiffman, Lerner and Salovey (2006) as associating with perceived interpersonal strategies after personality, well-being and verbal intelligence were held constant.

Petrides et al., (2007b) maintain that the developing conceptualisation of EI as a personality trait at the lower levels of trait taxonomies is the only method truly consistent with existing theories of individual difference. Measures of trait EI are therefore expected to show near-zero correlations with measures of cognitive ability given the general independence of personality and cognitive ability. For that reason, trait EI is hypothesised to lie outside the realm of human cognitive ability, occupying factor space at the lower levels of personality hierarchies, and the shared variance between trait EI and personality is expected to range between 50% and 80% (Petrides et al., 2007b).

3.2.2.4. Implications of group differences in emotional intelligence scores

A core assumption on which the ability model of El rests is that the skills associated with El cannot exist outside of the social context in which they operate. A close relationship therefore exists between El and socially defined appropriate behaviour within the relative contexts such as cultural, social and occupational (Salovey & Grewal, 2005). Whether these skills as a whole operate similarly in every social context is a question requiring further research. For this reason, El testing based on conceptual scoring should consist of normative data constructed from a diverse sample of people within many different contexts or even the ability to select normative data against which to score from within a specific context, for example if a study was conducted within a Chinese business firm, the normative scores should consist of a sample taken from people working in the occupational environment in China.

Cross cultural work outside of Western countries is lacking in the field of El and further research is required to assess the predicted outcomes of El in other cultures (Gohm, 2004), as well as the effect of cultural norms on emotional perception and expression in those cultures. Landy (2006) contends that even though normative data has been collected for EI tests from a number of countries such as Australia, United States, United Kingdom, Canada, countries of the European Union and South Africa, these countries share cultures that are more individualistic than collectivistic and more masculine than feminine. Studies that have been conducted on the possible ethnic differences in El have yielded inconclusive results and consequently there is an urgent need for studies exploring group differences in El (Roberts et al., 2001; Van Rooy, Alonso & Viswesvaran, 2005). According to Landy (2006), emotional intelligence research would benefit greatly from research done in countries that are very different from the western model such as China, Iran, Pakistan and Sweden.

Few research studies have reported on theoretically expected group differences using the MSCEIT specifically for factors such as culture, gender, age and ethnicity, and no longitudinal studies have been conducted to determine whether ability EI improves with age, experience or EI training courses offered by

companies such as MHS. Van Staaden (2001) did find theoretically expected differences between a group of psychology and engineering students using the MSCEIT, with psychology students exhibiting higher scores on management, understanding and facilitation of emotions. These differences could, however, not be replicated between students in the fields of humanities, management, sciences and engineering, in a similar study by Murphy (2006) using the SSREIT.

Analysis of gender differences has revealed mixed results, for example, Palmer et al., (2005) revealed that females scored significantly higher than males on the MSCEIT among student and adult samples, yet studies by both Bastian, Burns and Nettelbeck (2005) and Livingston and Day (2005) observed that gender was related to scores on only one task of the MSCEIT. Brackett and Mayer (2003) observed significant gender differences on the MSCEIT with women (M = 105.13, SD = 11.09) scoring higher than men (M = 95.17, SD = 13.43), however, in contrast to Schutte et al.'s (1998) findings, no significant gender differences were observed on the SSREIT. Both Murphy (2006) and Petrides and Furnham (2000b), on the other hand, found that women scored significantly higher on the social skills subscale identified on the SSREIT than men.

Studies on gender differences are therefore inconclusive, Stys and Brown (2004) have speculated that this discrepancy could be due to measurement choice, as research with a number of self-report tools such as the EQ-i and the SSREIT have mostly identified no evidence of gender differences (Brackett & Mayer, 2003), yet research with the MSCEIT generally differentiates EI between genders. They state therefore, that gender differences may exist only when EI is defined in a purely cognitive manner, possibly because males are more likely to over-estimate their ability on self-report measures.

3.2.2.5. The predictive validity of emotional intelligence: EI in applied settings

Petrides et al., (2007a) maintain that the most important criterion for establishing the validity of a measure of EI is whether it ultimately predicts life success in various domains related to emotional functioning. To be of value an emotional intelligence measure should be predicative of important outcomes of emotional life such as the ability to deal with stress, manage interpersonal relationships and adjust negative life events into positive learning experiences. The predictive validity of a measure therefore indicates the measure's ability to reflect the impact of EI on everyday life.

In a meta-analysis of the EI construct, Van Rooy and Viswesvaran (2004) observed that EI does have predictive validity for relevant life space criteria. They reported that EI has predicative validity in employment and life settings, but that the ability to predict academic performance was limited, a finding

which was supported by Bastian et al., (2005). Although the level of performance prediction measured was not as high as often claimed, the levels were found to be higher than those of other selection methods used, such as letters of reference. It was also reported that 4% of the variance in performance and 5% of the variance in work performance can be explained by EI (Van Rooy & Viswesvaran, 2004).

Although the relationship between the MSCEIT and intelligence has been observed to be slight, a number of studies have found evidence of relationships with measures of academic performance (Zeidner, Shani-Zinovich, Matthews, & Roberts, 2005; Brackett, Mayer, & Warner, 2004; Lopes et al., 2003; Lopes, Brackett, Nezlek, Schütz, Sellin, & Salovey, 2004; Lyons & Schneider, 2005). These findings may, however, be influenced by confounding variables, for example Brackett and Mayer (2003) discovered that the MSCEIT was unable to provide incremental validity in predicting academic performance above that of personality and intelligence. Lyons and Schneider (2005) reached similar conclusions by establishing that although a relationship was observed between math appraisals and EI in males, this relationship disappeared when controlling for general mental ability (GMA).

As the MSCEIT is still new and was published only recently, there have been few studies conducted with regard to the ability of the MSCEIT to predict life outcomes at home, work or at school. As a result, limited research has been publicised with regard to the measurement of work performance and leadership (Brackett & Salovey, 2006; Rode et al., 2008) and initial studies that have examined the relationship with job performance have produced contrasting results. One of the earliest studies conducted by Janovics and Christiansen in 2001 (cited in Zeidner, Matthews & Roberts, 2004a) reported that only the perception and understanding branches of the MSCEIT moderately correlated with job performance as assessed by supervisor rankings. As the study consisted of a sample of 176 undergraduates, however, the results are not a realistic reflection of the dynamics within occupational environments.

A recent study by Lopes et al., (2006) assessed the relationship between the MSCEIT and work outcomes using a performance test as well as company data, peer and supervisor assessment. The results identified that emotional intelligence was related to several indicators of work performance including company rank, and ratings of interpersonal facilitation, affect and attitude. A major limitation of this study, however, was that the sample consisted of only 44 respondents and was restricted to finance employees of a fortune 500 company and, therefore, did not provide an indication of the potential differences that may be expected due to different job expectations or complexity of job functions.

Several studies have established that the MSCEIT is related to various aspects of everyday living. MSCEIT scores have been correlated with scales of psychological well-being (Brackett & Mayer, 2003) and Lopes et al., (2003) have reported a significant positive correlation between the managing emotions subscale of the MSCEIT and global self-perceived quality of interpersonal relationships. The managing emotions subscale was also found to be associated with the quality of social interaction with friends

(Lopes et al., 2004) after controlling for Big Five personality traits. Limited evidence has however been reported to corroborate the relationship with life satisfaction and job satisfaction. Livingston and Day (2005) found that none of the MSCEIT scales were related to life satisfaction and only the scores on the emotional perception scale gave slight evidence of a correlation with job satisfaction scores (r = .14).

Research has produced evidence that El is predictive of adaptive behaviour. Both trait El (Martinez-Pons, 1997) and performance-based EI (Ciarrochi et al., 2000) measures have been observed as contributing uniquely to facets such as life satisfaction even after controlling for IQ and personality. Trait El was also found by Schutte et al., (2001) to predict greater social skills and cooperative interpersonal interactions and Ciarrochi et al., (2002) identified that the SSREIT moderated the relationship between stress and mental health after controlling for personality. In addition, Goldenberg et al., (2006), reported that the SSREIT is able to predict psychosocial factors such as coping and depressive affect whereas relations between the MSCEIT and individuals' coping and levels of depressive affect were observed to be largely insignificant.

The criterion validity of the SSREIT has been brought into question in a number of studies primarily due to the moderate correlations identified with Big Five personality traits (Brackett & Mayer, 2003; Saklofske et al., 2003; Chapman & Hayslip, 2005). As a result, there has been some uncertainty about whether the SSREIT provides any useful explanatory or predictive power beyond existing personality instruments. There is little consistency in findings regarding the relationship of the SSREIT to personality as some studies have reported high correlations of up to 0.4 and 0.5 with various Big Five personality factors (Brackett & Mayer, 2003), yet others have reported that the tool accounts for variance in measures not accounted for by personality (Saklofske et al., 2003; Ciarrochi et al., 2002).

Chapman and Hayslip (2005) examined the incremental validity of the SSREIT across a comprehensive range of college adjustment criteria using a hierarchic regression model to control for the Big Five measures of personality. They identified that the SSREIT provides a very small amount of additional predictive power as Big Five measures entered earlier in the regression capture most of the variance in psychosocial criteria. They also discovered an insignificance zero-order correlation with GPA which is in contrast to the high correlations observed initially by Schutte et al., (1998; r = .32). In spite of this, the results of this study revealed that the SSREIT has incremental validity in influencing more psychosocial and interpersonal factors such as loneliness. The conclusions from the research throw doubt on the predictive power of the SSREIT as a trait measure over that of existing personality measurement tools and yet gives further support to the hypothesis that trait EI has value in determining relevant life criteria.

Few studies have examined the predicative validity of the SSREIT within occupational environments. Carmeli (2003) has, however, reported that emotional intelligence was empirically related to positive work attitudes, altruistic behaviour, and contextual and task performance amongst senior managers of an

organisation. A direct relationship was also identified between trait EI and job satisfaction as well as withdrawal intentions from the organisation.

The SSREIT has been found to display positive and negative characteristics, yet a number of studies have indicated that the SSREIT displays sufficient reliability and validity in measuring self-report EI and can therefore be used with a reasonable certainty of obtaining meaningful results. Measures of self-reported EI will be strengthened to the extent that they can be empirically disentangled from other personality trait scales and the incremental relationships found with psychosocial criteria implies that there is room for continued investigation and refinement of the measurement instrument. The common self-report based methodology on the other hand, presents a complication due to the inflated correlations which occur as a result of common method variance (Chapman & Hayslip, 2005).

If more than one factor is used, as discussed previously, Chapman and Hayslip (2005) caution that one or more factors may have more or less predictive validity for a criterion measure than other factors or the composite score, but that such relationships will be masked by only examining the composite score. They provided support for the benefit of using more than one factor by citing Ciarrochi et al. (2002), who established that the Social Skills factor moderated the relationship between daily hassles and suicide tendencies, and Ciarrochi et al., (2001) who observed that the four SSREIT factors predicted social support from various sources, even when variance due to self-esteem and trait anxiety was controlled for. Consequently, the question to be explored further is whether trait EI accounts for sufficient influence in moderating social and interpersonal interactions over that of existing personality trait measurements, in order to be considered as a tool that provides unique value.

3.3. COMPARABILITY OF EMOTIONAL INTELLIGENCE MEASURES AND THE POTENTIAL FOR SEPARATING THE CONSTRUCTS

Zeidner, Roberts and Matthews (2004b) lament the inability of both ability and trait models of El to adequately explain the nature of the El construct. The limited number of studies that could provide evidence of correlations between trait and ability models results in concerns regarding the convergent validity of the field, as there is no consensus on the qualities that define El or rules that label personal qualities as emotionally intelligent or not. Petrides and Furnham (2000a) maintain that due to these findings, the two models should be seen as measuring different facets of El and that trait El theories should not view the construct as an ability of any kind (Petrides et al., 2007b). Some researchers

maintain that ability EI should be seen as the true measure of EI as a form of intelligence, and trait measures of EI should rather be viewed as measuring competence in using emotions (Ashkanasy, & Daus, 2005), and therefore seen as the ability to use and apply skills made available to the individual through his or her actual EI. Ability EI has the potential therefore, to test knowledge of emotions but not necessarily the ability to adequately apply that emotional knowledge in real life scenarios, whereas trait EI may contribute towards understanding how well emotional abilities are applied. The two models should, therefore, be seen as complimentary rather than contradictory to each other.

A few studies have examined the extent of the overlap between trait and ability-based EI measures finding minimal to no significant relationships. As EI tests claim to measure one underlying construct, different measures of EI need to be highly correlated with each other otherwise they cannot be said to be measuring the same construct (Matthews et al., 2003). The MSCEIT has been found to show mostly insignificant correlations with the Trait Meta-Mood Scale (Lopes et al., 2003) and the Bar-On scale (Mayer et al., 2002). In a more recent study, Brackett and Mayer (2003) obtained moderate correlations between the MSCEIT and Bar-On scales as well as between the MSCEIT and the SSREIT, however, as soon as personality and well-being were controlled for the MSCEIT became mostly independent of both inventories. Nevertheless, the two self-report scales were observed to have strong associations with a personality measure, as well as moderate correlations with each other which suggest that these two measures could be measuring the same construct. The ECI (Goleman, 1995) and the EQ-i (Bar-On, 1997) have also been found on previous occasions to be highly comparable (Matthews et al., 2003). A study by Warwick and Nettelbeck (2004) concurred that the lack of significant relationships between self-report and ability measures of EI ($r = .19$) provides support for two distinct forms of EI. This has resulted in some theorists believing that the two measures should be seen as measuring different constructs altogether (Petrides & Furnham, 2000a).

Petrides and Furnham (2001) maintain that by separating EI into two constructs defined by the boundaries of the assessment measures, many of the concerns regarding the validity of EI can be resolved. These theorists agree that self-report measures correlate highly with personality, but state that this is to be expected as personality is by definition a construct best measured through self-report means. Petrides and Furnham (2001, p. 442) further describe trait EI is a "distinguishable, lower order, composite, personality construct". In spite of these arguments, Roberts et al., (2001) criticise the distinction based solely on measurement instruments as premature due to the lack of evidence supporting EI as an intelligence.

It is unfortunately difficult to adequately judge the validity of any of the trait models of EI. Presently, the only way to measure EI as defined by the trait models is via self-perceived reports of the respondent's own EI, and therefore, the facet under scrutiny is self-reported EI rather than actual EI (Conte, 2005). Furthermore, some theorists argue that it is too early to insist on one consistent definition (Gohm, 2004).

The lack of a consensual definition of EI is of lesser importance than establishing the validity of the instruments, as there are many concepts in psychology for which there is no consensus on a definition such as consciousness, the mind and even personality and intelligence. Gohm (2004) contends that it is time to move beyond debates about whether EI is a standard intelligence or a personality trait, as it is more productive to examine whether EI is a set of skills that can be reliably and validly measured, whether the construct as defined by each model is useful for explaining psychological processes and whether the models are able to predict important outcomes. It is the hypothesis of this research study that these two models of EI could be more valuable to research on emotion if the models were separated and seen as two unique constructs that measure different facets of emotional capabilities.

It has been argued that trait or self-report measures would be more valid if they are to be considered as comprising a number of traits or attributes that are not seen as abilities (Goldenberg et al., 2006; Petrides et al., 2007a), contrary to broader trait measures that often combine attributes with emotional reasoning abilities (Brackett & Mayer, 2003). Petrides et al., (2004a) further maintain that trait EI should be examined on the basis of what it explains rather than what it predicts, as EI may have great value as an explanatory variable. The reason for this is that although EI may not have a direct influence on variables such as occupational and academic success, it may be able to explain why certain people are able to manipulate certain situations to their advantage.

The present study therefore proposes that trait models be revised to exclude references to ability and be re-named *emotional competence* which is in accordance with Goleman's (1995) label for his model, and that ability EI should be solely referred to as *emotional intelligence*. Consequently, rather than discarding measures of trait EI, these measures should be re-assessed for the benefit they can provide in facilitating understanding of the interaction between possessing emotional abilities and the actual application of these abilities, as well as self-perception regarding the person's own success in using these abilities. To validate this assumption, however, there is need for additional research in understanding the functioning of EI as an intelligence and as a trait or competence, by examining the nature of potential relationships with existing well established trait and intelligence measures. Additional research beyond the scope of this study is, therefore, required to validate this model by examining actual EI in real life situations by measuring and observing real-life emotional responses to scenarios or situations. For the purposes of this study, trait and ability EI will continue to be referred to as such, however, trait EI should be seen as synonymous with emotional competency and ability EI as synonymous with emotional intelligence.

3.4. A REVIEW OF THE RELIABILITY AND VALIDITY OF THE THINKING STYLES INVENTORY

The Thinking Styles Inventory (TSI) is based on Sternberg's (1988) theory of mental self-government. Styles are thought to be distinct from abilities, and involve unconscious preferences for ways of processing information and the use of abilities (Sternberg, 1997). The assumption is that a person will have certain preferences for thinking styles and although the preference for these styles may be flexible and adaptive to varying situations, people will still succeed more effectively in an environment that matches their preferred thinking styles.

The TSI is a self-report inventory consisting of 65 statements, with five items for each of the thirteen subscales. The measure originally consisted of 104 items, but was later shortened to 65 items (Zhang, 1999).

3.4.1. Reliability of the Thinking Styles Inventory

The principal reason for choosing the TSI to measure styles is that the theoretical constructs as well as the inventory generated by the theory have been proven to be valid and reliable in accessing thinking styles in many studies across a number of cultural groupings. The scale has been used extensively in the United States (Grigorenko & Sternberg, 1997; Spicer, 2004), as well as in Hong Kong and China (Zhang & Sachs, 1997; Zhang & Sternberg, 1998, 2000). Studies have also been conducted successfully in South Africa (Cilliers & Sternberg, 2001; Fraser, van Ede, Hislop-Esterhuysen, & Owen, 2004; Murphy 2006), the United Arab Emirates (Albaili, 1997) and a number of European countries (Balkis & Isiker, 2005; Fjell & Walhovd, 2004). Furthermore, the scale has been found to be reliable for student as well as adult populations (Zhang, 2005b).

The original college sample collected by Sternberg and Wagner (cited in Sternberg, 1997) obtained subscale reliabilities (Cronbach's alpha) ranging from 0.42 (monarchic) to 0.88 (external) with a median reliability of 0.78, which suggested an overall reliable measure. The original 104 item version of the TSI measure has also been found to be a reliable gauge of thinking styles with a South African student population as a recent study obtained a high overall Cronbach's alpha for the TSI of 0.90, with the subscales ranging from 0.66 (local) to 0.87 (liberal) (Murphy, 2006).

Table 6: Scale reliabilities obtained in previous studies for the thirteen subscales of the TSI

Categories	Scale Reliabilities			
	Zhang & Sternberg (1998) n=622 (65 items)	Zhang (2005b) n=333 (65 items)	Fer (2005) n=402 (104 items)	Murphy (2006) n=208 (104 items)
Legislative	.71	.78	.65	.79
Executive	.64	.60	.58	.79
Judicial	.71	.71	.58	.67
Monarchic	.46	.68	.50	.83
Hierarchical	.74	.77	.82	.82
Oligarchic	.63	.71	.67	.58
Anarchic	.43	.55	.71	.59
Local	.43	.69	.71	.56
Global	.58	.70	.77	.73
Internal	.78	.75	.81	.74
External	.73	.71	.82	.83
Liberal	.78	.82	.75	.87
Conservative	.68	.77	.89	.85

The overall TSI can therefore be considered as a reliable measure for exploratory research and preliminary decision making, however, some problems have emerged in recent research. For example, low reliabilities have been obtained with the local, monarchic and anarchic scales (Zhang, 2004), and as a result, Sternberg, Wagner and Zhang (2003) revised the original TSI, changing it into the TSI-R, by modifying some of the items and established greatly improved reliability scores including 0.55 for the anarchic style, 0.80 for the monarchic style, 0.69 for the local style. The present study was conducted using the shortened 65 item questionnaire rather than TSI-R because reliability and validity data was only available for this version of the instrument when the study was designed.

The reliability of the measure has been confirmed in independent studies with samples from different cultural backgrounds and Table 6 presents the Cronbach's alpha for each of the thirteen subscales in different cultural settings (Zhang, 2005b; Zhang & Sternberg, 1998; Fer, 2005; Murphy, 2006). Studies with Asian respondents have resulted in Cronbach's alpha scores ranging from 0.43 for the local subscale (Zhang & Sternberg, 1998) to 0.82 for the liberal subscale (Zhang, 2005b). Furthermore, a study with Turkish respondents revealed that the TSI is also reliable when translated into different languages (Fer, 2005). The study established an overall Cronbach's alpha of 0.90 and subscales scores ranging

from 0.50 to 0.89 as well as a four week test-retest scores for the subscales ranging between 0.63 and 0.78, which improved on the reliability values of the lower scoring subscales.

3.4.2. Validity of the Thinking Styles Inventory

The validity of the TSI has been verified by a number of studies across many domains. Although cognitive styles have primarily been examined within the field of education and learning, styles have been shown to be a fundamental factor in determining both individual and organisational behaviour. Styles have been used effectively in personal selection and career guidance (Hayes & Allinson, 1998) and have been observed to have predictive power for academic achievement beyond general abilities (Zhang, 2001a).

3.4.2.1. Factor structure of the Thinking Styles Inventory and convergence with theoretically similar constructs

Construct validity has been provided for the TSI through verification of its factor structure, as well as by assessing the measure's convergence with similar measures of cognitive styles and personality traits and by examining theoretically expected differences between groups. Previous studies with the TSI have generally, though not completely supported the structure of the theory. In accordance with the theoretical structure of thinking styles within five broad dimensions and three types (see Chapter 2 for a discussion), factor analysis techniques should reveal a good fit for both three and five factors within the data. In previous studies satisfactory fit for the three factor model (Yeung, 2006) and the five factor model (Sternberg, 1994b; Zhang, 1999; Fjell & Walhovd, 2004) have been identified using principal-axis factor analysis with oblique or varimax rotation methods. In a recent study with Turkish respondents, Fer (2005) was able to provide concrete evidence of the factorial validity of the measure as the results produced a model consisting of five independent factors that accounted for 45% of the total variance in thinking styles. In addition, the TSI was translated into Turkish for the purpose of the study which presumes that the factorial structure of the measure can be confirmed in different languages as well as different cultures.

There are studies that have, however, identified a four factor solution in the data (Zhang, 2001b; 2003), although in both sets the factor loadings made sense within the structure of the model as the first factor was dominated by type I styles, the second by type II styles, the third factor showed high loadings which

contrasted the internal and external styles and the fourth factor showed high loadings that contrasted the local and global styles.

The author of the TSI (Sternberg, 1994b) has reported that there should be a number of expected relationships observed between the subscales of the TSI. The legislative and liberal styles are expected to be closely associated, as are the executive and conservative styles. An inverse relationship is however expected between the global and local styles as well as the liberal and conservative styles. These relationships have been confirmed by previous studies for example, Zhang and Sternberg (1998) reported correlations between the positive executive and conservative styles ($r = .63$, $p < .001$) and the legislative and liberal styles ($r = .41$, $p < .001$), as well as negative correlations between the conservative and liberal styles ($r = -.14$, $p < .01$) and the internal and external styles ($r = -.30$, $p < .001$). These results were replicated by Murphy (2006).

Studies that have reviewed the domain of cognitive thinking styles (Jones, 2006; Zhang & Sternberg, 2005) have identified a number of theoretically similar measures that are expected to be conceptually related to each other if these instruments are to be considered as measuring a common domain that is theoretically valid. A number of studies have obtained correlations to various degrees with the TSI and the other measures of styles named in these reviews, such as Gregorc's measure of mind styles (Sternberg, 1994b) and Biggs' study processes questionnaire (Zhang & Sternberg, 2000). Based on these overlaps, Zhang and Sternberg (2005) contend that the different style constructs are not entirely similar but share certain degrees of similarities with each possessing its own uniqueness.

There is sufficient research to support the relationship between personality and cognitive styles. Previous research has obtained moderate to strong relationships between thinking styles and measures of personality such as the Myers-Briggs type Indicator (Sternberg, 1994b), a short version of Holland's measure of personality types (Zhang, 2001b) and the NEO Five factor Inventory which measures the Big-Five personality characteristics (Balkis & Isiker, 2005; Fjell & Walhovd, 2004; Zhang & Huang, 2001). He (2006) concludes that based on research findings, styles can be considered as acting at a cognitive control level to moderate personality and consequently, behaviour. These findings imply that thinking styles may partially be explained by the nature of the relationship between thinking styles and personality traits, however, the relationship is not strong enough to conclude that measures of thinking styles are made redundant by established measures of personality. The use of this measurement instrument for the purposes of the present study is based on He's premise that thinking styles are a dimension of personality that influences attitudes, values and social interaction, and therefore, a degree of overlap with existing measures of personality traits is expected.

3.4.2.2. Theoretically expected differences between groups

The theory of mental self-government describes thinking styles as variable throughout the lifespan and socialised by learning and environmental influences (Sternberg, 1997). It would therefore be expected that thinking styles would differ as a result of gender socialisation, cultural or language influences and age. Differences in thinking styles were identified between males and females in a number of studies. Male students were found to have higher scores on thinking styles such as the legislative, judicial, global, liberal (Zhang, 2002c; Zhang & Sternberg, 2000), executive (Zhang, 2002c; Zhang & Sternberg, 2002), monarchic (Zhang, 2002c) and internal styles (Zhang & Sternberg, 2000). Students who had additional life experience outside university such as travel and work experience (Zhang, 1999) were also found to be more inclined to use judicial, liberal and hierarchical styles than students who did not have similar experiences. A recent study conducted with a South African sample, however, did not find any gender or age related differences on the TSI (Murphy, 2006). On the other hand, these findings could be attributed to a lack of variation in age in a typically student based sample, as well as the impact of the socialisation effect of the teaching style of the university over that of gender stereotypes.

A focus point of the construct validity of the TSI that is important to the present study concerns the relationship between the TSI subscales and careers or study fields that are assumed to rely on specific styles of thinking by the nature of the job requirements. Previous studies with student samples have found relationships between study fields and thinking styles, for example, Cilliers and Sternberg (2001) found that arts, education and sciences students had different preference profiles for thinking styles. Arts students were found to prefer legislative and internal styles, whereas education students and natural sciences students were found to exhibit stronger preferences for the executive, global and conservative styles. The results of the aforementioned study, however, are based on first year students and therefore the thinking styles displayed could reflect training received at secondary school level. A study conducted on students consisting mostly of final year and postgraduate students did not reveal a difference in thinking styles between different study fields (Murphy, 2006), however, this lack of a finding could be attributed to more complex and creative thinking styles that could be required from final year students rather than the supposed norm favouring styles possibly required by first and second year students.

A study comparing thinking styles to vocational interests (Zhang, 2001b) observed that the external and judicial thinking styles were significantly related to people who were social and enterprising. A negative correlation was obtained between people who are artistic and the conservative, executive and local thinking styles. A study conducted on the thinking styles of creative writers in comparison to journalists (Kaufman, 2002) observed that creative writers had a significantly higher score on legislative style thinking, which supports construct validity because the legislative style characterises people who enjoy

creating and formulating new ideas and using creative thinking strategies. A limitation of this study, however, was that the sample consisted of students and not actual professionals. An additional study conducted with a sample of artists versus a sample of engineers (Gridley, 2007) revealed that artists also displayed a stronger preference towards legislative thinking styles as well as anarchic styles which indicate a creative, yet norm contesting thinking framework whereas engineers utilised the executive and hierarchic styles more prominently, indicating that they preferred to execute the plans of others.

3.4.2.3. *The predictive validity of the Thinking Styles Inventory*

The TSI has been assessed for its heuristic and predictive validity in educational settings and has been found to signal significant relationships between styles of thinking and factors such as academic performance, performance in varying subjects and demographic characteristics such as birth order and socio-economic status (Grigorenko & Sternberg, 1997; Sternberg, 1997; Sternberg & Grigorenko, 1995a).

As styles are not considered to be abilities, it is important to consider the fundamental differences between styles and abilities when assessing the predictive validity of the TSI with regard to achievement (He, 2006). A style focuses on the manner rather than level of performance and may as a result, only moderate the utilisation of ability, rather than generate abilities that were not present in the individual to begin with (He, 2006). Although styles do not determine levels of abilities, they have been found to have an impact on performance. Grigorenko and Sternberg (1997) identified that certain thinking styles significantly contribute to academic performance after scores on academic tests had been controlled for. The incremental validity of the TSI in predicting academic performance was supported by Zhang and Sternberg (1998) who replicated the findings in a Hong Kong setting, finding that thinking styles do serve as predictors of academic achievement over and above academic ability. Furthermore, results indicated that students with tendencies towards particular thinking styles performed better on some forms of assessments than others (Grigorenko & Sternberg, 1997).

3.5. RESEARCH HYPOTHESES

The variability of approaches used to measure EI have an impact on the validity of the construct, and the present confusion with regard to the true nature of EI does not do much good for the reputation of the field. As noted earlier, however, the limited relationship between self-report and performance based measures of EI may not be surprising, if a distinction is to be drawn between ability EI as a form of intelligence and trait EI as an emotional competence. Nevertheless, the convergent validity between these two measures should be similar, based on the extent to which these measures tap into common constructs.

Ciarrochi et al., (2000) laid out a number of conditions that a measure needs to satisfy if it truly measures EI as it claims to. These conditions are applicable to both the trait and ability measure of EI. Firstly, the subscales as well as the overall scale should indicate reasonable levels of reliability, and all the subscales should load on a single factor as both the MSCEIT and the SSREIT tests claim to measure an overall score of EI. The second condition is that women should score higher on EI than men, as women have been shown to be slightly superior to men in perceiving emotions (Mayer & Geher, 1996; Mayer et al., 1999; Petrides & Furnham, 2000b). The third criterion is that the tests should correlate with a number of criterion variables such as age and experience, and there should be no discrimination of EI measures towards people of different ethnic groups or cultures if the measure is to be considered as a universally valid tool. Additional variables that should correlate with EI are measures such as empathy, life and occupational satisfaction, self-esteem and quality of relationships, as people with high EI should be better at perceiving others' emotions, managing their own emotions and the emotions of others and adapting their emotions better to suit difficult situations. The constraint is that EI should measure these criteria even after controlling for other well-establish tests that have shown to predict these variables more accurately (Ciarrochi et al., 2000).

Zeidner et al., (2004b) called for the need to map out the construct of EI according to a more rigorous conceptual and definitional system, the application of alternative domains of knowledge to complement criterion validity studies and the investigation of whether it is practically useful in applied settings to measure EI for selection purposes. This study attempts to contribute to the first two requests, as well as partially contribute to the third, by examining the overlap between measures of ability and trait EI that are based on the same underlying theoretical principles (Salovey & Mayer 1990), to understand the relationship between these two constructs and a different measure of thinking described as a personality trait, and lastly to examine the applicability of EI within an occupational environment.

3.5.1. Construct validity of the trait emotional intelligence vs. ability emotional intelligence distinction

The main aim of the present study is to critically evaluate the EI construct as operationalised in the MSCEIT and the SSREIT. This study will examine the reliability and validity of a measure of trait EI (SSREIT) and a measure of ability EI (MSCEIT), specifically with regard to the factor structure and degree of overlap between the two instruments. The reliability of the instruments is expected to be the same as or improve on measures of reliability expressed in previous studies, as well as in the original test manuals. The factor structures of the instruments are also expected to be in accordance with the underlying models on which the measures are based. The relationship between the two models of EI and a trait measure of cognitive thinking styles will also be assessed, and the degree to which ability EI and trait EI are able to predict job satisfaction after controlling for thinking styles will be examined. Furthermore, criterion differences such as gender, ethnicity, age, experience, leadership and occupational functions will be examined to determine if these EI tests meet the criteria laid out by Ciarrochi et al., (2000).

The first objective of this study is to examine the relationship between a performance-based measure of EI (the MSCEIT) and a self-report measure of EI that was derived from an ability model conceptual framework (SSREIT). If the two instruments are measuring the same construct they should correlate with each other, as the SSREIT and the MSCEIT are based on the same theoretical definition of EI, however, if there is an underlying difference between the constructs which these two instruments are measuring, the two instruments should not yield any significant correlations.

The study further aims at empirically assessing the degree of convergence, if any, between these two measurement tools and trait measure of cognitive thinking styles. Nomological validity is established when the correlations between EI and theoretically related constructs are greater than zero as well as exceed the magnitude of the correlations used to establish discriminant validity (Rode et al., 2008). If EI was to be considered purely as an ability model, measures of EI should not correlate with existing well-established instruments used to measure behavioural traits (Rode et al., 2008). The question posed by this research is, therefore, whether ability and trait tests measure the same or different constructs, as well as the manner in which these tests overlap with existing well established measures of behavioural traits and the potential contribution of this relationship in defining the distinction between these measures.

Hypothesis 1.1: There will be no significant correlations between the total scales and subscales of the MSCEIT and the SSREIT.

Hypothesis 1.2: Significant correlations will be obtained between the SSREIT and the Thinking Styles Inventory but no significant correlations will be obtained between the Thinking Styles Inventory and the MSCEIT.

With respect to the underlying factor structure, it is not known whether a single emotional ability or personality trait factor underlies these various measures or whether an alternative structure applies. In order to validate the distinction between trait El as an emotional competence and ability El as a true intelligence, it is expected that a two factor structure would be identified, based on the hypothesis that trait inventories measure similar processes that are separate from the implicit processes tapped by ability measurements. If the trait and ability constructs are therefore to be considered as tapping diverse areas of human competence and ability, the two self-report measures are expected to load together, separately from the ability measure.

Hypothesis 1.3: Factor analysis using the subscales of the subscales of the EI and thinking styles measurement instruments will uncover an overlap between the trait EI and thinking styles measure, but the subscales of the ability EI measure are expected to load independently from both the trait EI and thinking styles subscales.

Hypothesis 1.4: Certain expected group criterion relationships will be obtained with the EI scales and subscales including a positive relationship between emotional intelligence age and experience, a lack of ethnic differences in ability or trait emotional intelligence, and women will score higher on emotional intelligence scales and subscales than men.

3.5.2. Predicative validity of trait emotional intelligence vs. ability emotional intelligence in the occupational environment

Cognitive thinking styles are defined as individual preferences in information processing that are partially socialised (Sternberg, 1997), which suggests that work environments can influence people's thinking styles. In Sternberg's triarchic theory (1985) humans are described as adaptive creatures that when unhappy in an environment, will either try to change the environment or if unsuccessful, will leave that environment. Research into thinking styles has shown that individuals who have a preference for a

particular thinking style will function more optimally in a situation that matches that thinking style, than a person using a different thinking style (Sternberg, 1997, 2003b). In many educational as well as occupational settings certain ways of thinking are valued more than others and people who do not use those ways of thinking cannot thrive in those situations (Sternberg, 2003b). Cools and Van Den Broeck (2007) identified the importance of cognitive fit between one's cognitive style and the demands of the job in predicting positive outcomes such as job satisfaction, whereas a mismatch is expected to lead to negative outcomes such as increased turnover and greater work-related stress or conflict.

Zhang and Sternberg (2002) identified that people who are in a more favourable work environment are generally happier and thus more willing to take risks, to be innovative, and to be persistent in trying different ways of solving problems. They observed that teachers who perceived their teaching environment as being more positive, reported greater use of type I styles, whereas teachers perceiving themselves as working in a less favourable environment reported the use of type II thinking styles (Zhang & Sternberg, 2002). Similarly Zhang (2005b) identified that both actual and perceived work environment patterns were successfully predicted by thinking styles. Perceived favourable work environments and job satisfaction were observed to be predicted by type I thinking styles which tend to be more creativity-generating and signify higher levels of cognitive complexity. Type II thinking styles which are styles that suggest a norm-favouring tendency and that signify lower levels of cognitive complexity, were predominantly predicted by 'prospect for a salary increase', and 'rating of one's salary'.

Hypothesis 2.1: Perceived favourable work environments will positively contribute towards the prediction of type I thinking styles, yet will contribute negatively towards type II thinking styles.

The role of thinking styles in mediating job satisfaction is expected to be confirmed based on both theoretical expectations as well as findings from previous studies. Due to the ambiguity in the EI field, however, the relationship between EI and job satisfaction is less certain. In order to have incremental validity, a measure of EI needs to be able to predict certain performance domains such as work and academic performance as well as leadership. Although measures of EI are already sold and used as recruitment and personal development tools in the world of work, little research has been done that conclusively links EI to performance at work.

It is expected that EI will be related to job satisfaction as EI is related to the coping mechanisms used to deal with external pressures within occupational environments (Goldenberg et al., 2006). People with high levels of EI are therefore expected to cope better with work pressure by reframing difficult environments into positive experiences and redirecting negative emotions such as anxiety into productive activities (Rode et al., 2008). Low EI on the other hand is expected to correlate with more negative

appraisals of situations. Research has also revealed a relationship between high EI and life satisfaction (Palmer et al., 2002), which similarly to job satisfaction requires the ability to positively regulate emotions, and when people relate positively to one another they are expected to experience greater life satisfaction and lower stress (Salovey et al., 2001).

Hypothesis 2.2: As EI defined as an ability is expected to mediate relationships with real life criteria independently from trait measurements, ability EI measured using the MSCEIT will explain unique variance in predicting job satisfaction after controlling for cognitive thinking styles.

Hypothesis 2.3: It is expected that both trait and ability EI will explain unique variance in predicting self-reported job satisfaction, however, ability EI will explain greater variance than trait EI given that ability EI is expected to have greater predictive power than trait EI in practical settings.

Cools and Van Den Broeck (2007) examined the thinking styles of employees in three groups separated according to the cognitive climate of their occupations. A knowing-oriented cognitive climate was seen as specific to employees in finance, information technology (IT), and research and development (R&D) functions, a planning-oriented cognitive climate was observed to be specific to administrative and technical functions, and a creating-oriented cognitive climate was specific to sales and marketing functions and general management. The study reported that cognitive styles differed for various occupation types, resulting in particular cognitive climates within particular job types. The present study will explore whether cognitive thinking styles could similarly be a predictor of job functions within different occupational groups defined according to the cognitive climates identified by Cools and Van Den Broeck (2007).

Hypothesis 2.4: Type I thinking styles (including the legislative, judicial, hierarchical, global and liberal styles), which are associated with creativity and higher cognitive complexity and external thinking styles (type III) contribute positively to the discrimination of respondents who work in knowing-oriented cognitive climates such as in finance, outsourced business processes, application management, information technology and research functions, and employees who work in creating-oriented cognitive climates such as consulting, sales and marketing functions.

Hypothesis 2.5: Type II thinking styles which are associated with more norm favouring and planning styles (executive, local, monarchic and conservative styles) and internal thinking styles (type III) contribute positively to the discrimination of respondents who work in a planning-oriented cognitive climate such as administrative and technical or IT development staff who are responsible for applying technical skills and capabilities to build and maintain technology solutions.

Petrides et al., (2004a) maintain that trait EI is an advantage in subjects that require consideration of affect-related issues. These findings are important for the current study as a similar hypothesis could be concluded for career choice. It is possible that individuals higher in trait EI would be able to attain more benefit from these abilities in careers that deal continuously with affect-laden information and may involve ambiguous situations requiring emotional problem solving such as human resources or management for instance. Trait EI may, however, be less beneficial in careers that require primarily technical skills such as IT skills. EI comprises the ability to adaptively understand and regulate emotions. People who have high levels of EI should therefore be drawn to careers that require interaction with people on a more emotive level. It is hypothesised that people who work in occupations that require emotional skills such as human resources and management will have higher levels of EI than people who work in careers that require greater technical skills and less in depth interpersonal interaction.

Hypothesis 2.6: Employees who work in occupations that deal primarily with affect laden information and require emotional problem solving such as human resources, consulting, sales and marketing will have higher levels of emotional intelligence than people who deal primarily with technical information required for building and maintain technology solutions.

Hypothesis 2.7: Employees in management roles will display greater levels of ability and trait emotional intelligence than employees in non-management roles**.**

3.6. CHAPTER SUMMARY

As the primary objective of the present study is to examine how measurement formats affect the psychometric and theoretical properties of the EI construct, this chapter focused specifically on the issues of validity and reliability that have arisen in previous research with measures of EI. The chapter provided a review of the validity and reliability of EI in general, although the majority of the chapter dealt with the specific trait and ability EI inventories as well as the thinking styles measurement instrument utilised in the present study. The chapter concluded with the research question and hypothesis to be tested.

CHAPTER 4
METHODOLOGY

4.1. RESEARCH DESIGN

The primary aim of the present study is to examine the possible relationship or lack of relationships between trait and ability measurements of EI by examining the underlying structure of these tools, as well as the potential interrelationships with a well established measurement of thinking styles. The study examines the validity of the proposition that there are two distinct forms of EI, namely trait and ability EI as postulated by Petrides and Furnham (2001). This was achieved by exploring the overlap of measurements instruments hypothesised to measure ability EI (the MSCEIT V2.0), and trait EI (the SSREIT), with the Thinking Styles Inventory (TSI) which has been shown in previous studies to be related to facets of personality (Zhang & Huang, 2001), as well as trait EI using the SSREIT (Murphy, 2006). The study argues that if trait and ability EI are to be seen as measuring the same construct, significant correlations should be obtained between the two instruments and similar relationships should be observable between both measures and the thinking styles scale.

Critics of EI suggest that the best way to demonstrate the value of EI is to demonstrate its incremental validity beyond traditional predictors of performance (Landy, 2005). Research has been conducted which examines the relationship between thinking styles and job satisfaction as well as career fit, however, less is known about the influence EI has in predicting these constructs. A further argument explored by the study is that if both trait and ability EI are to be considered as contributing uniquely to the study of emotion and cognition, the instruments should be capable of predicting real life criteria after controlling for the effects of existing well established measures which have been shown to influence the same criteria in previous studies.

The study was conducted within a large and diverse organisation in South Africa using an online quantitative survey research approach. The study used a non-experimental, correlational research design in order to analyse the strength of the relationship between the variables. The variables examined in the study include the components of trait EI and ability EI, the thirteen thinking styles categories, self-reported job satisfaction, primary job function, career level, actual resignation behaviour and the demographic characteristics of the participants such as age, ethnic group, gender and level of work experience. A limitation of correlational research is that errors of causality often arise. Inferences that one event causes

another event could often result in misleading conclusions as the impact could be the result of intervening variables. A further limitation of a correlational study is that the relationship between two variables could be the result of an artefact, such as a false positive relationship between two scales because the scales themselves contain similar items and not because their items are causally related (Babbie & Mouton, 2004). Considering that only an experimental research design with random sampling, which has not been used in this study (as explained in section 4.2), can prove a definitive cause-and-effect relationship, this research will only attempt to measure the degree of relationships between the variables and point to possible causal factors that can be explored in subsequent research.

4.2. SAMPLE SELECTION

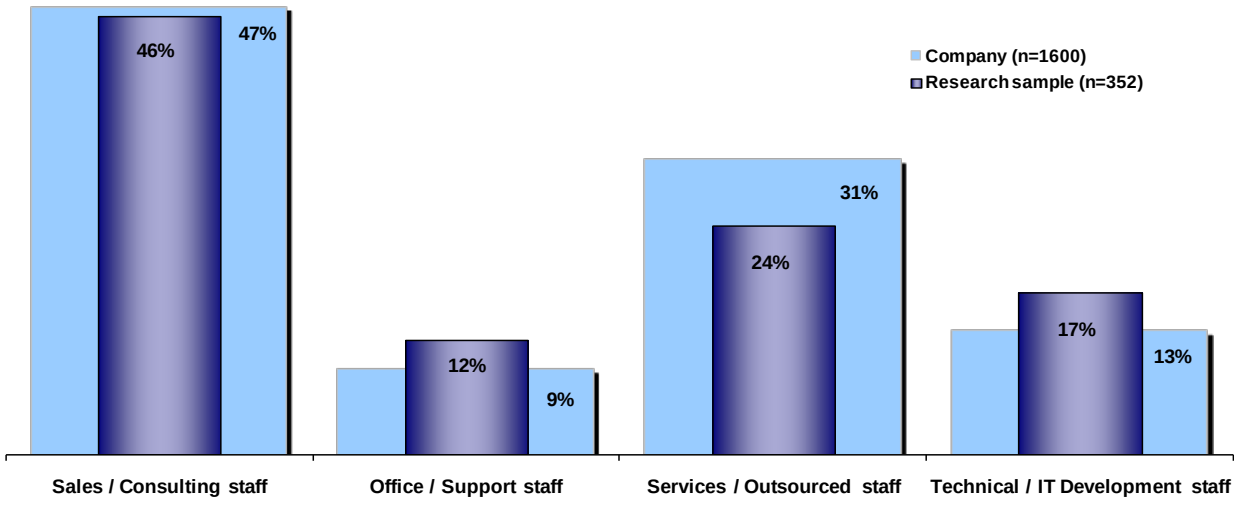
Employees of a large and diverse South African consulting firm that functions across a number of regions and industries formed the basis from which the sample was obtained. This particular organisation was utilised due to the large number of employees that work for the company and their diversity with regard to demographic characteristics as well as occupational roles. The sample consisted of employees from multiple disciplines within the company and from a number of dispersed regions across South Africa which reduces bias expected to appear within more heterogeneous companies.

The sample was collected using non-probability purposive sampling methods in order to obtain the maximum number of participants for the study. Purposive sampling involves collecting any cases that contain the most representative attributes of the population (De Vos, Strydom, Fouche & Delport, 2002). A non-random sample of convenience was utilised by sending invitations to all employees of the company, but the sample size was dependent on the number of respondents who voluntarily completed the questionnaires. Online Surveys were administered to 1600 employees from junior assistant to senior manager level within the organisation. The data was supplemented with information obtained from personnel files such as demographic information, job function and whether or not the respondent had resigned in the lapsed 12 to 15 months between the administration of the survey and the analysis of the data and reasons given for resignation.

The total size of the participating sample is 352 people which entails a response rate of 22% of the population. The response rate was lower than anticipated, but the sample size is acceptable for the purposes of the statistical analyses carried out in this research. Some of the methodological issues that

can arise from a low response rate in EI and cognitive styles research are discussed in Chapter 6 (Section 6.3.1). As can be seen in Figure 3 below, the distribution of the respondents within the four different workforces from which the sample was obtained adequately reflects the proportion of employees within each workforce for the entire company.

Figure 3: Distribution of sample within each of the workforces in comparison to the proportion of employees in each workforce for the entire company



The organisation from which the sample was taken is part of a global network and functions across a range of industries and working environments that includes traditional office bound environments, virtual working and remote off-site employment. The organisation was therefore considered to be a prime example of a complex modern workplace. The diverse spread of job functions within the sample offered an added benefit of examining the impact of thinking styles and EI within different occupational roles.

The organisation consists of four primary workforces that are largely distinct in terms of job functionality and expectations:

a) The first workforce is a consultancy-oriented workforce that is employed on complex projects and design complex solutions for clients. These employees work remotely from a number of diverse client sites rather than from a permanent office location, and are expected to have knowledge of a wide range of industries and work on complicated problems requiring creative solutions. Consequently, this workforce is expected to display more complex and creative thinking styles due to the dynamic and interactive nature of the role.

b) The second workforce is the services workforce, which is a workforce that is outsourced on long-term contracted services such as business processes, application management and information technology to clients, and work within client office buildings rather than a permanent office location.

c) The third workforce consists of technical or IT development personnel, who are responsible for applying technical skills and capabilities to build and maintain technology solutions at client locations. These employees are expected to display norm-favouring thinking styles that may be more associated with planning and execution of solutions and systems.

d) The fourth workforce consists of office or support staff which are employees that are currently in a business practice such as facilities, administration, finance, human resources, marketing, creative services, operations and research. The roles employed by these workforces require significant interaction with employees in the rest of the company within South Africa as well as global locations, and require a range of thinking styles from the application of knowledge to complex and creative design or problem solving.

4.3. RESEARCH INSTRUMENTS

The ability model of emotional intelligence was measured using the Mayer-Salovey-Caruso Emotional Intelligence Test Version 2 (MSCEIT V2.0) (see Appendix C for the online instructions and Appendix D for examples of questionnaire items) and the trait model of EI was measured using the Schutte Self-Report Emotional Intelligence Test (SSREIT, Schutte et al., 1998) (see Appendix A for the full questionnaire). The reason why the SSREIT was chosen was because firstly the measure has received sufficient research attention and there is empirical data and information available on more than one type of test validity in peer-reviewed research literature, and secondly because the measure is based on Salovey and Mayer's (1990) definition of EI, and the results from the two instruments can therefore be meaningfully compared.

The Thinking Styles Inventory (Sternberg & Wagner, 1992) was selected to measure thinking styles (see Appendix B for the full questionnaire). In addition to this, questions relating to job satisfaction and demographic details were requested in the survey.

4.3.1. Description and scoring of the MSCEIT

The MSCEIT contains 141 items and provides seven scores: one for each of the four branches, two area scores and a total EI score. As discussed in Chapter 3, the two area scores represent experiential emotional intelligence, which is calculated using the first two branch scores, perceiving emotions and facilitating thought, and strategic emotional intelligence, which is a combination of the third and fourth branch scores; understanding emotions and managing emotions. In addition, each of the four branches consists of eight tasks with two tasks for each branch. Faces and pictures combine to form the perceiving emotions score, sensations and facilitation combine to form the facilitating thought score. Blends and changes combine to make the understanding emotions score, and emotional management and emotional relations combine to form the managing emotions score. The eight subscale scores are determined by adding the weights for each item as determined by either the consensus or expert scoring method. The four branch scores are determined by adding the two corresponding subscale scores that measure each branch (JVR, 2007).

In addition to the total, area, branch and task scores, there are two supplemental scores. These measures provide additional information to help understand the respondent's response style. The scatter score provides an indication of the amount of fluctuation between a respondent's task scores. The positive-negative bias score provides a measure of an individual's tendency to respond to pictorial stimuli with either positive or negative emotions (Mayer et al., 2002).

For the purposes of this study, the MSCEIT was scored in a consensus fashion in which more or less correct answers to items are assigned according to normative averages. In this scoring method high scores on the MSCEIT are achieved by consistently choosing responses to items that have been endorsed by the majority of the normative sample which consists of the responses of more than 5000 respondents in different countries. The majority of the normative sample consists of respondents from the United States, however, multi-national data from Europe, Asia, Africa, North America outside the U.S. and Australia are also included. Response scores are weighted by the proportion of the normative sample that also provided that answer. The assumption is made that large samples of individuals converge on correct answers. There are two additional scoring methods available that can be selected by the researcher or practitioner administering the test. In the expert scoring method, correct items of the test are set by a panel of experts in emotion and in the target scoring method, correct answers to test items are set by the person or target that wrote or developed the item (see Chapter 2 for a discussion of the expert and consensus scoring methods).

This research study used the general scoring method with scores adjusted for age, ethnicity and gender differences. The research data were provided both in terms of raw, unadjusted scores and standardised scores based on the adjusted scores which are expressed in terms of a standard intelligence with a mean score of 100 (average score obtained in the general population) and a standard deviation of 15. Additionally, the manual provides qualitative ratings that correspond to each numeric score. For example, an individual who receives an overall EI score of 69 or less would achieve a rating of 'considerable development required' whereas someone scoring 130 or more would achieve a rating of 'significant strength' (Mayer et al., 2002). The details of the scoring procedures are retained as proprietary information by Multi-Health Systems Inc. (MHS) of Toronto, Ontario, Canada who own the rights to the MSCEIT.

4.3.2. Description and scoring of the SSREIT

The SSREIT consists of a 5-point Likert scale on which a score of 1 represents *strongly disagree* and a score of 5 represents *strongly agree* which the respondent uses to indicate the extent to which each item describes him or her. On completion, items 3, 5 and 28 are reverse coded. The sum of all the items results in a total score which can range from 33 to 165. Higher scores on the scale indicate a greater overall level of emotional intelligence (Schutte et al., 1998).

Schutte et al., (1998) collected the sample on which the questionnaire was standardised from a community sample of 328 respondents. Females obtained a mean score of 130.94 (SD = 15.09) and males had a mean score of 124.78 (SD = 20.25). Schutte and Malouff (1999) provided further group scores against which results can be compared. These included a group of psychotherapists with a mean of 134.92 (SD = 20.25), prisoners who had a mean score of 120.08 (SD = 17.71) and substance abuse clients with a mean of 122.23 (SD = 14.08).

Other than the limited comparative scores supplied by the authors, and normative data established by Palmer (2003) on an Australian general population sample, there are little further normative data available on this scale. A number of studies have, however, found results comparable to those provided by the authors with studies conducted amongst South African and other African respondents. Stone (2004) obtained a mean score of 127.74 and an average score of 3.87 on the measure's scale of 1 to 5 with a sample of South African Information Technology (Software Development) employees and Murphy (2006) obtained a mean score 128.22 with a sample of South African University Students. The SSREIT has also been used successfully with Nigerian samples (Salami, 2007; Aremu, 2005).

4.3.3. Description and scoring of the TSI

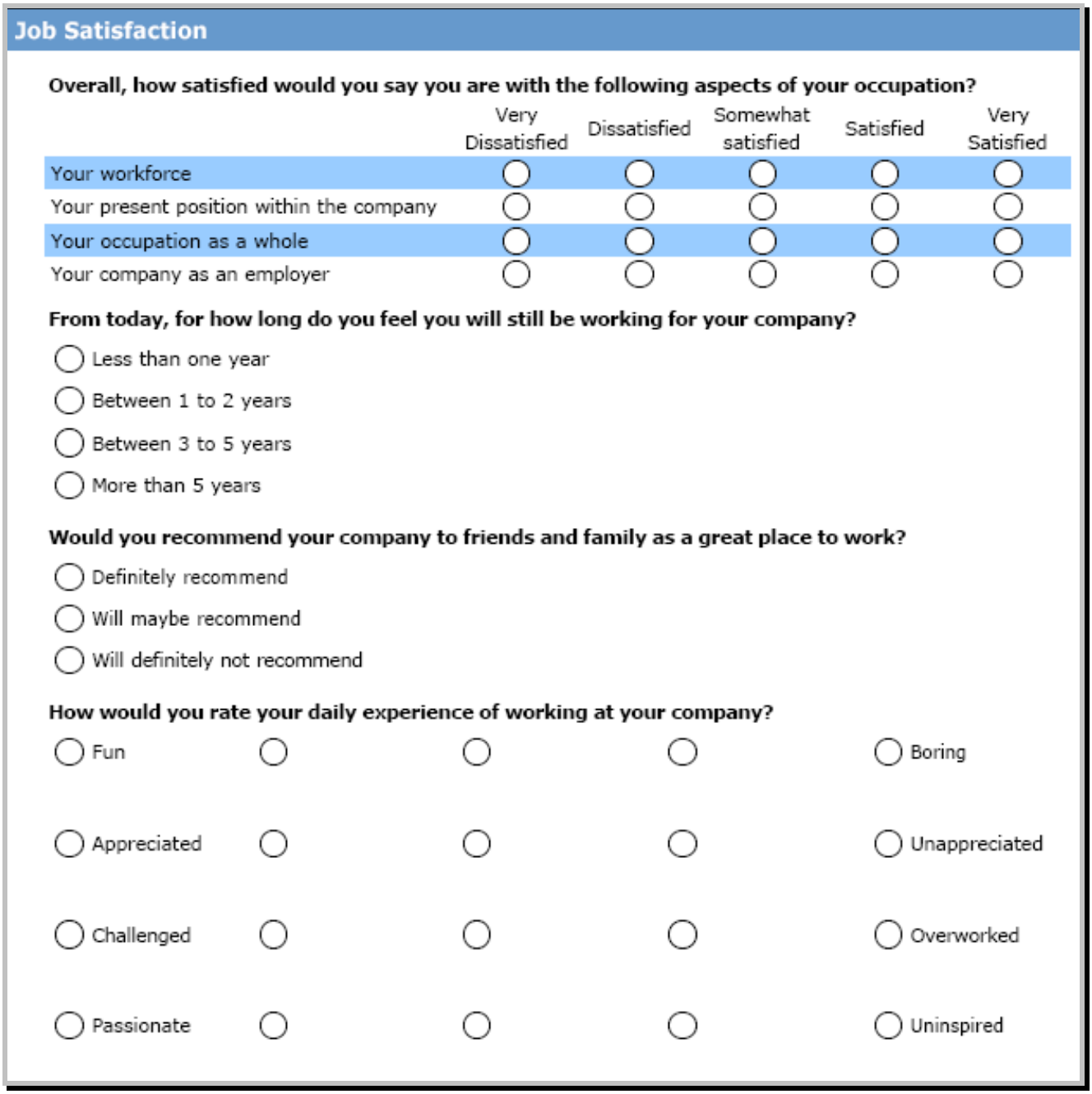
The Thinking Styles Inventory (TSI) developed by Sternberg and Wagner (1992) identifies 5 different dimensions of thinking styles which are further subdivided into thirteen categories of preference. For each item, the participants are asked to rate themselves on a Likert scale ranging from 1 (the statement does not describe the way they normally carry out tasks at all) to 7 (the statement characterises the way that they normally carry out tasks extremely well) (Sternberg, 1997). The present study uses a short version of the Thinking Styles Inventory as both versions have been used extensively in a number of settings and are considered to be comparable in terms of reliability, validity and factor structure. The main advantage of using the 65 item version is that it takes considerably less time to complete than the 104 item version (Sternberg et al., 2003; Zhang, 2004, 2005a, 2005b).

4.3.4. Measures of job satisfaction

Job satisfaction in the broad sense is considered to be a predisposition or an attitude, which is widely accepted as having three components: affect, cognition and behaviour (Saiyadain, 2003). This suggests that job satisfaction should be measured not only using self-reported assessments of feelings regarding occupational contentment, but also through the presence or absence of critical cognitive or behavioural responses.

This study attempts to examine all three components by assessing self-reported feelings of satisfaction with specific aspects of the respondent's job, cognitive intent that reflects the impact of satisfaction on potential behaviour such as willingness to recommend the organisation as a great place to work and intent to stay with the company for a certain number of years, as well as actual resignation behaviour and reported reasons for resignation. As the attitudinal and cognitive questions were included in an optional section at the end of the survey, not all the participants completed the questions. The questions were presented as optional due to the length of the questionnaire in order to prevent forced or randomized responses as a result of respondent exhaustion.

Figure 4: Questions used to measure self-reported job satisfaction



Job Satisfaction

Overall, how satisfied would you say you are with the following aspects of your occupation?

	Very Dissatisfied	Dissatisfied	Somewhat satisfied	Satisfied	Very Satisfied
Your workforce	◯	◯	◯	◯	◯
Your present position within the company	◯	◯	◯	◯	◯
Your occupation as a whole	◯	◯	◯	◯	◯
Your company as an employer	◯	◯	◯	◯	◯

From today, for how long do you feel you will still be working for your company?

- ◯ Less than one year
- ◯ Between 1 to 2 years
- ◯ Between 3 to 5 years
- ◯ More than 5 years

Would you recommend your company to friends and family as a great place to work?

- ◯ Definitely recommend
- ◯ Will maybe recommend
- ◯ Will definitely not recommend

How would you rate your daily experience of working at your company?

◯ Fun	◯	◯	◯	◯ Boring
◯ Appreciated	◯	◯	◯	◯ Unappreciated
◯ Challenged	◯	◯	◯	◯ Overworked
◯ Passionate	◯	◯	◯	◯ Uninspired

Attitudinal measures of job satisfaction

Four items on a 5-point scale (1 = *very dissatisfied*, 5 = *very satisfied*) were used to measure employees self-reported degree of overall satisfaction with their company as an employer, their satisfaction with their occupation, satisfaction with the work force to which they belong and satisfaction with their present position. These questions were administered to assess overall satisfaction not only with the company for which the respondent works, but also perceived fit with their position, workforce and overall choice of occupation.

Respondents were also requested to rate their daily working experience at their company to further measure emotional fit with the job. Respondents were asked to rate their experiences on four polar questions that ranged on a five point scale from *fun* (1) to *boring* (5), *appreciated* (1) to *unappreciated* (5), *challenged* (1) to *overworked* (5), and *passionate* (1) to *uninspired* (5). The relevant questions are provided in Figure 4.

In a separate follow-up study one year from the data collection period of the original study, the question examining self-reported degree of overall satisfaction with the company as an employer was again posed to a number of respondents who participated in the original study. These additional results will be used to determine whether there is any potential for a relationship between thinking styles or EI and changes in self-reported job satisfaction over time.

Cognitive measure of job satisfaction

Two additional questions were included in an attempt to counteract potential concerns regarding the self-report nature of the job satisfaction questions. Respondents' *intent to stay* with the company was assessed by asking how long the respondent felt that they would still be working for the company. Respondents were also requested to assess their willingness to *recommend* the company as a great place to work for family and friends (see Figure 4 for the relevant questions).

Behavioural measures of job satisfaction

The actual *resignation behaviour* and *reasons for resignation* was obtained from employee records held by the human resources department of the organisation. Resignations consisted of two main categories, those which can be classified as voluntary resignation and managed resignation when the employee has in fact been involuntarily dismissed. The study will control for unavoidable compared to avoidable termination of employment factors for example resignation due to the end of a contract period, death,

other country transfers or the decision not to return to work after pregnancy. Avoidable resignations are considered to be reasons for resignation that could have been prevented by the company.

4.3.5. Socio-demographic and occupational variables

Previous studies have observed that EI (Palmer, 2003) and thinking styles (Cilliers & Sternberg, 2001; Sternberg & Grigorenko, 1995a; Zhang, 2002c, 2005b; Zhang & Sachs, 1997) can vary with one or more of the following demographic characteristics: age, experience, gender and culture. The theory of mental self-government describes thinking styles as variable throughout the lifespan and socialised by learning and environmental influences (Sternberg, 1997). It would therefore be expected that thinking styles would differ as a result of gender socialisation, cultural or language influences and age.

These variables were incorporated in the analysis of the research as it was expected that similar results would be obtained for the present study. The following demographic or workforce information was collected either through the demographic information section of the survey questionnaire (see Figure 5 for the relevant questions) or through personnel information made available by the human resources department of the organisation.

Job function and leadership

The present study seeks to examine differences in emotional intelligence and thinking styles of people in different job functions: workforces and levels of management. As discussed in the sample specifications, the organisation from which the sample for the present study is drawn consists of four primary *workforces*; a consultancy-oriented workforce, a services workforce, a technical development or information technology (IT) based workforce and an office based workforce consisting of enterprise or support staff. Respondents were asked to indicate to which workforces they belong in the survey questionnaire but to further facilitate the distinction between job functions, additional information regarding the exact nature of the respondent's job function was obtained from human resources.

The thinking styles of respondents in different *job functions* will be further assessed according to differences in the cognitive climate of occupations based on a typology similar to that identified by Cools and Van Den Broeck (2007). This distinction between job functions was implemented specifically within the enterprise or office based workforce as this is the least homogenous workforce in the organisation,

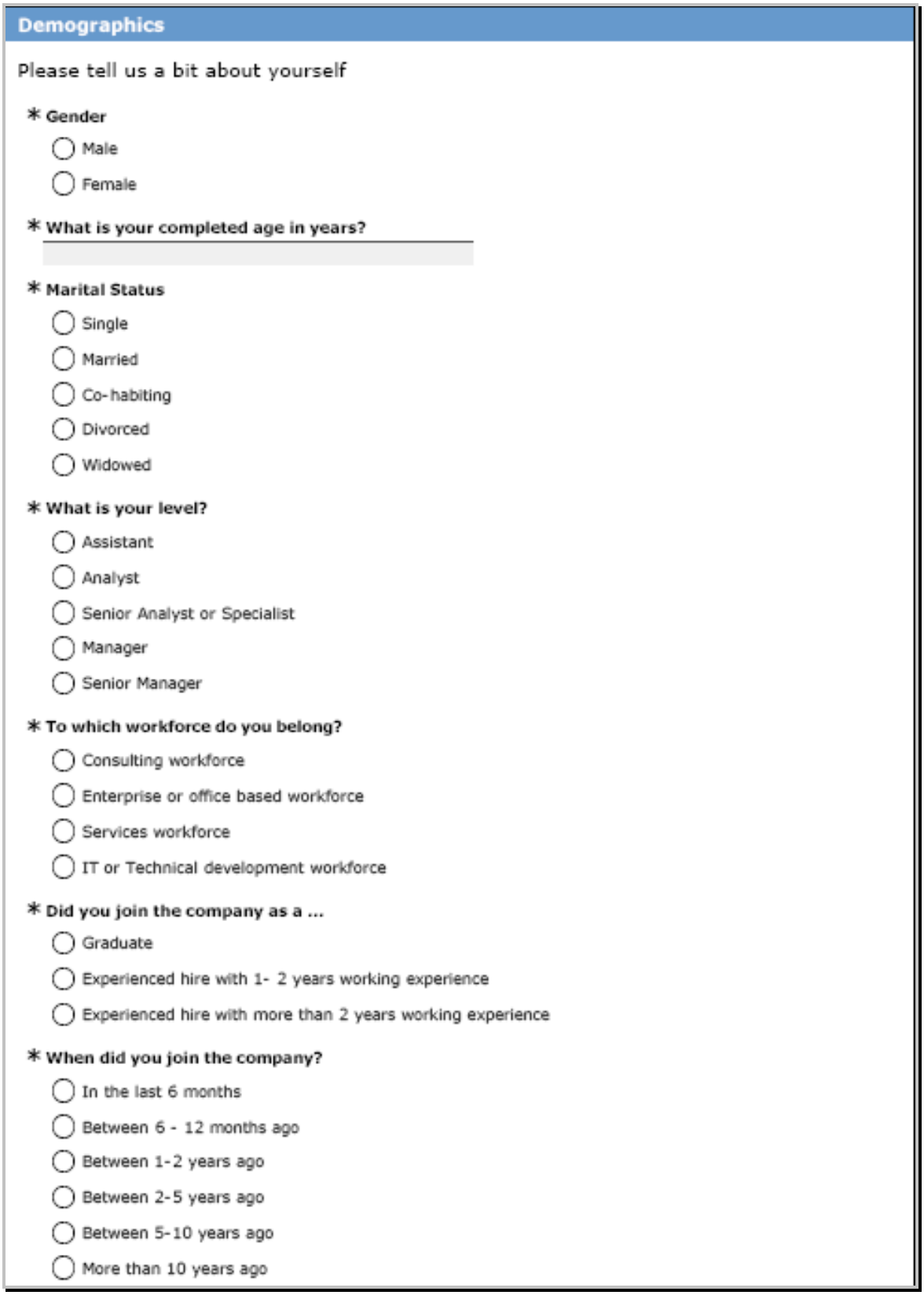
consisting of a number of career functions including office services, research, human resources, finance and creative services or marketing. The three groups of the typology are conceptualised as follows:

a) Job functions that require a *knowing-oriented cognitive climate* includes employees who belong to the services workforce, which is characterised by job functions such as outsourced business processes, application management and information technology, as well as employees who belong to the finance and research division of the enterprise workforce.
b) Job functions that require a *planning-oriented cognitive climate* includes employees who belong to the solutions workforce which is characterised by job functions such as the application of technical skills in building and maintaining technology solutions as well as employees who belong to the office services or human resources divisions of the enterprise workforce and thereby are required to possess a number of administrative skills.
c) Job functions that require a *creating-oriented cognitive climate* include employees in the consulting workforces as well as the creative services or marketing divisions of the enterprise workforce.

The difference in emotional intelligence for different job functions was assessed by separating employees into two groups. Respondents who worked in the consulting workforce as well as the creative services or human resources divisions of the enterprise workforce were considered as working in occupations that deal primarily with affect laden information and require emotional problem solving. Employees who worked in the services, technical or IT development workforces on the other hand were considered as belonging to occupations that deal primarily with technical information required for building and maintaining technology solutions.

Respondents were requested to specify their level within the company to assist in determining whether differences in EI or thinking styles could be identified for respondents who were in *management* positions compared to those who were not. Respondents were subdivided into two groups based on their level; those in either senior manager or manager positions and those who fell below the level of manager.

Figure 5: Questions used to measure socio-demographic and organisational variables



Demographics

Please tell us a bit about yourself

* **Gender**
  - ◯ Male
  - ◯ Female

* **What is your completed age in years?**

* **Marital Status**
  - ◯ Single
  - ◯ Married
  - ◯ Co-habiting
  - ◯ Divorced
  - ◯ Widowed

* **What is your level?**
  - ◯ Assistant
  - ◯ Analyst
  - ◯ Senior Analyst or Specialist
  - ◯ Manager
  - ◯ Senior Manager

* **To which workforce do you belong?**
  - ◯ Consulting workforce
  - ◯ Enterprise or office based workforce
  - ◯ Services workforce
  - ◯ IT or Technical development workforce

* **Did you join the company as a ...**
  - ◯ Graduate
  - ◯ Experienced hire with 1- 2 years working experience
  - ◯ Experienced hire with more than 2 years working experience

* **When did you join the company?**
  - ◯ In the last 6 months
  - ◯ Between 6 - 12 months ago
  - ◯ Between 1-2 years ago
  - ◯ Between 2-5 years ago
  - ◯ Between 5-10 years ago
  - ◯ More than 10 years ago

Age and experience of respondents

EI is expected to improve with age and experience, therefore questions to assess these aspects were included as a measure of construct validity. Age was assessed as a continuous variable with a question that asked the respondent to provide his or her full age in years, as well as by a categorical assessment of the different generations to which the respondents in the sample belong. Recent theories of *generational differences* in society maintain that the economic, social, and political experiences that occurred in the formative childhood and teenage years define differences between generations and influence interactions within the workplace as well as society as a whole (Codrington & Grant Marshall, 2004). The potential for differences in EI according to different generations is also assessed due to the increasing market related interest in generational differences in the workplace.

The sample participants were divided into three age groupings based on the generational divisions outlined in a report from The Pew Research Center for the People and the Press (PEW, 2007):

a) The *baby boom generation* is made up of 42 to 56 year-olds (born between *1946 and 1965),*

b) *Generation X* is made up of 27 to 41 years olds (born between 1966 and 1980), and

c) *Generation Y* is made up of 19 to 26 year-olds (born between 1981 and 1988).

Experience was assessed by determining the length of time respondents had been with the company as well as whether respondents that had joined the company in the past 12 months, had joined the company as graduates or employees who were appointed with either one to two years of working experience, or more than two years of working experience. Thinking styles and EI are expected to differ with experience, therefore it is expected that new joiners with more than two years work experience and employees who have been with the company for longer periods of time will have different EI and thinking styles compared to graduates or new joiners with only one or two years of previous work experience.

Gender, ethnicity and marital status of respondents

The *gender* of the respondent was requested as a measure of construct validity because previous research has suggested that women are more emotionally intelligent than men (Schutte et al., 1998). Thinking styles are expected to be different for men and women due to the effects of socialisation and as a result separate norms were developed for males and females to classify the different levels of each of the thirteen thinking styles (Sternberg, 1997).

All three instruments claim to be reliable amongst different cultures, therefore differences between *ethnic groups* were assessed to determine whether these measures are indeed reliable across different cultural

groupings. Due to the perceived sensitivity of this question, ethnic grouping was not asked in the questionnaire but was obtained separately from Human Resources for each of the respondents.

Previous research has established a link between marital status and general measures of well-being (Ryan, Michael & James, 1998). *Marital status* of respondents was therefore assessed to determine if there is any impact on emotional intelligence or thinking styles and thereby determine if the marital status of respondents needs to be controlled.

4.4. DATA COLLECTION PROCEDURE

Permission was obtained from the Human Resources manager of the company and senior management within the company who both supported the research and encouraged participants to complete the survey. The SSREIT, the TSI and the relevant demographic and workforce questions were programmed in HTML format into an online survey tool using a program called Survey Monkey (www.surveymonkey.com) which was used to conduct the survey. The MSCEIT was administered using a separate online version of the survey hosted by MHS. I was required to attend an accreditation course to be permitted to administer the instrument and the course was attended in March 2007 (see Appendix E for accreditation).

The online survey methodology was considered to be the best means for accessing the respondents as all employees have access to the internet but are not available in a single location at any one time. The online methodology therefore allows respondents to complete the survey in their own time at their convenience. The survey tool prevents respondents from missing or purposefully skipping questions. The tool also randomises the items, thereby decreasing the potential for response bias. An additional advantage of this data collection method is that it is cost effective and overrides the errors associated with manual data capturing which increases the reliability of the results.

The respondents were sent the link to the two surveys (The MSCEIT and the SSREIT, TSI combination survey) in an email supported by one of the senior managers of the company. In order to maximise response to both surveys, the respondents were randomly divided into two groups using the SPSS random sampling tool with one group receiving the MSCEIT before the SSREIT and TSI link and the second group receiving the links in the reverse order. Participants were given a three month period in

which to complete the surveys to encourage a maximum response rate and regular reminders were sent out during this time. As an incentive to participate, respondents were offered access to the final report. An additional incentive of a random draw on completion of the study for a R500 cash prize was also offered to respondents. A number of research respondents did not complete both surveys in this time, however, there were sufficient participants who did complete both the surveys, and the sample was judged to be sufficient for the continuation of the research.

The nature of the survey was explained to the respondents in the introductory email as well as the estimated time of completion. Participants were assured that their involvement was voluntary and that the results of their questionnaires would remain confidential and anonymous, and would not be made available to the company on an individual basis. The explanation of the surveys and instructions on how to complete the surveys were included in the actual online surveys and a contact email address and phone number of the researcher that was available for questions and guidance was included in the survey invitation. To prevent coercion, no Human Resources or management personnel were involved in the actual data collection procedure and all research invitations were sent from the researcher with permission from management and HR. The encouragement from management to take part in the survey took the form of a generic email sent to all personnel requesting voluntary participation in the study.

On completion of the data collection period, a raw excel spreadsheet was downloaded from the surveymonkey.com website. MHS holds the rights to the scoring for the MSCEIT and provided a scored dataset on completion of the research. The surveymonkey.com questions were linked to the MSCEIT dataset using unique identifiers. Additional demographic and workforce information relevant to the research was made available by human resources.

Twelve months after the data collection period, respondents were again requested to complete the SSREIT to determine if the measure had satisfactory test-retest reliability after one year, a figure which has as yet not been provided by research studies with the instrument. In addition, respondents were requested to respond to the question examining self-reported degree of overall satisfaction with their company as an employer, in order to determine if job satisfaction had changed over time. Only a portion of the original sample participated in the follow-up assessment as a number of the sample respondents had resigned in the twelve months after the original data collection period. A list of the respondents who had resigned in that time as well as reasons for resignation was provided by human resources.

In order to protect respondents from improper use of their test results a unique identifier was used for each respondent and personal details such as email addresses and names were kept in an encrypted file separate from the survey results. All personal identification was deleted once the data was collected to prevent improper access in the future.

4.4.1. Controlling for response bias in the administration of the online measures

In the literature review, criticisms of the vulnerability of self-report trait measures towards socially desirable responses were discussed. Consequently, a number of methods were employed in the present study in order to decrease the potential for socially desirable response bias. Schutte and Malouff (1999) affirm that if respondents believe that the questionnaires will be used to assess them on some level they may respond in ways to make themselves look better than they are, and that the best way to obtain honest responses is for respondents to remain totally anonymous. Respondents who participated in the study were assured anonymity and confidentiality to encourage them to answer truthfully. Access to the final report is also a method widely utilised in corporate research to ensure reliability of results as the opportunity to obtain insight applicable to participants on a professional level is considered as a sufficient incentive to encourage participants to answer truthfully. Hence, all participants in this research study will be given access to the final report when the study has been completed.

4.5. DATA ANALYSIS PROCEDURES

The following statistical techniques were applied in testing the hypotheses using the Statistical Package for the Social Sciences (SPSS) computer program for Windows version 16.0 as well as AMOS 7.0. Before commencement of the analysis the data from the SSREIT and TSI scores were transformed to aggregate scores. In scoring the SSREIT, items 5, 28 and 33 for the SSREIT were reverse coded and the sum of the scales were added together to provide a total EI score. The aggregate scores for each of the subscales of the TSI were obtained by calculating the mean of the items in each of the subscales.

It was decided not to control for non-normality in the results through data transformation or any other means as these types of procedures result in changes to the underlying construct being examined and therefore has negative implications for the interpretation of the results (Grayston cited in Field, 2005, p. 79). As the sample sizes are large, the impact of non-normality in the data is reduced but alternative procedures to reduce the potential for type I errors in the data will be used where applicable. The implications of this decision will be discussed in the section on the conclusion and limitations of the research study.

4.5.1. Reliability and validity of the measurement instruments

4.5.1.1. The factorial validity of the SSREIT

To examine the validity of the factor structure of the SSREIT an exploratory factor analysis method followed by a confirmatory factor analysis was used on the total sample. Exploratory factor analysis is used to discover the nature of the constructs that influence a set of responses whereas confirmatory factor analysis is a complex factor analysis technique used to confirm or test certain hypotheses concerning the structure underlying a set of variables (Field, 2005, p. 629).

In the overview of previous research regarding the factorial validity of the SSREIT it was discovered that a number of researchers have identified a clear four factor solution (Palmer, 2003; Petrides & Furnham 2000a; Saklofske et al., 2003) as well as a satisfactory fit for the one factor model (Ciarrochi et al., 2001; Schutte et al., 1998) identified by Schutte et al., (1998). It is important to note, however, that these models were all derived through different techniques.

The original version was developed using a principal component analysis of 66 items, after which the results were rotated orthogonally using a varimax rotation. Four components were identified but only one component was retained as a general factor which measured approximately 20% of the common variance. The study conducted by Petrides and Furnham (2000a) was aimed at reinterpreting the factor structure of the SSREIT, based on the premise that the original varimax rotation used would distribute variance away from a general factor. As discussed in Chapter 3, the findings from this study were unable to find an appropriate fit for the one factor model using confirmatory factor analysis, however, exploratory factor analysis revealed a clear four factor solution. Palmer (2003) used a confirmatory factor analysis to analyse a general factor, four oblique factors, four orthogonal factors and a higher order hierarchical model and confirmed previous findings that a four factor oblique model provided the best fit with the data.
In accordance with previous research, a study conducted on a sample of South African student respondents also revealed a four factor model (Murphy, 2006) using an exploratory factor analysis with oblique rotation, however, differences were found in the item association with the different subscales in this study compared to the previous studies. As these findings result in uncertainty regarding both the existence and the item structure of a possible four factor structure, it was decided to firstly attempt to replicate the four factor model and corresponding item structure identified by Murphy (2006) using an exploratory factor analysis with an oblique rotation.

Item-level exploratory factor analysis of the SSREIT

Although previous studies have utilised a principal component analysis, it was decided to use a principal axis factor analysis for the present study as this technique is designed to be less affected by unique and error variability due to the focus on shared variance, whereas the principal component analysis uses all the variance in the variables (Tabachnick & Fidell, 2007, p. 608). An oblique rotation rather than an orthogonal rotation such as the varimax method used by the authors of the scale (Schutte et al., 1998) was determined to be the most suitable method for analysing the factor structure of the SSREIT because at a conceptual level, multiple domains of a single construct should be related and therefore the factors are expected to be correlated. In addition, highly correlated factors may suggest additional factor structures, however, according to Petrides and Furnham (2000a) an orthogonal solution would obscure this. A direct oblimin rotation technique was utilised to examine the factor structure of the SSREIT as it is an oblique rotation method that allows variables to be highly correlated yet aids in achieving a simple structure (Kaplan, 2000, p. 44).

Catell's scree test was used to study the slope of the plotted eigenvalues in order to determine the factor solution. The eigenvalue (Kaiser's criterion) for a given factor measures the variance in all the variables explained by that factor. If a factor has a low eigenvalue then it is contributing little to the explanation of variance in the variables and may be considered as redundant. Kaiser's criterion has been criticised for resulting in the retention of too many factors, therefore Catell's scree test is used to clearly determine the number of factors to use. The scree test shows a sharp drop levelling off to a flat tail as each successive component's eigenvalue explains less and less of the variances. The Catell rule is to pick all factors prior to where the plot levels off, or changes (Pallant, 2001, p. 161).

The groups of items that loaded highest on each factor were compared to findings from previous studies and all 33 items were allocated to one of the four factors based on factor scores of 0.3 and above on the present study as well as on at least one of the three previous studies discussed. Items that did not meet these criteria were allocated to items based on their highest loadings in the factor analysis or loadings on factors that were identified in at least two prior studies. After the factors were created, the correlations between them were compared using a Pearson's product-moment correlation to determine whether the factors were related and could thereby confirm the oblique nature of the relationships between the factors.

Item-level confirmatory factor analysis of the proposed SSREIT models

Confirmatory factor analysis was performed to statistically compare the extent to which different exploratory factor solutions of the SSREIT provided a fit with the present data. Seven models were tested

via structural equation modelling using AMOS V7.0, four of these models were derived from the present study compared to three models obtained in previous studies.

A number of reasons were given previously as support for the oblique nature of the relationship between the factors, nevertheless, to test this assumption it was decided to compare an oblique factor model against an orthogonal model. In order to determine whether the instrument was capable of measuring one general EI factor as well as sub factors, a hierarchical model of EI that consisted of a general factor and the four lower order factors was also tested. In addition, due to the low percentage of variance explained by the fourth factor and because previous research studies have excluded this factor due to low reliability (Ciarrochi et al., 2002), it was decided to compare the four factor model against a three factor model that excluded the utilisation subfactor and corresponding items.

In the exploratory factor analysis it was determined that there were substantive differences between the present model and those obtained by Murphy (2006) which was based on an oblique rotation, and Palmer (2003) which was based on the orthogonally rotated model identified by Petrides and Furnham (2000a). Only the oblique version of this model will be examined as Palmer tested this model as an oblique and an orthogonal model and determined that although there was a satisfactory fit for both models, the oblique model provided the best fit for the data. The structure of these previous models was therefore re-examined in the analysis to further determine whether the item-structure of the revised model would provide a better fit for the present data than previously identified models.

In order to allow fair comparison between the model and models identified in previous research, all 33 items were used in each model, except for the three factor model which abandoned the last factor and corresponding items. No items were permitted to load on more than one factor in the assessment of any of the models. The seven hypothesised models to be compared are presented graphically in Chapter 5 and Appendix F, Section 1 and are summarised as follows:

a) A general factor using the original one factor model (Schutte et al., 1998).
b) The factor solution interpreted by the present study in four formats: as an oblique four factor model, as an orthogonal four factor model, as a higher order hierarchical model and as an oblique three factor model.
c) The orthogonal four factor model identified by Murphy (2006).
d) The orthogonal four factor model identified by Palmer (2003).

Maximum likelihood estimation was employed to estimate all models as maximum likelihood is typically used in latent variable modelling and its accuracy is less dependent on sample size (Tabachnick & Fidell, 2007, p. 713). The fit indices used to assess the degree to which the variance implied by the specified models match the observed variances were the same as those reported by Palmer (2003). The primary fit

index is the chi-square statistic (χ^2) (CMIN), followed by the normed chi-square adjustment (χ^2/df). The chi-square statistic is expected to roughly equal the degrees of freedom (df) therefore a ratio of 2.0 for good fit or 3.0 for adequate fit is required, whereas larger values suggest a lack of fit (Tabachnick & Fidell, 2007, p. 715; Palmer, 2003). A significant chi-square indicates lack of satisfactory model fit, however, as this statistic is highly susceptible to non-normality and sample size and therefore type II error, the decision to accept or reject model fit was supplemented by (1) the goodness-of-fit index (GFI), (2) the adjusted goodness-of-fit index (AGFI), (3) the comparative fit index (CFI), (4) the Tucker-Lewis Index (TLI), (5) the root mean square error of approximation (RMSEA), and (6) the standardised root mean square residual (SRMR).

The GFI and the AGFI are indices that index the relative amount of the observed variances and covariances explained by the model and minimum values of 0.90 for the GFI and 0.85 for the AGFI are required. The AGFI adjusts the GFI for the number of parameters estimated and is therefore reported in addition to the GFI to ensure the development of a parsimonious model (Tabachnick & Fidell, 2007, p. 718). The Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) which is also referred to as the Nonnormed Fit Index (NNFI) are incremental indices. The CFI indexes the relative lack of fit of a target model versus the independence baseline model and values between 0.90 and 0.95 on the CFI are considered to be a satisfactory fit, whereas values of more than 0.95 are considered to be a good fit of the data. The TLI was also reported as it is generally recommended when reporting incremental fit indices to report two of them and unlike the CFI, the TLI is moderately corrected for parsimony (Hoyle & Panter, 1995).

The root mean square error of approximation (RMSEA) was reported as it is a parsimony-adjusted index that utilises a maximum value of 0.08 for acceptable fit with values closer to or less than 0.05 indicating excellent fit. In addition, Hu and Bentler (cited in Tabachnick & Fidell, 2007, p. 720) suggest reporting the standardised root mean square residual (SRMR) which estimates the average differences between the sample variances and covariances and the estimated population variances and covariances. A maximum value of 0.08 is utilised for the SRMR and values closer to or less than 0.05 indicate excellent fit (Tabachnick & Fidell, 2007, p. 720).

As directed by Tabachnick and Fidell, (2007, p. 710), the path coefficients for all error variances as well as one regression coefficient to one of the measured variables from each of the latent factors, were set to one. For the hierarchical model, which required the four latent factors to load on a second order general EI factor, the variance of the general EI factor and the first order factors' disturbances were also set to one.

4.5.1.2. The factorial validity of the MSCEIT

To examine the validity of the factor structure of the MSCEIT, the one, two and four factor models which were obtained previously by Mayer et al., (2003) and on which the scales are based, were assessed for fit with the present data using confirmatory factor analysis with maximum likelihood estimation in AMOS V7.0. The model was also assessed as a hierarchical model with four branch scores, two area scores and one general EI score, rather than a nested model as examined previously by Palmer et al., (2005) who obtained a less than satisfactory fit for all the expected models using this procedure.

The analysis in this section was computed with both the unstandardised and unadjusted task scores as well as the standardised scores which were adjusted for age, gender and ethnicity by MHS. The same fit indices and corresponding cut-off points for satisfactory fit used previously to assess the SSREIT were applied to the assessment of the MSCEIT. Only two respondent cases were found to contain missing data which were consequently excluded from the analysis, resulting in a total sample of 223 respondents who successfully completed the instrument.

MacCann et al., (2003) emphasise that caution should be used when conducting statistical analysis which assumes multivariate normality on results from the MSCEIT largely because the nature of the consensus scoring procedures causes the scored tests to have high levels of kurtosis and negative skew simply because if a test item is reliable, the majority of people will get the answer correct on each item. Although the sample size of the present study is larger and therefore not as susceptible to violations of normality experienced by smaller samples, efforts to control for non-normality will be applied where applicable. For the confirmatory factor analysis for example, the Bollen-Stine *p*-value which is more robust to multivariate non-normality (Hancock & Nevitt, 1999) will be reported to assess overall model fit, instead of the usual maximum likelihood-based *p*-value.

4.5.1.3. Reliability of the measurement instruments

To ascertain the reliability of the TSI and the SSREIT, estimates of internal consistency for the overall SSREIT scale and the four identified subscales, as well as the overall TSI scale and the thirteen category subscales were obtained using Cronbach's alpha. An examination of the test-retest reliability of the SSREIT after 12 months was also obtained by examining scores from a subset of the sample population that completed the test originally and twelve months after the data collection period. A Pearson's product-

moment correlation coefficient was used to determine whether the original scores on the overall EI scale and four subscales were significantly correlated with the later data results.

Mayer and colleagues stress that reliability coefficients for the MSCEIT should be calculated on scored rather than unscored data as the analysis of the reliability of the unscored data would only reflect the individual differences in the use of the scales rather than measured emotional intelligence. They further stress that split-half reliability coefficients are the most important reliability coefficients in the assessment of the internal consistency of the MSCEIT as the items are not homogenous. Instead, the branches and full-scale scores are based on items that vary between tasks. Based on this recommendation, split-half reliability coefficients were used to examine the reliability of the branch, area and overall MSCEIT scores using the scored items (with Spearman Brown correction to control for non-normality), and Cronbach's alpha coefficients are reported at the task level due to item homogeneity (Mayer et al., 2003).

The relationships between the thirteen subscales of TSI were also investigated through the use of Pearson's product-moment correlation coefficient. The relationships were examined by measuring the intercorrelations among the subscales of the TSI to determine whether the relations shown were similar to those predicted by the theory of mental self-government (Sternberg, 1997) and those reported in previous studies.

4.5.1.4. The validity of the categorisation of the thinking styles subscales into five dimensions and three broad types

To examine the validity of the assertion that the thirteen subscales of the TSI can be grouped into three broad categories and five dimensions, a three factor as well as a five factor oblique model was assessed using confirmatory factor analysis with maximum likelihood estimation to determine if it was possible to identify these superordinate structures in the data. Missing data accounted for approximately 14% of the results, therefore the Bollen-Stine *p*-value and the GFI, AGFI and SRMR fit indices could not be used. The model was examined on a scale level rather than an item level using the thirteen subscales as observed factors and the types and dimensions as latent factors. The procedure and fit indices used to test the two models were the same as those used in the examination of the SSREIT and MSCEIT. Specifically, the error variance was set to be uncorrelated and latent variables were correlated or oblique.

Difficulties were found in the identification of the hypothesised three and five factor models which was attributed to insufficient sample size and problems caused by missing data in the sample. To attempt to

overcome these difficulties, a principal axis factor analysis was conducted at the subscale level to determine whether evidence could be obtained for the three and five factor models in this manner. A forced five factor model revealed appropriate size and directions of the factor loadings of the subscales on the expected five thinking styles dimensions. A forced three factor model revealed, however, that a number of the subscales in the third thinking styles type loaded more strongly with either type I or type II styles. This supports the claim by the authors of the scale that type III factors will associate more strongly with either type I or type II styles in certain situations. A confirmatory factor analysis procedure was again utilised to assess the model fit of the revised two factor model which was considered to be the most appropriate solution for the instruments based on the results of the combined analysis.

4.5.2. Assessment of the emotional intelligence and thinking styles of the sample respondents

4.5.2.1. Emotional intelligence and thinking styles profile of the sample and comparison to norms

To determine the extent to which the test sample compares to normative scores available for the EI and thinking styles measures, means and standard deviations were obtained for each scale to examine distributions on the total and subscale scores. In addition, single-sample t-tests were used to compare the results from the present sample to normative data obtained in previous studies. The standardised scores for the overall, area, branch and task scores of the MSCEIT provided by MHS and adjusted for age, gender and ethnicity, were compared to the standardised North American mean score of 100 and standard deviation of 15 as well as the preliminary norm scores obtained for South African samples obtained from a MHS report prepared by Gallant (2005). These norms for South Africa have as yet not been integrated into the online scoring program utilised by MHS as the MSCEIT requires a minimum of 35 respondents for each of the eight age by gender categories to compute suitable norms (Gallant, 2005).

The mean scores for the TSI were compared to the norms developed by Sternberg (1997) for non-student adults. As the norms are different for men and women the midpoint between the two cut-off points

for each male versus female scale norm was taken to guide how the overall results on these scores compare to the norms.

As no norms were generated by Schutte et al., (1998), the scores obtained for South African student respondents by Murphy (2006) for the total scale and subscales will be examined to begin establishing benchmarks for comparison within South African samples. It is important to note, however, that the subscales used in the present study are based on item structures which differ from those obtained in previous research.

4.5.2.2. Exploring the correlations between the MSCEIT, SSREIT and the TSI

The hypotheses that there would be no significant relationship between measures of trait and ability EI (Hypothesis 1.1) and that thinking styles which are defined as a lower order personality trait, will be related to trait EI but will be independent from ability EI (Hypothesis 1.2) were investigated through the use of a Pearson's product-moment correlation coefficient. The correlations between the overall scale and subscales of the MSCEIT and the SSREIT were examined first, to determine if there was evidence of a significant relationship between the scales as well as the strength and direction of the relationship. Following this, the correlations with the subscales of the TSI were examined.

4.5.2.3. Subscale level factor analysis of the three measurement instruments

With respect to the underlying factor structure of trait versus ability EI, it is not known whether a single emotional ability factor underlies these measures or whether these instruments measure unique constructs. To determine whether evidence of the distinction between ability and trait EI could be identified at the factor level, a principal axis factor analysis technique with a direct oblimin oblique rotation was applied at the subscale level using the thirteen subscales of the TSI, four subscales of the SSREIT and the four branch scores of the MSCEIT. The subscales of the TSI are expected to load on the same factor as those of the SSREIT if these measures are both to be considered as tapping into similar components in the personality trait space, whereas the MSCEIT subscales are expected to load in an independent manner from both instruments (Hypothesis 1.3). Catell's scree test was again used to determine the factor solution and a three factor model was identified. A Pearson's product-moment

correlation was used to examine the direction and nature of the relationship between the three identified factors.

4.5.2.4. Differentiation between demographic groups

The construct validity of the scales was further assessed by examining differences between variations of the variables; gender, age, generational grouping, work experience, ethnic group and marital status. According to Hypothesis 1.4, certain group criterion relationships are expected on the EI scales and subscales including a positive relationship between emotional intelligence, age and experience, a lack of ethnic differences in ability or trait emotional intelligence, and higher scores for women on emotional intelligence scales and subscales than men. The following methods of analysis were used to assess the differences between groups on the total scale and subscales of the MSCEIT, SSREIT and the thirteen subscales of the TSI.

Differences between groupings on the total scales of the MSCEIT and the SSREIT for the generation, work experience, ethnicity and marital status variables were assessed using a one-way analysis of variance (ANOVA). The post hoc Scheffe test was used to control the likelihood of a type I error and to indicate where the specific areas of difference lie. To prevent the incidence of type I error from conducting ANOVA on a number of related dependent variables, a multivariate analysis of variance (MANOVA) was used to assess the differences between these groups on the branch, task and area scores of the MSCEIT and the four subscales of the SSREIT as well as the thirteen subscales of the TSI.

To explore whether there were any significant differences for age as a continuous variable on the measurement instruments, the data was analysed using the Pearson's product-moment coefficient (Pearson's r). To explore whether there were any significant differences for gender on the measurement instruments an independent samples t-test was conducted.

4.5.3. Predictive validity of trait versus ability EI in the occupational environment

4.5.3.1. The relationship between emotional intelligence, thinking styles and job satisfaction

As the questions used to assess job satisfaction consisted of a combination of self-report attitudinal questions, questions designed to measure cognitive components such as intent to stay and willingness to recommend the company as a great place to work as well as actual resignation behaviour, the relationship between these various components was examined using a Pearson's product moment correlation to determine if various components are sufficiently related. To ensure that the highest score on the item indicated the most positive response, the 'intent to recommend' and daily experience questions were reverse coded. Resignation behaviour was assessed as a dichotomous variable with respondents recorded as either active employees or employees who had resigned in the 12 months since the data had been collected.

A series of hierarchical regression procedures was used to examine the hypothesis that perceived favourable work environments will positively contribute towards the prediction of type I thinking styles, yet will contribute negatively towards type II thinking styles, (Hypothesis 2.1). To eliminate the effects of age, ethnicity, length of work and experience of new joiners, these variables were entered into the regression analysis first using a standard enter method. The thirteen thinking styles were examined separately as dependent variables and the attitudinal and cognitive job satisfaction variables were entered into the regression model in the second step as predictor variables using a stepwise regression procedure to eliminate variables that did not contribute towards to prediction model. Listwise cases exclusion was used which resulted in a total sample size of 100 respondents which is a satisfactory sample size consisting of approximately 10 cases for every predictor in the model. The overall satisfaction after 12 months variable was excluded due to the low sample size of respondents who completed the measure and the thinking styles inventory (n=52).

Hypotheses 2.2 and 2.3 deal with the expectation that EI measures will have incremental validity in predicting life outcome variables such as job satisfaction over that of existing trait measures and were examined in three steps. Firstly a partial correlation coefficient was computed to examine the strength and direction of the potential relationships, controlling for the demographic characteristics that were observed as displaying significant differences on the MSCEIT and the SSREIT, specifically, age, gender, ethnicity and new joiner experience. The second step involved a series of multiple regression analyses

which were used to examine the ability of the SSREIT and the MSCEIT to predict variance in job satisfaction. Each of the individual job satisfaction items were analysed as dependent variables and were regressed separately onto the unstandardised branch scores of the MSCEIT and the four subscales of the SSREIT. It was decided to examine the job satisfaction variables separately because although the items appeared in section 5.1.1.1 to be highly related, the correlations examined with the MSCEIT and SSREIT indicate variability in the relationships with these variables.

The third step involved a series of hierarchical regression analyses with the job satisfaction variables that had been found to be significantly related to either the MSCEIT or SSREIT subscales. A hierarchical regression procedure was utilised in order to control for the potential effect of the demographic variables, as well as the thirteen subscales of the TSI. The MSCEIT and SSREIT scales were examined separately in the same manner as step 1. The four demographic variables were entered into the first step followed by the thirteen subscales of the TSI in the second step. In the final step the EI measures were entered separately into the same models. As the resignation status variable consisted of a dichotomous variable differentiating between active employees and employees who had resigned, a hierarchic logistic regression procedure was used to examine resignation behaviour as the outcome variable using the same procedure.

4.5.3.2. Thinking styles and cognitive climate

A discriminant analysis was performed to estimate the degree to which thinking styles could discriminate among respondents who work in knowing-oriented cognitive climates, creating-oriented climates or planning-oriented climates (Hypothesis 2.4 and 2.5). The total sample was split into the three cognitive climate groupings depending on the job function which they fulfilled. Respondents who work in finance, outsourced business processes, application management, information technology and research functions were grouped into the knowing-oriented cognitive climate, employees who work in consulting, sales and marketing functions were grouped into the creating-oriented cognitive climate, and respondents who work in administrative and technical or IT development functions were grouped in a planning-oriented cognitive climate. A sample of 284 respondents was available for this analysis.

4.5.3.3. Emotional intelligence and job functions

The hypothesis that employees who work in occupations that deal primarily with affect laden information and require emotional problem solving such as human resources, consulting, sales and marketing will have higher levels of emotional intelligence than people who deal primarily with technical information required for building and maintain technology solutions (Hypothesis 2.6) was examined using an independent samples t-test. Differences in emotional intelligence between job functions with more affective requirements versus job functions with more technical requirements were assessed using an independent samples t-test.

4.5.3.4. The potential relationship with levels of management

The hypotheses that respondents in management positions are expected to display greater levels of ability and trait emotional intelligence (Hypothesis 2.7) than respondents in non-management positions, was examined using an independent samples t-test.

4.6. CHAPTER SUMMARY

Chapter 4 provided a description of the methodology of the study as well as the history of the reliability and validity of the measurement instruments. The chapter began with an explanation of the selected design followed by the procedure used to select the sample. The description and scoring procedure for the test materials was explained, followed by an explanation of the data collection procedure. Lastly, the statistical techniques and assumptions used to analyse the data were presented in detail. The results of the data analysis are presented in Chapter 5. Chapter 6 provides a discussion of the findings, an overview of the limitations of the study and recommendations for future studies.

CHAPTER 5
RESEARCH FINDINGS

The following chapter reports the results of the study arrived at through analysis of the data using the SPSS statistical package V16.0. The primary purpose of this study was to examine the validity of the conceptualisation of trait and ability EI as two distinct constructs by exploring the overlap between these constructs and a measure of thinking styles. In addition, the study examined the impact of trait and ability EI on criterion variables such as gender, ethnicity, age and experience and occupational variables such as job satisfaction and job function. The population of the study consisted of employees of a large South African corporate firm who completed a number of measurement instruments including the MSCEIT (an ability based measure of EI), the SSREIT (a trait measure of EI) and the TSI (a self-report measure of cognitive thinking styles). Respondents also completed questions designed to assess self-reported job satisfaction and socio-demographic characteristics. Details of actual resignations were obtained from the company for the 12 to 15 months after the data collection period. A further follow-up survey was released one year after the data collection period in order to obtain 12 month test-retest reliability figures for the SSREIT and re-assess overall job satisfaction to determine if any change had occurred after 12 months.

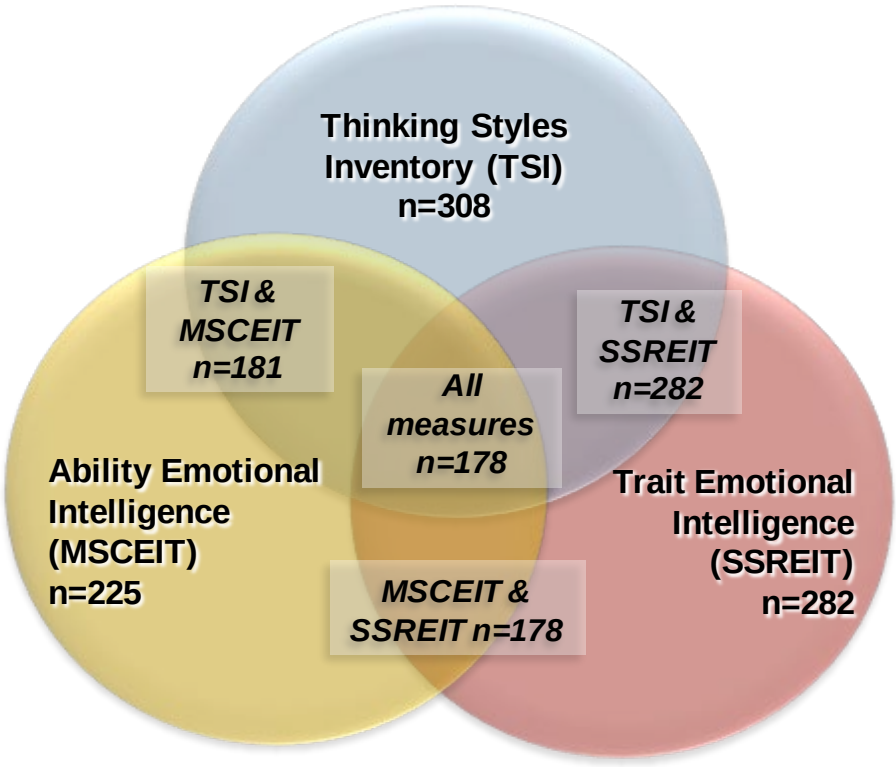
The results of the study are presented in five different sections. Firstly an overview of the demographic characteristics of the sample is provided which specifies the number of respondents in each of the demographic and occupational categories under examination. The second section involves an analysis of the validity of the expected factor structures of the measurement instruments. This section begins with an examination of the item level factor structure of the SSREIT using both factor and confirmatory analysis procedures. Following this is a confirmatory analysis of the MSCEIT factors and subscales and an attempt to confirm the anticipated three type factor structure and the five dimension factor structure of the TSI. The second section concludes with a review of the reliability of the scales and subscales identified in each of the three measurement instruments.

The third section entails an overview of the scores on the EI and thinking styles instruments for the total sample as well as a comparison of the results to norms for the measurement instruments and results from previous studies. The results from the assessment of the hypothesis that there will be sufficient differences between trait EI and ability EI as well as ability EI and cognitive thinking styles to support the hypothesised distinction between the two constructs is reported in the fourth section, including an examination of the expected demographic differences between groups on the measurements instruments specifically with regard to age, generation grouping, work experience, ethnicity, gender and marital status. The results of the analyses in this section are expected to contribute to the assessment of the

construct validity of the instruments under examination as well as determine whether any demographic characteristics need to be controlled when testing the remaining hypotheses of the study. The chapter concludes with the results of the analysis used to assess the predictive and incremental validity of emotional intelligence in the occupational environment.

A total of 352 respondents participated in the survey, of these 308 respondents completed the TSI, 225 completed the MSCEIT and 282 completed the SSREIT. There were 178 respondents who completed all three measures.

Figure 6: Number of respondents who completed each of the measurement instruments

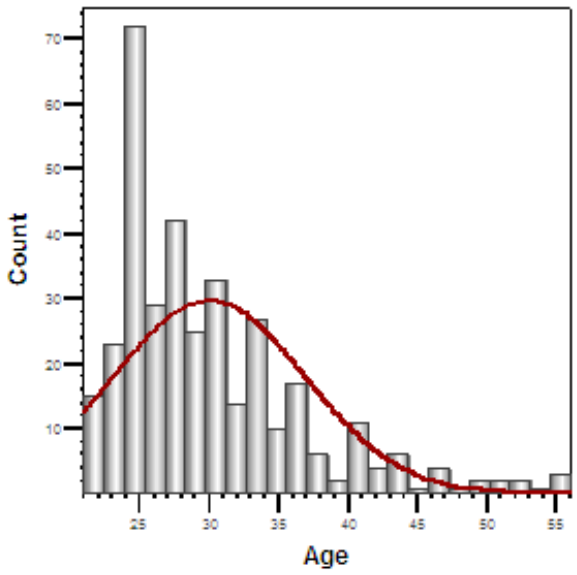


5.1. DEMOGRAPHIC PROFILE OF THE SAMPLE

5.1.1. Socio-demographic characteristics of the sample

The exact age which respondents provided ranged from 21 years to 56 years of age with a mean age of 30 and a standard deviation of 6.89. The mode was 25 years which included 11% of the respondents. The age distribution is positively skewed with respondents clustering in the lower age groups. Respondents were grouped according to the generational categories outlined in Chapter 4, with the majority of the sample consisted of generation X (ages 27 to 41, 53%) and generation Y employees (ages 19 to 26, 40%). Only a small proportion of the baby boomer generation were represented in the sample (ages 42 to 56, 7%). The gender composition of the sample is evenly split between men and women with men constituting a slight majority of the sample (53%). The distribution across the different ethnic groups is skewed towards White respondents who make up a large percentage of the sample (56%), however, Black (24%) and Indian (15%) respondents do constitute a sufficient portion of the sample. Most of the respondents are either single (49%) or married (40%), and divorced (5%) or co-habiting (6%) respondents make up a very small portion of the sample.

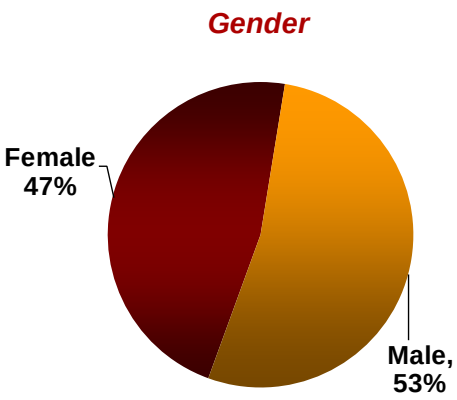
Figure 7: Age profile of the respondents



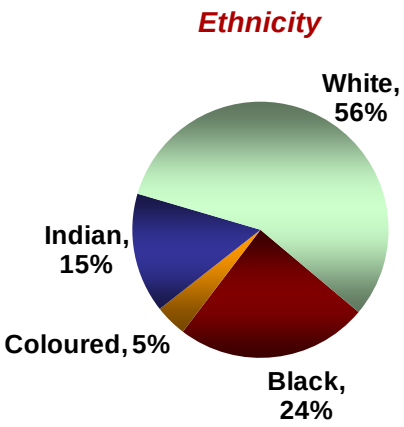
Age - Descriptives

Min	21
Max	56
Mean	30
Std Deviation	6.89
Mode	25
Total	352

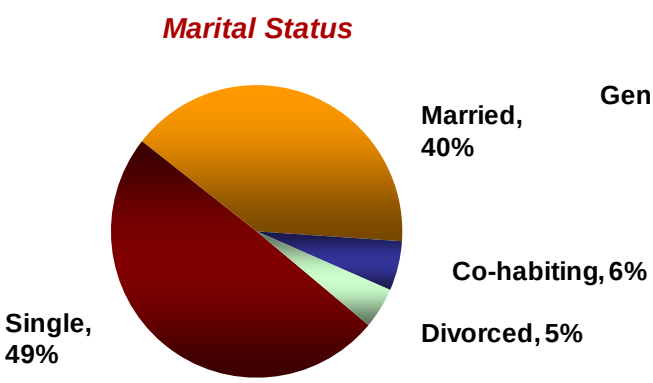
Figure 8: Socio-demographic characteristics of the sample



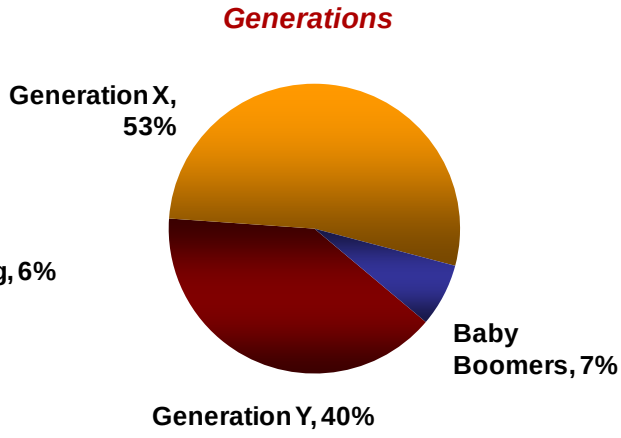
	n
Female	165
Male	187
Total	352



	n
Black	85
Coloured	15
Indian	53
White	198
Total	352



	n
Single	153
Married	125
Co-habiting	17
Divorced	14
Did not answer	43
Total	352

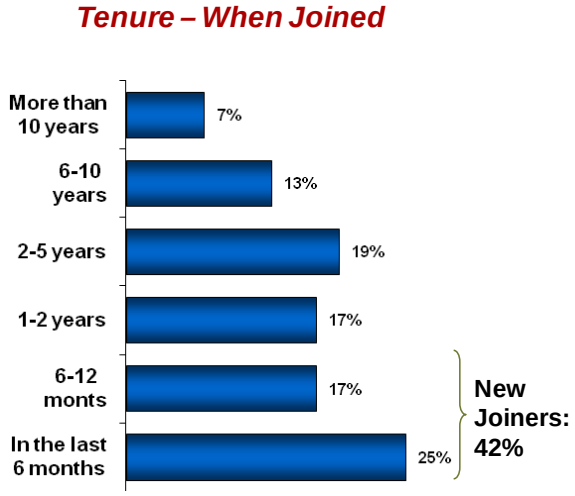


	n
Generation Y	139
Generation X	187
Baby Boomers	26
Total	352

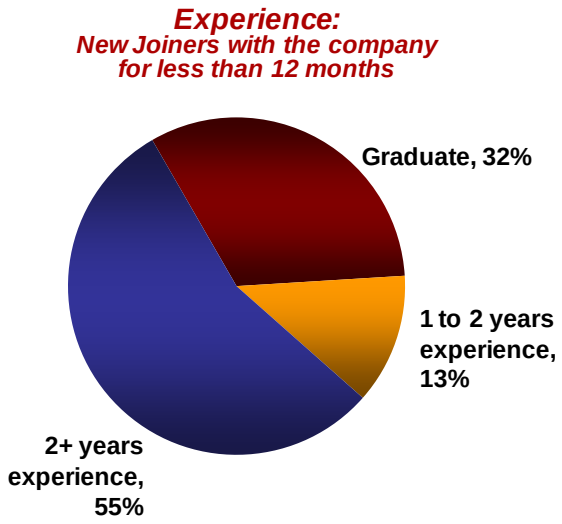
5.1.2. Occupational characteristics of the sample

Nearly half of the sample (42%) consists of new joiners that have been with the company for less than a year. About one in three employees (36%) have been with the company between one and five years and 20% of the sample have been with the company for more than six years. Within the sample of new joiners, 44 respondents joined the company as graduates, 17 joined with one to two years of work experience and 75 joined with more than two years work experience. The sample sizes are sufficient to determine if there are any differences in thinking styles or EI across the different experience groups. The sample consisted of 47 managers (14%) and 295 employees below manager level (86%).

Figure 9: Tenure and experience of the sample

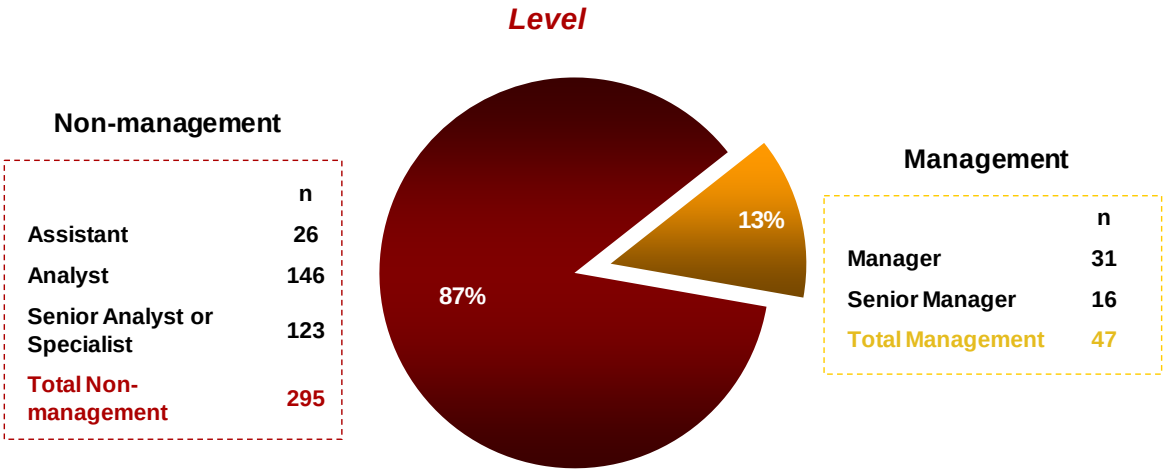


	n
In the last 6 months	89
6-12 months	60
1-2 years	61
2-5 years	66
6-10 years	44
More than 10 years	23
Did not answer	9
Total	352



	n
Experienced hire with more than 2 years experience	75
Experienced hire with 1-2 years experience	17
Graduate	44
Did not answer	13
Total New Joiners	149

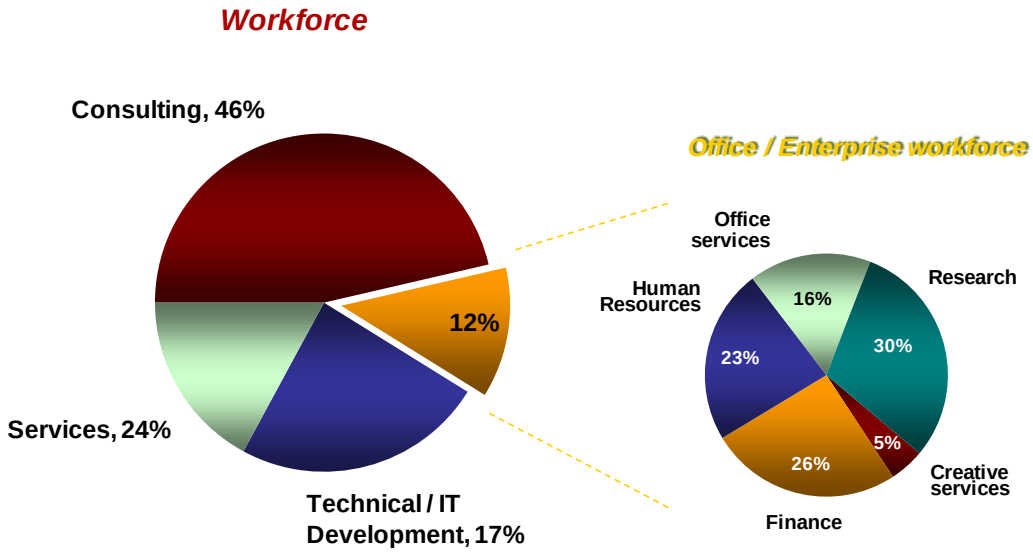
Figure 10: Management profile of the sample



	n
Assistant	26
Analyst	146
Senior Analyst or Specialist	123
Total Non-management	295

	n
Manager	31
Senior Manager	16
Total Management	47

Figure 11: Profile of the different workforces and cognitive climates to which the respondents belong



	n
Consulting workforce	160
Office / Enterprise workforce	43
Services workforce	83
Technical / IT Development workforce	59
Did not answer question	7
Total	352

	n
Research	13
Human Resources	10
Finance	11
Office services	7
Creative services	2
Total	43

As discussed in Chapter 4, the company workforce consists of four divisions. Sales or consulting employees who form the majority of the sample (46%) deal with clients on a daily basis, architecting and designing solutions as well as consulting on management and performance issues. The services division (24%) consists of employees within the outsourcing section of the company who provide long-term contracted services such as business processes, application management and information technology. Technical or IT development employees (17%) are responsible for applying technical skills and capabilities to build and maintain technology solutions. Lastly, the enterprise or support division includes office based employees who are currently in a business practice such as facilities, administration, finance, human resources, marketing and communications, operations and research (12%).

5.2. A CRITICAL EXAMINATION OF THE VALIDITY AND RELIABILITY OF THE MEASUREMENT INSTRUMENTS

In order to determine whether the ability and trait emotional intelligence measurement instruments utilised in the study measure EI as the theoretical models claim to, the reliability and validity of the MSCEIT and SSREIT were examined in accordance with the principles recommended by Ciarrochi et al., (2000) that were discussed in Chapter 3.

According to Ciarrochi et al., (2000), both measures of EI should load on a single factor, however, the MSCEIT is also expected to demonstrate a factor structure that is in accordance with the branches and subtasks that are specified by the theory. To determine whether the factor structure of the MSCEIT is in accordance with the underlying models on which the instrument is based, as well as previous research findings, the factor structure was assessed using confirmatory factor analysis. With regard to the SSREIT, although the authors (Schutte et al., 1998) specify that the instrument measures a single general factor of EI, previous research has yielded additional three and four factor models with some inconsistencies involving the exact item structure of the identified factors and resulting subscales (Palmer, 2003; Petrides & Furnham, 2000a, Ciarrochi et al., 2000). For this reason an exploratory factor analysis was utilised to identify the item structure to be used in the present study. This revised item structure was compared to the structures identified by Palmer (2003) and Murphy (2006) using confirmatory factor analysis to determine which structure provided the best fit with the data.

As the items vary between the different tasks (Mayer et al., 2003), split-half reliability coefficients rather than coefficient alphas were obtained to assess the internal consistency of the MSCEIT, with the

exception of each of the task scores which contain homogenous items. Estimates of internal consistency for the total scale and subscales (factors) of the SSREIT and the thirteen thinking-style scales were obtained using Cronbach's alpha. The scales were found to be reliable and valid for the population used in the present study. A twelve month test-retest reliability score for the SSREIT was also obtained.

To provide evidence of construct validity, the relationships between the subscales were also examined using a Pearson's product-moment correlation to determine whether the results reflected the strength and direction of the relationships predicted by the theory of mental self-government, as well as those obtained by previous research studies with a South African sample of university students (Murphy, 2006). As previous research has resulted in contradictory findings regarding whether the three types and five dimensions of thinking styles can be identified in the results with the TSI, these factor structures were examined using confirmatory factor analysis as well as exploratory factor analysis procedures.

5.2.1. Exploring the reliability and validity of the hierarchical four factor structure of the Schutte Self-Report Emotional Intelligence Test

Due to the uncertainty regarding the exact factor structure of the SSREIT, a principal axis factor analysis with a direct oblimin rotation was conducted to attempt to replicate the item structure and factor model identified by Murphy (2006). Following this procedure, a confirmatory factor analysis was performed to statistically compare the extent to which different exploratory factor solutions fit with the present data. The one factor model interpreted by Schutte et al., (1998) was compared to the item structure of the four factor models identified in the present study and the structures identified by Murphy (2006) and Palmer (2003).

5.2.1.1. Item-level exploratory factor analysis of the SSREIT

Prior to performing the factor analysis, the suitability of the data for factor analysis was assessed. The correlation matrix revealed a number of coefficients of 0.3 and above. The Kaiser-Mayer-Oklin value was 0.86 which exceeded the recommended value of 0.6 (Field, 2005, p. 648). The Bartlett's Test of Sphericity was statistically significant (p = .000). The sample size is greater than the recommended 150

respondents (n=282) and there were more than the recommended ratio of five cases for each of the variables or items (Field, 2005, p. 647). The data was therefore considered to be suitable for a factor analysis.

The initial eigenvalues were inspected to determine the number of factors to use for the factor analysis. Initial eigenvalues with a total value higher than 1.0 indicates a strong extraction (Field, 2005), therefore, all factors with eigenvalues below 1.0 were not reported in the results and can be seen as insignificant. Nine factors were found to have eigenvalues (Kaiser Criterion) exceeding 1.0 (see Table 7) which is similar to the eight factors obtained by Murphy (2006), this nine factor model accounts for 44.76% of the total variance. Inspecting Catell's scree test revealed that the graph levelled off at the fourth factor (see Figure 11), however, it is evident that the first factor does explain the majority of the variance (22.45%) which also supports an apparent one factor solution. In order to allow comparison with the factor structure found by Murphy (2006) it was decided to retain four factors for further investigation.

Table 7: Total variance explained for the overall scale of the SSREIT before extraction
(Excluding factors with eigenvalues lower than one)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.930	24.029	24.029	7.408	22.450	22.450
2	2.346	7.109	31.139	1.837	5.567	28.017
3	1.921	5.821	36.960	1.355	4.105	32.122
4	1.521	4.609	41.569	0.953	2.888	35.010
5	1.404	4.255	45.824	0.875	2.652	37.662
6	1.238	3.752	49.576	0.713	2.159	39.821
7	1.134	3.437	53.014	0.605	1.832	41.653
8	1.113	3.372	56.385	0.519	1.573	43.226
9	1.012	3.067	59.452	0.507	1.537	**44.764**
Extraction Method: Principal Axis Factoring.						

To aid in the interpretation of the four factors that were extracted, an oblique direct oblimin rotation with Kaiser Normalisation was performed. The communalities after extraction are considered to be high as none are below 0.2, which indicates that the items seem to be well defined by the factors (see Table 9). The four factor solution explained a total of 33.84% of the variance (see Table 8), which is slightly lower than the 36.30% obtained by Murphy (2006). Examining the factor matrix (see Table 9) after the four factors were extracted did not reveal a simple structure, with items loading on more than one factor which is the same as the previous results (Murphy, 2006). The majority of the items loaded strongly on the first factor which supports Schutte et al's (1998) claim that the SSREIT measures one general factor of EI.

Petrides and Furnham (2000a), however, maintain that the scale is predisposed to a strong general factor due to the varimax rotation used to develop the original scale.

Figure 12: Scree plot for the overall scale of the SSREIT

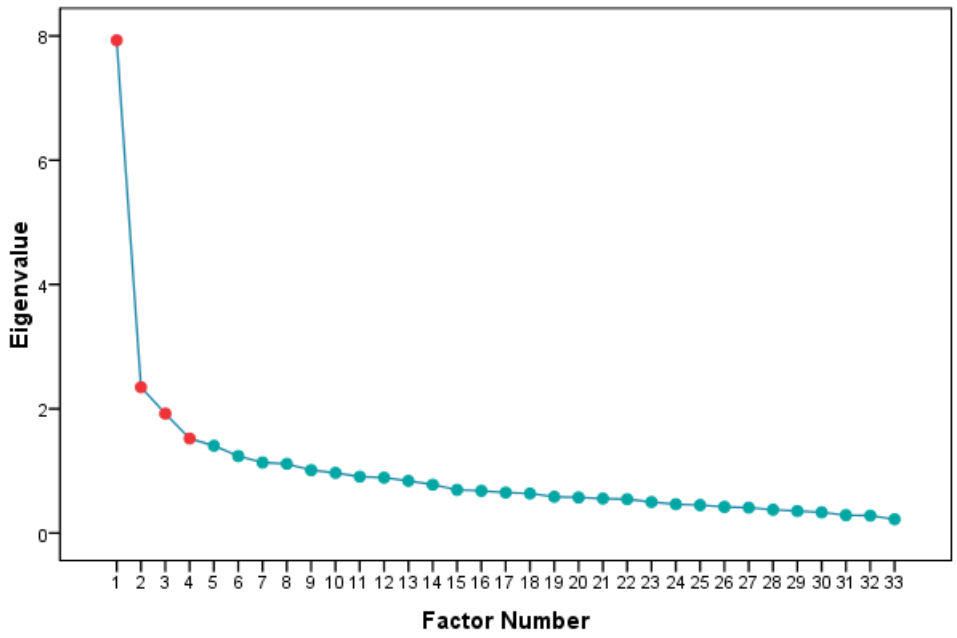


Table 8: Total variance explained for the overall scale of the SSREIT after extraction

(Excluding factors with eigenvalues lower than one)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings [a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.930	24.029	24.029	7.307	22.142	22.142	5.464
2	2.346	7.109	31.139	1.738	5.266	27.408	4.338
3	1.921	5.821	36.960	1.242	3.764	31.172	4.443
4	1.521	4.609	41.569	0.879	2.665	**33.836**	1.844
5	1.404	4.255	45.824				
6	1.238	3.752	49.576				
7	1.134	3.437	53.014				
8	1.113	3.372	56.385				
9	1.012	3.067	59.452				

Extraction Method: Principal Axis Factoring.
[a] When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 9: Factor matrix and communalities (h^2) for the four factor solution of the SSREIT

Item numbers	Factor 1	Factor 2	Factor 3	Factor 4	h^2 (After extraction)
1	**.335**	-.008	.137	.011	.131
2	**.510**	-.108	.242	-.006	.330
3	**.338**	-.087	.149	-.050	.147
4	**.422**	.094	-.090	.134	.213
5	.155	**.513**	.078	.124	.309
6	**.442**	-.048	-.064	.017	.202
7	**.351**	-.093	-.147	-.145	.175
8	**.457**	-.120	-.257	.177	.321
9	**.479**	.063	**.326**	.033	.341
10	**.479**	-.237	.140	.057	.308
11	**.401**	-.115	-.319	**.317**	.376
12	**.591**	-.260	.136	.048	.437
13	**.413**	-.138	-.265	**.308**	.354
14	**.458**	-.294	-.043	.086	.306
15	**.475**	.259	-.099	.049	.305
16	**.439**	-.058	.092	.099	.214
17	**.518**	-.196	.007	-.165	.334
18	**.534**	**.413**	-.132	-.174	.503
19	**.516**	.089	.218	.051	.324
20	**.570**	-.278	-.104	-.247	.474
21	**.398**	-.050	**.390**	-.145	.334
22	**.612**	.190	.261	-.007	.479
23	**.651**	-.220	.091	.002	.481
24	**.546**	.032	.152	.229	.375
25	**.489**	**.503**	-.117	-.069	.511
26	**.448**	-.016	-.247	.041	.264
27	**.471**	-.161	-.072	-.308	.348
28	.128	.135	**.387**	.021	.185
29	**.491**	**.423**	-.159	-.167	.474
30	**.649**	.102	-.154	.221	.505
31	**.650**	-.202	-.141	-.190	.520
32	**.387**	**.319**	-.199	-.284	.372
33	.102	**.302**	.186	.281	.215
Extraction Method: Principal axis factoring, 4 factors extracted, 5 iterations required					
Factor loadings greater than 0.3 are shown in boldface. The items along with their numbers are shown in Appendix A					

Table 10 displays the rotated pattern matrix which indicates a clearer distribution amongst the four factors. A comparison to the factor structures of the aforementioned studies (Murphy, 2006; Palmer, 2003; Petrides & Furnham 2000a) revealed that items loading on the first two factors were largely comparable to previous studies, however, there were a number of items that did not load consistently across all studies. The comparison for factor three and four yielded no relationship with the factor structure obtained by Murphy (2006) although the structure was somewhat consistent with that obtained by Palmer (2003) and Petrides and Furnham (2000a). The item structure used in Palmer's research was based on the findings of Petrides and Furnham (2000a), the only difference is that Palmer did not allow items to load on more than one factor due to restrictions imposed by the confirmatory factor analysis procedure utilised in the study.

The differences in item loadings can be attributed to a number of reasons such as the different factor extraction and rotation methods used, as well as the different nature of the samples involved in each of the studies. The model obtained by Murphy (2006) for example, was obtained using a sample of students with a mean age of 22 years whereas the present sample is obtained with a sample of working adults with a mean age of 30 years. The degree of consistency in the majority of the items across these four studies does on the other hand, support the validity of the four factor structure of the instrument.

After the factor analysis was performed, a score was calculated for each factor by obtaining the mean for all items comprising each factor. In order to enhance the validity of the subscales to be calculated from the factor scores in lieu of the different item structures found in the studies discussed previously, it was decided to allocate items to factors based on the following criteria:

- Firstly, items were allocated to a specific factor only if the item had attained factor loading of 0.3 and above on the present study and on at least one of the three previous studies discussed.
- Secondly, items that did not meet the first criterion were allocated to factors based on their highest loadings in the factor analysis.
- Thirdly, if an item had a factor loading which was found to load on a different factor to the present study in at least three prior studies, the item was placed within this factor (for example item 14).

This allocation was done to ensure that the calculated sub scales would consist of item structures that are consistent across studies. The items comprising different factors of the aforementioned factor models can be observed in Table 11.

Table 10: Pattern matrix and item loadings for the four factor solution of the SSREIT

Item numbers	Factor 1	Factor 2	Factor 3	Factor 4
21	**.611**	.023	.202	-.072
9	**.553**	.079	.010	.103
2	**.537**	-.003	-.065	-.056
22	**.528**	.279	-.010	.101
12	**.517**	-.090	-.246	-.141
23	**.497**	.007	-.245	-.180
19	**.460**	.146	-.079	.091
10	**.455**	-.116	-.204	-.105
24	**.421**	.042	-.298	.177
28	**.405**	-.001	.206	.200
3	**.352**	.014	-.014	-.086
17	**.345**	.100	-.097	**-.311**
16	**.335**	.019	-.207	.018
1	**.314**	.052	-.052	.003
29	-.001	**.681**	-.021	-.018
25	.012	**.680**	-.058	.120
18	.052	**.680**	-.017	-.026
32	-.061	**.632**	.067	-.168
15	.084	**.400**	-.208	.087
5	.012	**.394**	.020	**.390**
11	-.076	.002	**-.646**	.034
13	-.010	-.029	**-.616**	.031
8	.021	.067	**-.510**	-.069
30	.160	.260	**-.497**	.098
26	.003	.219	**-.355**	-.117
14	.281	-.115	**-.348**	-.170
4	.107	.193	**-.301**	.074
6	.187	.131	-.230	-.094
20	.291	.134	-.135	**-.465**
33	.140	.073	-.087	**.441**
27	.239	.218	.006	**-.426**
31	.275	.212	-.215	**-.400**
7	.077	.177	-.118	-.264

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalisation. Rotation converged in 21 iterations.

Factor loadings greater than 0.3 are shown in boldface. The items along with their numbers are shown in Appendix A

Table 11: Items comprising different factors on the SSREIT between the present study and previous studies

Item number				
Factor	**Present study**	**Murphy (2006)**	**Palmer (2003)**	**Petrides & Furnham (2000a)**
Factor 1 Optimism	1	1		
	2	2	2	2
	3	3	3	3
		*4		
		6		
		7		
	9			
	10	*10	10	10
	12		12	12
		14	14	14
	16	16		*16
	*17	17		*17
	19			
		20		*20
	21		21	21
	22			*22
	23	23	23	23
	24	24		
		*27		
	28	28	28	28
		31	31	*31
Factor 2 Social skills		*4		
	5	5	5	5
			9	9
	15	15	15	15
	18	18	18	18
			19	19
			22	*22
	25	25	25	25
	29	29	29	29
	32	32	32	32
		*30		
		33		

Item number				
Factor	**Present study**	**Murphy (2006)**	**Palmer (2003)**	**Petrides & Furnham (2000a)**
Factor 3 Appraisal			1	1
	4		4	4
	6		6	*6
	8	8	8	8
		9		
		*10		
	11		11	11
		*12		*12
	13		13	13
	14			
			16	*16
		19		
		22		
		21		
			24	24
	26		26	26
	30		30	30
				*31
			33	33
Factor 4 Utilisation				*6
	7		7	7
		11		
		13		
	*17		17	*17
		26		
	27	*27	27	27
	20		20	*20
		*30		
	31			*31
	33			

Note: Items highlighted in Blue are identified as belonging to these factors by the present study as well as more than one previous study
* Items that are recorded as loading on more than one factor

Of the original 33 items, 30 items loaded on factors that were previously associated with these items and only three items loaded on factors that were different to those identified by previous studies. Two items loaded with values less than 0.3 on any of the factors but as the factor location of these items was supported by previous studies, it was decided to retain these items for further analysis. The full items used in each of the factors can be observed in Appendix A.

a) The items retained for the first factor were 1, 2, 3, 9, 10, 12, 14, 16, 19, 21, 23, 24 and 28. Item 4 had a stronger loading score on factor 3 but it was decided to move this item to factor one as the item also loaded on this factor in the present study as well as all three previous studies discussed. In accordance with previous studies, this factor was referred to as 'optimism' and included items that refer to self motivation and positive emotions such as 'when I experience a positive emotion, I know how to make it last'.

b) The items retained for the second factor were items 5, 15, 18, 25, 29 and 32. This factor was called 'social skills' and included items such as 'I am aware of the non verbal messages I send to others' which refer to dealing with emotions in social contexts.

c) The third factor was composed of items 4, 6, 8, 11, 13, 26 and 30 which refer predominantly to recognising, awareness and control over emotions such as 'I help other people feel better when they are down', and will be referred to as 'appraisal' of emotions.

d) The fourth factor includes items 7, 17, 20, 27, 31 and 33, that refer to active use of emotions such as 'when I am in a positive mood, I am able to come up with new ideas' and will be referred to as 'utilisation' of emotions. Although item 17 loaded on factor one and factor four it was decided to incorporate the item with factor four as the item statement 'when I am in a positive mood, solving problems is easy for me' appears to refer more to utilisation of emotions than optimism. It is important to note that this factor explains the least variance and consists of the fewest number of items. Furthermore, the subscale was removed from the SSREIT factor structure identified by Ciarrochi et al., (2002) due to low reliability ($\alpha = .58$).

On analysis of the correlations between the subscales using a Pearson's product-moment correlation coefficient, it was identified that the subscales had positive and moderate to high correlations with one another (Cohen, 1988), as the correlations ranged from r = 0.37 to 0.86, which supports the use of an oblique rotation method. These results are presented in Table 12.

Table 12: Pearson's correlation matrix for the correlations between the four subscales and total score of the SSREIT

Factor	Total EI	Optimism	Social Skills	Appraisal	Utilisation
1. Optimism	.858**	1.000			
2. Social Skills	.669**	.383**	1.000		
3. Appraisal	.782**	.518**	.408**	1.000	
4. Utilisation	.729**	.580**	.367**	.523**	1.000
**p < .01 Total sample n=282					

5.2.1.2. Item-level confirmatory factor analysis of the SSREIT

Eight models were assessed using AMOS V7.0 to determine which provided the best fit with the present data. In order to allow fair comparison between the model identified in the present research study and models identified in previous research, all 33 items were used in each model, except for the three factor model which abandoned the last factor and corresponding items. No items were permitted to load on more than one factor in the assessment of any of the models. The eight hypothesised models to be compared are summarised in Table 13. Path diagrams and parameter estimates of the hypothesised models are presented in Appendix F, Section 1. Latent variables in the path diagrams are presented as circles and rectangles are used to indicate observed variables.

Table 13: Model specifications and item numbers for each of the SSREIT models under examination

Model	Source	Model specification		Factor	Item numbers
1	Schutte et al., (1998)	General one factor model		Factor 1	All 33 items
2	Present study	Four Factor model	Oblique	Factor 1	1, 2, 3, 9, 10, 12, 14, 16, 19, 21, 22, 23, 24, 28
3			Orthogonal	Factor 2	5, 15, 18, 25, 29, 32
4				Factor 3	4, 6, 8, 11, 13, 26, 30
5			Hierarchical	Factor 4	7, 17, 20, 27, 31, 33
6		Three Factor model	Oblique	Factor 1	1, 2, 3, 9, 10, 12, 14, 16, 17, 19, 21, 22, 23, 24, 28
				Factor 2	5, 15, 18, 25, 29, 32
				Factor 3	4, 6, 8, 11, 13, 26, 30
7	Murphy (2006)	Four Factor model	Oblique	Factor 1	1, 2, 3, 6, 7, 10, 14, 16, 17, 20, 23, 24, 28, 31
				Factor 2	4, 5, 15, 18, 25, 29, 30, 32, 33
				Factor 3	8, 9, 12, 19, 22, 21
				Factor 4	11, 13, 26, 27
8	Palmer (2003)	Four Factor model	Oblique	Factor 1	2, 3, 10, 12, 14, 21, 23, 28, 31
				Factor 2	5, 9, 15, 18, 19, 22, 25, 29, 32
				Factor 3	1, 4, 6, 8, 11, 13, 16, 24, 26, 30, 33
				Factor 4	7, 17, 27, 20

The distribution of the SSREIT scores was found to display pronounced multivariate skewness and kurtosis. The Mardia's coefficient of multivariate kurtosis had a critical ratio of 30.6 (see Appendix F, Table F1), which is higher than the critical ratio of 3 implying that the measured variables are not distributed normally. To control for the possible influence of non-normality on the data the Bollen-Stine *p*-value which is more robust to multivariate non-normality (Hancock & Nevitt, 1999) will be reported to assess overall model fit, instead of the usual maximum likelihood-based *p*-value. Structural equation modelling analysis was performed with data from 282 respondents and no data was missing.

Based on the majority of the item fit indicators, none of the models were found to be a good fit to the present data. As discussed previously, the chi-squared statistic is highly susceptible to type II errors and with sample sizes greater than 200 respondents, a good approximate fit may be accepted if indicated by other fit tests. The recommended criteria for GFI and AGFI figures were not met by any of the models examined, however, these indicators tend to bias results downwards when degrees of freedom are large relative to sample size (Garson, 2008, p. 5). The CFI and TLI figures were also below the recommended criteria for all models concerned. Possible reasons for the poor fit of these models is due to the observed lack of normality in the data and the high number of items to be estimated (33) in comparison to the sample size (n=282).

With regard to the four factor models identified by Palmer (2003) (χ^2_{489} = 1093.082, Bollen-stine *p* = .004, GFI = .80, AGFI = .77, CFI = .76, TLI = .75, RMSEA = .066, SRMR = .072) and Murphy (2006) (χ^2_{489} = 1157.568, Bollen-stine *p* = .004, GFI = .79, AGFI = .76, CFI = .74, TLI = .72, RMSEA = .070, SRMR = .076), both models presented less than satisfactory goodness of fit scores. Confirmatory factor analysis results obtained by Palmer (2003) who examined the structure originally proposed by Petrides and Furnham (2000a) indicated a satisfactory fit for the oblique (χ^2_{489} = 1312.69, normed χ^2 = 2.68, CFI = .98, RMSEA = .068), orthogonal (χ^2_{495} = 1888.17, normed χ^2 = 3.81, CFI = .97, RMSEA = .088) and hierarchical (χ^2_{495} = 1312.69, normed χ^2 = 3.48, CFI = .97, RMSEA = .082) four factor models as well as the general factor model by Schutte et al., (1998) (χ^2_{489} = 1723.32, normed χ^2 = 3.48, CFI = .97, RMSEA = .082) which he tested, however the oblique model yielded the best fit. Possible reasons for the discrepancy in the results may lie with the larger sample size of 367 participants used compared to 282 used in the present study. Palmer (2003), furthermore, did not report the exact *p* values or parameter estimates for comparison.

The general one factor model identified by Schutte et al., (1998) was the model that had the least acceptable fit to the data (χ^2_{495} = 1397.376, Bollen-stine *p* = .004, GFI = .74, AGFI = .71, CFI = .65, TLI = .62, RMSEA = .081, SRMR = .080). This is consistent with the findings by Petrides and Furnham (2000a) who argued against Schutte and colleagues' assumption that all the items load only on one general factor of EI.

The four orthogonal factor model (χ^2_{495} = 1378.638, Bollen-stine *p* = .004, GFI = .76, AGFI = .73, CFI = .65, TLI = .63, RMSEA = .080, SRMR = .174) and the three oblique factor models identified in the present study, provided the worst fit to the data (χ^2_{374} = 871.497, Bollen-stine *p* = .004, GFI = .82, AGFI = .79, CFI = .77, TLI = .75, RMSEA = .069, SRMR = .074). The lack of fit of the orthogonal model was evident in the high RMSEA and SRMR figures, which support the assumption that the underlying factors should not be considered as independent. The three factor oblique model was tested to examine the suggestion by Ciarrochi et al*.,* (2002) that the SSREIT would be more reliable without the fourth factor and the corresponding items. As this model did not improve on the goodness of fit scores observed in the four factor models, the suggestion to remove these items from the instrument was not endorsed.

The oblique four factor (χ^2_{489} = 1053.086, Bollen-stine *p* = .004, GFI = .81, AGFI = .79, CFI = .78, TLI = .76, RMSEA = .064, SRMR = .070) and hierarchical four factor (χ^2_{491} = 1059.164, Bollen-stine *p* = .005, GFI = .81, AGFI = .79, CFI = .78, TLI = .76, RMSEA = .064, SRMR = .071) models identified in the present study were found to be the best fitting models with the present data. The path diagram for the hierarchical four factor model is depicted in Figure 13. The normed chi-squared statistic for both models exceeded the recommended maximum value of 2.0 for good fit (Tabachnick & Fidell, 2007, p. 715), but still met the 3.0 criteria for acceptable fit. The GFI, AGFI, CFI and TLI statistics, although less than satisfactory, indicated the highest scores of all the models and the standardised coefficients for the four subscales on the general EI factor ranged from 0.63 to 0.86. The RMSEA and SRMR figures, however, suggested and adequate model fit for both models. Both models were comparable and only differed by one point with regard to normed χ^2 and SRMR scores. However, as the addition of a general EI factor would provide more information on EI than the four factor model on its own, it was decided to proceed with the hierarchic model of EI for further analysis.

On closer examination of the parameter estimates of the model, which are presented in Table 15, it was evident that one item (item 33) has a negative, nonsignificant factor loading. This item was one of the few items that has previously loaded on different factors in previous research and may, therefore, not be differentiated clearly enough. Removal of this item from the model made little impact on the fit indices, however, future studies should consider whether this item is appropriate to the scale. The factor loadings of the four subfactors on the general EI factor were high, ranging from 0.63 to 0.86, yet there were no factor loadings which exceeded 1.0 and, therefore, no multicollinearity is evident in the model.

Table 14: Fit Indices for the comparative models of the SSREIT identified in the present study

Model	CMIN (χ^2)	Normed χ^2	*df*	Bollen-stine *p*	GFI	AGFI	CFI	TLI	RMSEA	SRMR
Four oblique factor model	1053.086	2.15	489	.004	.81	.79	.78	.76	.064	.070
Four orthogonal factor model	1387.638	2.08	495	.004	.76	.73	.65	.63	.080	.174
Hierarchical four factor model	1059.164	2.16	491	.005	.81	.79	.78	.76	.064	.071
Three oblique factor model	871.497	2.33	374	.004	.82	.79	.77	.75	.069	.074
General factor identified by Schutte et al., (1998)	1397.376	2.82	495	.004	.74	.71	.65	.62	.081	.080
Four oblique factor model identified by Murphy (2006)	1157.568	2.36	489	.004	.79	.76	.74	.72	.070	.076
Four oblique factor model identified by Palmer (2003)	1093.082	2.24	489	.004	.80	.77	.76	.75	.066	.072
Limits		**2.0-3.0**			**.90**	**.85**	**.90**	**.90**	**.05-.08**	**.05-.08**

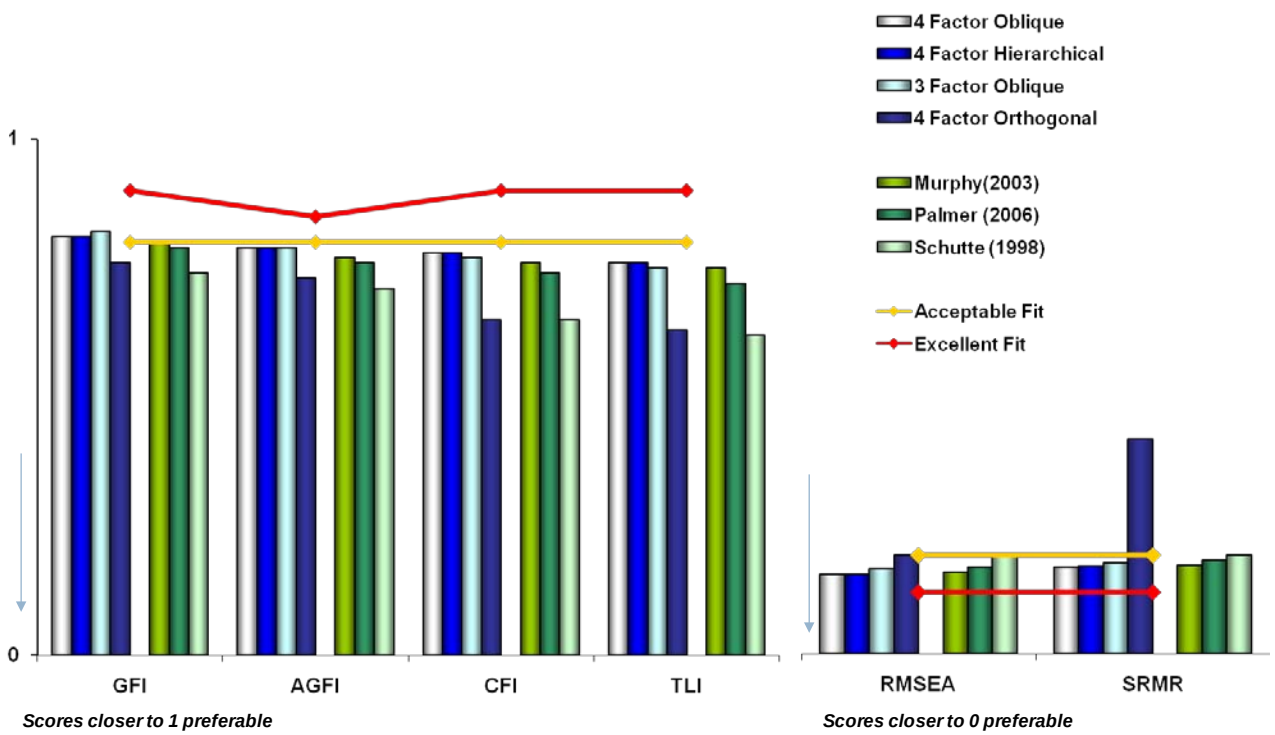


Figure 13: Four factor hierarchical model of emotional intelligence identified in the present study

Standardised solution (n=282)

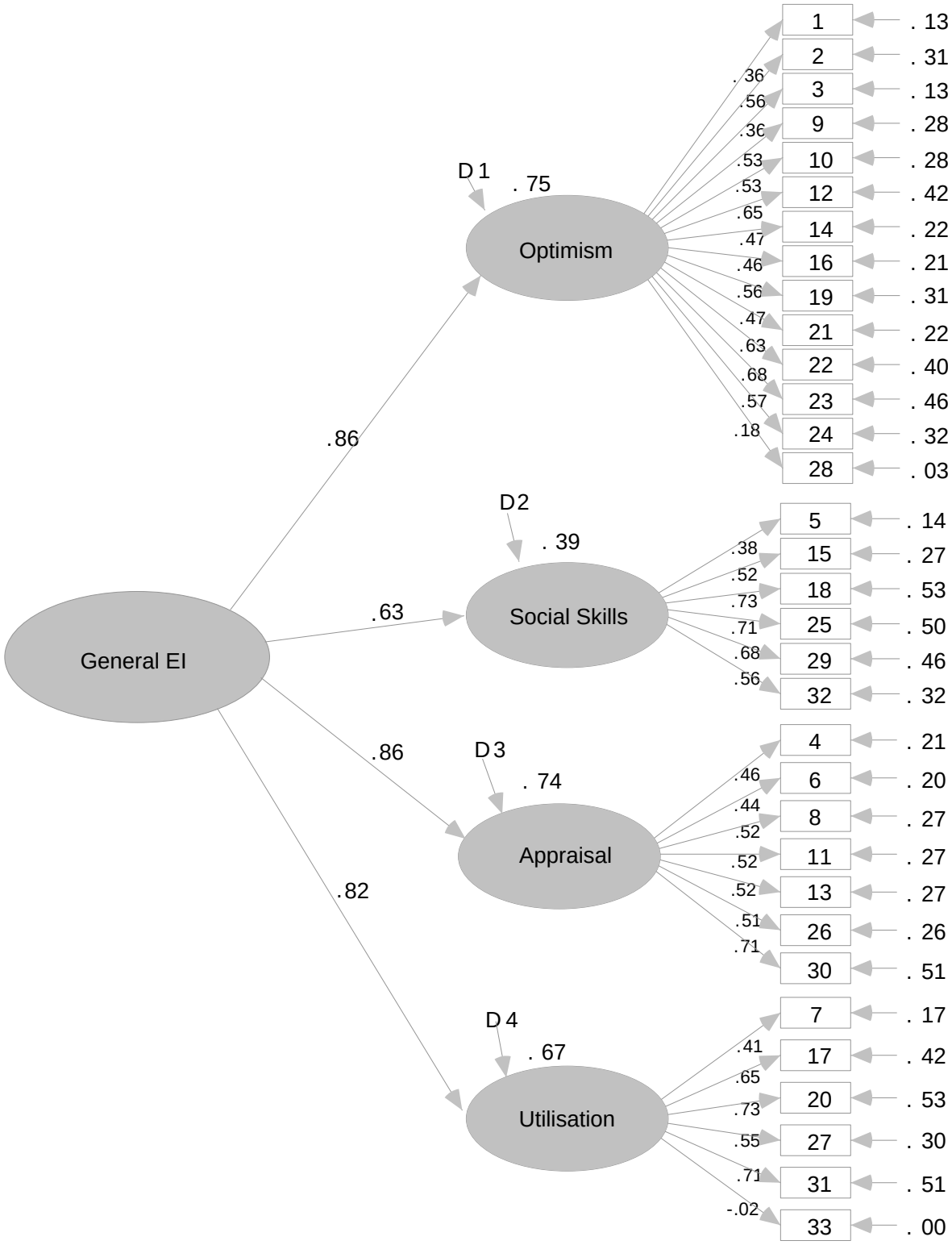


Table 15: Unstandardised and standardised parameter estimates, and significance levels for the four factor hierarchical model identified in the present study depicted in Figure 13

(Standard errors in parentheses, n=282)

Measurement Model Estimates			Unstandardised		Standardised	*p*
Optimism	←	General EI	0.27	(0.05)	0.86	***
Social skills	←	General EI	0.27	(0.05)	0.63	***
Appraisal	←	General EI	0.32	(0.05)	0.86	***
Utilisation	←	General EI	0.31	(0.05)	0.82	***
Item 1	←	Optimism	1.00		0.36	Na
Item 2	←	Optimism	1.24	(0.24)	0.56	***
Item 3	←	Optimism	0.74	(0.17)	0.36	***
Item 9	←	Optimism	1.27	(0.25)	0.53	***
Item 10	←	Optimism	1.34	(0.26)	0.53	***
Item 12	←	Optimism	1.76	(0.33)	0.65	***
Item 14	←	Optimism	1.15	(0.24)	0.47	***
Item 16	←	Optimism	1.02	(0.21)	0.46	***
Item 19	←	Optimism	1.30	(0.25)	0.56	***
Item 21	←	Optimism	1.24	(0.26)	0.47	***
Item 22	←	Optimism	1.43	(0.27)	0.63	***
Item 23	←	Optimism	1.92	(0.35)	0.68	***
Item 24	←	Optimism	1.01	(0.19)	0.57	***
Item 28	←	Optimism	0.41	(0.16)	0.18	.010
Item 5	←	Social skills	1.00		0.38	Na
Item 15	←	Social skills	1.09	(0.21)	0.52	***
Item 18	←	Social skills	1.27	(0.22)	0.73	***
Item 25	←	Social skills	1.39	(0.25)	0.71	***
Item 29	←	Social skills	1.39	(0.25)	0.68	***
Item 32	←	Social skills	1.01	(0.19)	0.56	***
Item 4	←	Appraisal	1.00		0.46	Na
Item 6	←	Appraisal	0.78	(0.15)	0.44	***
Item 8	←	Appraisal	1.47	(0.25)	0.52	***
Item 11	←	Appraisal	1.64	(0.28)	0.52	***
Item 13	←	Appraisal	1.36	(0.23)	0.52	***
Item 26	←	Appraisal	1.36	(0.24)	0.51	***
Item 30	←	Appraisal	1.38	(0.20)	0.71	***
Item 7	←	Utilisation	1.00		0.41	Na
Item 17	←	Utilisation	1.26	(0.21)	0.65	***
Item 20	←	Utilisation	1.55	(0.25)	0.73	***
Item 27	←	Utilisation	1.20	(0.22)	0.55	***
Item 31	←	Utilisation	1.585	(0.26)	0.72	***
Item 33	←	Utilisation	-0.046	(0.18)	-0.02	.792

***p < .001
Na: No p-values listed for these variables as they were constrained to one

5.2.1.3. Reliability of the SSREIT

As the hierarchical model was adopted as the primary model with which the remaining analysis will be conducted, the reliability of both a general factor of EI was assessed as well as the four identified factors, which will from now on be referred to as subscales. Previous findings with the SSREIT have reported good reliability for the overall EI scale, however, some of the reported scores for the subscales identified previously have been less than satisfactory. According to Schutte et al*.,* (1998) the SSREIT has demonstrated a good internal consistency with Cronbach's alphas reported of 0.90 for community members and 0.87 for college students. The Cronbach's alpha coefficients identified for the overall EI scale and the four subscales were surprisingly good considering that the confirmatory factor analysis yielded a less than optimal fit for the hierarchical four factor model.

Previous research by Murphy (2006) yielded an overall Cronbach's alpha coefficient of 0.90 with a mean of 128.22 and a standard deviation of 15.36, which supported findings by Palmer (2003) who obtained a Cronbach's alpha for the overall scale of 0.92, with a mean of 129.16 and a standard deviation of 15.82. The overall scale in the present study yielded a Cronbach's alpha coefficient of 0.89 which is slightly lower than the scores reported previously. The mean of the total EI score was 135 with a standard deviation of 12.74, which is higher than the mean reported using the student sample.

The optimism subscale yielded a high Cronbach's alpha of 0.82 which is in line with the 0.83 reported by Murphy (2006). Item 28 was identified in both studies as presenting a low corrected item-total correlation ($r = .21$ compared to $r = .29$ in 2006), however, as the overall reliability is high this item will be retained. The social skills subscale yielded a lower Cronbach's alpha of 0.75 compared to the 0.81 reported by Murphy, and the appraisal subscale had a good reliability of 0.72 (compared to 0.76). The utilisation scale initially had a moderate reliability of 0.61, however, on examination of the item-total correlations it was evident that item 33 was inappropriate to this scale ($r = -.06$). After removal of this item from the scale the total reliability increased to an appropriate level of 0.74.

Previous studies have identified good short term test retest reliability for the SSREIT. However, no studies have previously examined the long-term test retest reliability of any of the EI scales. A sample of the research participants in the original research were requested to complete the SSREIT again 12 months after the data collection period. A total of 89 respondents completed the measure once more, which is a response rate of 30% from the original 282 participants who completed the SSREIT. Test-retest reliability is assessed by examining the Pearson's correlation coefficient between the scores from the original assessment compared to the scores from the latest assessment. In the ideal case both scores should coincide for each respondent and therefore the correlation coefficient should be 1.0,

however, coefficients of 0.7 and 0.8 are considered good (Field, 2005, p.669). The 12 month test-retest score was not expected to reach or exceed the 0.7 standard due to the long period after assessment and the assumption that EI does change with age and experience. The reliability score obtained in the present study for the total scale did, however, reach a reasonable Cronbach's alpha of 0.63.

To determine whether there was evidence of consistency for the four identified subfactors, the correlations between the latest and the original scores were also assessed. The utilisation ($r = .69$, $p < .01$) and optimism ($r = .67$, $p < .01$) subscales had good test-retest reliability exceeding that of the total scale. The appraisal ($r = .58$, $p < .01$) and social skills ($r = .47$, $p < .01$) subscales yielded weaker scores which suggest that items in these factors are less stable across time. Table 16 presents the Cronbach's alpha coefficients and test-retest reliability scores of the total scale of the SSREIT and the four subscales identified in the present study.

Table 16: Scale reliabilities (Cronbach's alpha), means and standard deviations of the total scale and subscales of the SSREIT

Present study (n=282)						**Murphy** (2006, n=308)	**12 Month Test-retest**
Scale	***No.* of items**	**Item numbers**	**M**	**SD**	**α**	**α**	**r**
Total Scale	33		135	12.74	.89	.90	.64
Optimism	14	1, 2, 3, 9, 10, 12, 14, 16, 19, 21, 22, 23, 24, 28	4.31	0.41	.82	.83	.67
Social Skills	6	5, 15, 18, 25, 29, 32	3.91	0.59	.75	.81	.47
Appraisal	7	4, 6, 8, 11, 13, 26, 30	3.96	0.57	.72	.76	.58
Utilisation	5	7, 17, 20, 27, 31	3.95	0.52	.74	.72	.69

5.2.2. Establishing the reliability and nature of the factor structure of the Mayer-Salovey-Caruso Emotional Intelligence Test

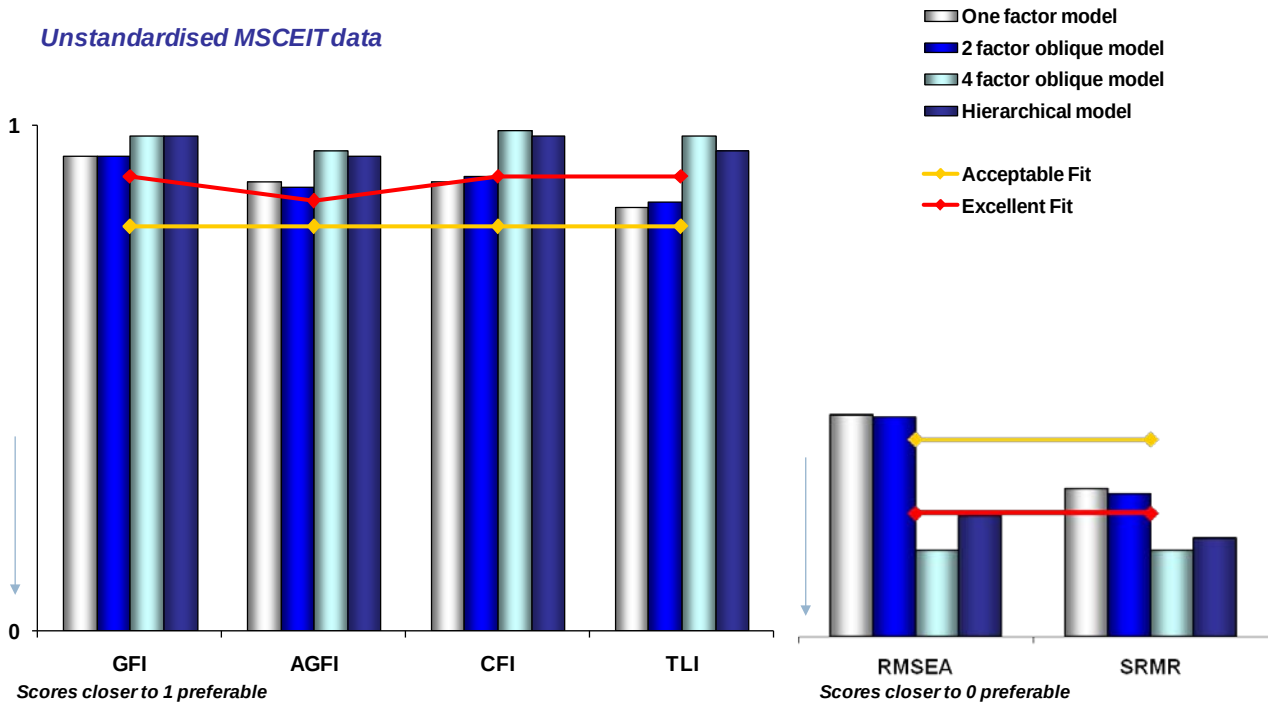
5.2.2.1. Confirmatory factor analysis of the MSCEIT

Few studies have examined the factor structure of the MSCEIT V2.0 using confirmatory factor analysis. Mayer et al (2003) provided a review of the expected factor structure of the MSCEIT and a number of fit indices for a one, two and four factor model. Although, when the factor structure was reassessed by independent studies (Palmer, 2003, Gignac, 2005, Palmer et al., 2005) a number of valid concerns regarding the factor structure were raised. One of the main concerns is that if the MSCEIT V2.0 measures emotional intelligence as an ability, all the subscales are expected to load on a single factor which could be referred to as 'emotional g' (Mayer et al., 1999). An additional concern is whether there is support for the two factor and four factor models of EI that were reported by Mayer et al., (2003).

Research studies such as those conducted by Palmer et al., (2005) could not provide support for the experiential area level factor as well as the facilitating branch level factor which suggests that these models may not be satisfactory. Furthermore, the results obtained by Mayer et al., (2003) contained a number of interpretation errors (Gignac, 2005). Gignac demonstrated that the close fit indices reported by Mayer et al were inaccurate as the values reported for the NFI, TLI and RMSEA were overestimated for each model. Gignac further revealed that contrary to the results presented by Mayer et al., the one factor and two factor models did not provide a good fit and the four factor model yielded a nonpositive definite matrix could have resulted from collinearity between the perceiving and facilitating branch level factors. These discrepancies were attributed by Mayer and colleagues (Mayer, Panter, Salovey, Caruso & Sitarenios, 2005) in a follow-up article, to changes in the manner in which incremental fit indices were calculated caused by an upgrade from AMOS Version 4 to 4.02. According to Mayer et al., both the one and two factor models were assessed using AMOS V4.0 which compared the models to a baseline model that constrained means, intercepts, and covariances to zero. The four-factor model, however, was assessed using AMOS V4.02 which compares the model against a baseline comparison model that relied on modelling independence among covariances only.

Table 17: Fit Indices for the comparative models of the MSCEIT

Model	CMIN (χ^2)	Normed χ^2	df	Bollen-stine p	GFI	AGFI	CFI	TLI	RMSEA	SRMR
Unstandardised, unadjusted data										
One factor model	55.922	2.79	20	.005	.94	.89	.89	.84	.090	.060
Two factor oblique model	52.280	2.75	19	.005	.94	.88	.90	.85	.089	.058
Four factor oblique model	17.901	1.28	14	.363	.98	.95	.99	.98	.035	.035
Hierarchical model	23.104	1.54	15	.082	.98	.94	.98	.95	.049	.040
Data based on standardised scores										
One factor model	61.672	3.08	20	.005	.93	.87	.87	.82	.097	.066
Two factor oblique model	45.359	2.39	19	.025	.95	.90	.92	.88	.079	.058
Four factor oblique model	15.114	1.08	14	.473	.98	.96	1.00	.99	.019	.034
Hierarchical model	20.471	1.37	15	.323	.98	.95	.98	.97	.041	.038
Limits		**2.0-3.0**			**.90**	**.85**	**.90**	**.90**	**.05-.08**	**.05-.08**



To examine the validity of the MSCEIT as a measure of ability EI with the present sample, a confirmatory factor analysis was performed to determine whether there would be a satisfactory fit for a one factor model measuring general EI, an oblique two factor model measuring the experiential and strategic areas and an oblique four factor model measuring the four branches of EI. The analysis is based on both standardised consensus data (which was adjusted for gender, age and ethnicity), as well as unstandardised unadjusted data to determine whether the EI structure was evident in data that had not been altered by the standardisation procedure.

The Mardia's coefficient of multivariate kurtosis had a critical ratio of 9.46 for the raw scores and 12.66 for the standardised scores (see Appendix F, Table F8), which is higher than the critical ratio of 3 which confirms that the measured task scores of the MSCEIT are not distributed normally, as discussed in Chapter 3. As a result, the Bollen-Stine *p*-value will be reported to assess overall model fit. Standardised parameter estimates for the comparative models of the MSCEIT are summarised in Table 18 and path diagrams as well as the full parameter estimates of the hypothesised models are presented in Appendix F, Section 2. The procedure used for the confirmatory analysis was the same as that employed previously by Mayer et al., (2003) in that error variance were set to be uncorrelated and latent variables were correlated or oblique.

Table 18: Standardised parameter estimates for the comparative models of the MSCEIT

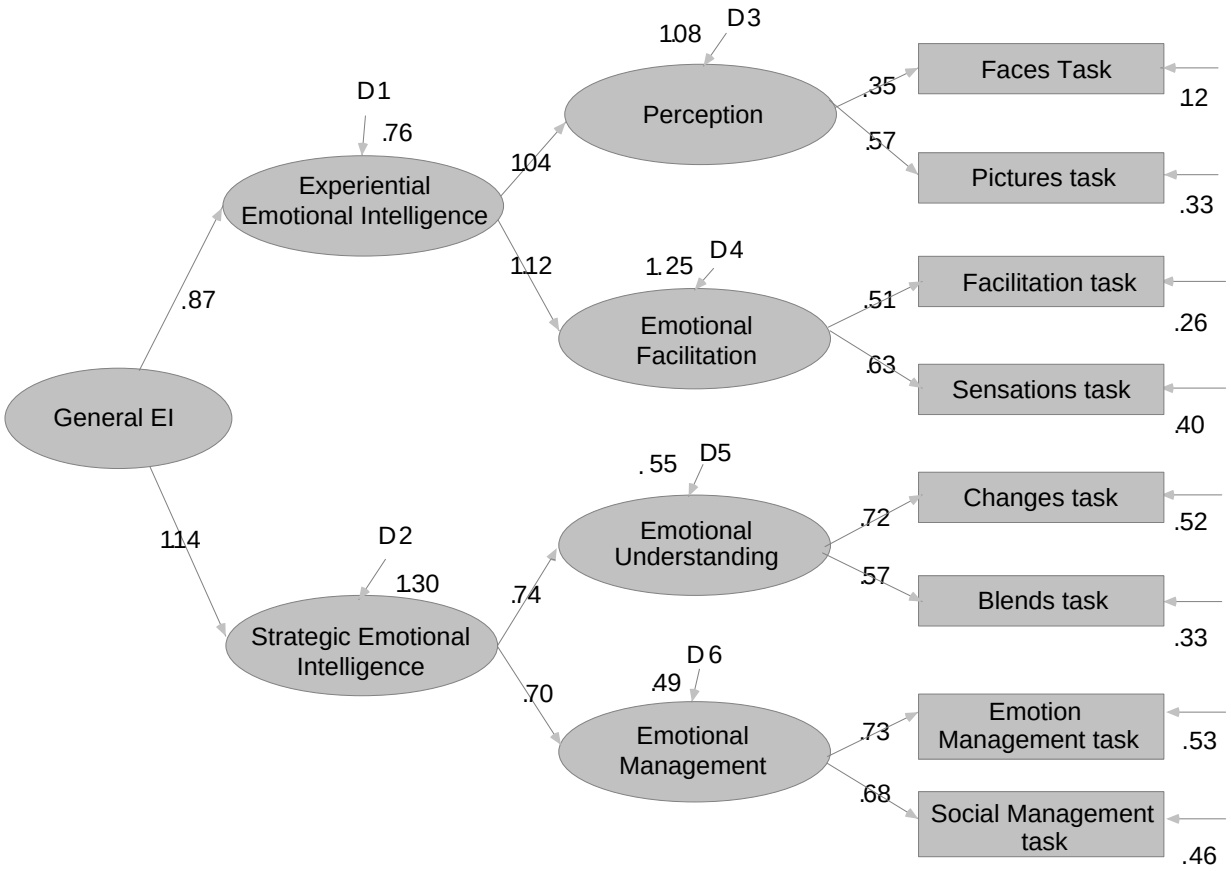
	One factor model	Two factor model	Four factor model	Four-branch / Hierarchical model		
Perception Branch	**I**	**I**	**I**	**I**	**I**	**I**
Faces	0.35	0.36	0.56	0.35	1.04	0.87
Pictures	0.58	0.6	0.73	0.57		
Emotional Facilitation			**II**		**II**	
Facilitation	0.58	0.55	0.36	0.51	1.12	
Sensations	0.55	0.67	0.57	0.63		
Understanding Branch		**II**	**III**	**II**	**III**	**II**
Changes	0.48	0.57	0.53	0.57	0.74	1.14
Blends	0.65	0.50	0.61	0.72		
Managing Branch			**IV**	**III**	**IV**	
Emotional Management	0.54	0.60	0.68	0.68	0.70	
Emotional Relationships / Social management	0.57	0.58	0.73	0.73		

Note: Roman numerals indicate the factors specified in each model. Below each Roman numeral are the parameter estimates for each of the subtests associated with that factor.

Although implied by the underlying theoretical assumptions, no research conducted by the authors of the instrument and only one independent previous research study using a sample of university students (Rossen et al., 2008) has examined the factor structure of the MSCEIT as a hierarchical structure. The present study also attempts to determine whether a hierarchical factor structure would not be more appropriate to the data than the one, two and four factor structures examined previously by Mayer et al., (2003) as well as the nested structures examined by Palmer and colleagues. In order to limit multicollinearity for the hierarchical structure, factor loadings for the second level factors on the third level factors were set to be equal to each other and residual variances for the second order factors were set to be equal to each other in accordance with the procedure followed by Rossen et al., (2008).

Figure 14: Hierarchical model of the MSCEIT based on the eight unstandardised observed task scores

Standardised solution (n=223)



Tables 18 and 19 display the standardised parameter estimates and goodness-of-fit indices for the models examined with confirmatory factor analysis. The results for the standardised and the unstandardised models were nearly identical which indicates that the factor structure is largely uninfluenced by the standardisation and adjustment of the results. Due to the slightly better fit indices provided for the unstandardised models, the results discussed will be based on these figures.

The one and two factor models based on the findings of Mayer et al., (2003) were found to display a poor fit to the data according to the χ^2 criteria (Bollen-stine $p > .05$). The one factor model yielded a $\chi^2_{20} = 55.922$ with unsatisfactory levels of fit (Bollen-stine $p = .005$ GFI = .94, AGFI = .89, CFI = .89, TLI = .84, RMSEA = .090, SRMR = .060) as did the two factor model ($\chi^2_{19} = 52.280$, Bollen-stine $p = .005$ GFI = .94, AGFI = .88, CFI = .90, TLI = .85, RMSEA = .089, SRMR = .040). When compared against the fit indices provided by Mayer et al., (2003) it is evident that the one and two factor models are not as well fitting as stated in the findings because although a TLI of 0.98 and 0.99 and an NFI of 0.99 and 0.99 are obtained respectively for the two models, in both cases the chi-square statistic was significant ($p < .001$) and RMSEA was much greater than 0.05 (0.124 and 0.093, respectively). All of the factor loadings on the general factor were statistically significant ranging from 0.35 to 0.58 which is comparable to the findings by Palmer et al., (2005) which supports a general factor of EI. The correlation between the experiencing and strategic area scores was 0.88 ($p < .001$) which is higher than the 0.74 reported by Palmer et al., (2005).

On their examination of the four factor model, Mayer et al., (2003) attempted to overcome high covariance identified between the perceiving and emotional facilitation factors by constraining the covariances between the perceiving emotions and emotional facilitation factors, and between the understanding and managing emotions factors to be equal to each other. This procedure was criticised by Gignac (2005) who retested the four factor model without the equality constraints and found a nonpositive definite matrix solution which indicated that the four-factor model was unacceptable. He also found that the chi-squared statistic for the unconstrained model was substantially lower than the constrained model which suggests that the two factors are not equal in magnitude as the equality constraints implied. Furthermore, Gignac (2005) contends that the correlation of 0.97 identified between the perceiving emotions and emotional facilitation factors suggests that the two scales are essentially measuring the same construct.

The examination of the four factor structure in the present study did not constrain the correlations between the area scores and contrary to Gignac (2005), found an excellent fit for the four factor structure with the present data ($\chi^2_{14} = 17.901$, Bollen-stine $p = .363$ GFI = .98, AGFI = .95, CFI = .99, TLI = .98, RMSEA = .035, SRMR = .035). A factor loading of 1.17 was obtained, however, between the perception and emotional facilitation area scores resulting in a negative residual variance for that subtest, indicating

that the four factor model is an improper model. This supports Gignac's (2005) concern that these two scores may be measuring the same construct.

The examination of the model as a hierarchical structure, however, revealed a very good fit to the data (χ^2_{15} = 23.104, Bollen-stine *p* = .082 GFI = .98, AGFI = .94, CFI = .98, TLI = .95, RMSEA = .049, SRMR = .040) which provides support for the model as a hierarchic structure as specified by the underlying theory. The path diagram for the hierarchical four factor model is depicted in Figure 14 and the parameter estimates for the model are summarised in Table 18. Several factor loadings were, however, greater than 1.0 (see Table 18) which indicates the presence of negative residual variance and as a result, this is also considered to be an improper model which is consistent with the findings of Rossen et al., (2008). The full parameter estimates and path diagrams of the comparative models are presented in Appendix F, Section 2.

Tables 19 and 20 display the intercorrelations among the eight MSCEIT task scores as well as the branch, area and overall EI scores. As can be seen in these tables, the correlations between the subscales range from 0.58 to 0.48 with many correlations in the mid 0.30 range. This is similar to the findings reported by Mayer et al., (2003). However, three of the correlations between the task scores are insignificant (see Table 18) and lower than the values which Mayer et al., reported as significant and ranging from 0.17 to 0.59. All three of these correlations are with the faces task.

Table 19: Correlations among the eight MSCEIT task scores

MSCEIT Tasks	Faces	Pictures	Sensations	Facilitation	Changes	Blends	Emotional Management	Emotional Relationships
Faces Task	1.000							
Pictures Task	.197**	1.000						
Sensations Task	.234**	.433**	1.000					
Facilitation Task	.219**	.319**	.327**	1.000				
Changes Task	.171*	.333**	.409**	.214**	1.000			
Blends Task	.080	.274**	.318**	.186**	.461**	1.000		
Emotion Management Task	.058	.217**	.350**	.371**	.296**	.272**	1.000	
Emotional Relationships Task	.094	.233**	.279**	.379**	.294**	.235**	.476**	1.000
****p < .001 **p < .01 *p < .05, n=223								

Table 20: Correlations among the MSCEIT branch, area, task and overall scores

MSCEIT scales		Branch scores				Area scores		Overall Emotional Intelligence
		Perception Branch	Facilitating Emotions	Understanding Branch	Managing Branch	Experiential	Strategic	
Task scores	Faces	.795**	.277**	.163*	.086	.650**	.146*	.502**
	Pictures	.748**	.473**	.363**	.268**	.732**	.381**	.677**
	Sensations	.419**	.879**	.426**	.357**	.719**	.471**	.705**
	Facilitation	.343**	.738**	.238**	.430**	.596**	.404**	.593**
	Changes	.305**	.402**	.833**	.346**	.390**	.705**	.590**
	Blends	.215**	.325**	.869**	.298**	.310**	.698**	.544**
	Emotion Management	.161*	.436**	.317**	.783**	.311**	.669**	.519**
	Emotional Relationships	.207**	.392**	.308**	.917**	.334**	.749**	.589**
Branch scores	Perception	1.000	.474**	.321**	.219**	.892**	.324**	.756**
	Facilitation		1.000	.427**	.473**	.816**	.543**	.805**
	Understanding			1.000	.369**	.423**	.818**	.673**
	Managing				1.000	.377**	.836**	.654**
Area scores	Experiential					1.000	.483**	.906**
	Strategic						1.000	.802**
Overall Emotional Intelligence								1.000
***p < .001 **p < .01 *p < .05, n=223								

5.2.2.2. Reliability of the MSCEIT

The split-half and Cronbach's alpha reliability coefficients for the MSCEIT overall and subscale scores are presented in Table 21. As recommended by Mayer et al., (2003), the means and standard deviations are presented as unstandardised scores. In addition, the reliability values reported at the task level are Cronbach's alpha coefficients due to item homogeneity, and split-half reliabilities are reported at the branch, area and overall test levels due to item heterogeneity.

The split-half reliability coefficient for the overall MSCEIT scale (r = .73) was found to be a great deal lower than the results provided by Mayer et al., (2003). The strategic (r = .71) and experiential (r = .73) area scores as well as all four branch scores were also found to be lower than previously reported. An

unexpected result was that a number of the Cronbach's alpha coefficients of the task scores improved even though the reliability scores of the higher order scales declined, but Mayer et al. (2003, p.) suggested that due to the low reliabilities at the task level, caution should be exercised when reporting task scores, and therefore the remaining analysis will be reported at the branch and overall scale levels only.

Table 21: Split-half and Cronbach's alpha Reliability coefficients for the MSCEIT V2.0

MSCEIT Subscales	**N of items**	**Present study** (n=282)			**General scoring** (Mayer et al., 2003)			**Expert scoring** (Mayer et al., 2003)		
		M	SD	Reliability	M	SD	Reliability	M	SD	Reliability
Overall Emotional Intelligence	141	.47	.06	.73	.48	.70	.93	.50	.80	.91
Experiential										
Area Score	80	.47	.08	.73	.49	.80	.90	.50	.90	.90
Perception Branch	50	.47	.11	.57	.50	.10	.91	.54	.13	.90
Faces Task	20	.48	.15	.80	.50	.12	.80	.57	.18	.82
Pictures Task	30	.49	.13	.91	.50	.13	.88	.50	.13	.87
Facilitation Branch	30	.47	.09	.53	.47	.90	.79	.45	.80	.76
Facilitation Task	15	.46	.09	.68	.44	.90	.64	.41	.70	.63
Sensations Task	15	.47	.13	.67	.50	.12	.65	.50	.12	.55
Strategic										
Area Score	61	.46	.06	.71	.47	.80	.88	.51	.10	.86
Understanding Branch	32	.52	.07	.62	.53	.10	.80	.60	.13	.77
Changes Task	20	.52	.08	.52	.56	.10	.70	.63	.14	.68
Blends Task	12	.48	.09	.47	.50	.12	.66	.57	.16	.62
Managing Branch	29	.41	.08	.64	.42	.10	.83	.42	.90	.81
Emotion Management Task	20	.41	.07	.57	.41	.90	.69	.40	.90	.64
Emotional Relationships Task	9	.42	.11	.72	.43	.12	.67	.43	.12	.64

The influence of cultural bias on psychometric scores is a topic that is of interest to most researchers who wish to apply any type of psychometric instrument to South African contexts. Van Staaden (2001) conducted one of the few reliability studies with the MSCEIT on a South African population and identified discrepancies in the factor structure of the MSCEIT between the South African data and the recommendations based on the North American context. To determine if the recommendations made by Van Staaden could be an indication of possible cultural differences between American and South African preferences for responding, the inter-item consistency of each task score was compared to the inter-item factor scores identified in Van Staaden's research.

Perceiving emotions: emotional identification in faces (Section A) and pictures (Section E)

The faces task and the pictures task contributes towards the measurement of the identification or perception of emotions branch by asking respondents to identify the emotions expressed in four photographs of people's faces and the feelings suggested by six artistic designs and landscapes. Below the image, respondents are provided with a list of five emotions and they need to indicate on a five point scale how much of each emotion is expressed in the image (Brackett & Salovey, 2006). As discussed previously, the answer option of 'no emotions present' is an answer option for every emotion in these two sections (MacCann et al., 2003).

Table 22: Item statistics of the emotional identification in faces scale items

	Item grouping Section A	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factor loadings (Van Staaden, 2001)
A1	Face 1 Emotion 1	.34	.12	-.125	.810	.045
A2	Emotion 2	.30	.10	.348	.797	.404
A3	Emotion 3	.40	.26	.394	.791	.423
A4	Emotion 4	.26	.06	.132	.802	.197
A5	Emotion 5	.44	.24	.473	.786	.413
A6	Face 2 Emotion 1	.42	.22	.429	.789	.362
A7	Emotion 2	.28	.09	-.218	.810	-.105
A8	Emotion 3	.28	.08	.345	.798	.441
A9	Emotion 4	.38	.24	.584	.779	.424
A10	Emotion 5	.57	.30	.592	.776	.578
A11	Face 3 Emotion 1	.65	.36	.467	.788	.327
A12	Emotion 2	.30	.14	.069	.805	.041
A13	Emotion 3	.24	.05	-.039	.804	.248
A14	Emotion 4	.36	.25	.441	.788	.474
A15	Emotion 5	.66	.32	.556	.779	.573
A16	Face 4 Emotion 1	.54	.19	-.122	.816	.012
A17	Emotion 2	.61	.29	.474	.786	.478
A18	Emotion 3	.54	.28	.553	.780	.618
A19	Emotion 4	.61	.28	.567	.779	.574
A20	Emotion 5	.62	.30	.583	.777	.533

Table 23: Item statistics of the emotional identification in pictures scale items

	Item grouping Section E	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factor loadings (Van Staaden (2001)
E1	Image 1 Emotion 1	.24	.08	-.045	.913	.024
E2	Emotion 2	.51	.27	.431	.910	.252
E3	Emotion 3	.44	.25	.496	.908	.410
E4	Emotion 4	.75	.31	.598	.907	.362
E5	Emotion 5	.81	.29	.575	.907	.333
E6	Image 2 Emotion 1	.22	.06	.182	.912	.100
E7	Emotion 2	.42	.21	.656	.906	.475
E8	Emotion 3	.44	.28	.576	.907	.362
E9	Emotion 4	.41	.21	.583	.907	.396
E10	Emotion 5	.52	.31	.388	.911	.177
E11	Image 3 Emotion 1	.23	.08	.409	.911	.023
E12	Emotion 2	.57	.24	.599	.907	.504
E13	Emotion 3	.63	.27	.706	.904	.469
E14	Emotion 4	.40	.25	.537	.908	.344
E15	Emotion 5	.68	.22	.726	.905	.476
E16	Image 4 Emotion 1	.49	.24	.549	.907	.371
E17	Emotion 2	.27	.09	.542	.910	.348
E18	Emotion 3	.22	.04	.295	.912	-.155
E19	Emotion 4	.27	.08	.570	.910	.32
E20	Emotion 5	.43	.21	.606	.907	.376
E21	Image 5 Emotion 1	.20	.09	-.242	.915	-.007
E22	Emotion 2	.71	.32	.638	.906	.474
E23	Emotion 3	.53	.27	.557	.907	.496
E24	Emotion 4	.52	.28	.573	.907	.489
E25	Emotion 5	.66	.33	.554	.908	.382
E26	Image 6 Emotion 1	.39	.21	.377	.910	.136
E27	Emotion 2	.23	.04	.311	.912	-.222
E28	Emotion 3	.43	.18	.633	.907	.388
E29	Emotion 4	.47	.28	.482	.909	.349
E30	Emotion 5	.46	.21	.525	.908	.338

The Cronbach's alpha coefficients for both the faces (α = .80) and the pictures tasks (α = .91) measured using all the items in the subscales are high and in line with the values provided by Mayer et al., (2003). The split-half reliability coefficient for the identification and perception branch score is, however, much lower (r = .57) than the values obtained by Mayer and colleagues (r = .91 to r = .90). Van Staaden (2001) did not calculate split-half reliability coefficients for the branch scores, however, the Cronbach's alpha coefficients he identified for both the faces task (α = .74) and the pictures task (α = .78) were also lower than reported in Mayer et al., (2003). This implies that there is some form of discrepancy between the emotional association made by the North American sample with certain items and the association made by the South African sample with the same items.

If the item-total correlations found in the present study are compared with the factor loadings obtained by Van Staaden (2001), it is evident that the same six items (A1, A4, A7, A12, A13, A16) which loaded poorly on the faces factor in Van Staaden's research also had low corrected item-total correlations (i.e. below the recommended level of r = 0.3 (Field, 2005, p. 672)) in the present study. One to two items in each item parcel (a single face task and corresponding emotions as answer options) were affected. In the pictures task, four of the items (E1, E6, E18, E21) which loaded poorly on Van Staaden's pictures factor, also had low or negative item total correlations in the present study. Four of the items identified by Van Staaden as being problematic (E2, E10, E26, E27) did, however, display acceptable item total correlations.

To examine whether the reliability of the subscales, and especially the split-half reliability of the branch scores, would improve if the identified items were removed, the task and branch scores were reassessed without items A1, A4, A7, A12, A13, A16, E1, E6, E18 and E21. The Cronbach's alpha for the revised faces task increased from 0.80 to 0.85 and the pictures task increased marginally from 0.91 to 0.92. However, the split-half reliability of the identification or perception branch score increased dramatically from a low 0.57 to an acceptable 0.64. The revised branch score is still much lower than that of the North American sample which indicates that there is still some discrepancy with regard to the item structure of this specific branch for the South African population.

Facilitating emotions: facilitation (Section B) and sensations (Section F)

The facilitation of emotions is measured by the sensations and facilitation subtasks. In the sensations test respondents are requested to imagine certain emotions and indicate the extent to which they match different situations and in the facilitation task, respondents are asked to indicate the extent to which certain emotions would assist cognitive tasks or behaviour. The Cronbach's alpha coefficient for both these task scores were found to be higher than reported by Mayer et al., (2003). The split-half reliability coefficient for the facilitation branch score is, however, also much lower (r = .53) than the values obtained by Mayer et al., (r = .79 to r = .76).

Five of the items in the facilitation task (B4, B10, B11, B12, B13) and six of the items in the sensations task (F1, F2, F5, F7, F8, F10, F11) loaded poorly or negatively in the factors obtained in the Van Staaden (2001) study and displayed low or negative corrected item-total correlations in the present study. Similarly to the findings by Van Staaden, removal of these items from the facilitation task resulted in a decreased Cronbach's alpha from 0.68 to 0.67, however, the sensations task improved from 0.67 to 0.72. The resulting revised branch also increased from a low 0.53 to a more acceptable 0.59. Together, the two branch scores, perception and facilitation of emotions, combine to form the experiential area scores.

When the split-half reliability score for the area score was recalculated without the identified problematic items it was discovered that the score improves from 0.73 to 0.78.

Table 24: Item statistics of the facilitation scale items

	Item grouping Section B	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factor loadings (Van Staaden (2001)
B1	Situation 1 Item 1	.79	.24	.396	.649	.529
B2	Item 2	.69	.27	.355	.656	.379
B3	Item 3	.78	.24	.252	.672	.407
B4	Situation 2 Item 1	.23	.08	.181	.677	-.080
B5	Item 2	.36	.17	.173	.679	.319
B6	Item 3	.44	.24	.478	.634	.422
B7	Situation 3 Item 1	.39	.21	.333	.659	.286
B8	Item 2	.74	.28	.450	.638	.389
B9	Item 3	.30	.10	.150	.679	.334
B10	Situation 4 Item 1	.24	.09	.010	.687	.050
B11	Item 2	.22	.08	.234	.675	.088
B12	Item 3	.26	.14	.258	.670	.257
B13	Situation 5 Item 1	.27	.13	.242	.671	.087
B14	Item 2	.38	.15	.271	.668	.379
B15	Item 3	.60	.26	.408	.646	.289

Table 25: Item statistics of the sensations scale items

	Item grouping Section F	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factor loadings (Van Staaden (2001)
F1	Feeling 1 Item 1	.24	.06	-.041	.681	.253
F2	Item 2	.23	.07	-.037	.682	.068
F3	Item 3	.76	.30	.489	.622	.373
F4	Feeling 2 Item 1	.54	.25	.358	.648	.404
F5	Item 2	.24	.08	.155	.673	-.132
F6	Item 3	.52	.34	.412	.642	.389
F7	Feeling 3 Item 1	.20	.04	.045	.678	.055
F8	Item 2	.24	.08	.100	.676	.163
F9	Item 3	.35	.20	.375	.646	.330
F10	Feeling 4 Item 1	.30	.12	.005	.685	.183
F11	Item 2	.27	.11	.160	.672	-.021
F12	Item 3	.41	.21	.347	.650	.229
F13	Feeling 5 Item 1	.49	.19	.414	.642	.348
F14	Item 2	.53	.30	.532	.612	.589
F15	Item 3	.35	.16	.418	.645	.452

Understanding emotions: changes (Section C) and blends (Section G)

The understanding of emotions is measured by the changes and blends subtasks which require respondents to identify emotions that result from the intensification of certain feelings or to identify emotions that combine to form more complex feelings. The Cronbach's alpha coefficient for both these task scores are very low in the present study and the split-half reliability coefficient for the understanding emotions branch score is again much lower (r = .62) than the values obtained by Mayer et al., (2003) (r = .80 to r = .77).

Table 26: Item statistics of the changes scale items

	Item grouping Section C	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factor loadings (Van Staaden (2001)
C1	Changes Item 1	.60	.32	.089	.532	.238
C2	Changes Item 2	.71	.33	.164	.516	.401
C3	Changes Item 3	.35	.13	.150	.518	.131
C4	Changes Item 4	.41	.24	.247	.499	.331
C5	Changes Item 5	.47	.27	.176	.512	.300
C6	Changes Item 6	.62	.30	.385	.464	.290
C7	Changes Item 7	.43	.22	.251	.500	.229
C8	Changes Item 8	.44	.13	.079	.524	.227
C9	Changes Item 9	.47	.21	.087	.525	.165
C10	Changes Item 10	.30	.11	.237	.512	.396
C11	Changes Item 11	.72	.24	.080	.528	.351
C12	Changes Item 12	.52	.24	-.074	.554	.250
C13	Changes Item 13	.65	.31	.014	.548	.162
C14	Changes Item 14	.34	.11	.406	.499	.449
C15	Changes Item 15	.34	.18	.314	.495	.448
C16	Changes Item 16	.51	.20	.165	.514	.256
C17	Changes Item 17	.65	.26	.321	.483	.349
C18	Changes Item 18	.76	.25	.264	.495	.354
C19	Changes Item 19	.61	.27	.099	.526	.230
C20	Changes Item 20	.79	.26	.188	.509	.260

A larger percentage of items in both tasks, ten items of the twenty in the changes task (C1, C3, C7, C8, C9, C12, C13, C16, C19, C20) and four of the twelve items in the blends task (G3, G4, G8, G10), loaded poorly on the factors identified in the Van Staaden (2001) study and also had low or negative corrected item-total correlations in the present study. Removal of these items resulted in a small increase in the Cronbach's alpha from 0.52 to 0.55 for the changes task and from 0.47 to 0.49 for the blends task. The resulting revised branch, however, decreased from 0.62 to 0.60.

Table 27: Item statistics of the blends scale items

	Item grouping Section B	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factor loadings (Van Staaden (2001)
G1	Blends Item 1	.50	.30	.222	.423	.433
G2	Blends Item 2	.57	.31	.273	.401	.319
G3	Blends Item 3	.46	.13	-.140	.494	.131
G4	Blends Item 4	.29	.07	.228	.448	.049
G5	Blends Item 5	.61	.31	-.002	.510	.329
G6	Blends Item 6	.32	.15	.285	.422	.340
G7	Blends Item 7	.72	.28	.254	.410	.393
G8	Blends Item 8	.32	.12	.167	.447	.129
G9	Blends Item 9	.70	.28	.196	.432	.377
G10	Blends Item 10	.31	.08	-.047	.473	.029
G11	Blends Item 11	.47	.24	.342	.384	.330
G12	Blends Item 12	.41	.24	.287	.402	.375

Managing emotions: Emotional management (Section D) and Emotional relationship (Section H)

The managing of emotions area score is measured by a combination of the emotion management task, which requires respondents to indicate how effective certain actions might be in regulating certain moods and the emotional relationships task, which requires respondents to indicate how effective certain actions might be in regulating the emotions of another person. The low split-half reliability coefficient for the managing emotions area score (r = .64) results from the combination between the reasonable Cronbach's alpha for the emotional relationships task score of 0.72 and the lower Cronbach's alpha for the emotional management task score of 0.57.

Ten items in the emotional management score (D4, D5, D6, D7, D8, D9, D10, D12, D15, D19, D20) are comparable to the problematic items identified by Van Staaden (2001), whereas only one item (H8) in the emotional relationships task was found to be problematic. However, removal of the items resulted in a decrease in the Cronbach's alpha from 0.57 to 0.51 for the emotional management scale, but only in a small increase for the social relationships task from 0.72 to 0.74.

The strategic area score, which is obtained from the combination of the understanding emotions and managing emotions branch scores, actually decreases by a large amount after removal of the identified items. It changes from a split-half reliability coefficient of 0.71 to a low 0.51 and the overall emotional intelligence scale reliability coefficient decreases from 0.73 to 0.72. These findings suggest that the problems with the reliability of the task, branch and area scores cannot be rectified simply by removing problematic items.

Table 28: Item statistics of the emotional management scale items

	Item grouping Section D	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factor loadings (Van Staaden (2001)
D1	Scenario 1 Item 1	.52	.30	.122	.572	.481
D2	Item 2	.52	.19	.272	.529	.575
D3	Item 3	.51	.23	.243	.534	.456
D4	Item 4	.26	.08	.035	.560	.140
D5	Scenario 2 Item 1	.32	.15	.163	.548	.274
D6	Item 2	.24	.07	.089	.556	.165
D7	Item 3	.28	.13	.128	.552	.251
D8	Item 4	.38	.19	.226	.537	.271
D9	Scenario 3 Item 1	.39	.13	.237	.539	.202
D10	Item 2	.33	.15	.146	.550	.222
D11	Item 3	.46	.17	.376	.513	.405
D12	Item 4	.29	.15	-.057	.578	.073
D13	Scenario 4 Item 1	.44	.14	.108	.555	.308
D14	Item 2	.49	.16	.387	.514	.529
D15	Item 3	.25	.10	.081	.557	-.016
D16	Item 4	.27	.11	.163	.549	.304
D17	Scenario 5 Item 1	.54	.26	.396	.495	.312
D18	Item 2	.31	.08	.304	.541	.285
D19	Item 3	.27	.06	.209	.549	.260
D20	Item 4	.54	.27	.141	.560	.201

Table 29: Item statistics of the emotional relationship scale items

	Item grouping Section H	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factor loadings (Van Staaden (2001)
H1	Problem 1 Item 1	.57	.28	.549	.668	.582
H2	Item 2	.41	.19	.537	.672	.478
H3	Item 3	.57	.26	.527	.672	.510
H4	Problem 2 Item 1	.40	.18	.338	.709	.652
H5	Item 2	.42	.19	.496	.680	.442
H6	Item 3	.37	.18	.409	.697	.335
H7	Problem 3 Item 1	.31	.12	.258	.719	.424
H8	Item 2	.23	.05	.008	.736	-.115
H9	Item 3	.38	.17	.327	.710	.375

These findings suggest that although the MSCEIT appears to be a highly reliable measure in predominantly westernised countries such as Australia, America and Europe, there may be a discrepancy in the interpretation of certain images and scenarios by South African respondents. However, as the sample examined by Van Staaden's study consisted only of 207 psychology students and 195 engineering students from two separate South African universities, the findings from this analysis may not be reflective of the SA population as a whole. As a result further research with more diverse South African samples is required to validate these findings.

5.2.3. The validity and reliability of the Thinking Styles Inventory and theoretical assumptions regarding the measurement structure

5.2.3.1. Subscale reliabilities and correlations between scales

The overall Cronbach's alpha coefficient obtained for the 65 items version of the TSI (5 items in each scale) used in the present study was 0.92 which was higher than the 0.90 obtained by Murphy (2006) with the total 104 items (8 items in each scale). The alpha coefficients were mostly equivalent to, or improved on the subscale reliability coefficients obtained by Murphy (2006) on the 104 items as well as the findings of previous research with the 65 item scale (Zhang & Sternberg, 1998; Zhang, 2005b). The local scale which obtained a low Cronbach's alpha with the 104 item scale improved from 0.56 to 0.68 in the shortened version. The monarchic and anarchic subscales, however, had lower alpha coefficients in the present study than reported by Murphy, although these coefficients were higher than reported previously by Zhang and Sternberg (1998).

The anarchic and monarchic subscales have previously been found to display low alpha coefficients in a number of studies (Zhang, 2005b). Examination of the item total correlations for the subscales reveals that four of the five items in the anarchic subscale had item-total correlations below 0.30, but analysis showed that removal of these items do not improve the alpha coefficient of the overall scale. All items in the monarchic scale do show sufficient item total correlations and consequently removal of items will not improve the reliability of the scale either.

Table 30: Scale reliabilities (Cronbach's alpha), means and standard deviations of the TSI subscales

	65 Item - Present study (n=308)				104 Item - Murphy (2006) sample (n=309)		
Subscale	**Item numbers**	**M**	**SD**	**α**	**M**	**SD**	**α**
Legislative	5, 10, 14, 32, 49	5.02	0.96	.76	5.30	0.82	.79
Executive	8, 11, 12, 31, 39	4.71	1.01	.70	4.84	0.94	.79
Judicial	20, 23, 42, 51, 57	4.66	1.31	.78	4.71	0.77	.67
Global	7, 18, 38, 48, 61	3.87	1.14	.70	4.19	0.84	.73
Local	1, 6, 24, 44, 62	4.35	1.14	.68	4.48	0.77	.56
Liberal	45, 53, 58, 64, 65	5.00	1.06	.85	4.95	1.02	.87
Conservative	13, 22, 26, 28, 36	4.12	1.17	.83	4.27	1.06	.85
Internal	9, 15, 37, 55, 63	3.98	1.17	.70	4.76	0.91	.74
External	3, 17, 34, 41, 46	5.31	1.14	.81	4.52	1.07	.83
Hierarchic	4, 19, 33, 25, 56	5.35	1.15	.77	5.40	0.92	.82
Monarchic	2, 43, 50, 54, 60	3.73	1.19	.64	3.96	1.00	.83
Oligarchic	27, 29, 30, 52, 59	4.26	1.07	.77	4.28	0.79	.58
Anarchic	16, 21, 35, 40, 47	4.59	1.04	.47	4.67	0.79	.59

Table 31: Item statistics of the anarchic scale items

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Item 16	19.42	11.545	.273	.092	.404
Item 21	18.43	13.391	.201	.056	.451
Item 35	18.89	13.141	.216	.068	.441
Item 40	19.39	12.918	.178	.065	.470
Item 47	19.19	10.887	.406	.169	.304

Table 32: Item statistics of the monarchic scale items

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Item 2	15.64	16.182	.336	.135	.614
Item 43	16.85	17.010	.314	.133	.622
Item 50	15.40	16.333	.334	.126	.615
Item 54	15.37	14.049	.499	.346	.532
Item 60	15.74	13.344	.486	.331	.537

The validity of the TSI is supported by the magnitude and direction of the correlations between the thirteen subscales. The correlations between the thirteen subscales of the TSI, which are presented in Table 33, mostly exceed 0.30 and are significant at the $p < 0.01$ level which indicates that the styles are not orthogonal to each other and tend to correlate with one another to form profiles of thinking styles. The relationships between the scales were also in the direction predicted by the theory of mental self-government (Sternberg, 1997). Scales defined as polar opposites were found to correlate negatively, for example global correlated negatively with local ($r = -.204$, $p = .001$), conservative with legislative ($r = -.090$, $p = .126$), and liberal with conservative ($r = -.297$, $p = .000$). Subscales that are described as related were found to be positively associated such as the executive and conservative styles ($r = .778$, $p = .000$), and the legislative and liberal styles ($r = .687$, $p = .000$). The TSI scale was therefore considered to be a valid measure for this population.

Table 33: Pearson's correlation matrix for thirteen subscales of the TSI

	Subscale	1	2	3	4	5	6	7	8	9	10	11	12
1	Legislative												
2	Executive	.036											
3	Judicial	.433**	.257**										
4	Global	.359**	-.025	.222**									
5	Local	.196**	.524**	.324**	-.204**								
6	Liberal	.687**	-.113	.457**	.365**	.174**							
7	Conservative	-.091	.778**	.088	-.032	.457**	-.297**						
8	Internal	.458**	.097	.153**	.233**	.322**	.366**	.128*					
9	External	.292**	.275**	.524**	.293**	.126*	.313**	.077	-.157**				
10	Hierarchic	.379**	.262**	.465**	.116	.238**	.349**	.127*	.154**	.470**			
11	Monarchic	.272**	.462**	.230**	.193**	.417**	.168**	.440**	.399**	.132*	.161**		
12	Oligarchic	.203**	.440**	.303**	.269**	.357**	.158**	.425**	.199**	.320**	.251**	.520**	
13	Anarchic	.428**	.223**	.450**	.311**	.365**	.489**	.138*	.324**	.374**	.353**	.276**	.407**

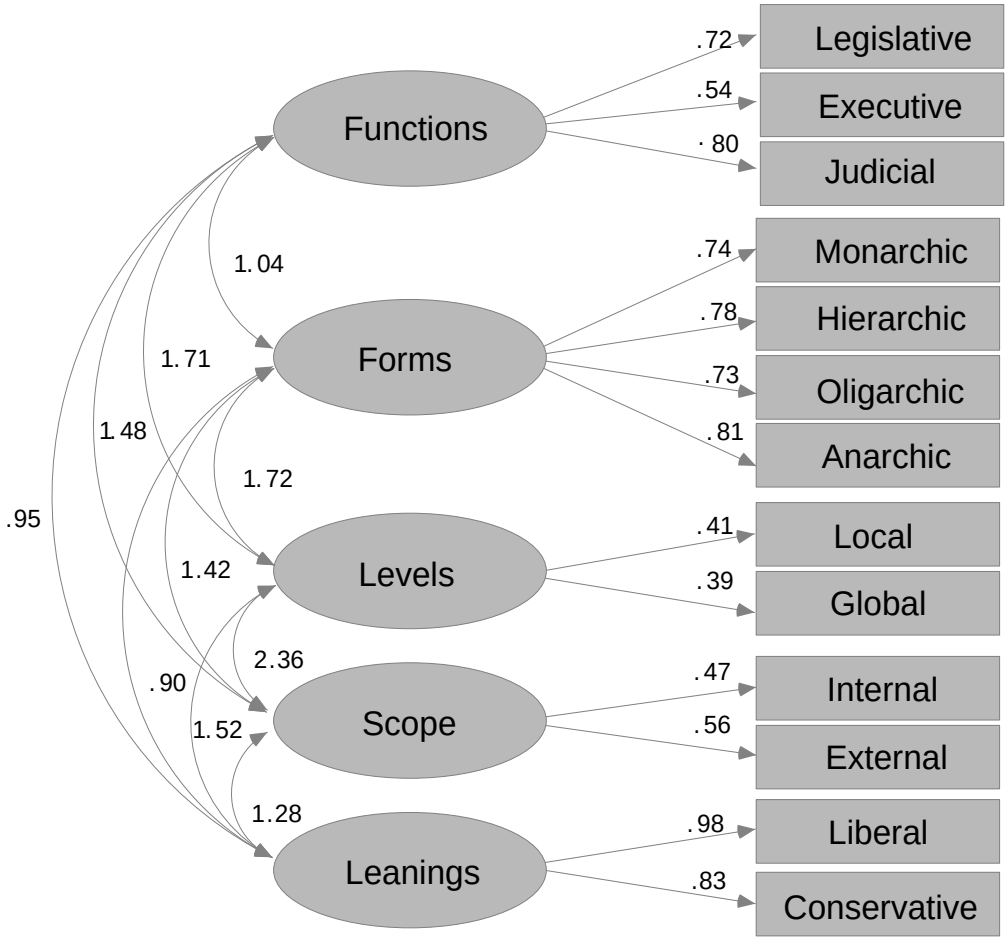
Total sample n=308
***p < .001 **p < .01 *p < .05

5.2.3.2. Confirmation of the categorisation of the thinking styles subscales into five dimensions and three broad types

The validity of the claim that the thirteen subscales of the TSI can be grouped into three broad categories and five dimensions has previously been verified only through the use of exploratory factor analysis and as yet no published studies have used confirmatory factor analysis to test whether a good fit can be obtained for both the three and the five factor models. To verify this claim a three factor oblique model of the three types of thinking styles and a five factor oblique model of the five dimensions of thinking styles was evaluated using confirmatory factor analysis in AMOS V7.0.

Figure 15: Five factor oblique model of the TSI

Standardised solution (n=284)



A nonpositive definite matrix solution was obtained for the five factor oblique model which suggests that the model is not satisfactory. This occurred as a result of a negative variance estimate obtained for the latent variable, leanings. As the risk of negative variance estimates is highest in small samples when there are only two or three indicators per latent variable and when the communalities of the indicators are low (Brown, 2006, p. 189), model misspecification may have occurred as four of the five latent variables had only two or three indicators per variable. Attempts to correct this such as placing equality constraints on the model were ineffective, although fixing the error variance to a small positive value (0.1) corrected the negative variance obtained in the covariance matrix and allowed standardised coefficients to be calculated for the model parameters. The solution obtained as a result of this modification was also inadmissible, however, due a number of factor loadings greater than 1.00 between latent variables. Figure 15 presents the path diagram and Table 34 presents the standardised and unstandardised estimates for this model specification.

Table 34: Unstandardised and standardised parameter estimates, and significance levels for the five factor model depicted in Figure 15

(Standard errors in parentheses, n=284)

Measurement Model Estimates			Unstandardised		Standardised	*p*
Legislative	←	Functions	1.00		0.721	Na
Executive	←	Functions	0.79	(0.081)	0.543	***
Judicial	←	Functions	1.51	(0.104)	0.801	***
Monarchic	←	Forms	1.00		0.743	Na
Hierarchic	←	Forms	1.01	(0.071)	0.779	***
Oligarchic	←	Forms	1.04	(0.080)	0.726	***
Anarchic	←	Forms	0.96	(0.064)	0.813	***
Liberal	←	Leanings	1.00		0.984	Na
Conservative	←	Leanings	0.27	(0.011)	0.829	***
Internal	←	Scope	1.00		0.475	Na
External	←	Scope	1.15	(0.113)	0.558	***
Local	←	Levels	1.00		0.412	Na
Global	←	Levels	0.96	(0.107)	0.391	***

***p < .001
Na: No p-values listed for these variables as they were constrained to one

The fitting of the three factor oblique model also failed because the produced covariance matrix for the latent variables was not positive definite due to a number of negative eigenvalues. Figure 16 presents the path diagram and Table 35 presents the standardised and unstandardised estimates for this model specification. Before the conclusion can be drawn that the five and three factor models are inappropriate, the results would need to be confirmed with a larger sample size.

Figure 16: Three factor oblique model of the TSI

Standardised solution (n=284)

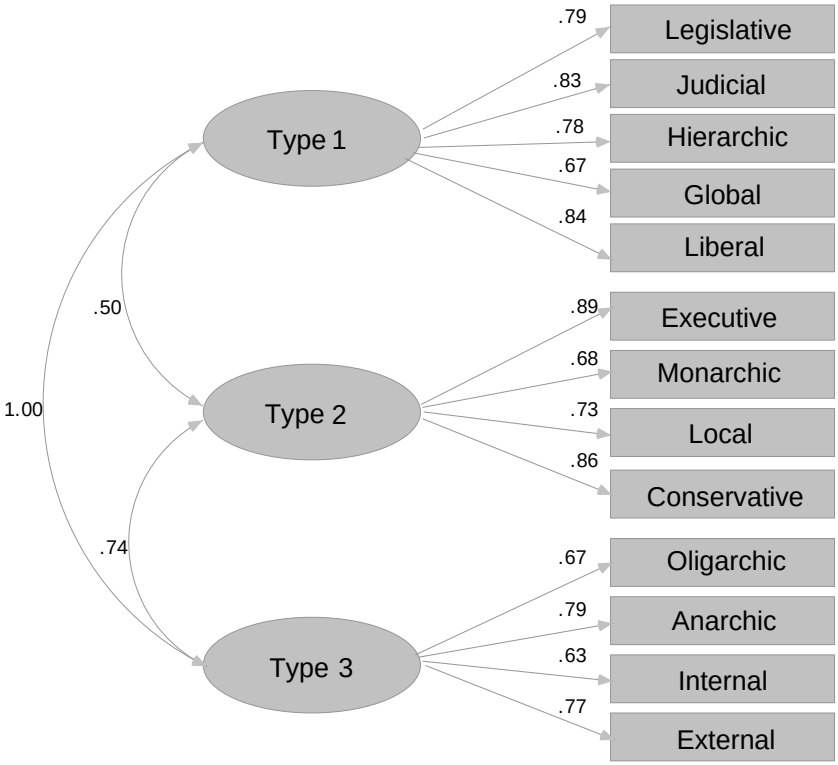


Table 35: Unstandardised and standardised parameter estimates, and significance levels for the three factor model depicted in Figure 16

(Standard errors in parentheses, n=308)

Measurement Model Estimates			Unstandardised		Standardised	*p*
Legislative	←	Type I	1.00		0.785	Na
Judicial	←	Type I	1.44	(0.089)	0.834	***
Global	←	Type I	1.02	(0.082)	0.674	***
Liberal	←	Type I	1.48	(0.092)	0.841	***
Hierarchic	←	Type I	1.19	(0.080)	0.781	***
Local	←	Type II	1.00		0.733	Na
Conservative	←	Type II	1.21	(0.082)	0.861	***
Monarchic	←	Type II	0.98	(0.084)	0.685	***
Executive	←	Type II	1.08	(0.071)	0.893	***
External	←	Type III	1.00		0.771	Na
Anarchic	←	Type III	0.94	(0.061)	0.787	***
Oligarchic	←	Type III	0.94	(0.075)	0.673	***
Internal	←	Type III	0.84	(0.071)	0.635	***

***p < .001
Na: No p-values listed for these variables as they were constrained to one

Due to the difficulties identified in the estimation of the model fit using confirmatory factor analysis it was decided to attempt to confirm the factor structure using exploratory factor analysis. Principal axis factor analysis was employed at the subscale level with a direct oblimin rotation method to determine whether the rotated factor loadings of the thirteen subscales would provide evidence for the expected three and five factor models. Listwise deletion was used to control for missing values.

The five factor model was found to explain a total of 63.78% of the variance and the loadings evident in the rotated pattern matrix did provide support for the hypothesised groupings of items within five domains. The legislative, executive and judicial factors loaded together on the functions factor with factor loadings of more than 0.2. As expected, according to the theoretical relations between subscales, the liberal and conservative, internal and external, and global and local factors loaded highly on the same factors but with inverse factor scores. The forms factor was less distinct with only the monarchic, oligarchic and anarchic factors loading highly, the hierarchic factor on the other hand had a higher loading on the functions factor.

Table 36: Total variance explained for the five factor model of the TSI after extraction

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings [a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.347	33.439	33.439	3.968	30.526	30.526	3.008
2	2.459	18.917	52.356	2.197	16.901	47.427	2.280
3	1.457	11.209	63.565	1.113	8.558	55.985	2.056
4	1.109	8.530	72.095	.744	5.719	61.705	1.128
5	.665	5.117	77.211	.270	2.078	**63.783**	2.927
6	.571	4.393	81.604				
7	.531	4.081	85.686				
8	.438	3.368	89.053				
9	.379	2.912	91.966				
10	.327	2.519	94.485				
11	.300	2.308	96.793				
12	.243	1.872	98.665				
13	.174	1.335	100.000				

Extraction Method: Principal Axis Factoring.
[a] When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 37: Pattern matrix for the hypothesised five factor model of the TSI dimensions

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Subscales	Functions	Leanings	Scope	Levels	Forms
Legislative	**.476**	-.102	.539	.126	.039
Executive	**.259**	.771	.006	-.093	-.076
Judicial	**.652**	-.015	.026	-.058	-.128
Global	.094	-.007	.174	**.640**	-.238
Local	.171	.115	.180	**-.653**	-.365
Liberal	.476	**-.433**	.390	.019	-.141
Conservative	-.014	**.874**	.066	-.012	-.088
Internal	-.094	.070	**.787**	.012	-.080
External	.772	.043	**-.389**	.154	-.160
Hierarchic	.645	.130	.069	-.026	.076
Monarchic	-.060	.277	.277	.013	**-.445**
Oligarchic	.012	.127	-.075	.056	**-.733**
Anarchic	.354	-.097	.161	-.029	**-.377**

Extraction Method: Principal Axis Factoring
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 14 iterations.

Some of the subscales loaded highly on more than one factor, however, the nature of these relationships is in line with the relationship between the three thinking style types. The executive subscale had a higher loading on the leanings factor than on the functions factor indicating a strong relationship with the liberal and conservative subscales. The external and anarchic subscales also had a high loading on the functions factor, even though they theoretically belong to type III subscales rather than type I subscales. This is not surprising, however, as the type III subscales have been known to correlate more strongly with either type I or type II groupings depending on the situation or nature of the sample.

The three factor model was found to explain a total of 54.77% of the variance in the thinking styles inventory. The rotated pattern matrix, however, revealed that although type I and type II thinking styles are clearly differentiated on different factors, all subscales, except for the internal subscale, loaded more strongly on either the type I or type II subscales. This supports the claim by the authors of the scale that type III factors can be associated more strongly with either type I or type II styles depending on the situation. As a result of this finding a two factor model was forced to determine which subscales associated more strongly with either type I or type II subscales and the revised structure was examined using confirmatory factor analysis to determine if a satisfactory fit for a two factor model could be obtained with the present data.

Table 38: Total variance explained for the five factor model of the TSI after extraction

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings [(a)]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.347	33.439	33.439	3.892	29.939	29.939	3.391
2	2.459	18.917	52.356	2.127	16.359	46.297	3.045
3	1.457	11.209	63.565	1.101	8.471	**54.768**	1.194
4	1.109	8.530	72.095				
5	.665	5.117	77.211				
6	.571	4.393	81.604				
7	.531	4.081	85.686				
8	.438	3.368	89.053				
9	.379	2.912	91.966				
10	.327	2.519	94.485				
11	.300	2.308	96.793				
12	.243	1.872	98.665				
13	.174	1.335	100.000				

Extraction Method: Principal Axis Factoring.
[a] When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 39: Pattern matrix for the three factor model of the TSI types and a forced two factor type model

	3 Factor Model				2 Factor Model	
	1	2	3		1	2
Legislative	.719	-.048	.273	Legislative	.790	-.116
Executive	-.067	.872	-.159	Executive	-.065	.880
Judicial	.643	.159	-.174	Judicial	.603	.148
Global	.449	-.075	.059	Global	.466	-.104
Local	.101	.600	.144	Local	.169	.565
Liberal	.832	-.237	.227	Liberal	.896	-.308
Conservative	-.290	.912	-.036	Conservative	-.262	.924
Internal	.239	.230	.681	Internal	.380	.120
External	.674	.086	-.608	External	.457	.127
Hierarchic	.517	.163	-.173	Hierarchic	.478	.158
Monarchic	.142	.581	.257	Monarchic	.237	.520
Oligarchic	.256	.523	-.003	Oligarchic	.285	.505
Anarchic	.576	.217	.069	Anarchic	.616	.177

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 18 iterations.

a. Rotation converged in 8 iterations.

Figure 17: Two factor model of the TSI

Standardised solution (n=284)

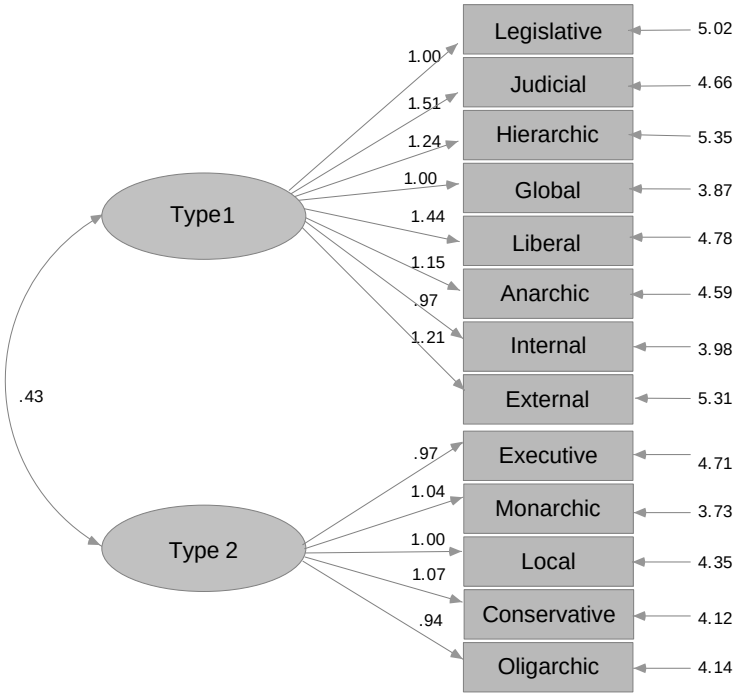


Table 40: Unstandardised and standardised parameter estimates, and significance levels for the two factor model depicted in Figure 17

(Standard errors in parentheses, n=308)

Measurement Model Estimates			Unstandardised		Standardised	*p*
Legislative	←	Type I	1.00		0.770	Na
Judicial	←	Type I	1.51	(0.093)	0.854	***
Hierarchic	←	Type I	1.25	(0.083)	0.767	***
Global	←	Type I	1.00	(0.085)	0.803	***
Liberal	←	Type I	1.44	(0.097)	0.836	***
Anarchic	←	Type I	1.15	(0.075)	0.759	***
Internal	←	Type I	0.97	(0.088)	0.796	***
External	←	Type I	1.21	(0.082)	0.648	***
Local	←	Type II	1.00		0.811	Na
Executive	←	Type II	0.97	(0.064)	0.704	***
Monarchic	←	Type II	1.04	(0.077)	0.818	***
Conservative	←	Type II	1.07	(0.075)	0.615	***
Oligarchic	←	Type II	0.94	(0.077)	0.786	***

***p < .001
Na: No p-values listed for these variables as they were constrained to one

Confirmatory factor analysis with the revised two factor model revealed an admissible model, although the chi-squared statistic was significant (χ^2_{64} = 746.325, p = .000, $\chi^2_{/df}$ = 11.66, CFI = .76, TLI = .65), indicating a less than satisfactory model fit. Nevertheless, as this is the only model for which an admissible model structure could be confirmed, the two factor model will be used to investigate the remaining hypotheses of the study.

5.3. PROFILE OF EMOTIONAL INTELLIGENCE AND THINKING STYLES OF RESPONDENTS

5.3.1. Employee scores on the total scale and subscales of the MSCEIT: Comparison with South African and North American MSCEIT norms

The MSCEIT standardised scores are reported in a similar manner to intelligence scores with an average of 100 and a standard deviation of 15, with scores around 100 regarded as falling within the average range of emotional intelligence. In order to examine the extent to which the standardised scores obtained in the present sample differed from the MSCEIT North American norms, a one-sample t-test was conducted for each scale comparing the scale's standard score to 100.

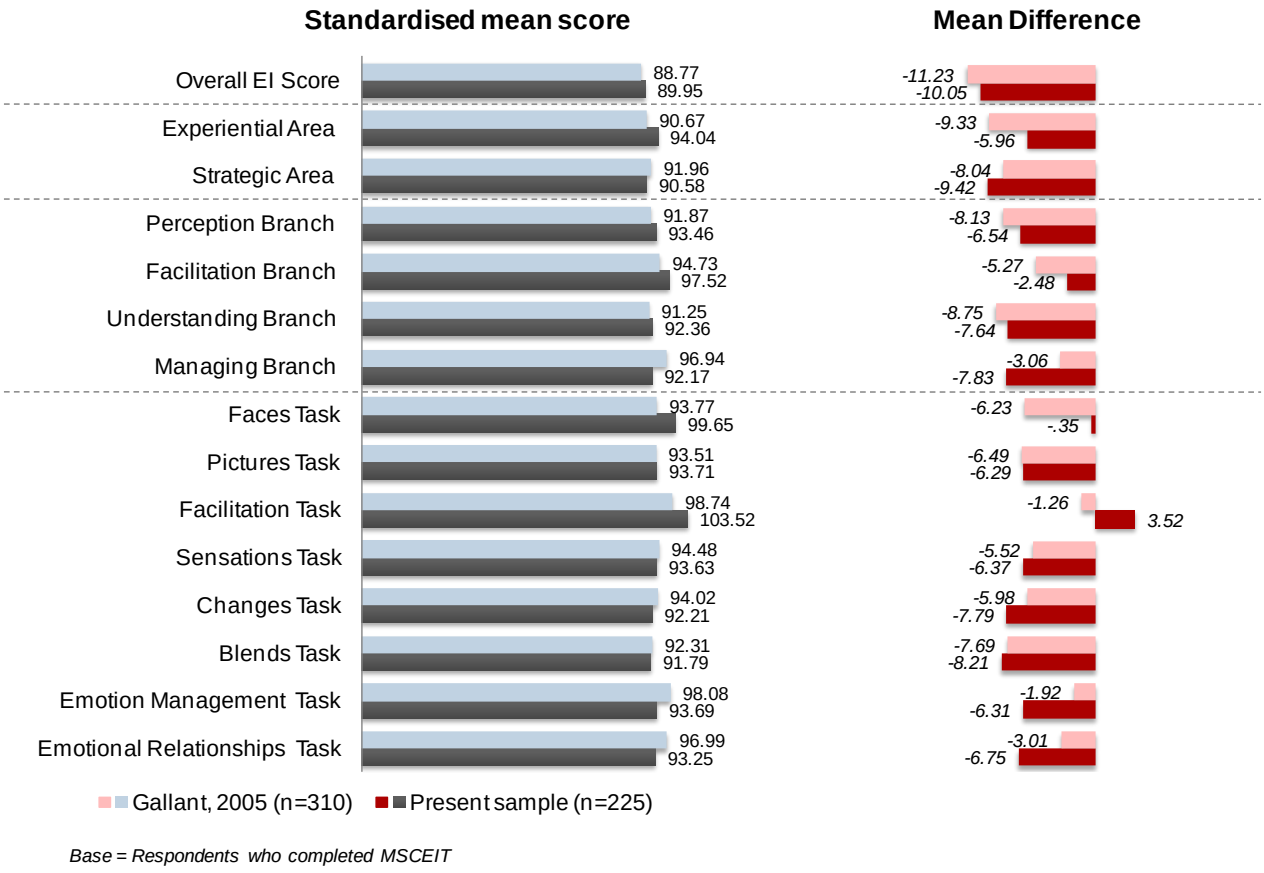
The mean scores and significance levels for the standardised scores are presented in Table 41 and the mean differences from the North American norms are presented in Figure 18. All of the standardised scores excluding the faces task for the present sample were significantly below the mean score of 100 which is considered to indicate an average emotional intelligence ability level, except for the facilitation task which was significantly higher than the mean score. None of the scores, however, were found to lie outside the standard deviation of 15, although the effect size for all measures was large with eta for the significant differences ranging from r = 0.15 (facilitation branch score) to r = 0.63 (strategic area score). These findings are comparable to those recorded by Gallant (2005) who reported that all of the preliminary South African norms developed for the MSCEIT were significantly below the American mean for each scale, with the exception of the facilitation branch score which was not significant.

Table 41: Comparison of results with the South African norms obtained by Gallant (2005) and the North American MSCEIT norms

MSCEIT *(Standardised consensus scores)*	**Gallant (2005, n=310)**			**Present sample (n=225)**		**Single-sample T-Test (Mean = 100)**	**Effect size**
	M	**SD**		**M**	**SD**		**(eta)**
Overall EI Score	88.77	14.45		89.95	13.35	t (221) = -11.219, p = .000***	.60
Experiential Area	90.67	14.94		94.04	16.00	t (221) = -5.545, p = .000***	.35
Strategic Area	91.96	13.45		90.58	11.51	t (223) = -12.244, p = .000***	.63
Perception Branch	91.87	13.46		93.46	15.38	t (223) = -6.370, p = .000***	.39
Facilitation Branch	94.73	18.48		97.52	16.12	t (221) = -2.294, p = .023*	.15
Understanding Branch	91.25	13.99		92.36	11.63	t (223) = -9.833, p = .000***	.55
Managing Branch	96.94	14.72		92.17	11.90	t (223) = -9.848, p = .000***	.55
Faces Task	93.77	12.80		99.65	23.13	t (223) = -0.225, p = .822	.02
Pictures Task	93.51	15.36		93.71	12.63	t (224) = -7.471, p = .000***	.45
Facilitation Task	98.74	16.19		103.52	15.77	t (221) = 3.329, p = .001**	.22
Sensations Task	94.48	18.14		93.63	14.37	t (223) = -6.639, p = .000***	.41
Changes Task	94.02	14.67		92.21	11.29	t (223) = -10.332, p = .000***	.57
Blends Task	92.31	13.56		91.79	11.16	t (224) = -11.031, p = .000***	.59
Emotion Management Task	98.08	14.25		93.69	11.40	t (223) = -8.285, p = .000***	.49
Emotional Relationships Task	96.99	14.76		93.25	12.57	t (224) = -8.053, p = .000***	.47
***p < .001 **p < .01 *p < .05							

The positive negative bias subscale is a validity index used to establish the fake-good or fake-bad tendencies of individuals completing the measure. The scores on this scale were not significantly different from the norm [M = 101.99, SD = 17.28; t (224) = 1.73, p= .085] which supports the validity of the MSCEIT scores for use with this particular research population and that the interpretation of group performance on the scales is appropriate. The scatter score which provides an indication of the amount of fluctuation between a respondent's task scores was also not significantly different from the norm [M = 98.13, SD = 14.74; t (224) = -1.90, p= .059].

Figure 18: Mean scores and mean differences for the present study and South African norms in comparison to the North American MSCEIT norm of 100



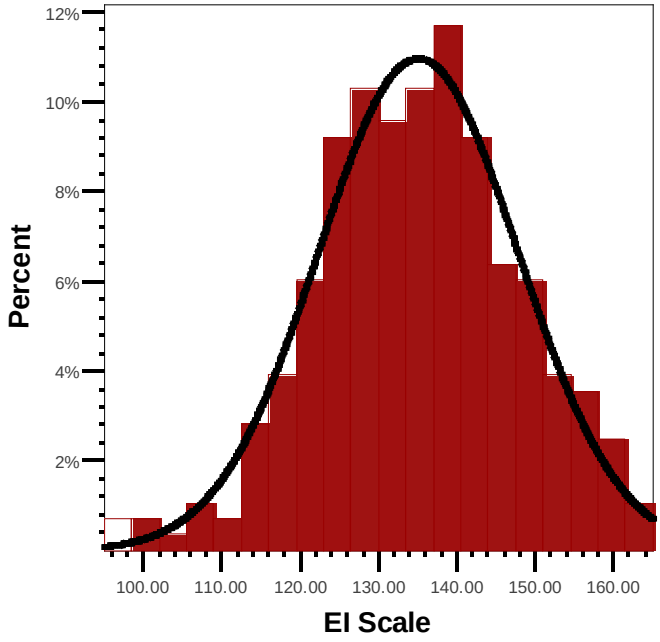
Base = Respondents who completed MSCEIT

5.3.2. Respondent scores on the total scale and subscales of the SSREIT

The histogram depicted in Figure 19 suggests that the total EI scores for the respondents are more or less normally distributed with a slight positive skew and an even distribution of EI scores from a low of 95 to a high of 165. The mean score for total EI was 135 with a standard deviation of 12.74 which is significantly higher than the mean score obtained with the student sample by Murphy (2006) [M = 128.22, SD = 15.36; t (281) = 9.04, p = .000]. The mean scores on the subscales for the four dimensions as presented in Figure 20 are comparable, but slightly higher than those recorded by Murphy (2006).

Significant differences were not calculated between the subscales as the item structures differ between the two studies.

Figure 19: Respondent scores on the total scale of the SSREIT

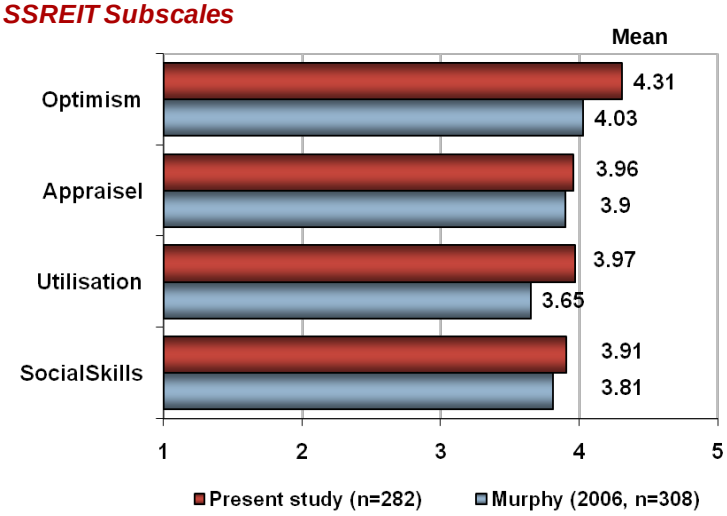


EI Scale - Descriptives

Min	**95**
Max	**165**
Mean	**135**
Std Deviation	**12.74**
Total	**282**

Figure 20: Respondent scores on the subscales of the SSREIT

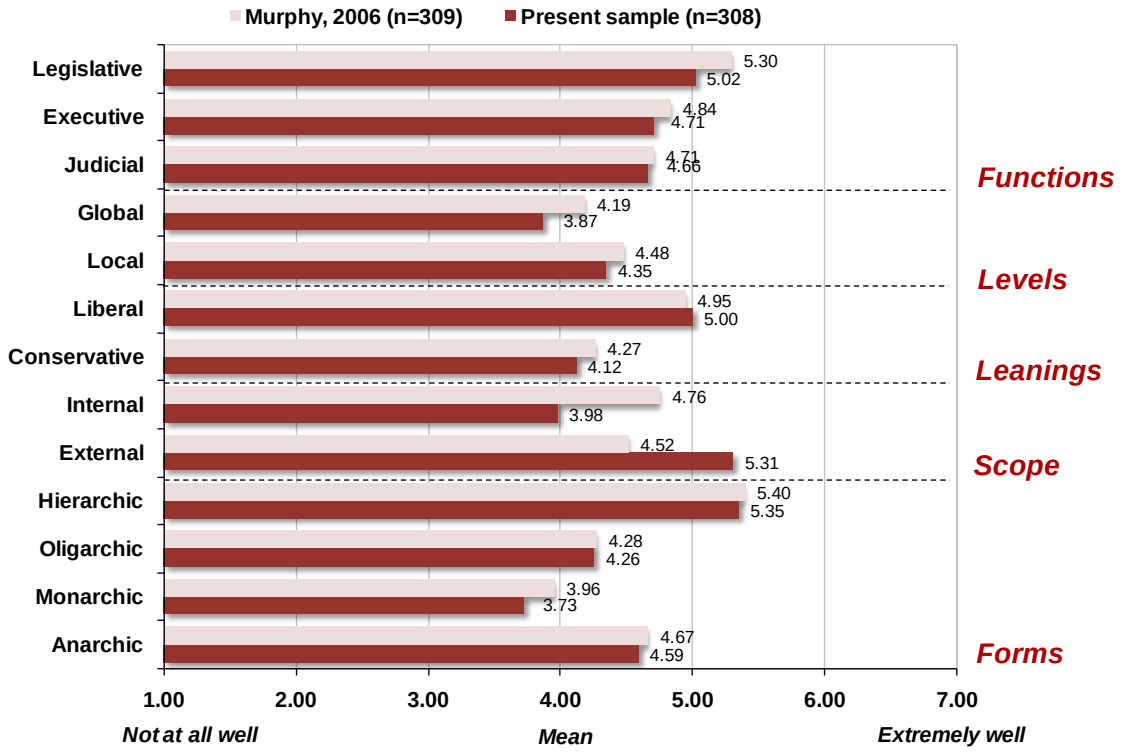
SSREIT Subscales



	Min	Max	Std Deviation
	2.50	**5**	**0.41**
	2.14	**5**	**0.57**
	1.80	**5**	**0.59**
	1.83	**5**	**0.59**

5.3.3. Profile of employees' preferred thinking styles

Figure 21: Raw scores on the subscales of the TSI for the present sample compared to the raw scores obtained for a South African student sample (Murphy, 2006)



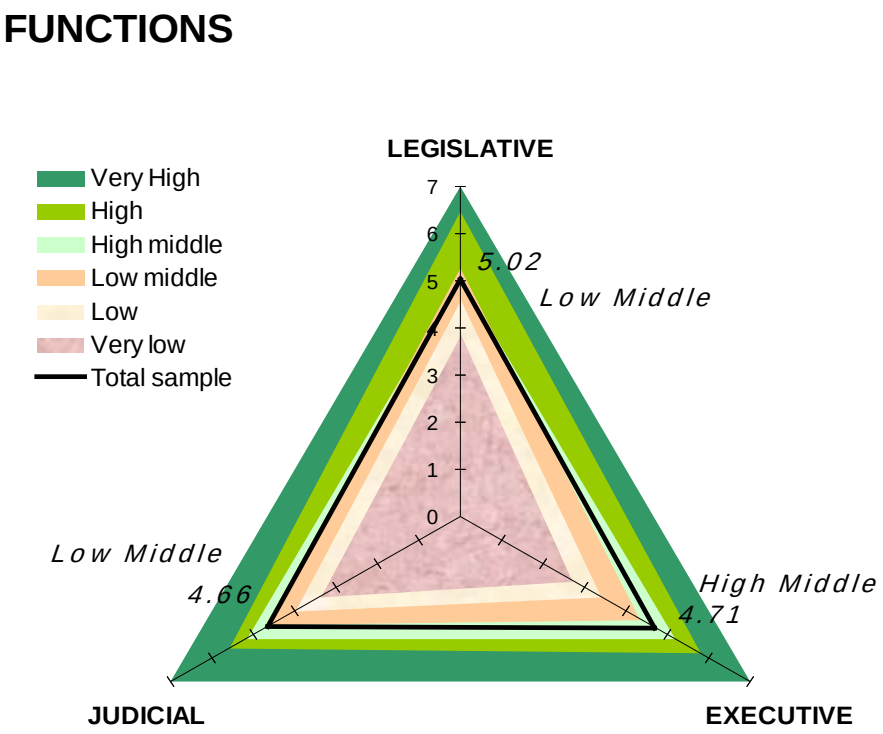
Base = Respondents who completed TSI

TSI Raw scores	Murphy (2006, n=309)		Present sample (n=308)		T-Test	Effect size (eta)
	M	SD	M	SD		
Legislative	5.30	0.82	5.02	0.96	t (307) = -5.121, p = **.000*** **	.28
Executive	4.84	0.94	4.71	1.01	t (307) = -2.227, p = **.027***	.13
Judicial	4.71	0.77	4.66	1.31	t (307) = -0.674, p = .501	.04
Global	4.19	0.84	3.87	1.14	t (307) = -4.944, p = **.000*** **	.27
Local	4.48	0.77	4.35	1.14	t (307) = -2.029, p = **.043***	.12
Liberal	4.95	1.02	5.00	1.06	t (283) = 0.825, p = .410	.05
Conservative	4.27	1.06	4.12	1.17	t (307) = -2.296, p = **.022***	.13
Internal	4.76	0.91	3.98	1.17	t (307) = -11.771, p = **.000*** **	.56
External	4.52	1.07	5.31	1.14	t (307) = 12.170, p = **.000*** **	.57
Hierarchic	5.40	0.92	5.35	1.15	t (307) = -0.703, p = .482	.04
Monarchic	3.96	1.00	3.73	1.19	t (307) = -3.450, p = **.001****	.19
Oligarchic	4.28	0.79	4.26	1.07	t (291) = -0.359, p = .720	.02
Anarchic	4.67	0.79	4.59	1.04	t (307) = -1.343, p = .180	.08
***p < .001 **p < .01 *p < .05						

The bar graph depicted in Figure 21 summarises the means scores of respondents on the 13 TSI sub scales in comparison to the subscale scores obtained by Murphy (2006) with a South African student sample. Eight of the thirteen subscale scores were found to be significantly different from than those obtained by Murphy (2006) using a single-sample t-test. Of these eight subscales, all the sores were lower with the exception of the external subscale which was significantly higher. Only the differences on the scope subscales though, achieved high effect sizes of r = 0.56 for the internal subscale and r = 0.57 for the external subscale. The effect sizes for the remaining results ranged from a low r = 0.12 (local) to a moderate r = 0.28 (legislative).

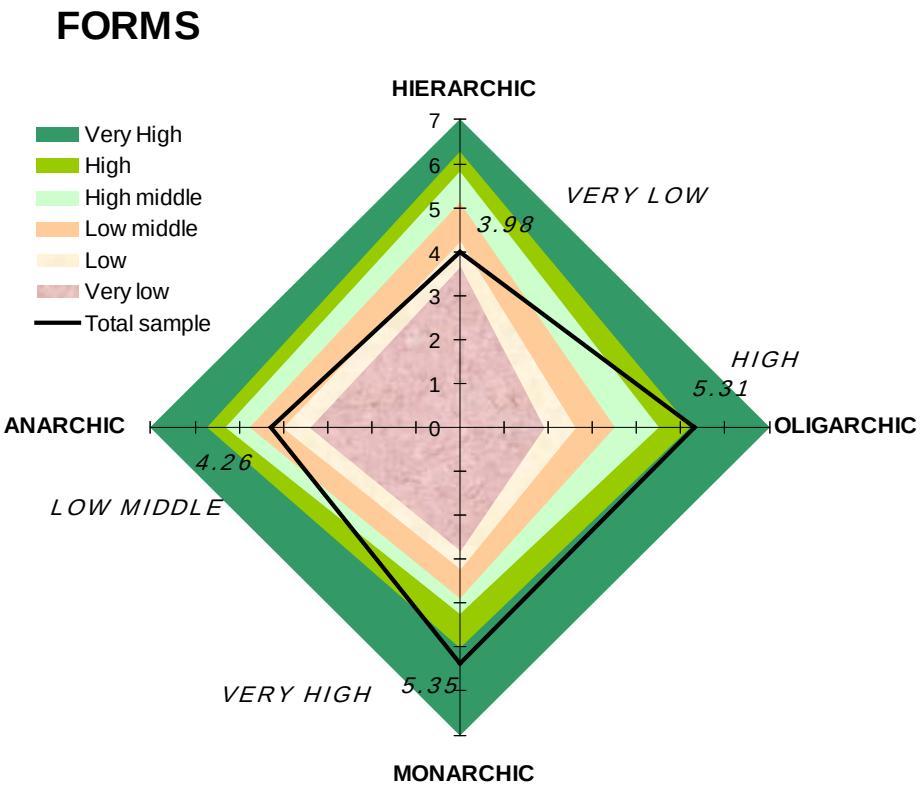
On assessing the total sample scores for the functions styles (see Figure 22) against the North American non-student adult norms developed by Sternberg (1997), it appears as though the employees in this company have a high middle executive score, a low middle judicial score and a low middle legislative score. This may indicate that these employees have most of the characteristics of the executive thinking style and few of the characteristics of the judicial and legislative styles.

Figure 22: A comparison of respondent scores on the functions subscales of the TSI to North American norms developed by Sternberg (1997)



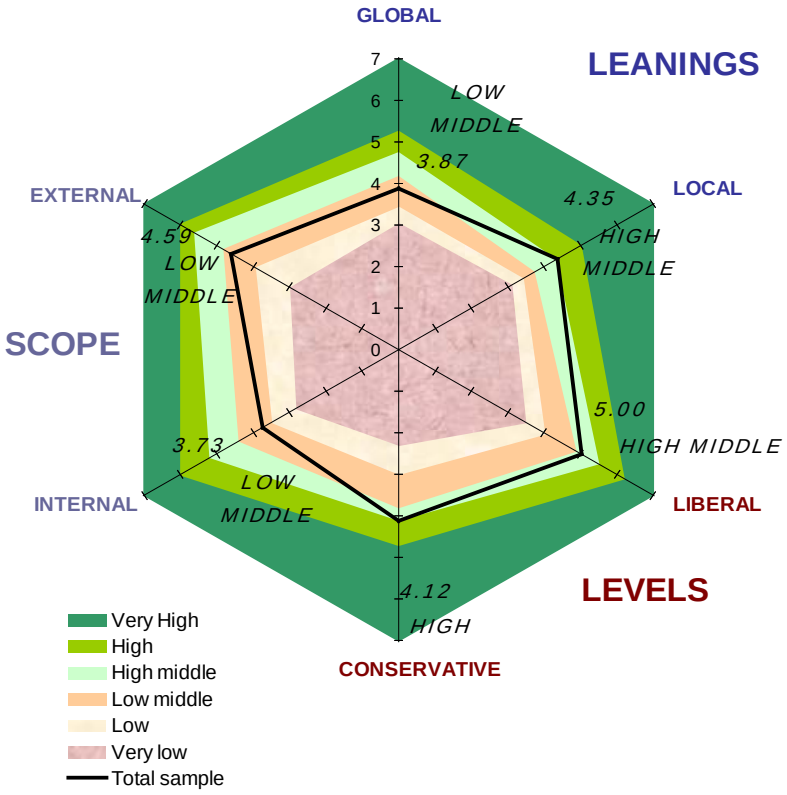
The comparison of the scores for the forms styles (see Figure 23) reveals that in comparison to North American norms, these employees have very high monarchic scores and high oligarchic scores but low middle anarchic scores and very low hierarchic scores. This implies that employees in this company mostly prefer to focus on one project at a time and to a lesser extent, prefer working on multiple objectives during the same period of time without clear set priorities.

Figure 23: A comparison of respondent scores on the forms subscales of the TSI to the North American norms developed by Sternberg (1997)



The comparison of the scores for the leanings, scope and levels styles (see Figure 24) reveals that in comparison to the North American norms, these employees have high conservative scores and high middle local and liberal scores, but low middle external, internal and global scores. This implies that compared to North American adult samples, the South African employee sample may be more inclined to prefer working with details and prefer novelty and ambiguity rather than strict rules and procedures.

Figure 24: A comparison of respondent scores on the leanings, scope and levels subscales of the TSI to the North American norms developed by Sternberg (1997)



5.4. CONSTRUCT VALIDITY OF TRAIT VS. ABILITY EI: EXPLORING THE BOUNDARIES OF THE EMOTIONAL INTELLIGENCE CONSTRUCT IN RELATION TO THINKING STYLES

5.4.1. Correlations between emotional intelligence and thinking styles measures

Table 42 presents the correlations between the MSCEIT standardised total score and branch scores with the total score and subscale scores of the SSREIT. As expected, the overall MSCEIT scale and the overall SSREIT scale do not correlate significantly with each other (r = -.075, p = .322). The utilisation subscale of the SSREIT does, however, show a small significant negative correlation with the overall MSCEIT scale (r = -.149, p = .048). The MSCEIT understanding branch score in turn shows small significant negative correlations with the overall SSREIT score (r = -.157, p = .038) and the optimism subscale scores (r = -.186, p = .013). As the strength of these results in both instances is weak, the relationship between these two scales does suggest that they are measuring independent constructs, thereby confirming Hypothesis 1.1.

Table 42: Pearson's correlations between the total score and branch scores of the MSCEIT and the total score and sub scores of the SSREIT

Measurement scales		MSCEIT				
		Overall EI Score	Perception Branch score	Facilitation Branch score	Understanding Branch score	Managing Branch score
SSREIT	Overall EI Score	-.075	-.073	-.107	-.157*	.020
	Optimism	-.132	-.106	-.142	-.186*	-.021
	Appraisal	.025	-.001	-.010	-.057	.096
	Utilisation	-.149*	-.146	-.132	-.139	-.089
	Social Skills	.059	.115	-.106	.031	.060
Total sample n=178 ***p < .001 **p < .01 *p < .05						

The results of the examination of Hypothesis 1.2, which states that *significant correlations will be obtained between the SSREIT and the Thinking Styles Inventory, but no significant correlations will be obtained between the Thinking Styles Inventory and the MSCEIT,* are presented in Table 43. The results of the Pearson's correlations between these two measures are mostly as expected, because firstly all of the thinking styles subscales except for the conservative and internal subscales correlate significantly in a

positive direction with the overall score of the SSREIT. In addition, most of the TSI subscales also correlate significantly with the subscales of the SSREIT. The strength of the significant relationships observed ranges from a low r = 0.121 (p = .042) between the executive subscale and the overall SSREIT score to a moderate r = 0.505 (p = .000) between the hierarchic and optimism subscales. As most of the correlations imply low to moderate relationships below r = 0.5 between the SSREIT and the TSI, these scales cannot be said to overlap to such an extent that the instruments are measuring exactly the same construct.

Table 43: Pearson's correlations between the total score and branch scores of the MSCEIT and the total score and sub scores of the SSREIT with the subscales of the TSI

Measurement scales		MSCEIT					SSREIT				
		Overall EI Score	Perception Branch score	Facilitation Branch score	Understanding Branch score	Managing Branch score	Overall EI Score	Optimism	Appraisal	Utilisation	Social Skills
TSI	Legislative	.049	.030	.075	.056	.094	.361**	.289**	.215**	.307**	.309**
	Executive	.011	-.083	.037	.108	-.024	.121*	.138*	.105	.116	.040
	Judicial	-.045	-.084	-.053	.075	.055	.432**	.402**	.290**	.344**	.302**
	Global	.008	.004	-.020	.074	-.018	.219**	.140*	.218**	.236**	.109
	Local	-.154*	-.186*	-.068	-.020	-.052	.208**	.194**	.146*	.201**	.135*
	Liberal	-.121	-.123	-.093	-.060	.071	.426**	.335**	.312**	.421**	.276**
	Conservative	-.003	.000	.042	.041	-.132	-.069	-.039	-.039	-.073	-.035
	Internal	-.079	-.065	-.022	-.026	-.125	.105	.036	.104	.141*	.102
	External	.041	-.013	.063	.083	.086	.432**	.410**	.353**	.273**	.246**
	Hierarchic	-.040	-.159*	.028	.042	.069	.463**	.505**	.264**	.270**	.304**
	Monarchic	-.133	-.144	-.047	-.046	-.078	.150*	.101	.130*	.254**	.078
	Oligarchic	-.005	-.050	.001	.133	-.023	.205**	.169**	.218**	.255**	.051
	Anarchic	-.138	-.099	-.055	-.040	-.085	.382**	.267**	.321**	.361**	.265**

Total sample n=178
***p < .001 **p < .01 *p < .05

Three significant but weak negative relationships were observed between the MSCEIT and the TSI with the local subscale of the TSI subscales demonstrating a small significant but negative relationship with the overall scale of the TSI (local; r = -.154, p = .039), and the perception branch score demonstrating a small significant negative relationship with the local (r = -.186, p = .013) and hierarchic subscales (r = -.159, p = .033) of the TSI. Although not significant, most of the TSI subscales have small inverse relationships with the MSCEIT except for the legislative, executive, external and global subscales which

are generally perceived to be thinking styles that require more cognitive complexity and it could therefore be argued that these styles require a greater component of the ability to integrate emotion with thought. It could similarly be argued that a lower emotional intelligence may result in a greater preference for styles that are more simplistic. Repeat studies with larger samples would be required to confirm these hypotheses.

In order to determine whether the relationships observed between the MSCEIT and the SSREIT could be attributed to the small relationship observed with the TSI, a partial correlation was computed controlling for the thirteen subscales of the TSI. This resulted in the disappearance of all the observed relationships between the SSREIT and the MSCEIT. These results are presented in Table 44.

Table 44: Partial correlations between the total score and branch scores of the MSCEIT and the total score and sub scores of the SSREIT controlling for the thirteen subscales of the TSI

Measurement scales		MSCEIT				
		Overall EI Score	Perception Branch score	Facilitation Branch score	Understanding Branch score	Managing Branch score
SSREIT	Overall EI Score	-.068	-.066	.052	-.245	-.036
	Optimism	-.086	-.027	.005	-.252	.023
	Appraisal	-.098	-.105	.008	-.182	-.164
	Utilisation	-.118	-.118	-.012	-.184	-.024
	Social Skills	.032	.013	.112	-.128	-.019
Total sample n=178						

5.4.2. Factorial relationships between emotional intelligence and thinking styles measures

To determine whether any evidence of an overlap is evident between ability and trait EI, a principal axis factor analysis with an oblique rotation was conducted on the unadjusted, unstandardised subscales of the MSCEIT and the subscales of the SSREIT. The thirteen subscales of the TSI were included in this analysis to further examine the hypothesis of the study that the SSREIT is measuring EI as a lower order personality trait whereas the MSCEIT is measuring EI as an independent construct which will be unrelated to any alternative trait measures at the factor level.

The factor analysis performed on all the subscales from the MSCEIT, SSREIT and TSI inventories resulted in six factors with eigenvalues (Kaiser Criterion) exceeding 1.0 (see Table 45). A three factor solution was retained for further analysis based on visual inspection of Catell's scree test. After rotation using an oblique direct oblimin method with Kaiser normalisation, the three factor solution explained a total of 40.94% of the variance (see Table 46).

Table 45: Total variance explained for the MSCEIT, SSREIT and TSI subscales before extraction
(Excluding factors with eigenvalues lower than one)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.179	24.661	24.661	4.741	22.576	22.576
2	2.670	12.713	37.375	2.363	11.252	33.828
3	2.298	10.944	48.318	1.830	8.715	42.543
4	1.672	7.961	56.279	1.278	6.085	48.628
5	1.308	6.230	62.509	.888	4.230	52.858
6	1.125	5.357	67.866	.630	2.999	**55.858**
Extraction Method: Principal Axis Factoring.						

Figure 25: Scree plot for the joint loading of the subscales of the MSCEIT, SSREIT and TSI

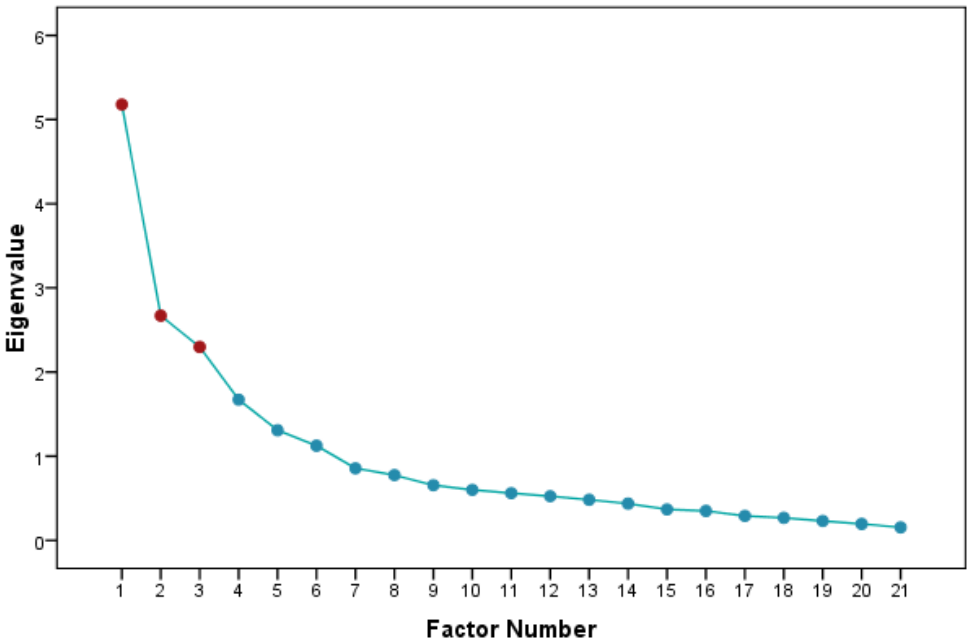


Table 46: Total variance explained for the MSCEIT, SSREIT and TSI subscales after extraction

(Excluding factors with eigenvalues lower than one)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings [a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5.179	24.661	24.661	4.589	21.851	21.851	4.460
2	2.670	12.713	37.375	2.276	10.836	32.687	2.666
3	2.298	10.944	48.318	1.733	8.252	**40.939**	1.789
4	1.672	7.961	56.279				
5	1.308	6.230	62.509				
6	1.125	5.357	67.866				

Extraction Method: Principal Axis Factoring.
[a] When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 47: Pattern matrix and factor loadings jointly for the subscales of the MSCEIT, SSREIT and TSI

Subscales	Factor 1	Factor 2	Factor 3
TSI - Liberal	.821	-.207	-.097
TSI - Legislative	.756	-.078	.093
TSI - Judicial	.627	.160	.072
TSI - Anarchic	.611	.150	-.065
SSREIT - Utilisation	.587	.005	-.148
SSREIT - Optimism	.545	-.023	-.055
SSREIT - Appraisal	.535	-.035	-.112
SSREIT - Social Skills	.531	-.048	-.007
TSI - External	.508	.027	.220
TSI - Hierarchic	.495	.184	.091
TSI - Global	.449	-.090	.121
TSI - Internal	.322	.114	-.106
TSI - Conservative	-.298	.894	.058
TSI - Executive	-.085	.867	.100
TSI - Local	.108	.576	-.158
TSI - Monarchic	.293	.504	-.111
TSI - Oligarchic	.312	.415	.038
MSCEIT - Understanding Branch score	-.036	.087	.739
MSCEIT - Facilitation Branch score	-.022	.041	.695
MSCEIT - Perception Branch score	-.077	-.102	.539
MSCEIT - Managing Branch score	.118	-.015	.491

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 5 iterations.

The results from the analysis provided support for the distinctiveness of ability EI from trait EI and confirmed Hypothesis 1.3 that *factor analysis using the subscales of the subscales of the EI and thinking styles measurement instruments will uncover an overlap between the trait EI and thinking styles measure and the subscales of the ability EI measure will load independently from both the trait EI and thinking styles subscales.* On examination of the pattern matrix presented in Table 47, it is evident that all the subscales from the SSREIT and eight of the thirteen TSI subscales loaded uniquely on the first factor. These TSI subscales are the same combination of complex and creative type I and type III subscales that were identified as loading independently on the two factor model for the TSI identified in section 5.2.3.2. The combination of norm-favouring type II and type III thinking styles identified in section 5.2.3.2 loaded independently on the second factor. On the other hand, the four subscales of the MSCEIT loaded independently on the third factor and no cross loadings were observed on any of the three identified factors.

Analysis of the direction of the correlations between the three factors as presented in Table 48 supports these findings, as the ability EI factor correlates negatively with both factor 1 and factor 2 on which the thinking styles and SSREIT subscales load. Factor 1 and 2 are, however, positively correlated to a moderate degree. These results support the hypothesis that EI defined as an ability is conceptually and empirically distinct from EI defined as a trait. The lack of a relationship between the MSCEIT and the TSI is also significant, specifically because the TSI is defined as a lower order personality trait but is related to cognitive processes. The MSCEIT therefore appears to measure an emotional intelligence construct that is relatively independent from any form of personality.

Table 48: Factor correlation matrix for the correlations between the three identified factors

Factor	**Factor 1** (SSREIT & Type I TSI subscales)	**Factor 2** (Type II TSI subscales)	**Factor 3** (MSCEIT subscales)
Factor 1 (SSREIT & Type I TSI subscales)	1.000		
Factor 2 (Type II TSI subscales)	.198	1.000	
Factor 3 (MSCEIT subscales)	-.052	-.080	1.000

5.4.3. Differences in emotional intelligence and thinking styles for groups with differing demographic characteristics

To contribute towards examining the construct validity of the trait versus ability EI distinction, the differences between groups were examined to assess whether theoretically expected differences could be observed on the three measures. Demographic variables that will be examined in this section include age and work experience, ethnic differences, gender and marital status. Only significant differences found will be presented in table form in this chapter, the detailed results are presented in Appendix F, Section 3.

5.4.3.1. Age, generational differences and work experience: Does emotional intelligence change over the life span?

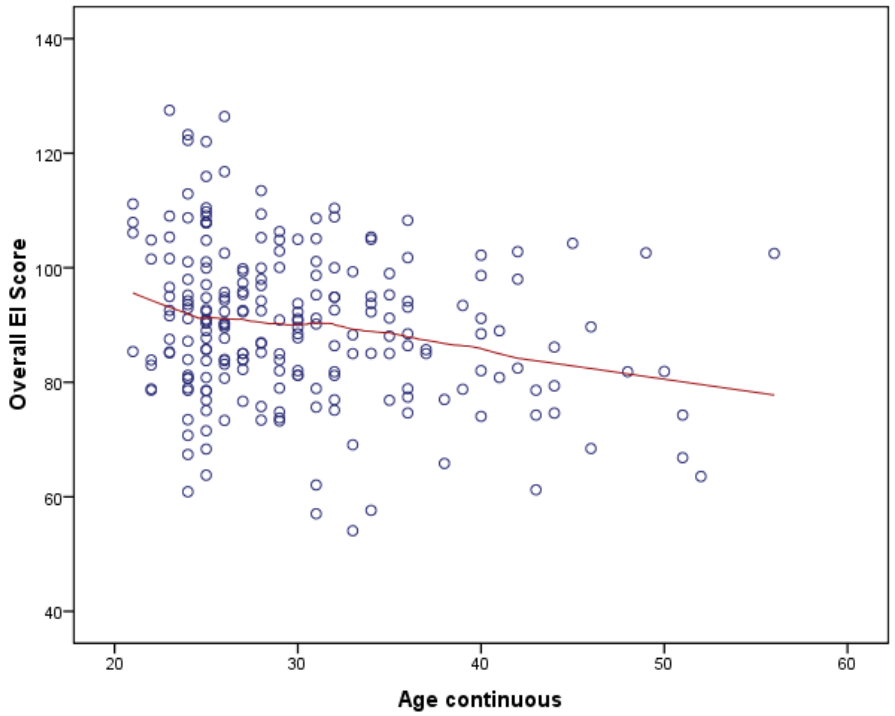
The relationships between age as a continuous variable (which ranged from a minimum of 21 to a maximum of 56), and the total score and subscales of the MSCEIT, SSREIT and the subscales of the TSI were examined using Pearson's product-moment correlation coefficient. No significant relationships were observed between age and the total scale or subscales of either the SSREIT or the thirteen subscales of the TSI. These results are presented in Appendix F, Table F14.

For the MSCEIT, as presented in Table 49, there were no differences evident on the perception branch score, though significant inverse relationships were observed on the remaining branch scores which is contrary to expectations. The magnitude of the relationships, however, suggests that there is little increase in EI associated with age in the present sample. Repeating the analysis with the unstandardised and unadjusted overall and branch scores results in a disappearance of the significant relationship with age, although the direction of the Pearson's correlation coefficients are still negative for the overall, perception, facilitation and understanding scores. Figure 26 presents a scatterplot depicting a weak inverse relationship between age and overall EI with the majority of the results clustering below the North American mean of 100. These findings are therefore influenced by the tendency for South African respondents to score below the North American mean (Gallant, 2005) as well as the positive skew evident in the age distribution with the majority of respondents clustering in the lower age groups.

Table 49: Pearson's correlation matrix for age on the total scale and subscales of the MSCEIT

Scales	N	Pearson Correlation	Sig. (2-tailed)
MSCEIT *(MHS standardised scores)*			
Overall EI Score	222	-.230**	.001
Perception Branch	224	-.076	.258
Facilitation Branch	222	-.190**	.005
Understanding Branch	224	-.372**	.000
Managing Branch	224	-.180**	.007
MSCEIT *(Unstandardised scores)*			
Overall EI Score	222	-.091	.177
Perception Branch	224	-.054	.420
Facilitation Branch	222	-.090	.184
Understanding Branch	224	-.152*	.022
Managing Branch	224	.046	.495
***p < .001 **p < .01 *p < .05			

Figure 26: Scatterplot depicting the inverse relationship between age and overall ability EI



The three generational groupings, generation X (ages 27 to 41), generation Y (ages 19 to 26) and the baby boomer generation (ages 42 to 56), were assessed for differences in trait versus ability EI at the total scale level using a one-way analysis of variance (ANOVA). EI at the subscale level as well as

thinking styles were examined for differences using a multivariate analysis of variance (MANOVA). The sample size of the baby boomers sample is small (n=26) in comparison to generation X (n=187) and generation Y (n=139), therefore, caution should be taken when drawing inferences from the results.

Significant differences between generational groups were identified on the standardised total [F (2, 219) = 5.31, p = .006] and branch scores of the MSCEIT [F (2, 219) = 4.09, p = .000, Wilks' Lambda = .86, eta = .26]. The analysis, however, yielded a significant Box's test of equality of covariance matrices (p = .010) on the MSCEIT branch scores which indicates that the homogeneity assumptions of the test have been violated. Repeating the analysis on the unstandardised and unadjusted scores revealed a non-significant Box's test (p = .246) as well as no significant differences on the total [F (2, 219) = 1.44, p = .239] or branch scores [F (2, 219) = 1.12, p = .347, Wilks' Lambda = .96, eta = .14], which suggests that the procedure used to standardise the results significantly affects the covariance evident in the data. For this reason it was decided to continue the analysis with the MSCEIT total scale and subscales using both the standardised and the unstandardised data in order to compare the differences in the results.

Table 50: Generational differences on the standardised versus the unstandardised total scales and subscales of the MSCEIT

Scale	Generation Y		Generation X		Baby Boomers		ANOVA	Effect size (eta)
	M	SD	M	SD	M	SD		
MSCEIT *(Standardised scores)*	n=91		n=112		n=19			
Overall EI Score	92.77	14.37	88.87	11.81	82.81	13.89	F (2,219) = 5.311, p = **.006****	.22
Perception Branch	94.73	17.32	93.05	13.08	89.96	18.01	F (2,219) = 1.517, p = .222	.12
Facilitation Branch	100.03	16.12	96.67	15.67	90.45	17.02	F (2,219) = 3.148, p = .**045***	.17
Understanding Branch	97.10	11.68	89.98	10.54	84.26	8.61	F (2,219) = 16.357, p = **.000*****	.36
Managing Branch	94.45	13.85	90.87	10.15	89.19	9.99	F (2,219) = 3.470, p = **.033***	.18
MSCEIT *(Unstandardised scores)*								
Overall EI Score	.46	.06	.47	.06	.44	.08	F (2,219) = 1.440, p = .239	.11
Perception Branch	.49	.11	.49	.10	.46	.14	F (2, 219) = 1.133, p = .324	.10
Facilitation Branch	.46	.09	.46	.08	.43	.11	F (2, 219) = 1.033, p = .358	.10
Understanding Branch	.51	.06	.51	.07	.48	.07	F (2, 219) = 2.321, p = .101	.14
Managing Branch	.39	.08	.41	.07	.41	.07	F (2, 219) = 0.780, p = .459	.08
***p < .001 **p < .01 *p < .05								

Results of the post hoc Scheffe test revealed that generation Y respondents scored higher on the overall EI score as well as the facilitation, understanding and managing branch than respondents who belonged to the baby boomer category. The effect size was low to moderate with eta ranging from r = 0.17 to r =

0.36. The means and standard deviations for the standardised and unstandardised branch and total MSCEIT scores are presented in Table 50.

No significant differences were observed on the total scale [F (2, 279) = 0.04, p = .959] or subscales of the SSREIT [F (2, 279) = 0.67, p = .717, Wilks' Lambda = .98, eta = .10] between the three groups, nor were any differences observed on the thirteen subscales of the TSI [F (2, 281) = 1.15, p = .282, Wilks' Lambda = .90, eta = .23]. The means and standard deviations of the generation groups on the subscales of the SSREIT and TSI are presented in Appendix F, Table F15.

Work experience was assessed by examining whether EI and thinking styles differed for respondents depending on the length of time respondents had been with the company as well as whether respondents who had joined the company in the past 12 months, joined as graduates, or employees who were appointed with either one to two years of working experience, or more than two years of working experience.

No significant differences were observed for the length of time respondents had been with the company on both the standardised total [F (5, 207) = 0.84, p = .522] and branch scores [F (5, 207) = 0.80, p = .717, Wilks' Lambda = .93, eta = .14] as well as the unstandardised total [F (5, 207) = 0.67, p = .648] or branch scores [F (5, 276) = 0.59, p = .921, Wilks' Lambda = .94, eta = .12]. No significant differences were observed on the total scale [F (5, 276) = 2.11, p = .064] or subscales of the SSREIT [F (5, 207) = 1.76, p = .051, Wilks' Lambda = .88, eta = .18] between the three groups, nor were any differences observed on the thirteen subscales of the TSI [F (5, 278) = 1.13, p = .223, Wilks' Lambda = .77, eta = .23]. These results are presented in Appendix F, Table F16.

Significant differences were evident for the experience of the new joiner on the standardised total [F (2, 181) = 3.07, p = .049] and branch scores [F (2, 181) = 3.51, p = .001, Wilks' Lambda = .86, eta = .27] but not on the unstandardised total [F (2, 181) = 0.08, p = .925] or branch scores [F (2, 181) = 0.88, p = .532, Wilks' Lambda = .96, eta = .14]. Post hoc tests revealed that graduates had higher scores on overall EI as well as the facilitation, understanding and managing branches of the standardised MSCEIT scores than experienced hires with more than 2 years work experience. See Table 51 for further details. These results are therefore most likely the result of the age adjustment to North American norms undertaken for the standardised scores than actual differences in the sample.

Table 51: Experience of the new joiner - differences on the standardised versus the unstandardised total scales and subscales of the MSCEIT

Scale	Graduate		Experienced hire with 1-2 years experience		Experienced hire with more than 2 years experience		ANOVA	Effect size (eta)
	M	SD	M	SD	M	SD		
MSCEIT *(Standardised scores)*	n=55		n=26		n=103			
Overall EI Score	94.67	14.99	90.60	11.87	89.23	12.49	F (2,181) = 3.065, p = **.049***	.18
Perception Branch	94.96	19.81	91.59	14.69	94.54	13.96	F (2,181) = 0.409, p = .665	.06
Facilitation Branch	102.59	15.08	97.72	14.82	96.12	15.49	F (2,181) = 3.233, p = **.042***	.18
Understanding Branch	97.61	12.41	94.39	11.43	89.60	10.50	F (2,181) = 9.293, p = **.000*****	.30
Managing Branch	97.45	13.75	94.75	10.88	90.30	10.34	F (2,181) = 7.655, p = **.001****	.28
MSCEIT *(Unstandardised scores)*								
Overall EI Score	.47	.06	.47	.06	.47	.06	F (2,181) = 0.077, p = .925	.04
Perception Branch	.48	.12	.48	.12	.50	.10	F (2,181) = 0.825, p = .440	.09
Facilitation Branch	.48	.07	.46	.09	.46	.08	F (2,181) = 0.524, p = .593	.08
Understanding Branch	.52	.06	.51	.06	.51	.07	F (2,181) = 0.606, p = .547	.08
Managing Branch	.41	.07	.42	.06	.41	.07	F (2,181) = 0.229, p = .796	.05
***p < .001 **p < .01 *p < .05								

No significant differences were found on the total scale [F (2, 279) = 0.55, p = .579] or subscales of the SSREIT [F (2, 279) = 0.92, p = .498, Wilks' Lambda = .97, eta = .11] between the three groups, nor were any differences found on the thirteen subscales of the TSI [F (2, 281) = 1.17, p = .261, Wilks' Lambda = .90, eta = .23]. These results are presented in Appendix F, Table F17.

5.4.3.2. Gender differences: Examining the stereotype of the emotionally superior female

Gender differences in both EI and thinking styles are components that assist in providing construct validity. Women are considered to be better equipped to recognise facial emotions and distinguish amongst emotions and women are perceived to provide better emotional support in social settings (Day and Carroll, 2004). With regard to thinking styles, women have been found to score differently on the thinking styles subscales and therefore different norms were developed for males and females (Sternberg, 1997). An independent samples t-test was conducted to compare the differences in the mean

scores on the total scale and sub scales of the MSCEIT, SSREIT and the subscales of the TSI for males and females.

Men were found to score higher than women on the standardised MSCEIT total score and branch scores. The findings were considered to be unusual, however, as the unstandardised scores that had not been adjusted for age, gender or ethnicity revealed significant differences between men and women on only the managing emotions branch score which is more consistent with the underlying theory of the MSCEIT, and again brings into question the accuracy of the North American norms scores used for the adjustment of the standardised results. These comparisons are presented in Table 52.

Table 52: Gender differences on the standardised versus the unstandardised total scales and subscales of the MSCEIT

Scale	Female		Male		T-Test	Effect size (eta)
	M	SD	M	SD		
MSCEIT *(MHS standardised scores)*	n=103		n=122			
Overall EI Score	87.88	12.96	91.71	13.47	t (220)= -2.149 , p = **.033***	.14
Perception Branch	91.14	13.61	95.43	16.53	t (222)= -2.098 , p = **.037***	.14
Facilitation Branch	94.84	15.05	99.80	16.71	t (220)= -2.308 , p = **.022***	.15
Understanding Branch	89.81	11.30	94.54	11.50	t (222)= -3.092 , p = **.002****	.20
Managing Branch	89.53	10.53	94.43	12.55	t (222)= -3.131 , p = **.002****	.21
MSCEIT *(Unstandardised scores)*						
Overall EI Score	.47	.06	.46	.06	t (220) = 1.510, p = .132	.10
Perception Branch	.49	.11	.48	.11	t (222) = 0.608, p = .544	.04
Facilitation Branch	.47	.08	.45	.09	t (220) = 1.090, p = .277	.07
Understanding Branch	.51	.07	.51	.06	t (222) = 0.400, p = .690	.03
Managing Branch	.42	.07	.39	.08	t (222) = 2.437, p = **.016***	.16
***p < .001 **p < .01 *p < .05						

Differences between men and women on the SSREIT, which are presented in Table 53, were found to be more consistent with expectations as women performed better than men on the overall scale of the SSREIT as well as the appraisal subscale. However, the magnitude of the effect sizes were small, with eta ranging from r = 0.13 to r = 0.22. With regard to thinking styles, only two significant differences were observed on the legislative and liberal subscales, with men scoring higher on both these subscales than women. The effect size for these results were also small (r = .18 and r = .20 respectively). The results provided by Murphy (2006) also only revealed one significant difference between genders on the

oligarchic subscale which suggests that there may not be much difference in the thinking styles between genders for South African samples.

Table 53: Gender differences on the total scales and subscales of the SSREIT and TSI

Scale	Female		Male		T-Test	Effect size (eta)
	M	SD	M	SD		
SSREIT	n=142		n=140			
Overall EI Score	136.73	12.52	133.40	12.78	t (280) = 2.207, p = **.028***	.13
Optimism	4.35	.39	4.27	.43	t (280) = 1.703, p = .090	.10
Appraisal	4.08	.51	3.83	.59	t (280) = 3.801, p = **.000*****	.22
Utilisation	4.00	.57	3.94	.61	t (280) = 0.857, p = .392	.05
Social Skills	3.92	.60	3.90	.58	t (280) = 0.254, p = .800	.02
TSI	n=155		n=153			
Legislative	4.84	.90	5.20	1.00	t (306) = -3.257, p = **.001****	.18
Executive	4.74	1.00	4.68	1.01	t (306) = 0.542, p = .588	.03
Judicial	4.59	1.26	4.73	1.36	t (306) = -0.980, p = .328	.06
Global	3.78	1.08	3.96	1.20	t (306) = -1.335, p = .183	.08
Local	4.42	1.07	4.28	1.19	t (306) = 1.100, p = .272	.06
Liberal	4.80	1.07	5.21	1.02	t (282) = -3.350, p = **.001****	.20
Conservative	4.15	1.16	4.09	1.18	t (306) = 0.455, p = .649	.03
Internal	4.01	1.15	3.95	1.18	t (306) = 0.422, p = .673	.02
External	5.23	1.11	5.39	1.17	t (306) = -1.254, p = .211	.07
Hierarchic	5.39	1.09	5.32	1.21	t (306) = 0.589, p = .557	.03
Monarchic	3.69	1.19	3.76	1.20	t (306) = -0.498, p = .619	.03
Oligarchic	4.20	1.01	4.32	1.13	t (290) = -0.931, p = .352	.05
Anarchic	4.59	1.03	4.59	1.06	t (306) = 0.034, p = .973	.00
***p < .001 **p < .01 *p < .05						

5.4.3.3. Ethnic differences in emotional intelligence and thinking styles

Significant differences between ethnic groups were observed on both the unstandardised total [F (3, 218) = 9.14, p = .000] and branch scores [F (3, 218) = 3.61, p = .000, Wilks' Lambda = .82, eta = .25] as well as the standardised total [F (3, 218) = 4.41, p= .005] and branch scores of the MSCEIT [F (3, 218) = 3.36, p = .000, Wilks' Lambda = .83, eta = .24]. The standardised scores again yielded a significant Box's test of equality of covariance matrices (p = .025) on the MSCEIT branch scores, yet the unstandardised scores revealed a non-significant Box's test (p = .144). Coloured respondents were excluded from the

analysis with the MSCEIT due to a low base size (n=2). The means and standard deviations for the standardised and unstandardised branch and total MSCEIT scores are presented in Table 54.

Table 54: Ethnic differences on the standardised versus the unstandardised total scales and subscales of the MSCEIT

Scale	Black		Indian		White		ANOVA	Effect size (eta)
	M	SD	M	SD	M	SD		
MSCEIT *(Standardised scores)*	n=44		n=40		n=136			
Overall EI Score	84.49	12.79	94.12	14.68	90.63	12.54	F (2,219) = 4.406. p = **.005****	.24
Perception Branch	87.25	13.33	91.35	16.76	96.18	15.00	F (2,219) = 4.28. p = **.006****	.24
Facilitation Branch	96.43	15.51	99.73	18.43	97.40	15.69	F (2,219) = 0.696. p = .556	.10
Understanding Branch	89.59	11.74	97.77	12.53	91.68	10.70	F (2,219) = 3.985. p = **.009****	.23
Managing Branch	93.41	13.19	96.84	13.00	90.56	10.77	F (2,219) = 3.874. p = **.010***	.22
MSCEIT *(Unstandardised scores)*								
Overall EI Score	.43	.07	.45	.06	.48	.06	F (2,219) = 9.143. p = **.000*****	.33
Perception Branch	.43	.11	.45	.10	.51	.10	F (2,219) = 9.096. p = **.000*****	.33
Facilitation Branch	.44	.09	.46	.10	.47	.08	F (2,219) = 1.691. p = .170	.15
Understanding Branch	.47	.08	.50	.06	.52	.06	F (2,219) = 7.789. p = **.000*****	.31
Managing Branch	.38	.09	.39	.07	.41	.07	F (2,219) = 3.499. p = **.016***	.22
***p < .001 **p < .01 *p < .05								

Significant differences between ethnic groups were also observed on the total scale [F (3, 278) = 3.70, p = .012] and branch scores [F (3, 278) = 1.87, p = .035, Wilks' Lambda = .92, eta = .16] of the SSREIT as well as the subscales of the TSI [F (3, 280) = 2.78, p = .000, Wilks' Lambda = .68, eta = .34]. These findings which are presented in Table 55 are contrary to the findings by Murphy (2006) who observed no differences between ethnic groups on either the SSREIT or the TSI.

Table 55: Ethnic differences on the total scales and subscales of the SSREIT and TSI

Scale	Black		Coloured		Indian		White		ANOVA	Effect size (eta)
	M	SD	M	SD	M	SD	M	SD		
SSREIT	n=63		n=11		n=45		n=163			
Overall EI	139.60	12.04	131.18	16.77	133.47	13.65	134.03	12.13	F (3,278) = 3.703, p = **.012***	.20
Optimism	4.49	0.38	4.14	0.57	4.26	0.47	4.27	0.38	F (3,278) = 5.357, p = **.001****	.23
Appraisal	4.05	0.52	3.90	0.83	3.93	0.57	3.93	0.56	F (3,278) = 0.803, p = .493	.09
Utilisation	4.22	0.53	3.84	0.64	3.92	0.57	3.90	0.59	F (3,278) = 5.001, p = **.002****	.23
Social Skills	3.97	0.59	3.89	0.56	3.87	0.61	3.91	0.58	F (3,278) = 0.307, p = .821	.06
TSI	n=73		n=14		n=49		n=172			
Legislative	5.18	1.00	4.80	0.92	4.92	0.95	5.00	0.95	F (3,280) = 2.813, p = **.040***	.17
Executive	4.81	0.96	4.67	1.11	4.90	1.02	4.62	1.01	F (3,280) = 3.215, p = **.023***	.18
Judicial	4.95	1.46	4.33	1.65	4.82	1.42	4.52	1.15	F (3,280) = 11.21, p = **.000*****	.33
Global	3.84	1.27	3.73	1.41	3.71	1.05	3.94	1.09	F (3,280) = 0.761, p = .517	.09
Local	4.55	1.12	4.31	1.19	4.42	1.07	4.25	1.15	F (3,280) = 4.208, p = **.006****	.21
Liberal	5.25	.97	5.18	1.00	5.10	1.00	4.87	1.11	F (3,280) = 2.338, p = .074	.16
Conservative	3.96	1.32	3.94	1.39	4.23	1.15	4.16	1.09	F (3,280) = 0.997, p = .394	.10
Internal	3.68	1.32	3.71	1.35	4.00	1.09	4.12	1.08	F (3,280) = 0.646, p = .586	.08
External	5.48	1.22	5.04	1.38	5.30	1.24	5.26	1.05	F (3,280) = 4.593, p = **.004****	.22
Hierarchic	5.38	1.24	4.96	1.34	5.58	1.23	5.31	1.07	F (3,280) = 4.118, p = **.007****	.21
Monarchic	3.72	1.33	3.67	1.76	3.80	1.19	3.71	1.09	F (3,280) = 2.531, p = .057	.16
Oligarchic	4.04	1.13	4.70	.93	4.61	1.01	4.22	1.04	F (3,280) = 2.68, p = .047	.17
Anarchic	4.61	1.05	4.71	1.31	4.61	1.10	4.57	1.01	F (3,280) = 1.861, p = .136	.14
***p < .001 **p < .01 *p < .05										

5.4.3.4. The potential influence of marital status

No significant differences were observed for the length of time respondents had been with the company on both the standardised total [F (3, 176) = 0.77, p = .515] and branch scores [F (3, 176) = 1.42, p = .152, Wilks' Lambda = .91, eta = .18] as well as the unstandardised total [F (3, 176) = 0.53, p = .665] or branch scores [F (3, 176) = 0.96, p = .488, Wilks' Lambda = .94, eta = .15]. No significant differences were observed on the total scale [F (3, 278) = 0.82, p = .485] or subscales of the SSREIT [F (3, 278) = 1.67, p = .301, Wilks' Lambda = .95, eta = .13] between the three groups, nor were any differences observed on the 13 subscales of the TSI [F (3, 280) = 1.02, p = .435, Wilks' Lambda = .87, eta = .22]. These results are presented in Appendix F, Table F18.

5.5. THE ABILITY OF TRAIT EI VERSUS ABILITY EI TO PREDICT LIFE OUTCOMES IN THE OCCUPATIONAL ENVIRONMENT

The question of relevance and suitability for predicating outcomes in the occupational environment is a prominent question to be considered when selecting either a trait or an ability model of EI for occupational testing. The extent to which both constructs have incremental validity beyond what can be measured by personality or intelligence measures is a critical determinant of the effectiveness of the instruments. This section reports the extent to which trait EI in comparison to ability EI is capable of predicting job satisfaction, career function and leadership status.

5.5.1. Criterion-related validity of emotional intelligence in predicting job satisfaction

5.5.1.1. Relationship between self-reported measures of job satisfaction

Table 56 presents the Pearson's correlation matrix used to analyse the relationship between the various items that measure job satisfaction. Overall satisfaction was found to display a significant positive relationship to all the measures except for resignation status, and overall satisfaction measured again after one year remained positively related to most of the variables. Intent to stay and willingness to recommend the company were furthermore related to all the measures, except for willingness to recommend, which was unrelated to resignation behaviour. The daily experience attitudinal measures which appeared to have the least relationships with the other satisfaction variables are the scales ranging from unappreciated to appreciated, and overworked to challenged. Resignation status on the other hand displayed the strongest significant relationships with the satisfaction with workforce and satisfaction with present position items. Smaller significant relationships were observed between the satisfaction with chosen occupation item and the boring versus fun daily experience item.

Table 56: Pearson's correlation matrix depicting the relationships between the variables used to measure job satisfaction

Subscale		1	2	3	4	5	6	7	8	9	10	11
Attitudinal measure - Satisfaction												
1	Overall satisfaction											
2	Overall - After a year	.517**										
3	Workforce	.167*	.323*									
4	Present position	.193*	.177	.532**								
5	Occupation	.245**	.251*	.423**	.424**							
Attitudinal measure - Daily experience												
6	Boring - Fun	.551**	.291*	.172	.300**	.365**						
7	Unappreciated - Appreciated	.394**	.146	.011	.225*	.246*	.662**					
8	Overworked - Challenged	.405**	.149	.151	.170	.246*	.603**	.574**				
9	Uninspired - Passionate	.520**	.352**	.076	.191	.344**	.732**	.644**	.602**			
Cognitive measure												
10	Intent to stay	.497**	.284*	.292**	.342**	.297**	.476**	.376**	.372**	.526**		
11	Recommend	.470**	.392**	.123	.267**	.316**	.434**	.441**	.451**	.512**	.359**	
Behavioural Measure												
12	Resignation status	-.024	.032	.245**	.261**	.150*	.188*	.037	.087	.124	.180*	.138
***p < .001 **p < .01 *p < .05												

5.5.1.2. Thinking styles and job satisfaction

Hypothesis 2.1 was based on the expectation that respondents who reported higher levels of job satisfaction would score significantly higher on type I thinking styles, whereas those reporting lower levels of satisfaction were expected to score significantly higher on type II thinking styles. Table 57 presents the results from the hierarchical regression analysis including the variance accounted for by the controlled variables and the final model, the F value and degree of freedom in the analysis of variance for each final model and the standardised beta coefficients for each of the significant variables that contribute to the final model.

Results indicated that three of the type I thinking styles, specifically the hierarchic, external and anarchic styles, and two of the type II thinking styles, local and oligarchic, were statistically predicted by participant's reported work environment variables over and above their age, ethnicity, length of work and experience of new joiners. The thinking styles groupings used were based on the factors identified in section 5.2.3.2.

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Table 57: Predicting thinking styles from job satisfaction

Subscale	R^2_{adj} (Control)	R^2_{adj}	ANOVA	Standardised Beta coefficients	
Type I styles *(Factor 1, Section 5.2.3.2)*					
Judicial	.081	-	F (4,95) = 3.183, p = .017	*β Ethnicity* *β Join experience*	-.270, p = .006 .285, p = .022
Liberal	.075	-	F (4,95) = 3.005, p = .022	*β Ethnicity* *β Join experience*	-.254, p = .010 .266, p = .033
Hierarchic	.034	.075	F (5,94) = 2.596, p = .030	*β Ethnicity* *β Age* *β Satisfaction - present position*	-.199, p = .048 -.359, p = .013 .236, p = .025
Global	-.018	-	F (4,95) = 0.573, p = .683	-	-
Legislative	.022	-	F (4,45) = 1.552, p = .193	-	-
External	.016	.108	F (5,94) = 3.409, p = .007	*β Join experience* *β DE: Boring - Fun*	.253, p = .040 .317, p = .001
Anarchic	.047	.076	F (5,94) = 2.626, p = .029	*β Ethnicity* *β Join experience* *β Satisfaction - occupation* *β DE: Overworked - Challenged*	-.213, p = .031 .294, p = .019 .196, p = .050 .372, p = .000
Internal	.031	-	F (4,45) = 1.790, p = .137	-	-
Type II styles *(Factor 2, Section 5.2.3.2)*					
Local	.058	.174	F (6,93) = 4.483, p = .000	*β Ethnicity* *β Satisfaction - present position* *β DE: Overworked - Challenged*	-.204, p = .036 -.209, p = .041 .372, p = .000
Oligarchic	-.003	.098	F (6,93) = 2.791, p = .015	*β DE: Unappreciated - Appreciated* *β DE: Overworked - Challenged*	-.240, p = .050 .415, p = .001
Executive	-.014	.035	F (5,95) = 1.711, p = .140	*β DE: Overworked - Challenged*	-.317, p = .001
Conservative	-.016	-	F (4,95) = 0.606, p = .659	-	-
Monarchic	.028	-	F (4,95) = 1.721, p = .152	-	-
Total sample n=100					

The nature of the results were able to provide partial support for the hypothesis, as satisfaction with present position was found to positively predict 4% of the variance in the hierarchic thinking style, the boring versus fun daily experience item was found to predict 9% of the variance in the external thinking style and the satisfaction with occupation as well as overworked versus challenged daily experience variables were found to positively predict 3% of the variance in the anarchic thinking style. In addition, satisfaction with present position contributed negatively to the type II local style and the appreciated versus unappreciated daily experience variable contributed negatively to the type II oligarchic style. The overworked versus challenged daily experience item, on the other hand, contributed positively to both the local and oligarchic styles. Demographic variables that had a strong predictive impact on a number of thinking styles were ethnicity and experience of the new joiner.

5.5.1.3. The influence of emotional intelligence on job satisfaction

To examine the relationship between trait and ability EI and the job satisfaction variables partial correlations were computed controlling for the demographic characteristics, age, gender, ethnicity and new joiner experience. These findings are presented in Table 58. It was expected that both trait and ability EI would be associated with higher levels of self-reported job satisfaction, but that ability EI would account for a larger component in the prediction of job satisfaction than trait EI. Contrary to expectations, none of the MSCEIT scales was related to the job satisfaction variables, with the exception of a moderate relationship observed between occupational satisfaction and the managing emotions branch (r = .458, p = .011).

The total SSREIT scale and all the subscales were positively correlated with a number of the job satisfaction variables excluding overall satisfaction, the boring versus fun daily experience variable, intent to stay, willingness to recommend and actual resignation status. As these last three variables can be considered as measuring intent or actual behaviour, the observed relationship between the self-reported job satisfaction variables and the SSREIT scales may be a function of common method variance.

Table 58: Partial correlation matrix for the total scale and subscales of the MSCEIT and SSREIT with self-reported job satisfaction variables

	MSCEIT					SSREIT				
Subscale	EI	PB	FB	UB	MB	EI	O	A	U	SS
Overall satisfaction	-.295	-.299	-.336	.029	-.029	.100	.194	.070	.093	-.120
Overall - After a year	-.137	-.054	-.280	.070	-.041	.368*	.316	.392*	.126	.294
Workforce	.109	.086	-.056	.071	.198	.134	.229	.150	-.121	.065
Present position	-.227	-.217	-.174	-.246	.116	.465*	.562**	.340	.318	.082
Occupation	-.090	-.166	-.261	-.140	.458*	.254	.345	.197	.087	-.031
Boring - Fun	-.035	-.131	-.145	.121	.161	.177	.299	.086	.103	-.037
Unappreciated - Appreciated	.031	-.106	.168	-.025	.067	.240	.390*	.136	.211	-.076
Overworked - Challenged	.174	.094	.133	.137	.072	.349	.314	.428*	.097	.181
Uninspired - Passionate	-.004	-.121	-.008	.042	.144	.382*	.381*	.278	.395*	.081
Intent to stay	-.105	.048	-.300	-.050	.044	.229	.280	.157	.139	.056
Recommend	-.120	.004	-.328	.147	-.095	.080	.053	.122	-.029	.115
Resignation status	.018	-.007	.126	-.083	-.005	-.052	-.068	.031	-.015	-.036

***p < .001 **p < .01 *p < .05

MSCEIT: EI = Overall EI score, PB = Perceiving branch score, FB = Facilitation branch score, UB = Understanding branch score, MB = Managing branch score
SSREIT: EI = Overall EI score, O = Optimism, A = Appraisal, U = Utilisation, S = Social Skills

To examine the incremental validity of the EI scales in predicting job satisfaction, a series of multiple regression analyses were conducted using the various self-report job satisfaction variables as well as intent to stay, willingness to recommend and resignation status as outcome variables. A logistic regression procedure was used to examine the prediction of resignation status which is a dichotomous variable. The summary for the series of multiple regression analyses is presented in Appendix F, Table F19.

Both the MSCEIT and the SSREIT predicted less than 10 percent of variance in the job satisfaction variables, yet the SSREIT was able to account for significant variance in only three of the job satisfaction variables namely, satisfaction with workforce, occupation and present position whereas the MSCEIT was able to account for significant variance in these three variables as well as intent to stay. These results are presented in Table 59. The lack of predictive ability could be due to the nature of the job satisfaction variables as the items used were not based on existing established instruments, however, Burns, Bastian and Nettlebeck (2007) also reported that the MSCEIT was unable to predict more than 10 percent variance in established life outcome variables and Livingston and Day (2005) identified no relationship between the MSCEIT and life satisfaction and only a small relationship between the emotional perception branch score and job satisfaction ($r = .14$). An additional reason for the lack of relationships identified could be attributed to the low base sizes of these measures.

To determine whether these EI measures are able to predict job satisfaction over thinking style traits, hierarchical regression analyses were carried out on the four job satisfaction variables on which significant differences were identified to control for the TSI as well as the demographic characteristics, gender, ethnicity, join status and age. Table 60 shows that the significant relationship found between the MSCEIT and SSREIT subscales and the satisfaction with workforce variable disappeared when the demographic and thinking styles variables were entered into the model. The MSCEIT was able to account for an additional 8% in the prediction of satisfaction with present position, 11% for satisfaction with occupation and 6% for intent to stay after thinking styles and demographic variables were controlled for, compared to the SSREIT which was able to predict 5%, 6% and 1% more respectively. Although the amount of variance explained in the job satisfaction variables is small, these findings do partially support the hypothesis that EI defined as an ability has a stronger relationship with job satisfaction variables than trait EI variables even after personality traits such as thinking styles have been controlled for.

Table 59: Multiple regression of job satisfaction variables onto emotional intelligence measures

SSREIT			MSCEIT		
Satisfaction with workforce					
$R^2_{adj\ (n=258)}$	.031	Sig.	$R^2_{adj\ (n=165)}$	.045	Sig.
F (4, 264)	3.158	**.015**	F (4, 164)	2.983	**.021**
β Optimism	.257	.001	*β Perception Branch*	.075	.410
β Appraisal	-.007	.931	*β Facilitation Branch*	-.156	.093
β Utilisation	-.059	.444	*β Understanding Branch*	-.111	.216
β Social Skills	-.044	.515	*β Managing Branch*	.259	.002
Satisfaction with present position					
$R^2_{adj\ (n=264)}$	.042	Sig.	$R^2_{adj\ (n=170)}$	.075	Sig.
F (4, 269)	4.026	**.003**	F (4, 169)	4.516	**.002**
β Optimism	.169	.030	*β Perception Branch*	-.036	.690
β Appraisal	.091	.228	*β Facilitation Branch*	-.034	.710
β Utilisation	.032	.669	*β Understanding Branch*	-.181	.040
β Social Skills	-.035	.605	*β Managing Branch*	.303	.000
Satisfaction with occupation					
$R^2_{adj\ (n=262)}$	.072	Sig.	$R^2_{adj\ (n=168)}$	.083	Sig.
F (4, 268)	6.314	**.000**	F (4, 167)	4.879	**.001**
β Optimism	.305	.000	*β Perception Branch*	.150	.093
β Appraisal	-.001	.986	*β Facilitation Branch*	-.119	.189
β Utilisation	-.034	.643	*β Understanding Branch*	-.199	.024
β Social Skills	.017	.792	*β Managing Branch*	.314	.000
Intent to stay					
$R^2_{adj\ (n=157)}$	-.005	Sig.	$R^2_{adj\ (n=124)}$	.068	Sig.
F (4,156)	.815	.517	F (4, 119)	3.238	**.015**
β Optimism	.054	.639	*β Perception Branch*	.030	.774
β Appraisal	-.043	.693	*β Facilitation Branch*	-.275	.010
β Utilisation	.102	.347	*β Understanding Branch*	-.063	.530
β Social Skills	.045	.631	*β Managing Branch*	-.047	.622

Table 60: Hierarchical regression analysis using emotional intelligence, thinking styles and demographic measures as predictors of job satisfaction variables

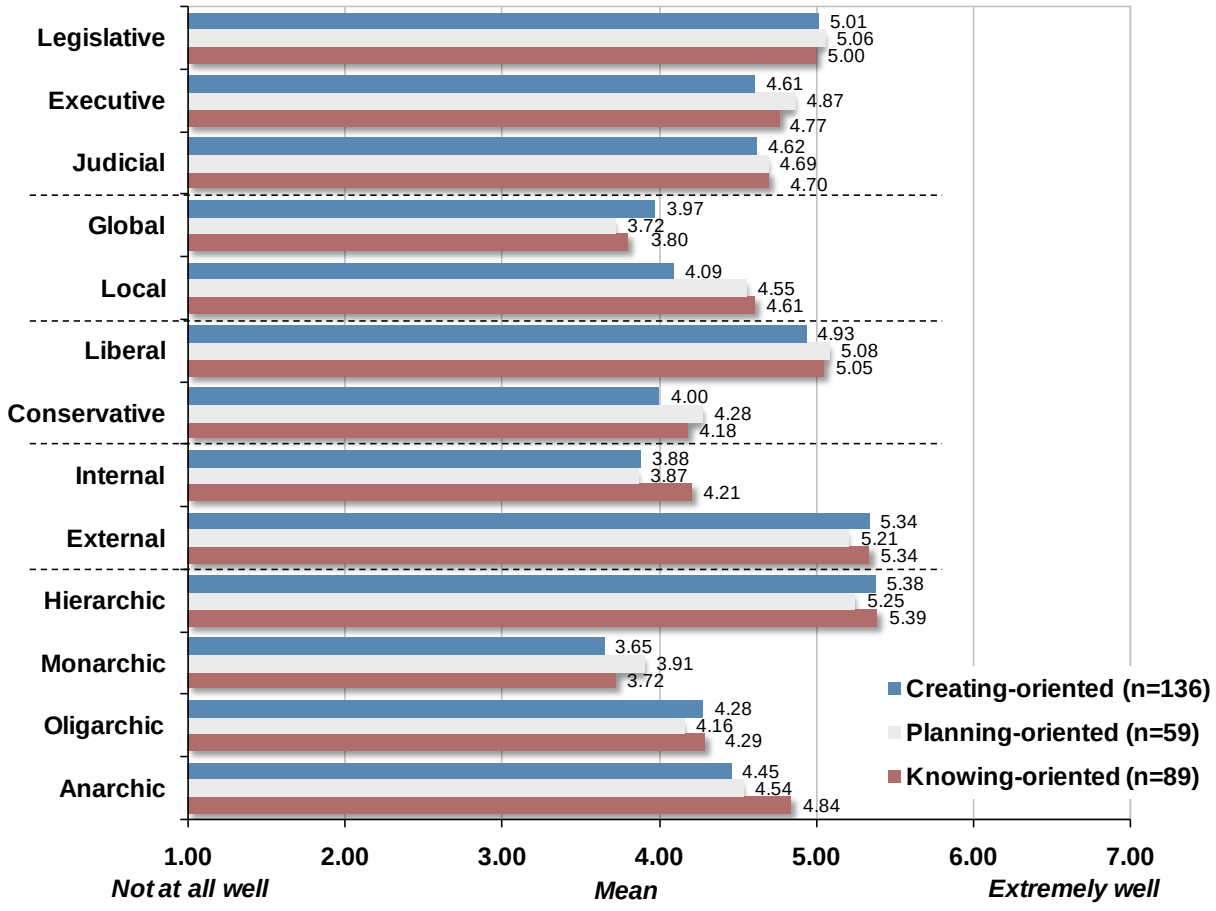
		SSREIT subscales (O, A, U, S)				MSCEIT subscales (PB, FB, UB, MB)			
Model	**Predictors**	**R**	**R^2_{adj}**	**ΔR^2**	**Sig.**	**R**	**R^2**	**ΔR^2**	**Sig.**
Satisfaction with workforce		n=258				n=163			
1a	Age, Gender, Ethnicity, Join status	.095	-.007		.678	.072	-.020		.935
1b	Age, Gender, Ethnicity, Join status, LS, JS, GS, LIS, HS, IS, ES, AS, EXS, LOS, CS, MS, OS	.241	-.008	.049	.605	.268	-.037	.067	.838
1c	Age, Gender, Ethnicity, Join status, LS, JS, GS, LIS, HS, IS, ES, AS, EXS, LOS, CS, MS, OS, SSREIT or MSCEIT subscales	.314	.019	.041	.225	.380	.017	.073	.321
Satisfaction with present position		n=264				n=168			
2a	Age, Gender, Ethnicity, Join status	.226	.036		.009	.213	.022		.107
2b	Age, Gender, Ethnicity, Join status, LS, JS, GS, LIS, HS, IS, ES, AS, EXS, LOS, CS, MS, OS	.363	.072	.081	.005	.337	.013	.068	.331
2c	Age, Gender, Ethnicity, Join status, LS, JS, GS, LIS, HS, IS, ES, AS, EXS, LOS, CS, MS, OS, SSREIT or MSCEIT subscales	.429	.114	**.052**	.000	.439	.077	**.079**	.043
Satisfaction with occupation		n=262				n=166			
3a	Age, Gender, Ethnicity, Join status	.020	.005	.020	.267	.143	-.004	.020	.501
3b	Age, Gender, Ethnicity, Join status, LS, JS, GS, LIS, HS, IS, ES, AS, EXS, LOS, CS, MS, OS	.101	.038	.081	.062	.392	.057	.133	.076
3c	Age, Gender, Ethnicity, Join status, LS, JS, GS, LIS, HS, IS, ES, AS, EXS, LOS, CS, MS, OS, SSREIT or MSCEIT subscales	.164	.091	**.063**	.002	.517	.160	**.113**	.001
Intent to stay		n=157				n=110			
4a	Age, Gender, Ethnicity, Join status	.214	.020		.129	.246	.025		.159
4b	Age, Gender, Ethnicity, Join status, LS, JS, GS, LIS, HS, IS, ES, AS, EXS, LOS, CS, MS, OS	.448	.103	.155	.012	.505	.117	.194	.033
4c	Age, Gender, Ethnicity, Join status, LS, JS, GS, LIS, HS, IS, ES, AS, EXS, LOS, CS, MS, OS, SSREIT or MSCEIT subscales	.455	.083	**.006**	.042	.556	.145	**.055**	.022

TSI: LS = Legislative style, JS = Judicial style, GS = Global style, LIS = Liberal style, HS = Hierarchical style, IS = Internal style, ES = External style, AS = Anarchic style, EXS = Executive style, LOS = Local style, CS = Conservative style, MS = Monarchic style, OS = Oligarchic style
MSCEIT: EI = Overall EI score, PB = Perceiving branch score, FB = Facilitation branch score, UB = Understanding branch score, MB = Managing branch score
SSREIT: EI = Overall EI score, O = Optimism, A = Appraisal, U = Utilisation, S = Social Skills

5.5.2. Predicting cognitive climate from thinking styles

Discriminant analysis was used to examine the possibility that thinking styles are able to distinguish between employees working in different cognitive climates. The three types of cognitive climates utilised in the research include a knowing-oriented cognitive climate, a planning-oriented cognitive climate and a creating-oriented cognitive climate. The means for the three groups on the thirteen thinking styles are shown in Figure 27.

Figure 27: Mean scores for the different cognitive climates on the thirteen subscales of the TSI



Base = Respondents who completed TSI

The assumptions of a discriminant analysis require, inter alia, an initial MANOVA test to confirm whether there are real differences between the three groups. The overall multivariate test was statistically significant at the $p < .05$ level [$F(2, 281) = 2.21$, $p = .001$, Wilks' Lambda = .82, eta = .31] which supports an attempt to classify individuals into different cognitive climate groupings. On examination of the results from the discriminant analysis it was apparent that the group differences shown by the MANOVA can be explained in terms of two underlying dimensions. The first function ($\chi^2_{26} = 55.587$, $p = .001$) explains 60% of the variance and according to the functions at group centroids, appears to discriminate the creating-oriented cognitive climate from the planning and knowing-oriented climates. The second function ($\chi^2_{12} = 22.210$, $p = .035$) explains 40% of the variance and appears to discriminate the planning-oriented cognitive climate.

Table 61: Classification Function Coefficients and Structure matrix for the thirteen thinking styles

Standardized Canonical Discriminant Function Coefficients			Structure Matrix		
	Function			Function	
	1 (Planning climate)	2 (Creating climate)		1 (Planning climate)	2 (Creating climate)
Local	.525	.197	Local	.627*	.292
Anarchic	.622	-.305	Anarchic	.447*	-.180
Global	-.401	-.129	Global	-.383*	-.187
Internal	.306	-.693	Internal	.300*	-.122
External	.003	-.335	External	-.159*	-.141
Liberal	.370	.402	Liberal	.149*	.114
Monarchic	-.237	.864	Monarchic	.022	.529*
Executive	.055	.048	Executive	.159	.215*
Hierarchic	-.338	-.327	Hierarchic	-.139	-.203*
Conservative	.023	.189	Conservative	.146	.180*
Legislative	-.432	.334	Legislative	-.091	.157*
Judicial	-.179	.244	Judicial	-.013	.124*
Oligarchic	-.123	-.434	Oligarchic	.017	-.083*
Total sample n=284					
Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions Variables ordered by absolute size of correlation within function. *. Largest absolute correlation between each variable and any discriminant function					

On examination of the standardised discriminant variate coefficients presented in Table 61 it was revealed that the dominant predictor variables of the first function were the local style with a coefficient of 0.525 and the anarchic style with a coefficient of 0.622. The dominant prediction variables of the second function were the monarchic style with a coefficient of 0.864 and the internal style with a coefficient of -0.693. However, the variables which contribute most to group separation in function 2 are the monarchic and executive styles. According to the structure matrix, the only type I thinking styles which significantly

contributes towards the discrimination of the creating-oriented climate in a positive direction is the liberal style. On the other hand, three of the type II styles contribute positively towards the planning-oriented climate, specifically the monarchic, executive and conservative styles, and the type I hierarchic style contributes in a negative direction to this climate. This provides partial support for the research hypothesis which expected type I thinking styles to contribute more towards the prediction of the knowing and creating climates and type II thinking styles to contribute more towards the prediction of the planning-oriented climate.

5.5.3. Differences in emotional intelligence depending on job function

Results from an independent samples t-test on the total scale and subscales of the MSCEIT confirmed the hypothesis that job functions which require more affect laden information and emotional problem solving will have higher levels of emotional intelligence than job functions which require more technical information.

Table 62: Differences on the standardised versus the unstandardised total scales and subscales of the MSCEIT for job functions that have more affective requirements compared to functions which have more technical requirements

Scale	Affective Requirements		Technical Requirements		T-Test	Effect size (eta)
	M	SD	M	SD		
MSCEIT *(MHS standardised scores)*	n=109		n=90			
Overall EI Score	93.74	12.34	87.24	13.35	t (195)= 3.364 , p = **.002****	.22
Perception Branch	94.70	14.08	93.13	16.89	t (173)= 4.372 , p = .482	.05
Facilitation Branch	101.05	14.15	95.37	16.84	t (195)= 3.384 , p = **.011***	.18
Understanding Branch	96.55	11.68	88.96	10.09	t (197)= 2.126 , p = **.000*****	.33
Managing Branch	95.00	12.36	90.10	11.24	t (197)= 0.101 , p = **.004****	.20
MSCEIT *(Unstandardised scores)*						
Overall EI Score	.50	.10	.48	.11	t (195) = 1.343, p = **.000*****	.25
Perception Branch	.48	.07	.45	.09	t (197) = 2.980, p = .173	.10
Facilitation Branch	.53	.06	.49	.07	t (155) = 10.436, p = **.018***	.19
Understanding Branch	.41	.07	.39	.08	t (197) = 0.301, p = **.000*****	.25
Managing Branch	.50	.10	.48	.11	t (197) = 0.536, p = .065	.13
***p < .001 **p < .01 *p < .05						

Respondents who worked in job functions with greater affective requirements scored higher on overall EI as well as all the branch scores except for the perception branch compared to respondents who worked in job functions with greater technical requirements. These results were observable on both the standardised and the unstandardised scales of the MSCEIT. The results of these comparisons are presented in Table 62. No significant differences were evident for the mean scores, however, on the total scale or subscales of the SSREIT. The means and standard deviations for the different job functions on the SSREIT are presented in Appendix F, Table F20.

5.5.4. Thinking styles, emotional intelligence and levels of management

An independent samples t-test was used to determine whether differences in EI could be identified for respondents who were in management positions compared to those who were not. The results of the analysis could not confirm the hypothesis as no differences in EI could be found for managers versus non-managers on either the MSCEIT or SSREIT subscales. As management performance was not measured, these results do not make any inferences about the relationship between EI and management, only that within the present sample managers and non-managers do not differ significantly in terms of EI.

One difference was observed on the subscales of the TSI between managers and non-managers, however, Managers (M = 4.41, SD = 1.12) were observed to score higher on the local thinking style than non-managers [M = 4.02, SD = 1.19; t (306) = -2.666, p = .008]. In addition, non-managers (M = 4.28, SD = 1.24) were observed to score higher on the global thinking style than managers [M = 3.80, SD = 1.11; t (306) = 2.158, p = .032]. The magnitude of the effect size for these differences was small (r = .15 and r = .12 respectively). The detailed results are presented in Appendix F, Table F21.

CHAPTER 6
DISCUSSION OF RESULTS AND CONCLUSIONS

As an emerging field, the concept of EI has been enthusiastically examined yet few boundaries have been developed that guide the growth of empirical knowledge in a coherent and concise direction. The aim of this study was to contribute towards clarifying the nature of EI specifically with regard to the trait versus ability EI distinction. A further aim of the study was to examine the incremental validity of trait EI compared to ability EI in predicting real life outcomes, such as job satisfaction.

6.1. SUMMARY OF THE STUDY

The primary focus of the study was to critically evaluate the EI construct operationalised as either an ability or a trait by examining the relationship with a conceptually related measure of trait cognitive thinking styles, to determine whether a clear distinction can be made between the constructs and thereby provide support for the hypothesis that they should be seen as independent and unique concepts. The study utilised the Mayer-Salovey-Caruso Emotional Intelligence Test Version 2 (MSCEIT V2.0) as a measure of ability EI and the Schutte Self-Report Emotional Intelligence Test (SSREIT) as a measure of trait EI. In addition the two instruments were compared to a measure of cognitive thinking styles, which have been defined as a lower order personality trait, to determine whether they can be sufficiently distinguished from alternative personality constructs to be considered as measuring a component of cognitive abilities.

The study used an exploratory correlational design and was conducted on a sample of 352 employees from a large and diverse South African consulting firm, obtained using a non-probability purposive sampling method. The MSCEIT V2.0 measures one general level of EI as well as two area scores, four branch scores, and eight task scores. The overall EI score and the four branch scores formed the basis of the analysis of the study. The SSREIT measures one general level of EI, however, four subscales that were identified during the factor analysis procedure were used in the analysis to add depth to the results. The Thinking Styles Inventory (TSI) (Sternberg & Wagner, 1992), which was the instrument used to measure cognitive thinking styles, measures thirteen categories of thinking styles.

The research was reported in two successive stages. The first stage of the research study presented a critical review of the validity and reliability of the MSCEIT and the SSREIT and focused on four aspects. Firstly the factorial validity of the instruments was assessed to determine whether the theoretical structure on which these instruments are based can be empirically replicated. Secondly, the reliability of the instruments was examined to determine whether the instruments demonstrate adequate internal consistency at the total scale and subscale levels. Thirdly, the degree of overlap of the measure of ability EI and trait EI was examined in relation to the measure of thinking styles, to determine whether a single emotional ability factor underlies these two measures, or whether these instruments measure unique constructs. In the fourth component, the construct validity of the instruments was examined by assessing whether theoretically expected differences between groups on variables such as gender, age and level of experience could be observed. The second stage entailed a review of the ability of EI measures to moderate practical outcomes in the occupational environment such as job related satisfaction, resignation behaviour, variations in job functions and levels of management over that of cognitive thinking styles.

This chapter will discuss the research findings for each of the hypotheses of the study in the context of the EI literature and previous studies that have critically examined the validity and reliability of the aforementioned instruments such as Ciarrochi et al., (2000), Petrides and Furnham (2000a) and Palmer et al., (2005). Thereafter the broader implications of the results will be explored. Finally, limitations of the present study and directions for future research will be outlined.

6.2. DISCUSSION OF THE RESULTS

6.2.1. Reliability and validity of the TSI

It is fitting to discuss the findings regarding the reliability and validity of the TSI first. The TSI was adopted as a benchmark against which to assess the distinctiveness of the trait versus the ability measures. The theoretical domain of cognitive thinking styles probes practical intelligence and therefore addresses a component of the same general domain that EI instruments explore. An interesting question to explore would be whether the criticism of the validity and reliability of existing EI measurement instruments have been overly harsh due to the overwhelming popular interest in the concept, in comparison to the discrepancies overlooked in less controversial measurement instruments.

The study utilised the shortened 65 item version of the TSI which has been found in previous research studies to present estimates of internal consistency using Cronbach's alpha that are similar to those obtained with the longer 104 item version (Murphy, 2006; Zhang & Sternberg, 1998; Zhang, 2005b). Two of the subscales presented Cronbach's alpha coefficients that were lower than 0.70, specifically the anarchic subscale which obtained a low Cronbach's alpha coefficient of 0.47 and the monarchic subscale which was still acceptable for research purposes at 0.64. The low internal consistency of these two scales has apparently been improved in the revised TSI-R (Sternberg et al., 2003) which was not utilised in the study. Conclusions drawn from the study regarding the validity and reliability of the TSI would accordingly require reassessment with the revised TSI-R.

The validity of the TSI was supported by the intercorrelations between the thirteen thinking styles which were in the expected direction according to the theory of mental self-government. Scales defined as polar opposites for example, were found to correlate in inverse directions with each other such as the global and local styles and the liberal and conservative styles. Subscales that were described as related were found to be positively associated such as the executive and conservative, and legislative and liberal styles.

The present study is the first research study that has attempted to verify the validity of the claim that the thirteen subscales of the TSI can be grouped into three broad categories and five dimensions, using confirmatory rather than exploratory factor analysis. The results obtained, however, did not provide support for either the five or the three factor models due to negative variance estimates evident in the latent variables. The failure in obtaining a fit for the five factor model probably occurred for two reasons:

- There were only two indicator variables per thinking styles dimension for the levels, scope and leanings latent factors
- Missing data account for approximately 14% of the sample which resulted in a lower than desired sample of 284 respondents for the analysis

The missing data in the TSI occurred as a result of respondents who dropped out of the survey before completing it. As the order of the items was randomised by the online survey tool to prevent bias, the reliability or validity of a single item or scale would not have been affected. Measures were put in place to attempt to prevent respondent drop-out such as eligibility for incentives only on completion of all the questionnaires. Suggestions for reducing drop-out of online surveys in future studies would include conducting the surveys with groups of participants in a single venue either on computers or using traditional paper and pencil methods. Repeat studies with larger samples may also be able to increase the probability of a good fit as the risk of negative variance estimates is highest in small samples when there are only two or three indicators per latent variable (Brown, 2006).

The inadmissibility of the three factor model, on the other hand, was also due to the lack of a positive definite covariance matrix although each of the three latent variables had more than two indicators. This may signal that two of the variables in the model are perfectly correlated with each other, implying that two of the variables may be measuring the same thing (Brown, 2006). A non positive definite covariance matrix may also occur as a result of missing data or when sample sizes are small as a result of sampling fluctuation (Brown, 2006).

In an attempt to explore the reasons for the lack of fit, an exploratory factor analysis method was used to confirm both the three and five factor structures. With regard to the five factor structure, although thinking styles were found to load in the expected directions on the hypothesised five dimensions and the model accounted for approximately 64% of the variance, a number of the subscales were found to cross-load strongly on alternative dimensions. Examination of the three factor model revealed that only 55% of the variance could be explained by the model, leaving 45% of the variance unaccounted for. In addition, a number of the hypothesised type III thinking styles, loaded strongly with either the type I or type II thinking styles.

Confirmatory analysis did reveal an admissible model for the revised two factor model, however, the chi-squared statistic was found to be significant and the CFI and TLI figures were lower than the 0.80 cut-off for an acceptable fit. Similar difficulties have been identified by other researchers who tried to confirm the five or three factor models using exploratory analysis. Thus Zhang (2001b; 2003) suggest that the five dimension and three or even two type models hypothesised by the theory of mental self-government may not be suitable structures for categorising the thirteen styles identified by the theory. It is unfortunate that the present study was unable to utilise the revised TSI-R which has apparently greatly improved the reliability of the subscales (Sternberg et al., 2003), and may as a consequence, reveal a more robust factor structure. The consistency in reliability estimates and the nature of the relationships between the subscales for studies conducted in different regions globally (for example Yeung, 2006; Fer, 2005) seem to confirm that the instrument is able to measure a coherent construct across different social and cultural groups.

6.2.2. Factorial validity of the MSCEIT in comparison to the SSREIT

Contradictory results regarding the nature of the factor structure of both the MSCEIT and the SSREIT identified in previous studies have formed the basis for a number of the concerns about the validity of the constructs on which these measures are based. The emotional intelligence model developed by Salovey and Mayer (1990) and Mayer and Salovey (1997) outlined first three then four interrelated yet hierarchical subcomponents of emotional intelligence that culminate in an overall measure of EI. As both measures are based on this same underlying model, both measures should be able to present evidence of these four components as well as a general factor of EI and hierarchical relationship between them. In this study the structure of these two instruments were tested using both exploratory and confirmatory factor analysis approaches.

The present study could not confirm the one-dimensional factor structure of the SSREIT as claimed by the authors (Schutte et al., 1998) using exploratory factor analysis, finding instead evidence of a four factor structure in the data which supports findings made by researchers such as Palmer (2003), Petrides and Furnham (2000a), Ciarrochi et al., (2000) and Murphy (2006). The item structure of this four factor model does not, however, present a consistent item structure across the aforementioned studies and the reliability of some of the individual items raises questions regarding the suitability of these items in measuring self-reported EI in accordance with the theoretical assumptions on which the model is based. Results from confirmatory analysis furthermore could not reveal a satisfactory fit to the data for either a one factor, three factor, four factor or four factor hierarchical model based on the item structures identified in the present sample as well as in previous studies (Palmer, 2003; Petrides & Furnham, 2000a, Murphy, 2006) using the chi-squared statistic. In addition the results showed evidence of high levels of positive skew and kurtosis which most likely occurred as a result of the lack of negatively worded items in the questionnaire and self response bias which may particularly occur in self-report instruments if respondents perceptions of their own abilities are inaccurate or if they wish to present a favourable image of themselves (Roberts et al., 2001).

Results of recent confirmatory analysis studies (Gignac, 2005; Palmer et al., 2005; Rossen et al., 2008) have raised concerns regarding the structure of the MSCEIT. In addition there has only been one study, conducted by Rossen et al., (2008) with a sample of university students that has examined the MSCEIT as a hierarchic model, which is the structure suggested by the underlying theory. This prompted a review to determine whether satisfactory fit could be identified using the MSCEIT for a one, two and four factor model as professed by Mayer et al., (2003) and whether evidence of a hierarchical structure could be identified in the data.

The results of the study identified that a one factor model reflecting a general score of EI did not provide a good fit to the data using either standardised or unstandardised data. Although the GFI, AGFI, CFI, TLI and SRMR fit indices did attain acceptable levels, the chi-squared statistic was significant (Bollen-stine $p < .05$) and the normed chi-squared statistic was high at 2.79 for the unstandardised results and 3.08 for the standardised results. On the other hand, all the loadings of the subscales were found to be positive and significant which does suggest the presence of a general factor of EI, a finding that correspondents with the results of Rossen et al., (2008). The findings from the oblique two factor model were similar to the one factor model and did not improve the overall fit to the data which suggests that neither the general EI score nor the distinction between two areas of EI are valid for assessment of EI with the present sample.

The fit provided by both the oblique four factor model which reflected the four branches of the ability model and the hierarchic four factor model which reflected the four branches and two areas of the model did result in a satisfactory fit to the data according to the chi-squared statistic (Bollen-stine $p > .05$). In both cases, however, factor loadings greater than 1.0 were evident with both the standardised and unstandardised data which suggests negative residual variance in the models and implies that the branches may be difficult to distinguish from one another. As these findings are similar to the conclusions reached by previous researchers (Gignac, 2005; Palmer et al., 2005; Rossen et al., 2008), it appears that the MSCEIT does lack structural fidelity.

As mentioned by both Rossen et al., (2008) and Palmer et al., (2005) the non-positive definite matrices identified in the four factor and hierarchic models may be a result of only two indicators contributing towards each factor and as a result, three to four indicators should ideally be used to account for each latent factor (Bollen, cited in Palmer et al., 2005). As the MEIS consisted of a greater number of items and scenarios designed to measure each branch of EI, it may be worthwhile to reassess the structure of the MEIS to determine whether some of these components could not be reintegrated into the MSCEIT to strengthen the structure.

A larger issue that needs to be raised at this point is the assumption of multivariate normality which is required by the maximum likelihood estimation method used for the confirmatory analysis procedure by the present research study as well as the previous studies. A dilemma arises as a result of conclusions reached in a study by MacCann et al., (2003) which identified that consensually scored tests have very high levels of kurtosis and negative skew and therefore, statistical analysis assuming multivariate normality cannot be validly used. MacCann et al demonstrated that scores could be normal only if scale reliability is low so that different people obtain high scores on different items and therefore, tests based on consensus scoring cannot be both reliable and normally distributed. As a result, even though maximum likelihood estimation has been reported to be fairly robust against violations of normality (McDonald & Ho, 2002), the research results from not only confirmatory analysis studies but all research

with the MSCEIT which uses data analysis measures that assume multivariate normality are suspect. This is an issue that cannot be resolved within the context of the present research study and requires debate regarding whether the techniques used to assess the construct validity of the MSCEIT at present are sufficiently robust to allow for a fair assessment.

In summary, the assessment of the SSREIT, within the limitations of the present study, has not shown sufficient evidence of robust, theoretically defensible factor structure. In order to enhance the potential for obtaining an appropriate factor structure, the SSREIT appears to require a thorough review of the theoretical basis of the measure and the content of the items used to assess the four identified components of EI. In addition, there are several methodological differences that may contribute to differences in the observed item structures of the measurement instrument. As the branches of EI are theoretically interrelated, for example, assessment of the factor structure of the instrument should be based on oblique rather than orthogonal techniques. In a number of studies however (Ciarrochi et al., 2000; Petrides & Furnham, 2000a), this has not been the case, including the original study used to design the measurement instrument (Schutte et al., 1998). A recommendation for future research would be to reassess the original 62 items on which the SSREIT was based using an oblique rotation to determine if a more cohesive set of items can be identified for the four hypothesised subscales and the instrument overall. The measure would also benefit from the inclusion of items that would enhance the robustness of the measure and reduce bias such as a larger number of negatively worded items and items developed to assess self-response bias.

On the other hand, it is uncertain whether the identification problems with the MSCEIT arise from the items or actual item structure or whether the problems lie with the scoring procedure used to score the results. Re-assessment of the impact of analysis methods that have been used to examine the validity of the MSCEIT in the present research study as well as previous research results that are based on assumptions of normality in the data may be required. Reviews of alternative scoring methods to reduce the bias in the data and improve reliability, such as the recent study by MacCann, Roberts, Matthews, and Zeidner (2004) who examined the influence of the Method of Reciprocal Averages (MRA) scaling as an alternative scoring technique for the MSCEIT, may also succeed in improving the interpretability and overall validity of the measurement tool.

6.2.3. Reliability and internal consistency of the SSREIT in comparison to the MSCEIT

The reliability of the measurement instruments is the domain in which self-report measures have a clear advantage over ability measures. The present study identified that the SSREIT displayed a high Cronbach's alpha of 0.89, which is consistent with previous findings that have continuously placed the reliability of the SSREIT around the 0.90 level. The reliability of the MSCEIT on the other hand, measured using split-half reliability measures, only reached a satisfactory level of 0.73 which is much lower than the scores provided by the authors (Mayer et al., 2003). Although reliability scores above 0.6 are sufficient for research, scores that meet or exceed 0.90 are preferable for use in applied settings (Matthews, Zeidner, & Roberts, 2007). The overall scale of the MSCEIT does not therefore appear to be appropriate for use in contexts such as personnel selection.

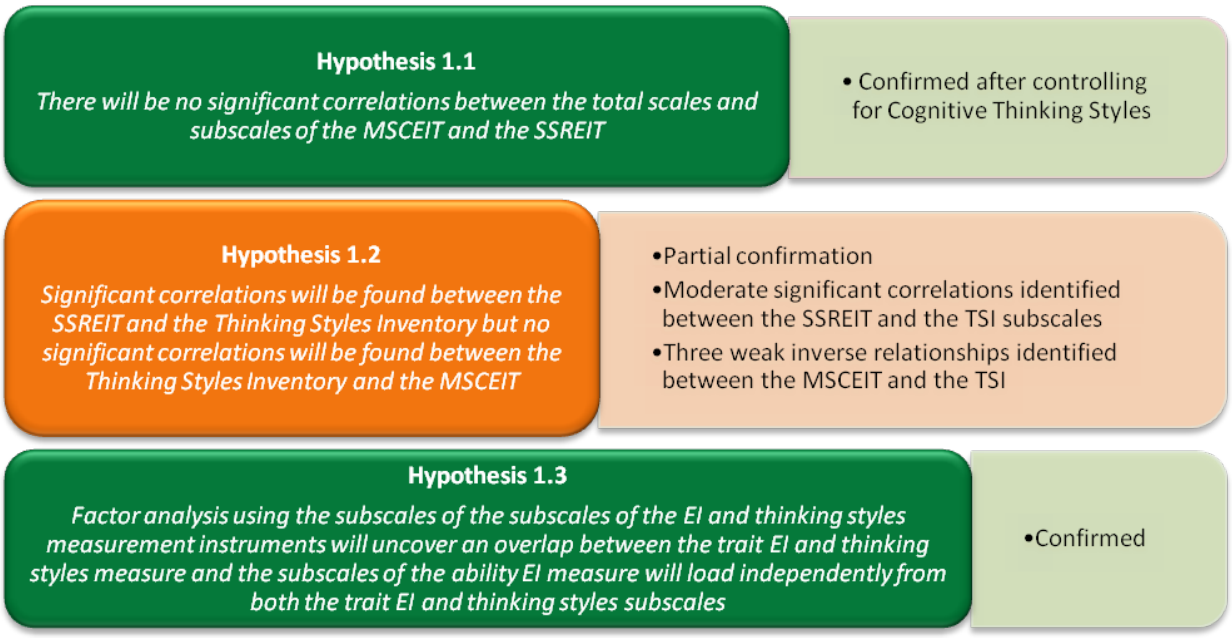
The subscales of the SSREIT identified in the present study also indicated reasonable internal consistencies ranging from 0.72 for the appraisal subscale to 0.82 for the optimism subscale. Test re-test reliability examined after 12 months also supported the reliability of the instrument as scores were found to range from 0.58 for the appraisal subscale to 0.67 for the optimism subscale and 0.64 for the overall EI score. Although the subscales of the SSREIT that were identified appear to be reliable according to Cronbach's alpha, the lack of consistency with regard to item structure between studies brings into question the ability of the SSREIT to accurately measure the EI construct according to the underlying theoretical structure.

The split-half reliability scores for the MSCEIT were lower than required with the branch scores ranging from 0.53 for the facilitation branch to 0.64 for the managing branch and the task scores ranging from 0.47 for the blends task to 0.91 for the pictures task. A comparison of the reliability findings of the MSCEIT to an assessment conducted on a South African student sample by Van Staaden (2001) revealed that a number of the items which presented low corrected item-total correlations in the present study displayed low factor scores in the study conducted by Van Staaden, which suggests that either the items are being misinterpreted within the South African cultural context, or that the items themselves may be faulty. As only these two studies have examined these issues with South African samples, the findings may not be reflective of the South African population as a whole. Additional research with more representative South African samples and cultural groupings from which the MSCEIT norms were developed is required to further explore the reasons for these findings and determine whether one or both of these inferences can be confirmed. Either way, the reliability of the MSCEIT may be improved by increasing the number of items within the subscales as well as more rigorous item development or review (Matthews et al., 2007).

The tendency for South African respondents to score significantly below the North American mean (Gallant, 2005) which was confirmed by the results of the present study for all the subscales excluding the faces and facilitation tasks, also results in concerns regarding the reliability of the MSCEIT items as well as the scoring procedure across cultural boundaries. The effect size for these differences was large with eta exceeding 0.40 for ten of the fifteen scores. These findings bring into question all the results of the MSCEIT obtained specifically using the standardised scores and the tool is unlikely to be beneficial for use within practical contexts in South Africa until the problems with the normative scoring procedure is resolved.

6.2.4. Discriminant validity of the trait versus ability EI distinction in relation to cognitive thinking styles

The key component of the study was to assess the degree of convergence between EI conceptualised as a trait and EI conceptualised as an ability, to establish whether they can be seen as tapping into one concept or whether there is support for drawing a distinction between them. Three research hypotheses were examined in this regard:



The results of the analyses provided substantial support for the distinctiveness between trait EI, measured with the SSREIT, and ability EI, measured using the MSCEIT, as not only where there no correlations obtained between the MSCEIT and the SSREIT after thinking styles had been controlled for, but a scale level exploratory factor analysis using an oblique rotation revealed that the branch scores of the MSCEIT loaded separately from both the SSREIT subscales and the thirteen subscales of the TSI.

Trait EI has been identified in research as a distinct, compound construct that lies at the lower levels of personality hierarchies (Petrides et al., 2007b), which is similar to the definition of thinking styles which have also been identified as a lower order personality trait (Zhang, 2002c). The results from the study supported this categorisation of both measures as the SSREIT was found to correlate strongly with the TSI subscales, however, none of the correlations exceeded a correlation of 0.5 which suggests that the measures are not so strongly correlated that they are measuring the same construct. A surprising finding was that the subscales of the SSREIT loaded on the same factor as the type I subscales of the TSI identified in the factor analysis of the model, and the type II subscales loaded independently on their own factor. These findings support the distinction made between the two thinking styles factors identified in the study and also suggests that the relationship between these measures is not merely a result of common method variance.

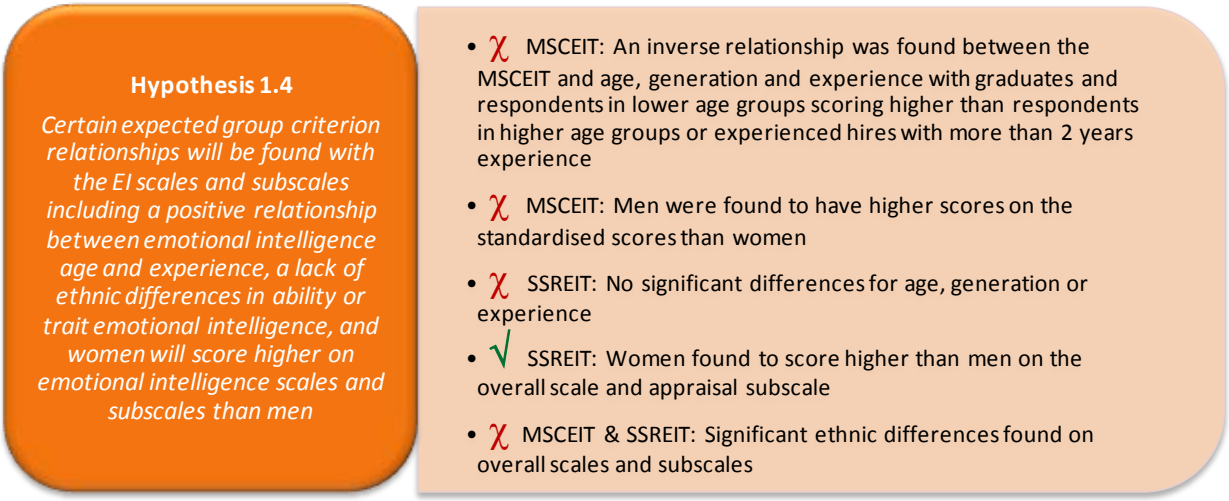
Previous research that examined the relationship between the SSREIT and the TSI (Murphy, 2006) has identified a series of positive correlations between high EI and the legislative, judicial, liberal, hierarchical, anarchic and internal styles as well as a negative correlation with the conservative style. When examined in light of the present findings, it appears as though high levels of EI are strongly associated with type I styles but low EI is not particularly related to type II styles. This supports the assumption of the theory of mental self-government that styles are continuous rather than dichotomous and neither good nor bad, but rather that the effectiveness of the style depends on the task that is being performed and the situation in which that task is being performed (Sternberg, 1994a). This study provides an interesting observation of the nature of the relationship between trait constructs as well as the characteristics that may be associated with people who prefer type I thinking styles and it would be worthwhile to see if the relationship can be established with other measures of trait EI, possibly even measures that have been based on different theoretical structures such as the ECI or the EQ-i.

The three weak, inverse relationships observed between the MSCEIT overall scale and the local TSI subscale as well as the perception branch scale and the local and hierarchic TSI subscales are also unexpected. The local style refers to people who prefer to work with details and may therefore suggest that overemphasis on details may lessen the ability to perceive emotions in the self or others. This explanation, however, seems to be counterintuitive. The inverse relationship with the hierarchic subscale could make sense as this refers to people that distribute attention across several prioritised tasks. People who prefer the hierarchic style may therefore simply be too occupied with cognitive activities to pay

attention to emotional cues. These correlations may also result from the potential relationship between thinking styles and cognitive abilities implied by the definition, as thinking styles are defined as traits that are able to moderate the use of cognitive abilities. As the magnitude of the observed correlations between the MSCEIT and the TSI are low and the factors on which the TSI and SSREIT subscales load and the factor on which the MSCEIT subscales load are inversely correlated, it appears that the MSCEIT does seem to measure a construct that is relatively independent from any form of personality.

6.2.5. Effectiveness of trait versus ability EI in differentiating demographic characteristics

Additional criteria that were assessed in order to demonstrate whether the MSCEIT or SSREIT presented construct validity was the examination of theoretically expected differences between groups. Three criteria formed the basis of the research hypothesis, EI should increase with age and experience, women should score higher on EI than men and there should be no discrimination of EI measures towards people of different ethnic groups or cultures if the measure is to be considered as a universally valid tool.



The results of the analysis could not substantiate the construct validity of either measure because in addition to being unrelated to the SSREIT, the MSCEIT was found to present a different pattern of association to both the SSREIT and the expectations of the study. An inverse significant relationship was uncovered between the standardised scales of the MSCEIT and the age of the respondents. In addition,

respondents in the younger generation Y age group scored significantly higher on the MSCEIT scales than respondents in the older baby boomers category and respondents who had recently graduated presented a higher level of EI according to the MSCEIT than respondents who had two or more years of work experience. The relationship with gender further confounded the results as men were found to have higher scores on most of the subscales than women, which is a finding that is contrary to most studies with the MSCEIT (Goldenberg et al., 2006; Brackett & Mayer, 2003). On the other hand, when the analyses were repeated with the unstandardised scores these differences mostly disappeared. These findings again bring into question the validity of the scoring procedure for use outside North American samples.

The SSREIT on the other hand did present significant differences between men and women, with women scoring higher than men on the overall scale and appraisal subscales. This is contrary to the findings of Murphy (2006) who observed no differences on the total scale with a South African student sample, however, women were observed to score higher on the social skills subscales than men. The different findings on the subscales may be more related to the instability of the factor structure rather than interpretable differences between men and women. In addition, no evidence was observed for the expected relationship with either age or experience, which is consistent with findings with the SSREIT (Goldenberg et al., 2006; Palmer, 2003; Murphy, 2006).

It is uncertain whether the differences in results of the findings of the MSCEIT and the SSREIT with regard to gender is due to a lack of validity on the part of the measurement instrument or whether gender differences may not be as consistent in the differentiation of individuals with high EI from those with low EI as previously thought. In addition, as EI abilities are expected to develop with age and experience the unusual pattern identified with the MSCEIT and the lack of findings with the SSREIT bring into question the validity of both measures in adequately assessing EI within the present sample. If the MSCEIT is to be considered as a more valid tool in measuring EI than the SSREIT, it could be argued that the results stem from the greater emotional awareness that younger generations have regarding the importance of emotions in the workplace, however, this is an assumption that will require additional research to validate.

The findings with regard to ethnic differences also results in a level of concern because both the SSREIT and the MSCEIT standardised and unstandardised subscales showed evidence of discrimination towards different ethnic groups. The pattern of group differences on the SSREIT favoured Black respondents which is a finding supported by Van Rooy et al., (2005) who reported similar results with the SSREIT. The findings with the MSCEIT, on the other hand, favoured White and Indian respondents. These findings are a clear indication that both scales do not measure a construct that is consistent across cultural boundaries.

Although the construct validity of the TSI was not under review in the hypothesis of the study, the theory of mental self-government describes thinking styles as variable throughout the lifespan and socialised by learning and environmental influences (Sternberg, 1997). Thinking styles are therefore expected to differ as a result of age, experience and gender socialisation. Analysis of the TSI subscales identified only two significant gender differences on the legislative and liberal subscales with men scoring higher than women on both. This is supported by previous research that has identified male students as having higher scores on the legislative, judicial, global, liberal (Zhang, 2002c; Zhang & Sternberg, 2000), executive (Zhang, 2002c; Zhang & Sternberg, 2002), monarchic (Zhang, 2002c) and internal styles (Zhang & Sternberg, 2000). As only two subscales provided evidence of thinking styles differences, however, thinking styles may be less variable within occupational environments than those in the typically researched student environments.

Results of the study did not show any relationship with age or experience for the subscales of the TSI which is a finding supported by both Murphy (2006) and Zhang (2001) who also reported no relationships between thinking styles and age. As the lack of differences cannot be attributed to a lack of variation in age or experience across this particular sample, thinking styles may be less dependent on age and experience than previously thought.

Significant ethnic differences were also discovered on six of the thirteen TSI subscales with Black and Indian respondents scoring higher on these scales than White respondents. This is a finding contrary to that of Murphy (2006) who reported no variation in the thinking styles of students as a result of ethnicity or language. As the pattern of differences with regard to these demographic findings are similar for the SSREIT and TSI, who both seem to demonstrate alternative findings to the MSCEIT, it could be argued that these differences are a function of the self-report methodology that the TSI and SSREIT have in common. Regardless of the reason, if either the EI or the thinking styles instruments are to be used reliably outside of the social and cultural groups that were used to develop the instruments, accurate normative scores would need to be developed for those regions.

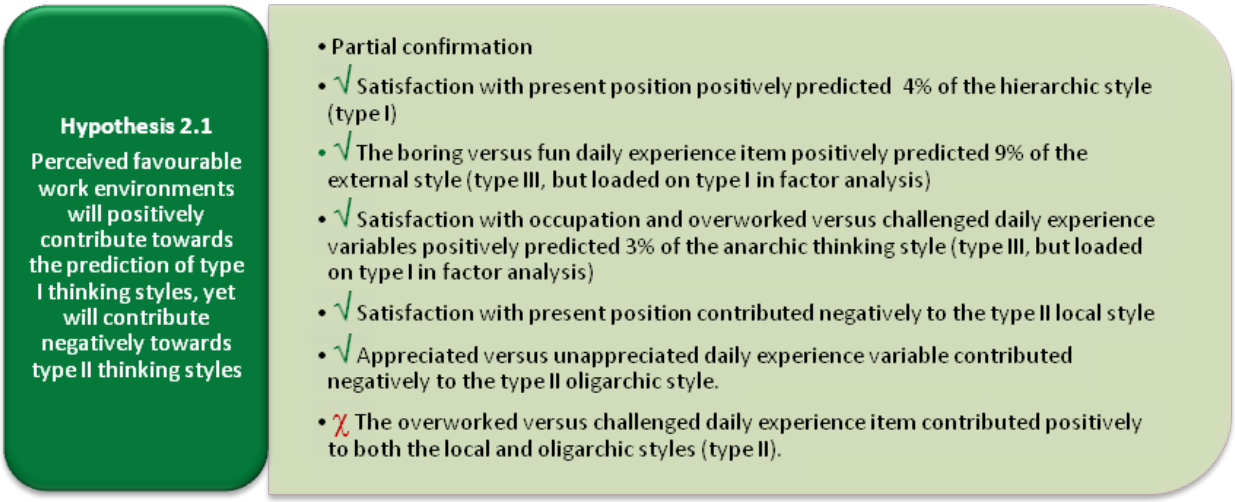
6.2.6. Evaluating the effectiveness of trait versus ability EI in predicting occupational characteristics and outcomes

Emotional Intelligence has to affect a wide array of work behaviours such as job performance, teamwork, satisfaction and so forth to be considered as a valuable construct, however, research into these claims has had mixed results (Zeidner et al., 2004a). As relationships between cognitive abilities, personality and

success have been consistently supported, alternative constructs that claim to fill the gaps left by these measures must demonstrate sufficient predictive power beyond that already demonstrated by existing, well established measures (Zeidner et al., 2004a). Although the present study did not utilise measures of intelligence or personality such as the Big Five, which have already been explored in existing literature (for example Petrides et al., 2007b), the study did seek to identify the extent to which either the MSCEIT or the SSREIT were able to display incremental validity in predicting occupational outcomes beyond the variance accounted for by demographic characteristics as well as an established measures of trait thinking styles.

6.2.6.1. Job satisfaction, thinking styles and emotional intelligence

An array of self-report job satisfaction variables, self-reported perceptions of daily working experience, as well as two cognitive outcome variables, intent to stay with the organisation for a period of time and willingness to recommend the company as a great place to work, were used to assess the job satisfaction of employees. In addition, actual resignation behaviour was assessed, controlling for unavoidable compared to avoidable termination of employment factors. As these variables do not constitute a validated measurement instrument, it was decided not to attempt to develop a composite score, but rather to examine the impact of the individual variables.



A hierarchical regression analysis procedure was utilised to determine whether job satisfaction was indicative of preferences for certain thinking styles in the organisational environment over demographic

characteristics. Perceived favourable work environments were expected to contribute positively to the prediction of type I thinking styles, yet contribute negatively towards type II thinking styles. The two factor model that was identified in the factor analysis of the subscales of the TSI was used as the basis for the assessment of the findings. For this reason the type III external, internal and anarchic subscales were categorised as type I styles and the oligarchic subscale was categorised as a type II style.

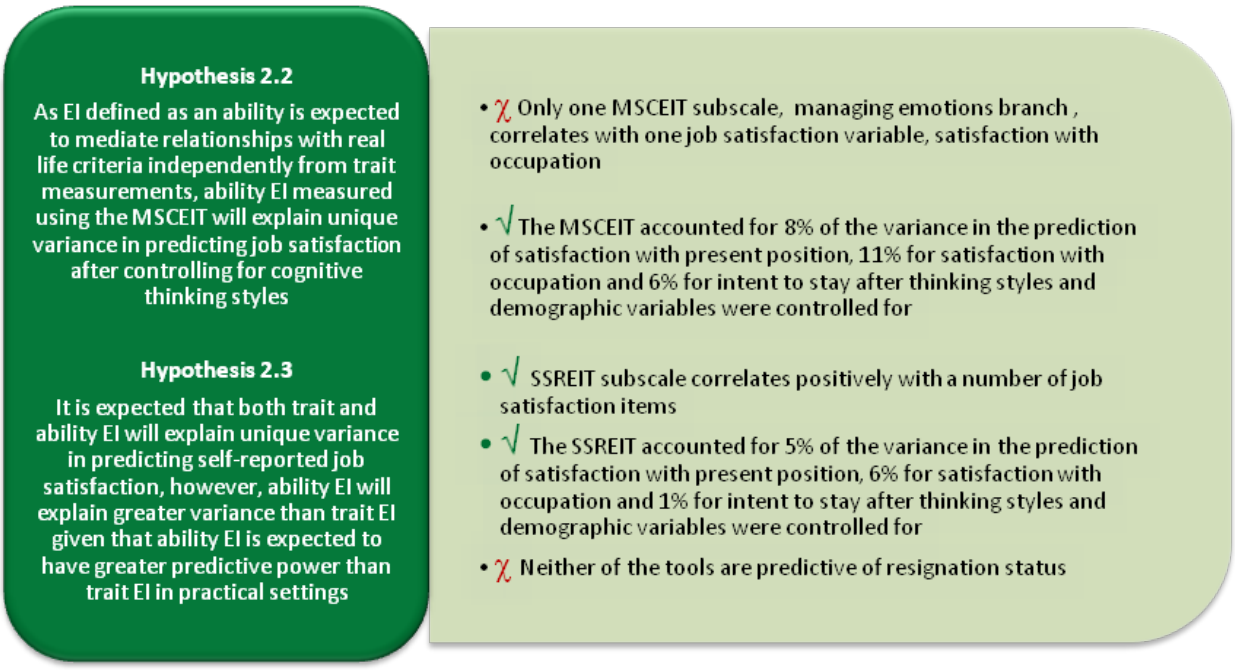
The results of the research partially supported the hypothesis as two of the self-reported satisfaction variables, satisfaction with present position and satisfaction with occupation, as well as two of the self-reported daily experience variables, boring versus fun and overworked versus challenged, predicted between 3% and 9% of the variance in the hierarchic, internal or anarchic type I thinking styles. The impact of the boring versus fun variable on the external style made conceptual sense as a fun work environment would appear to be the ideal environment to encourage styles that result in the building of interpersonal relationships. The influence of satisfaction with occupation and being challenged at work in promoting an anarchic style on the other hand was interesting as it suggests that employees in occupations in which they are satisfied and challenged are more likely to use styles that defy normative and rule bound guidelines, preferring to deal with problems in creative and unique ways. This is a style that would be highly valued in a consulting environment in which creative thinking is required.

Satisfaction with present position was also found to contribute negatively to the local style and the appreciated versus unappreciated daily experience variable contributed negatively to the oligarchic style. A finding that was contrary to expectations, however, was that the overworked versus challenged daily experience items contributed positively to both the local and the oligarchic styles. These findings therefore support the assumption that perceived workplace satisfaction may result in different styles of thinking within the workplace, which is a finding that may interest organisations who wish to stimulate creative thinking in order to promote good performance.

The measure of cognitive thinking styles was utilised both as a benchmark against which to compare the influence of EI, measured using either the trait or the ability model, on practical occupational outcomes. Although thinking styles are not a personality assessment tool, but rather a measure of lower order personality traits, it was decided to examine the dynamics of these constructs rather than personality as the overlap with standard measures of personality and EI as well as occupational performance has been previously explored (for example, Bastian et al., 2005; Burns et al., 2007).

As EI defined as an ability is considered to be independent from all aspects of personality, the MSCEIT should be capable of predicting practical outcomes over that of any form of personality measurement. In addition, if trait EI is to be considered as a conceptually valid construct it should also be able to predict practical outcomes independently from other trait measures. The validity of the assumption that ability EI

is a superior predictor of life outcomes than trait EI will be supported if the MSCEIT is able to predict greater amounts of unique variance in occupational outcomes than the SSREIT after controlling for thinking styles and demographic characteristics. These hypotheses were examined using three steps, a partial correlation to determine the nature and direction of the relationship with the occupational characteristics discussed previously, a multiple regression analysis to determine which of the characteristics could potentially be predicted by either measure and a hierarchical regression analysis with these items to determine whether the instruments could predict unique variance after thinking styles and demographic characteristics had been controlled for.



The lack of correlations between the MSCEIT and all of the job satisfaction variables, except for satisfaction with occupation and the managing emotions branch, suggests that the MSCEIT is not strongly related in any way to either perceptions of satisfaction experienced by respondents or slightly more discernable outcomes such as intentions to stay, willingness to recommend and actual resignation. The SSREIT on the other hand, correlated to a moderate degree with a number of the actual self-report variables. As none of the cognitive or behaviour aspects showed evidence of a correlation, these findings may be the result of common method variance.

The multiple regression analysis, with either the MSCEIT or the SSREIT as predictors of the job satisfaction variables, revealed possible causal relationships with three of the self-report variables,

satisfaction with workforce, satisfaction with present position and satisfaction with occupation, as well as one of the cognitive variables, intent to stay. No evidence was found of a causal relationship with actual resignation status using a logistical regression procedure, which suggests that neither trait nor ability EI may be a mediator of job satisfaction to the extent that the construct will influence drastic employee behaviour such as resignation. As the number of respondents who had resigned was not large, it was decided not to proceed with an assessment of actual reasons given for resignation, although there may be some relationship with resignation as a result of low job satisfaction or forced resignation, which may be discernable in larger samples.

Evidence for the incremental validity of both the SSREIT and the MSCEIT was apparent on three of the four items that were further examined with the hierarchical regression analysis. The MSCEIT was found to account for an additional 8% in the prediction of satisfaction with present position, 11% for satisfaction with occupation and 6% for intent to stay after thinking styles and demographic variables were controlled for, compared to the SSREIT which was able to predict 5%, 6% and 1% more respectively.

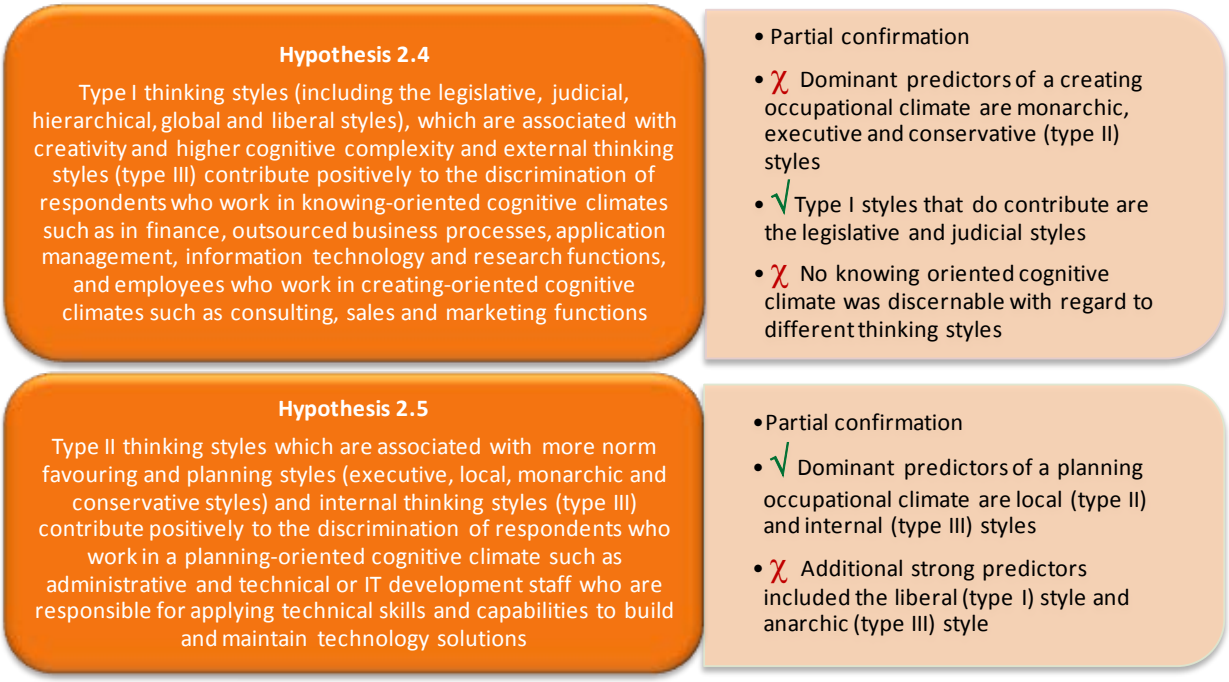
These findings support both the hypotheses that trait and ability EI will predict unique variance in job satisfaction as well as that the MSCEIT will have superior predictive power over the SSREIT. As the percentage of unique variance explained is small, leaving more than 90% of the variance unaccounted for in both instances, the practical value of these measures in predicting self-reported job satisfaction is negligible.

6.2.6.2. Job function, cognitive climate and levels of management

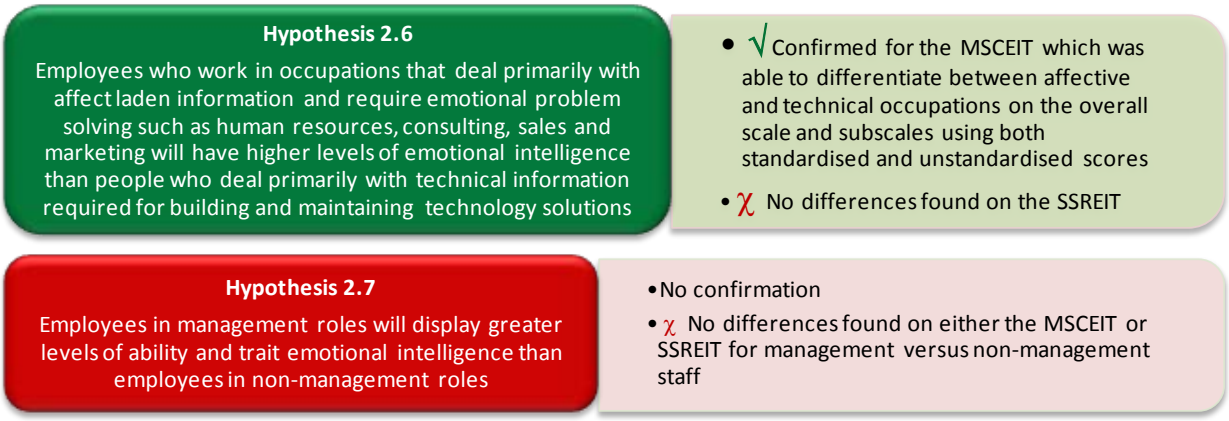
Previous research studies have provided preliminary evidence of differences in thinking styles for different career or study fields (Cilliers & Sternberg, 2001; Sternberg, 2003b), therefore the present research study attempted to determine whether thinking styles could discriminate between the cognitive climates required by certain types of organisations according to the model developed by Cools (2007; Cools & Van den Broek, 2007).

Partial support was identified for the hypothesis that type I thinking styles, and the type III thinking styles that were found to associate strongly with type I styles, would discriminate the creating-oriented and knowing-oriented cognitive climates from planning-oriented climates which would display higher scores on the type II thinking styles. Evidence for only two cognitive climates could be identified using discriminant analysis, a planning-oriented climate and a creating-oriented climate, as no distinctive pattern of thinking styles was evident for the knowing-oriented job functions. The creating-oriented

climate was predicted by two type I styles, the legislative and judicial styles, however, the profile for this cognitive climate included the monarchic, executive and conservative type II styles. The planning-oriented climate on the other hand was significantly predicted by two type II styles, the local and internal style, but also by the liberal and anarchic styles which were associated with type I styles. These findings suggest that respondents who work in the consulting, marketing and sales job functions may employ a different combination of styles in their line of work than respondents who work in technical or IT development positions. As the factor structure of the thinking styles measure was not found to be consistent in the present study these findings would need to be replicated before valid interpretations can be made from the results.



As the three hypothesised cognitive climates were not clearly discernable in the research sample, it was decided not to test whether the EI scales could account for differences between the groups of job functions used to define the three cognitive climates. Instead, job functions were separated into two groups based on the assumptions of whether the job functions consisted of primarily technical components or affective components. It was hypothesised that people who worked in job functions that required a greater amount of emotional problem solving and deal primarily with affect laden information would have higher EI than people who work in job functions that may require more technical skills. In addition, it was hypothesised that employees in management roles would display greater levels of emotional intelligence than people in non-management roles.



The hypothesis was confirmed using the total scale and subscales of the MSCEIT as respondents in the primarily affective job functions scored higher on the EI scales than respondents in the technical job functions. As no differences were discernable on the SSREIT, this may be additional evidence for the superiority of ability tools over self-report tools in discriminating between variables that are independent of self-response bias. An intriguing finding, however, was the lack of a relationship between management and non-management on both the MSCEIT and the SSREIT. Some level of relationship between these two groupings was expected, specifically because of popular notions of EI and their influence on the business world. On the other hand, leadership style or performance was never examined, therefore these results cannot make any inferences regarding the relationship between emotional intelligence and the effectiveness of management.

6.3. CONCLUSION

On the basis of the above discussion it is clear that stronger evidence is needed if EI is to be considered as measuring the three basic characteristics of an intelligence as suggested by Mayer et al., (2001). Furthermore, if one considers the framework specified by Ciarrochi et al., (2000) for the assessment of the suitability of an EI measure, both the MSCEIT and the SSREIT seem to demonstrate a number of psychometric concerns that require thorough assessment before either of these measures can be considered as suitable for use within applied contexts such as occupational environments. These criteria and the corresponding results from the study are presented graphically in Figure 28.

Figure 28: Analysis of the results of the research study according to the reliability and validity criteria specified by Ciarrochi et al., (2000)

The first criteria specified was that the overall scale should indicate reasonable levels of reliability, and all the subscales should load on a single factor as both the MSCEIT and the SSREIT tests claim to measure an overall score of El. Although the overall SSREIT scale has consistently reached high levels of reliability assessed using Cronbach's alpha, the problems with the factor structure raises concerns about the usefulness of the tool. Even though the SSREIT is inherently biased towards a unifactoral interpretation, as pointed out by Petrides and Furnham (2000a), the inability to confirm an acceptable fit for a general factor using confirmatory analysis brings into question the ability of the measure to reliability assess even a general EI score. In addition, the difficulties experienced in identifying consistent item structures to measure the four components of EI outlined in the theoretical model point to an insufficient number of items to effectively cover the content domain of the four EI areas as well as problems with the actual items themselves, for example, the lack of negatively worded items results in bias towards a positive skew in the results.

The present study is the first research study to explore the structure of the MSCEIT as a hierarchical structure organised into three levels, which is the structure implied by the definition of EI as an ability, with a sample of non-university respondents. This was an improvement on the only other research study which examined the MSCEIT as a hierarchical model conducted by Rossen et al., (2008), who used a sample of university respondents. Although the MSCEIT has been promoted as a superior measure of EI to self-report measures, the evidence for the construct validity of the tool was lacking. Taken as a whole, the lack of structural fidelity, low internal consistency at the task level and lack of consistency in item structure across cultures suggests that the MSCEIT lacks construct validity and therefore may not adequately measure ability EI as it was intended to.

The primary contribution of this study results from the partial confirmation of the criteria which insists that measures of EI should present evidence of discriminant validity from established measures of personality and intelligence (Ciarrochi et al., 2000). The SSREIT and the MSCEIT were found to be unrelated and the MSCEIT presented evidence of independence from alternative personality traits, beyond the Big Five or the Giant Three. Although a variety of other studies have explored the nature of the relationship between EI and personality or intelligence, there are few studies that have examined the implications of these relationships for the trait versus ability EI distinction. The present research was aimed at obtaining sufficient evidence for the divergence between the two constructs to support the hypothesis that two unique constructs, rather than two faces of the same construct, are being measured. A theoretical concern that requires further investigation, however, is whether a trait is actually a measurable characteristic that can always be distinguished from ability within a common domain.

Although these findings appear to be a positive step for research in the field of EI as greater legitimacy is provided for the establishment of a distinction between trait and ability EI, the results also bring into question the nature of EI and what these so called trait or ability instruments actually measure. If trait and

ability EI are not related to each other on any level, then the place of trait EI measures in the EI field need to be reconsidered as well. Based on the research findings, future recommendations for the conceptualisation of these two constructs is that EI measured using ability measures should be defined as emotional intelligence, whereas due to the significant overlap with personality and other trait measures such as cognitive thinking styles, trait EI should be defined as measuring emotional competence. In this way confusion regarding the actual nature of these two theories and the extent of the overlap between them can be avoided. Ability EI has, however, not been confirmed as a distinct general factor and is yet to be adequately located within the factor space of intelligence (MacCann et al., 2004). The status of ability EI as a form of intelligence is therefore still uncertain.

Contradictory evidence was obtained for the conditions that women should score higher on EI than men, the tests should correlate with age and experience, and there should be no discrimination of EI measures towards people of different ethnic groups or cultures if the measure is to be considered as a universally valid tool. The lack of findings with the SSREIT and the contradictory findings with the MSCEIT regarding age and experience suggests that the measures are not able to accurately measure EI as a construct that develops as a function of age and cognitive maturation. Furthermore, only the SSREIT was able to display theoretically expected differences with regard to gender.

The bias towards South African respondents present in this research study with both measurement instruments as well as those reported by previous researchers such as Gallant (2005) and Van Staaden (2001) using the MSCEIT, further indicates that the interpretations drawn from these tools within South African contexts may not be valid. This study was the first study to assess the interaction between an ability and a trait measure of EI outside of the geographical contexts in which the instruments were developed and standardised. The research results were therefore able to identify inconsistencies in the coherency of the items, structural fidelity of the tools and scoring procedure of the MSCEIT which may have previously been masked by socialisation processes in western cultures.

Findings with regard to the final criteria that EI should have incremental validity in measuring practical life outcomes after controlling for other well-establish tests that have shown to predict these variables more accurately (Ciarrochi et al., 2000), did reveal a degree of support for the incremental validity of both the SSREIT and the MSCEIT tools. Although EI measured using both trait and ability EI appear to contribute significantly to the prediction of occupational outcomes specifically self-reported perceptions of job satisfaction and daily experience, above that of trait thinking styles and demographic characteristics, the percentage of variance explained is less than 10% and is therefore far lower than expected and raises doubts regarding the value of EI as a tool in organisational development. In addition, no measures were used to control for the influence of either mental ability of personality factors other than thinking styles, therefore the extent to which these constructs influence the findings is unknown.

The results of these findings regarding the independence of the ability from the trait model suggest, however, that although only a small percentage of additional variance in occupational outcomes may be explained by trait or ability EI, these components may be cumulative rather than complimentary as the two measures clearly examine different components of emotional intelligence, or emotional competence as a preferred domain for trait EI. The potential worth of these measures may therefore be justified, although, the psychometric problems with both measurement instruments need to be addressed before valid inferences can be made regarding the nature and direction of potential relationships with life outcomes.

The superiority of the predictive validity over that of the SSREIT does suggest that the MSCEIT has practical value in application to real life outcomes that is lacking in the SSREIT. These conclusions suggests that further review, not only of the items used to assess EI in the MSCEIT, is required, but the accuracy of the normative scores used to determine correctness of answers to items, require review within samples that do not conform to the characteristics of the norm sample. The conclusions of this study are therefore in agreement with conclusions made by Keele and Bell (2008) on completion of their factor analysis of the SSREIT and the MSCEIT, that little progress can be made in predicting real life criteria unless the tools of measurement actually measure the scales and factors they propose to measure. On the other hand, according to Burns et al., (2007) even modest incremental validity will serve a useful purpose and it is reasonable to expect that, given improved reliability of scoring methods, incremental validity will also improve.

6.3.1. Limitations and directions for future research

There are several limitations to this study that may decrease the ability to draw conclusions about the validity and reliability of the instruments under examination as well as general conclusions about the population of business professionals utilised for the purposes of the research. Firstly, the generalisation of the conclusions to broader contexts is limited because only people who are employed in a large corporate institution were involved and the findings may therefore be confounded by the organisational climate inherent to the specific institution. In addition, Coloured respondents are underrepresented in the sample (specifically on the MSCEIT) which suggests that the distribution of ethnic groups incorporated in the sample is not sufficiently reflective of the South African population. As the sample is, therefore, not sufficiently representative of the broader South African community, these results cannot be generalised to the population as a whole. Furthermore, as the sample constituted only 22% of the organisational population, the effects of nonparticipation bias may result in a significant influence on the results

specifically if those respondents who do not participate are very different from those who do (Lin & Schaeffer, 1995).

The missing data that resulted from respondents dropping out of the survey impacted the TSI more so than the other measures due to the length of the questionnaire. Although the version used was shorter than the original 104 items, the 65 items may still have appeared to be too lengthy for the respondents to complete. Future studies could consider reducing the number of items in the TSI or alternatively structure the research process to allow respondents to complete the questionnaire in a central venue or a dedicated time.

The greatest limitation of the study refers to the lack of normality evident in the research sample with both the MSCEIT and the SSREIT. The SSREIT appears to be biased towards a positive skew due to the lack of negatively coded questions in the questionnaire as well as the potential influence of self-response bias. The MSCEIT on the other hand, appears to be inherently biased towards high levels of kurtosis and negative skew (MacCann et al., 2003) as a result of the consensus scoring procedures used to standardise the results. It was decided not to attempt to statistically alter the data to prevent potential changes to the underlying nature of the construct, but to rely on the potential robustness of traditional parametric test statistics. These tests statistics may, however, not be robust under all non-normal data conditions and the results may therefore be vulnerable to type I and type II error rates (Cribbie & Keselman, 2003). These limitations apply not only to the present study but to all research studies that have evaluated these instruments with data analysis methodologies based on assumptions of multivariate normality. The implication of this firstly is that alternative analysis methods need to be identified such as non-parametric statistical tools, in order to reassess the influence of the assumptions that were violated in the course of the analysis. Secondly, research on more appropriate scoring methods and possible revision of the items of the tests is required such as the research conducted by MacCann et al., (2004).

A further limitation is that the items used to investigate employee perceptions of job performance were not based on a standardised measure of job satisfaction. In addition, the items are susceptible to reporting bias as they were based on perceptions of satisfaction. It was attempted to counteract this concern by measuring actual resignation behaviour and cognitive responses such as intention to stay and willingness to recommend. As the reason for resignations were not examined it is not certain whether EI would be related to resignation because of low job satisfaction or terminated employment contracts. The results of the study would need to be confirmed with standardised tools, actual objective measures of performance and more representative samples before any conclusions can be drawn that would be valuable for practical implementation in organisations. In addition, any findings regarding the relationship between the SSREIT subscales and occupational variables are dependent on whether the item structures of the subscales can be replicated and confirmed. The subscales therefore need to be standardised if additional research is to be conducted with the SSREIT.

Future research with these measures need to pay attention to the definitions of trait measures as an emotional competency and ability measures as an emotional intelligence in order to begin differentiating between the two constructs and mapping the contributions of each in explaining the interaction between cognition and emotion. Additional research is also required to validate the relationship of these two theories with actual performance, specifically if ability EI is to be considered as measuring an objective form of intelligence. Finally, given the gender differences identified on the subscales of the MSCEIT, specifically the standardised subscales, future research with subjects outside the normative populations should consider examining whether gender differences impact on the factor structure of the MSCEIT.

To summarise, the results of the research study leave considerable doubts about the construct validity of both the trait and ability measures of EI that were utilised, however, reconceptualisation of the field may improve the inconsistencies that accompany the existing definitions. The lack of support at most levels of the validation process for the SSREIT results in uncertainty regarding the suitability of the SSREIT for use either in research or as an applied tool for measuring EI, or emotional competence as proposed by the study. Although this research cannot fully discount the usefulness of the tool, the consolidated findings of this research study are in agreement with the conclusions made by Petrides and Furnham (2000a) that due to the psychometric problems experienced with the instrument specifically regarding the instability of the factor structure of the SSREIT, future research should reconsider the use of the instrument as a measure of EI. As the SSREIT is no longer the only trait EI tool available in the public domain, but has been joined by counterparts such as the TEIQue (Petrides & Furnham, 2003) and the SUEIT (Palmer & Stough, 2001), it may be of greater contribution to the field to begin exploring the limitations of these tools. With regard to the MSCEIT, although the structural fidelity of the instrument appears to be lacking, the incremental validity of the instrument over trait measures does suggest that improvement of the scoring procedures may result in improved reliability and validity of the tool. Future research attention should therefore be focused on rectifying the psychometric problems with the instrument before the practical application is discussed.

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APPENDIX A: Schutte Self-Report Emotional Intelligence Test (SSREIT)

Schutte et al., (1998)

Directions:

Each of the following items asks you about your emotions or reactions associated with emotions. After deciding whether a statement is generally true for you, use the 5-point scale to respond to the statement. Please circle the '1' if you strongly disagree that this is like you, the '2' if you somewhat disagree that this is like you, '3' if you neither agree nor disagree that this is like you, the '4' if you somewhat agree that this is like you and the '5' if you strongly agree that this is like you. There are no right or wrong answers. Please give the response that best describes you.

1	2	3	4	5
Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree

1. I know when to speak about my personal problems to others.
2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them.
3. I expect that I will do well on most things I try.
4. Other people find it easy to confide in me.
5. I find it hard to understand the non verbal messages of other people.
6. Some of the major events of my life have led me to re evaluate what is important and not important.
7. When my mood changes, I see new possibilities.
8. Emotions are one of the things that make my life worth living.
9. I am aware of my emotions as I experience them.
10. I expect good things to happen.
11. I like to share my emotions with others.
12. When I experience a positive emotion, I know how to make it last.
13. I arrange events others enjoy.
14. I seek out activities that make me happy.
15. I am aware of the non verbal messages I send to others.
16. I present myself in a way that makes a good impression on others.
17. When I am in a positive mood, solving problems is easy for me.
18. By looking at their facial expressions, I recognise the emotions people are experiencing.

19. I know why my emotions change.
20. When I am in a positive mood, I am able to come up with new ideas.
21. I have control over my emotions.
22. I easily recognise my emotions as I experience them.
23. I motivate myself by imagining a good outcome to tasks I take on.
24. I compliment others when they have done something well.
25. I am aware of the non verbal messages other people send.
26. When another person tells me about an important event in his or her life, I almost feel as though I experienced this event myself.
27. When I feel a change in emotions, I tend to come up with new ideas.
28. When I am faced with a challenge, I give up because I believe I will fail.
29. I know what other people are feeling just by looking at them.
30. I help other people feel better when they are down.
31. I use good moods to help myself keep trying in the face of obstacles.
32. I can tell how people are feeling by listening to the tone of their voice.
33. It is difficult for me to understand why people feel the way they do.

APPENDIX B: Thinking Styles Inventory (TSI)

(Sternberg & Wagner, 1992)

Directions

Read each statement carefully and decide how well it describes you. Use the scale provided to indicate how well the statement fits the way you typically do things at university, at home, or on a job. Circle 1 if the statement does not fit you at all, that is, you almost never do things this way. Circle 7 if the statement fits you extremely well, that is, you almost always do things this way. Use the values in between to indicate that the statement fits you in varying degrees.

1	2	3	4	5	6	7
Not At All Well	Not Very Well	Slightly Well	Somewhat Well	Well	Very Well	Extremely Well

There are no right or wrong answers. Please read each statement and circle the number on the scale next to the statement that best indicates how well the statement describes you. Please proceed at your own pace, but do not spend too much time on any one statement. If you have any questions, feel free to ask them now.

1. I prefer to deal with specific problems rather than with general question.
2. When talking or writing about ideas, I stick to one main idea.
3. When starting a task, I like to brainstorm ideas with friends or peers.
4. I like to set priorities for the things I need to do before I start doing them.
5. When faced with a problem, I use my own ideas and strategies to solve it.
6. In discussing or writing on a topic, I think the details and facts are more important than the overall picture.
7. I tend to pay little attention to details.
8. I like to figure out how to solve a problem following certain rules.
9. I like to control all phases of a project, without having to consult with others.
10. I like to play with my ideas and see how far they go.
11. I am careful to use the proper method to solve any problem.
12. I enjoy working on things that I can do by following directions.
13. I stick to standard rules or ways of doing things.
14. I like problems where I can try my own way of solving them.

15. When trying to make a decision, I rely on my own judgment of the situation.
16. I can switch from one task to another easily, because all tasks seem to me to be equally important.
17. In a discussion or report, I like to combine my own ideas with those of others.
18. I care more about the general effect than about the details of a task I have to do.
19. When working on a task, I can see how the parts relate to the overall goal of the task.
20. I like situations where I can compare and rate different ways of doing things.
21. When there are many important things to do, I try to do as many as I can in whatever time I have.
22. When I'm in charge of something, I like to follow methods and ideas used in the past.
23. I like to check and rate opposing points of view or conflicting ideas.
24. I like to collect detailed or specific information for projects on which I work.
25. In dealing with difficulties, I have a good sense of how important each of them is and in what order to tackle them.
26. I like situations where I can follow a set routine.
27. When discussing or writing about a topic, I stick to points of view accepted by my colleagues.
28. I like tasks and problems that have fixed rules to follow in order to complete them.
29. I prefer to work on a project or task that is acceptable to and approved by my peers.
30. When there are several important things to do, I do those most important to me and my colleagues.
31. I like projects that have a clear structure and a set plan and goal.
32. When working on a task, I like to start with my own ideas.
33. When there are many things to do, I have a clear sense of the order in which to do them.
34. I like to participate in activities where I can interact with others as a part of a team.
35. I like to tackle all kinds of problems, even seemingly trivial ones.
36. When faced with a problem, I like to solve it in a traditional way.
37. I like to work alone on a task or a problem.
38. I tend to emphasise the general aspect of issues or the overall effect of a project
39. I like to follow definite rules or directions when solving a problem or doing a task.
40. When discussing or writing down ideas, I use whatever comes to mind.
41. When working on a project, I like to share ideas and get input from other people.
42. I like projects where I can study and rate different views of ideas.
43. When trying to make a decision, I tend to see only one major factor.
44. I like problems where I need to pay attention to details.
45. I like to challenge old ideas or ways of doing things and to seek better ones.
46. I like situations where I interact with others and everyone works together.
47. I find that solving one problem usually leads to many other ones that are just as important.
48. I like working on projects that deal with general issues and not with nitty-gritty details.
49. I like situations where I can use my own ideas and ways of doing things.
50. If there are several important things to do, I do the ones most important to me.

51. I prefer tasks or problems where I can grade the designs or methods of others.
52. When there are several important things to do, I pick the ones most important to my friends and colleagues.
53. When faced with a problem, I prefer to try new strategies or methods to solve it.
54. I like to concentrate on one task at a time.
55. I like projects that I can complete independently.
56. When starting something, I like to make a list of things to do and to order things by importance.
57. I enjoy work that involves analysing, grading, or comparing things.
58. I like to do things in new ways not used by others in the past.
59. When I start a task or project, I focus on the parts most relevant to my peer group.
60. I have to finish one project before starting another one.
61. In talking or writing down ideas, I like to show the scope and context of my ideas, that is, the general picture.
62. I pay more attention to parts of a task than to its overall effect or significance.
63. I prefer situations where I can carry out my own ideas, without relying on others.
64. I like to change routines in order to improve the way tasks are done.
65. I like to take old problems and find new methods to solve them.

APPENDIX C: Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) online instructions

(Mayer et al., 2003)

Online Instructions – MSCEIT

Thank you for taking the time to complete the MSCEIT questionnaire. Do not hesitate to contact us during office hours at (011) 781-3705 should you have any questions. The feedback on results will be scheduled with you after receiving your assessment.

***Please note the following*:**

1. **Complete the questionnaire when you are alone, have time (it usually takes around 50 minutes), are relaxed and able to concentrate.**
2. **Try to complete the questionnaire in one session (avoid interruptions if possible).**
3. **Read the instructions carefully.**
4. **Do not think too long about the questions.**

***Step-by-step instructions*:**

Please visit www.mhsassessments.com and login with the code and password that appear below.

Code: 1060-A02-64

Password: MSCEIT (case sensitive).

Click on Login.

- ☑ Read through the "Permitted Access" and click on "I Accept".
- ☑ Read through the "Welcome Note" and click on "Next".
- ☑ Insert your First Name, Last Name, Age, Gender and Ethnicity (for research and scoring purposes only) and click on "Submit".
- ☑ Read through the instructions, and click on "Start MSCEIT" to start with the questionnaire.
- ☑ The questionnaire is divided into 8 separate sections containing a few questions each. Read all the instructions on every page as they differ on each page. Answer all the questions and click on "Forward" at the end of each of the pages until you are finished. Once you have answered the last question at the end of Section H, the system will inform you that you have completed the questionnaire and request you to exit your internet browser. [If you left out any answers, the system will indicate the "Missed Items" and request you to complete them. You may not leave out any answers. Answer the missed items and click on "Continue" to complete the test.]

APPENDIX D: Example items for the MSCEIT

These examples are obtained from http://www.emotionaliq.org/MSCEIT-Sample.htm and are meant to illustrate the type of items that MSCEIT consists of.

1. Identifying Emotions

Indicate how much of each emotion is expressed by this face:

None 1 2 3 4 5 Very Much

Happiness
Anger
Fear
Excitement
Surprise

2. Using/ Facilitation

What mood(s) might be helpful to feel when meeting in-laws for the very first time?

	Not Useful				*Useful*
a) Slight Tension	1	2	3	4	5
b) Surprise	1	2	3	4	5
c) Joy	1	2	3	4	5

3. Understanding Emotions

Tom felt anxious, and became a bit stressed when he thought about all the work he needed to do. When his supervisor brought him an additional project, he felt ____. (Select the best choice.)

a) Overwhelmed
b) Depressed
c) Ashamed
d) Self Conscious
e) Jittery

4. Managing Emotions

Debbie just came back from vacation. She was feeling peaceful and content. How well would each action preserve her mood?

Action 1: She started to make a list of things at home that she needed to do.
Very Ineffective..1.....2.....3.....4.....5..Very Effective
Action 2: She began thinking about where and when she would go on her next vacation.
Very Ineffective..1.....2.....3.....4.....5..Very Effective
Action 3: She decided it was best to ignore the feeling since it wouldn't last anyway.
Very Ineffective..1.....2.....3.....4.....5..Very Effective

APPENDIX E: MSCEIT Certification

JOPIE VAN ROOYEN

CERTIFICATE OF

ACCREDITATION

This certificate acknowledges that

A. Murphy
PSIN0094471

successfully completed the following accreditation training:

Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT™)
Training

on

13-14 March 2007
MSCEIT - 011 - 820331 - 2007

jopie van rooyen

K. Pott

27 June 2007
Date

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APPENDIX F: TABLES AND FIGURES

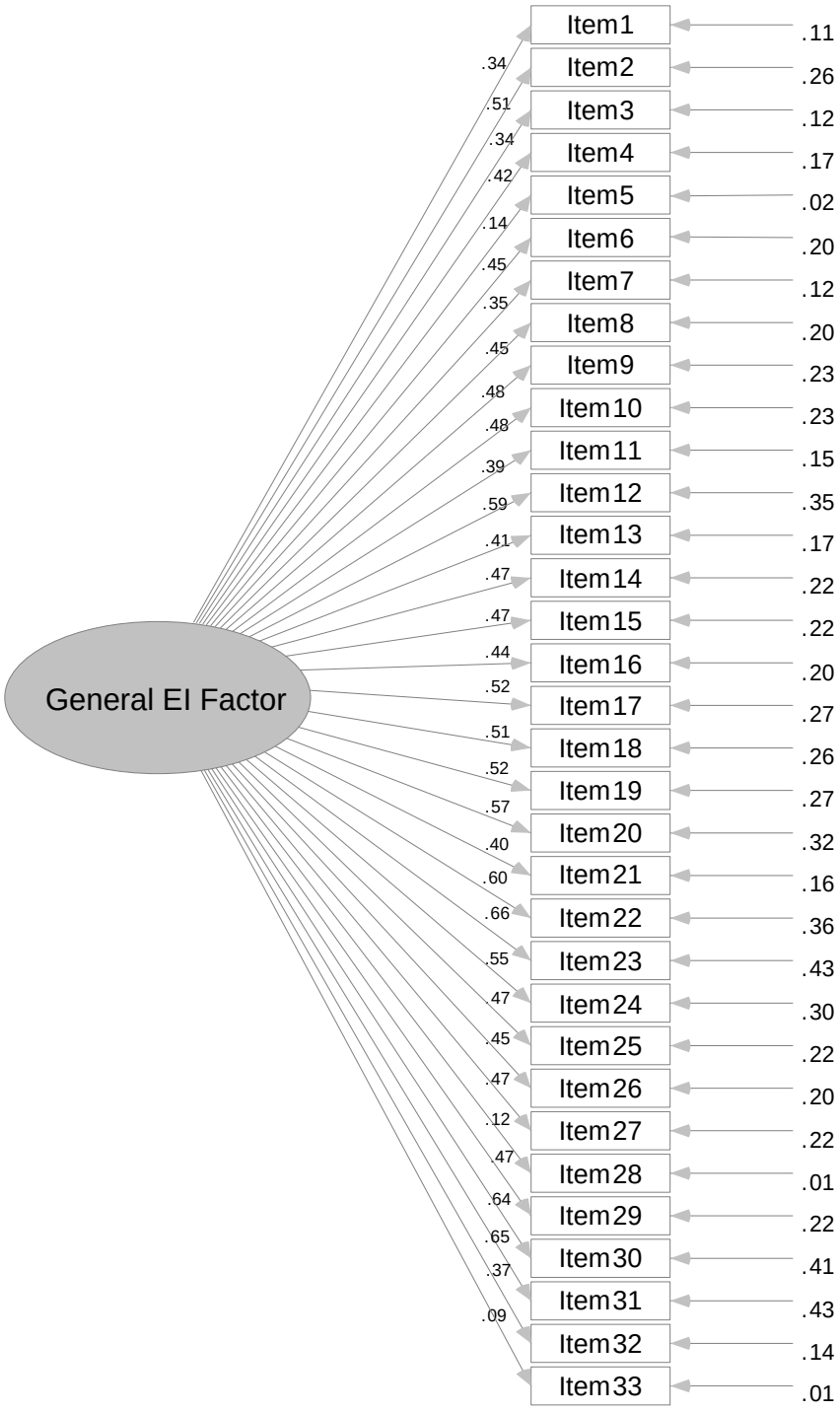
Appendix F - Section 1: Path diagrams and parameter estimates for the hypothesized models of the SSREIT (Section 5.2.1.2)

Table F1: Assessment of normality of SSREIT items used in confirmatory factor analysis

Variable	min	max	skew	c.r.	kurtosis	c.r.
Item 31	1.00	5.00	-0.78	-5.38	0.49	1.69
Item 2	1.00	5.00	-0.88	-6.06	1.27	4.34
Item 28	1.00	5.00	-2.59	-17.73	7.34	25.17
Item 12	1.00	5.00	-0.78	-5.37	0.78	2.67
Item 21	2.00	5.00	-0.70	-4.81	0.11	0.36
Item 14	1.00	5.00	-1.21	-8.31	1.96	6.72
Item 23	1.00	5.00	-0.97	-6.68	0.69	2.37
Item 3	2.00	5.00	-1.12	-7.70	0.93	3.19
Item 10	1.00	5.00	-1.16	-7.98	1.57	5.37
Item 18	1.00	5.00	-0.76	-5.24	1.02	3.51
Item 25	1.00	5.00	-0.83	-5.66	0.76	2.59
Item 29	1.00	5.00	-0.39	-2.66	-0.18	-0.62
Item 19	2.00	5.00	-0.79	-5.38	0.86	2.95
Item 5	1.00	5.00	-0.66	-4.52	-0.38	-1.31
Item 32	1.00	5.00	-0.87	-5.93	1.17	4.02
Item 22	2.00	5.00	-0.87	-5.93	1.11	3.82
Item 15	1.00	5.00	-0.68	-4.64	0.14	0.47
Item 9	2.00	5.00	-1.22	-8.38	1.55	5.32
Item 33	1.00	5.00	-0.59	-4.07	-0.21	-0.71
Item 8	1.00	5.00	-0.72	-4.91	-0.13	-0.46
Item 1	1.00	5.00	-1.17	-7.99	1.21	4.15
Item 16	1.00	5.00	-1.04	-7.15	1.84	6.30
Item 24	2.00	5.00	-1.31	-9.01	1.47	5.03
Item 6	2.00	5.00	-1.37	-9.36	1.88	6.44
Item 26	1.00	5.00	-0.43	-2.97	-0.26	-0.89
Item 30	1.00	5.00	-0.94	-6.42	1.46	5.00
Item 13	1.00	5.00	-0.63	-4.33	0.18	0.61
Item 4	1.00	5.00	-1.36	-9.31	2.72	9.33
Item 11	1.00	5.00	-0.37	-2.56	-0.67	-2.29
Item 20	2.00	5.00	-0.58	-3.98	-0.56	-1.90
Item 7	1.00	5.00	-0.39	-2.64	-0.11	-0.36
Item 27	1.00	5.00	-0.26	-1.80	0.13	0.43
Item 17	2.00	5.00	-0.95	-6.52	0.02	0.05
Multivariate					**175.18**	**30.60**

Figure F1: General one factor model of emotional intelligence identified by Schutte et al., (1998)

Standardised solution (n=282)



Model fit = (χ^2_{495} = 1397.376, Bollen-stine p = .004, GFI = .74, AGFI = .71, CFI = .65, TLI = .62, RMSEA = .081, SRMR = .080)

Table F2: Unstandardised and standardised parameter estimates, and significance levels for the one factor model depicted in Figure F1

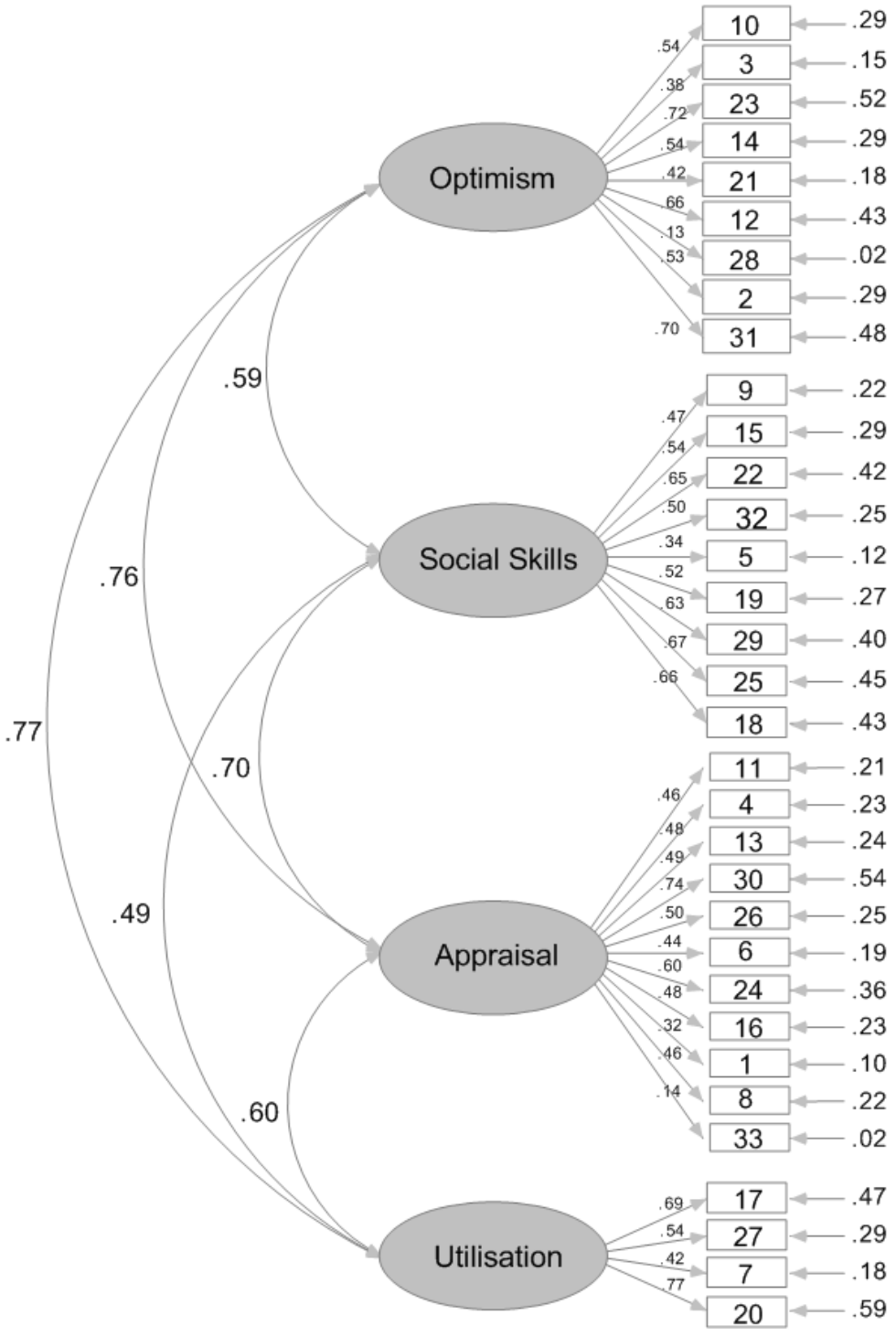
(Standard errors in parentheses, n=282)

Measurement Model Estimates			Unstandardised		Standardised	*p*
Item 1	←	General EI Factor	1.00		0.34	Na
Item 2	←	General EI Factor	1.20	(0.25)	0.51	***
Item 3	←	General EI Factor	0.74	(0.18)	0.34	***
Item 4	←	General EI Factor	1.15	(0.26)	0.42	***
Item 5	←	General EI Factor	0.54	(0.26)	0.14	.037
Item 6	←	General EI Factor	1.00	(0.22)	0.45	***
Item 7	←	General EI Factor	1.11	(0.27)	0.35	***
Item 8	←	General EI Factor	1.62	(0.35)	0.45	***
Item 9	←	General EI Factor	1.21	(0.26)	0.48	***
Item 10	←	General EI Factor	1.30	(0.27)	0.48	***
Item 11	←	General EI Factor	1.56	(0.36)	0.39	***
Item 12	←	General EI Factor	1.72	(0.33)	0.59	***
Item 13	←	General EI Factor	1.36	(0.30)	0.41	***
Item 14	←	General EI Factor	1.21	(0.26)	0.47	***
Item 15	←	General EI Factor	1.42	(0.30)	0.47	***
Item 16	←	General EI Factor	1.05	(0.23)	0.44	***
Item 17	←	General EI Factor	1.32	(0.27)	0.52	***
Item 18	←	General EI Factor	1.30	(0.27)	0.51	***
Item 19	←	General EI Factor	1.28	(0.26)	0.52	***
Item 20	←	General EI Factor	1.59	(0.31)	0.57	***
Item 21	←	General EI Factor	1.12	(0.26)	0.40	***
Item 22	←	General EI Factor	1.45	(0.28)	0.60	***
Item 23	←	General EI Factor	1.97	(0.37)	0.66	***
Item 24	←	General EI Factor	1.03	(0.21)	0.55	***
Item 25	←	General EI Factor	1.34	(0.28)	0.47	***
Item 26	←	General EI Factor	1.53	(0.33)	0.45	***
Item 27	←	General EI Factor	1.35	(0.29)	0.47	***
Item 28	←	General EI Factor	0.29	(0.16)	0.12	.066
Item 29	←	General EI Factor	1.41	(0.30)	0.47	***
Item 30	←	General EI Factor	1.56	(0.30)	0.64	***
Item 31	←	General EI Factor	1.90	(0.36)	0.65	***
Item 32	←	General EI Factor	0.98	(0.23)	0.37	***
Item 33	←	General EI Factor	0.33	(0.23)	0.09	.145

***p < .001
Na: No p-values listed for these variables as they were constrained to one

Figure F2: Four factor oblique model of emotional intelligence identified by Palmer (2003)

Standardised solution (n=282)



Model fit = (χ^2_{489} = 1093.082, Bollen-stine p = .004, GFI = .80, AGFI = .77, CFI = .76, TLI = .75, RMSEA = .066, SRMR = .072)

Table F3: Unstandardised and standardised parameter estimates, and significance levels for the four factor model identified by Palmer (2003) depicted in Figure F2

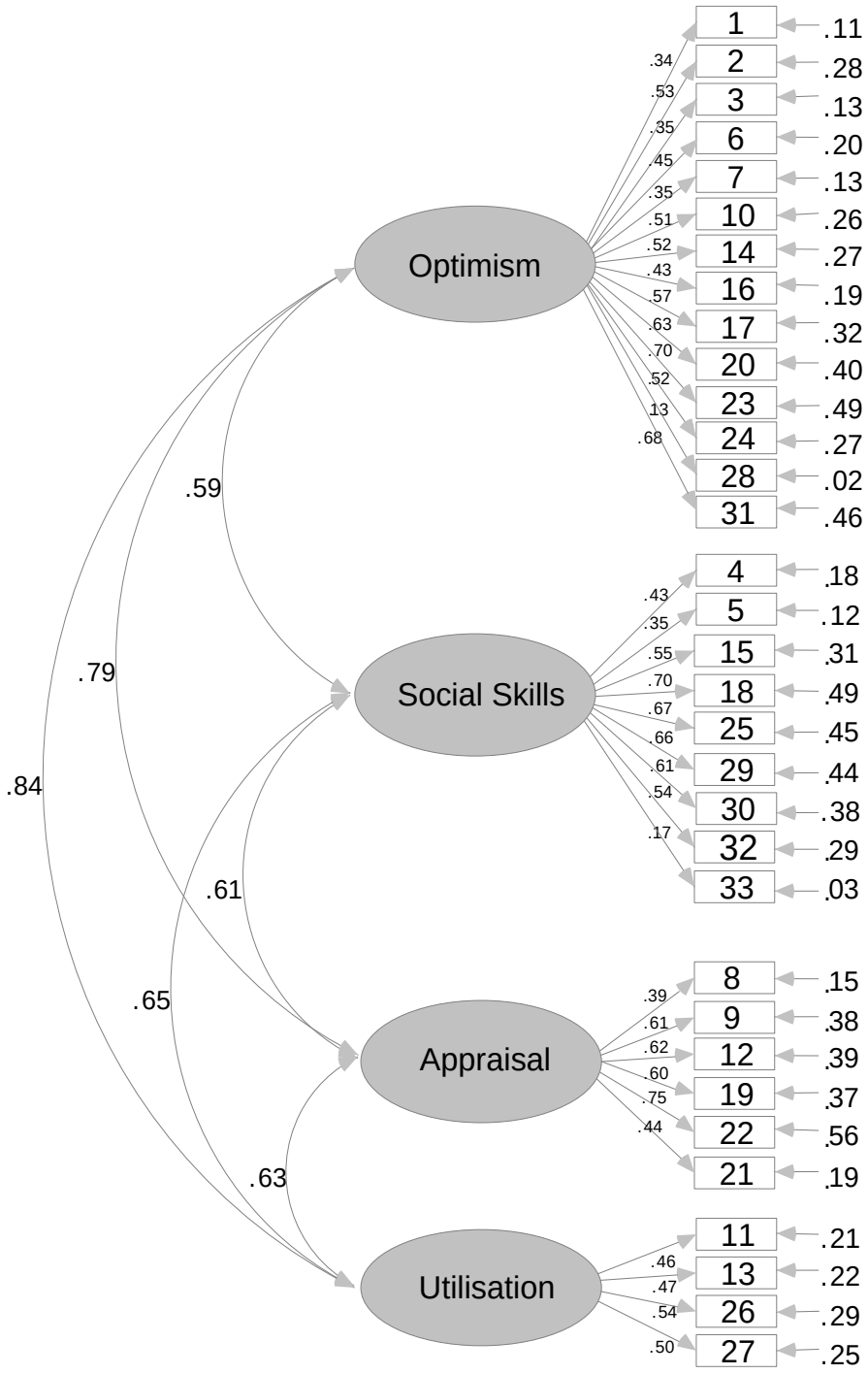
(Standard errors in parentheses, n=282)

Measurement Model Estimates			Unstandardised		Standardised	*p*
Item 17	←	Utilisation	1.00		0.69	Na
Item 27	←	Utilisation	0.89	(0.12)	0.54	***
Item 7	←	Utilisation	0.78	(0.13)	0.42	***
Item 20	←	Utilisation	1.24	(0.13)	0.77	***
Item 11	←	Appraisal	1.00		0.46	Na
Item 4	←	Appraisal	0.72	(0.13)	0.48	***
Item 13	←	Appraisal	0.87	(0.15)	0.49	***
Item 30	←	Appraisal	0.98	(0.14)	0.74	***
Item 26	←	Appraisal	0.92	(0.16)	0.50	***
Item 6	←	Appraisal	0.53	(0.10)	0.44	***
Item 24	←	Appraisal	0.62	(0.09)	0.60	***
Item 16	←	Appraisal	0.61	(0.11)	0.48	***
Item 1	←	Appraisal	0.51	(0.12)	0.32	***
Item 8	←	Appraisal	0.90	(0.16)	0.46	***
Item 33	←	Appraisal	0.26	(0.13)	0.14	.04
Item 9	←	Social skills	1.00		0.47	Na
Item 15	←	Social skills	1.38	(0.22)	0.54	***
Item 22	←	Social skills	1.31	(0.19)	0.65	***
Item 32	←	Social skills	1.10	(0.18)	0.50	***
Item 5	←	Social skills	1.11	(0.24)	0.34	***
Item 19	←	Social skills	1.07	(0.18)	0.52	***
Item 29	←	Social skills	1.57	(0.23)	0.63	***
Item 25	←	Social skills	1.59	(0.23)	0.67	***
Item 18	←	Social skills	1.40	(0.20)	0.66	***
Item 10	←	Optimism	1.00		0.54	Na
Item 3	←	Optimism	0.57	(0.11)	0.38	***
Item 23	←	Optimism	1.47	(0.18)	0.72	***
Item 14	←	Optimism	0.96	(0.14)	0.54	***
Item 21	←	Optimism	0.81	(0.14)	0.42	***
Item 12	←	Optimism	1.30	(0.16)	0.66	***
Item 28	←	Optimism	0.21	(0.11)	0.13	.05
Item 2	←	Optimism	0.86	(0.12)	0.53	***
Item 31	←	Optimism	1.39	(0.17)	0.70	***

***p < .001
Na: No p-values listed for these variables as they were constrained to one

Figure F3: Four factor oblique model of emotional intelligence identified by Murphy (2006)

Standardised solution (n=282)



Model fit = (χ^2_{489} = 1157.568, Bollen-stine p = .004, GFI = .79, AGFI = .76, CFI = .74, TLI = .72, RMSEA = .070, SRMR = .076)

Table F4: Unstandardised and standardised parameter estimates, and significance levels for the four factor model identified by Murphy (2006) depicted in Figure F3

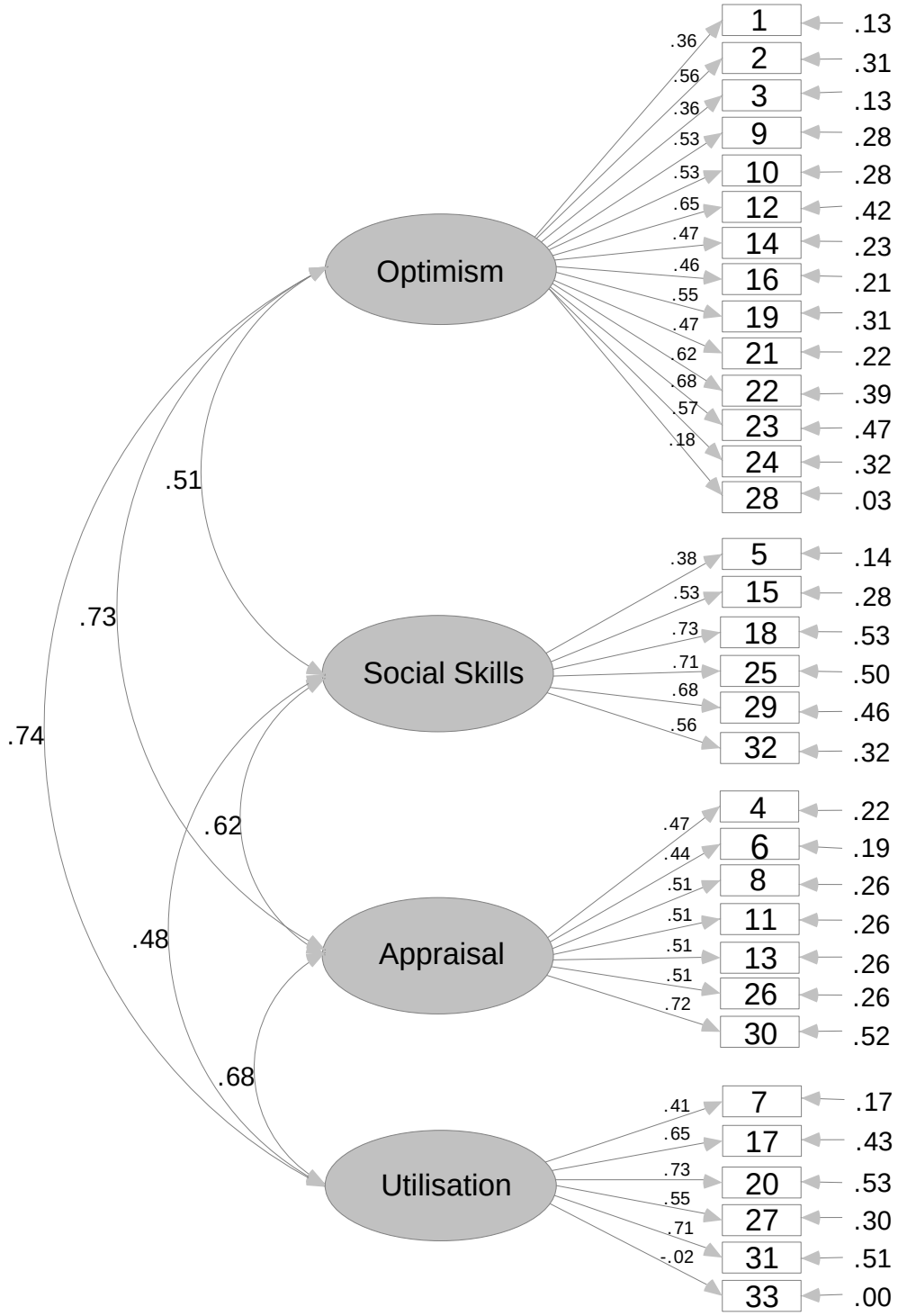
(Standard errors in parentheses, n=282)

Measurement Model Estimates			Unstandardised		Standardised	*p*
Item 27	←	Utilisation	0.78	(0.14)	0.50	***
Item 3	←	Optimism	0.77	(0.19)	0.36	***
Item 23	←	Optimism	2.09	(0.40)	0.70	***
Item 14	←	Optimism	1.35	(0.28)	0.52	***
Item 2	←	Optimism	1.23	(0.25)	0.53	***
Item 7	←	Optimism	1.13	(0.28)	0.35	***
Item 10	←	Optimism	1.37	(0.28)	0.51	***
Item 13	←	Utilisation	0.85	(0.16)	0.47	***
Item 26	←	Utilisation	1.01	(0.18)	0.54	***
Item 11	←	Utilisation	1.00		0.46	Na
Item 20	←	Optimism	1.76	(0.34)	0.63	***
Item 17	←	Optimism	1.44	(0.29)	0.57	***
Item 24	←	Optimism	0.97	(0.20)	0.52	***
Item 31	←	Optimism	1.97	(0.38)	0.68	***
Item 28	←	Optimism	0.30	(0.16)	0.13	.061
Item 16	←	Optimism	1.02	(0.23)	0.43	***
Item 1	←	Optimism	1.00		0.34	Na
Item 12	←	Appraisal	1.16	(0.14)	0.62	***
Item 19	←	Appraisal	0.96	(0.12)	0.61	***
Item 9	←	Appraisal	1.00		0.61	Na
Item 33	←	Social skills	0.50	(0.20)	0.17	.014
Item 32	←	Social skills	1.19	(0.21)	0.54	***
Item 29	←	Social skills	1.67	(0.26)	0.66	***
Item 6	←	Optimism	1.01	(0.22)	0.45	***
Item 4	←	Social skills	1.00		0.43	Na
Item 15	←	Social skills	1.42	(0.24)	0.55	***
Item 5	←	Social skills	1.14	(0.26)	0.35	***
Item 18	←	Social skills	1.51	(0.23)	0.70	***
Item 25	←	Social skills	1.62	(0.26)	0.67	***
Item 30	←	Social skills	1.26	(0.21)	0.61	***
Item 8	←	Appraisal	0.88	(0.16)	0.39	***
Item 22	←	Appraisal	1.16	(0.12)	0.75	***
Item 21	←	Appraisal	0.80	(0.13)	0.44	***

***p < .001
Na: No p-values listed for these variables as they were constrained to one

Figure F4: Four factor oblique model of emotional intelligence identified in the present study

Standardised solution (n=282)



Model fit = (χ^2_{489} = 1053.086, Bollen-stine p = .004, GFI = .81, AGFI = .79, CFI = .78, TLI = .76, RMSEA = .064, SRMR = .070)

Table F5: Unstandardised and standardised parameter estimates, and significance levels for the four factor oblique model identified in the present study depicted in Figure F4

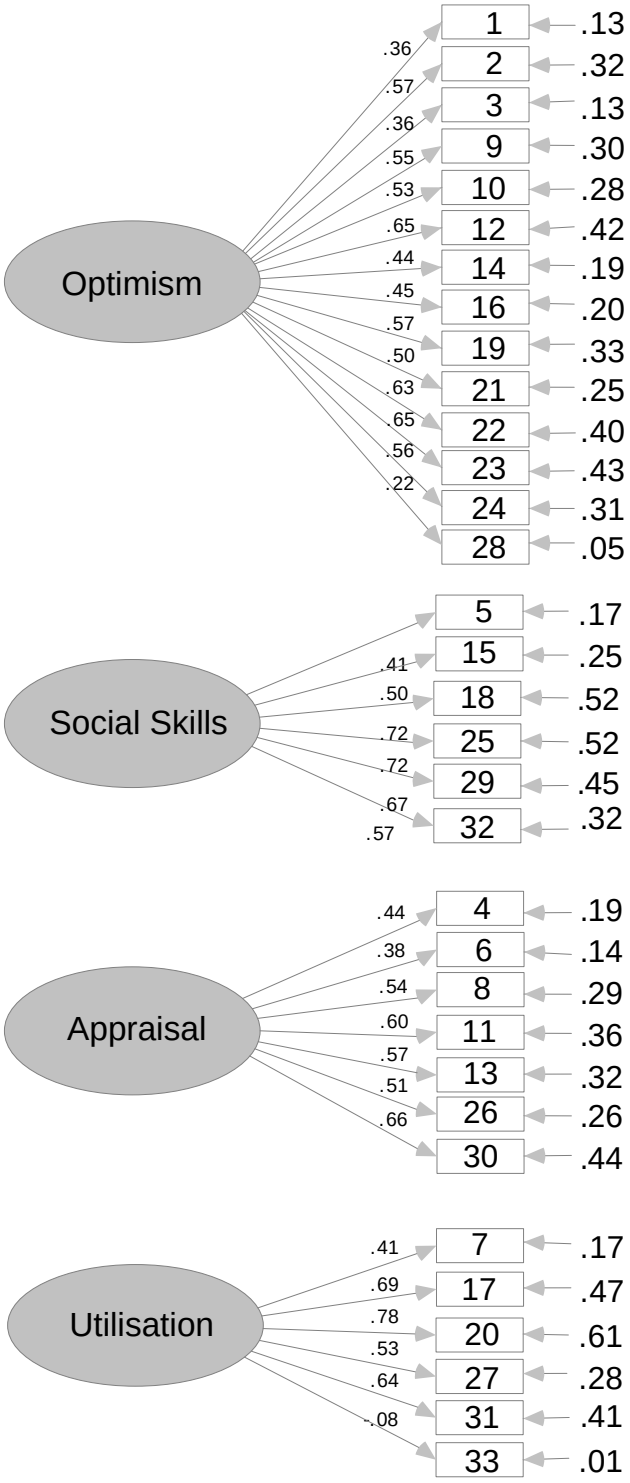
(Standard errors in parentheses, n=282)

Measurement Model Estimates			Unstandardised		Standardised	*p*
Item 33	←	Utilisation	-0.05	(0.18)	-0.02	.775
Item 3	←	Optimism	0.74	(0.17)	0.36	***
Item 22	←	Optimism	1.42	(0.27)	0.62	***
Item 14	←	Optimism	1.17	(0.24)	0.47	***
Item 2	←	Optimism	1.24	(0.24)	0.56	***
Item 10	←	Optimism	1.35	(0.27)	0.53	***
Item 12	←	Optimism	1.78	(0.33)	0.65	***
Item 27	←	Utilisation	1.21	(0.22)	0.55	***
Item 31	←	Utilisation	1.60	(0.26)	0.71	***
Item 20	←	Utilisation	1.57	(0.26)	0.73	***
Item 21	←	Optimism	1.25	(0.26)	0.47	***
Item 19	←	Optimism	1.29	(0.25)	0.55	***
Item 23	←	Optimism	1.94	(0.35)	0.69	***
Item 28	←	Optimism	0.41	(0.16)	0.18	.01
Item 24	←	Optimism	1.01	(0.19)	0.57	***
Item 16	←	Optimism	1.02	(0.21)	0.46	***
Item 1	←	Optimism	1.00		0.36	Na
Item 26	←	Appraisal	1.35	(0.23)	0.51	***
Item 30	←	Appraisal	1.37	(0.20)	0.72	***
Item 13	←	Appraisal	1.32	(0.22)	0.51	***
Item 9	←	Optimism	1.27	(0.25)	0.53	***
Item 5	←	Social skills	1.00		0.38	Na
Item 18	←	Social skills	1.27	(0.22)	0.73	***
Item 15	←	Social skills	1.10	(0.22)	0.53	***
Item 25	←	Social skills	1.38	(0.25)	0.71	***
Item 29	←	Social skills	1.39	(0.25)	0.68	***
Item 11	←	Appraisal	1.59	(0.27)	0.51	***
Item 8	←	Appraisal	1.43	(0.24)	0.51	***
Item 6	←	Appraisal	0.77	(0.14)	0.44	***
Item 32	←	Social skills	1.01	(0.19)	0.56	***
Item 4	←	Appraisal	1.00		0.47	Na
Item 17	←	Utilisation	1.28	(0.22)	0.65	***
Item 7	←	Utilisation	1.00		0.41	Na

***p < .001
Na: No p-values listed for these variables as they were constrained to one

Figure F5: Four factor orthogonal model of emotional intelligence identified in the present study

Standardised solution (n=282)



Model fit = (χ^2_{495} = 1378.638, Bollen-stine p = .004, GFI = .76, AGFI = .73, CFI = .65, TLI = .63, RMSEA = .080, SRMR = .174)

Table F6: Unstandardised and standardised parameter estimates, and significance levels for the four factor orthogonal model identified in the present study depicted in Figure F5

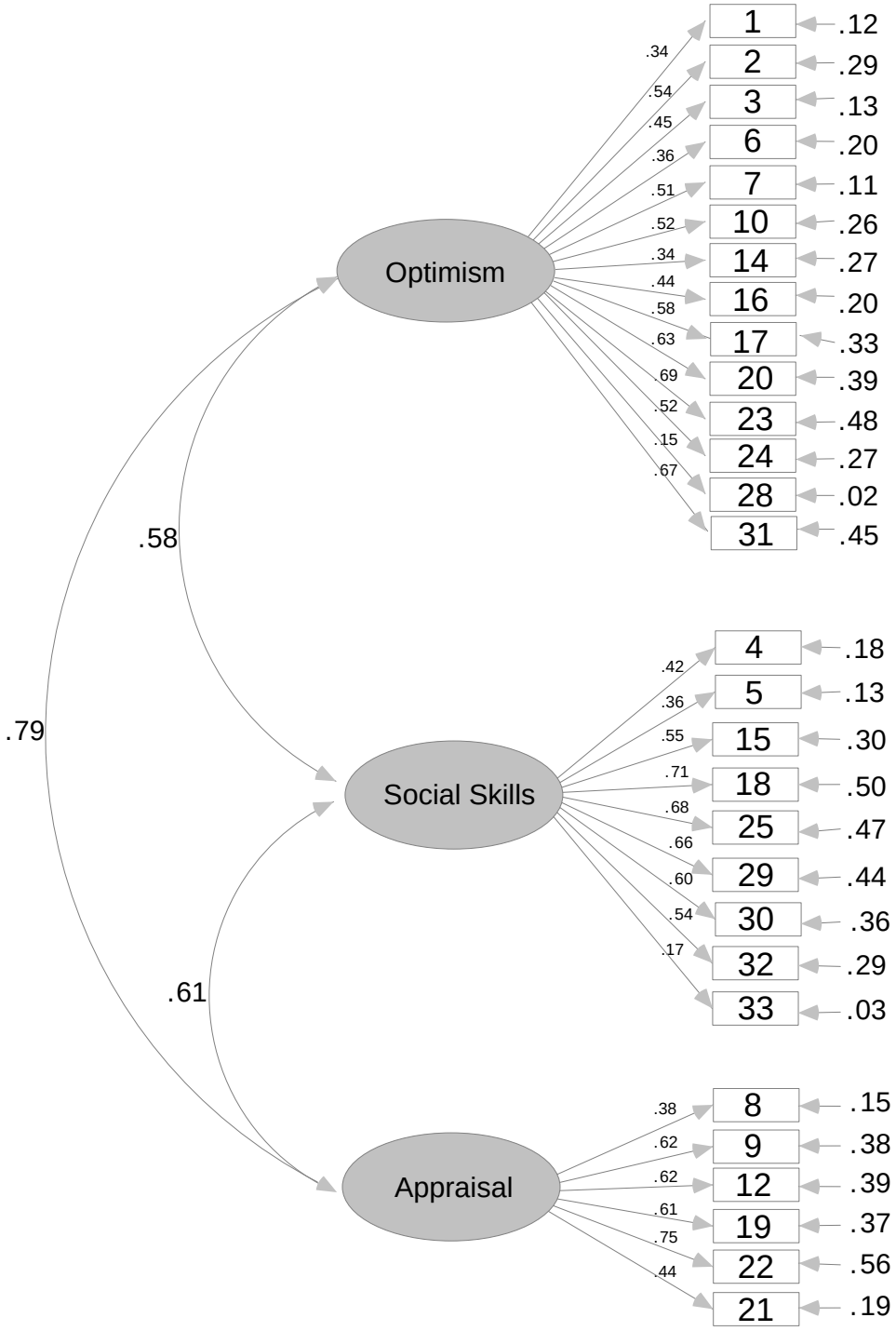
(Standard errors in parentheses, n=282)

Measurement Model Estimates			Unstandardised		Standardised	*p*
Item 33	←	Utilisation	-0.22	(0.18)	-0.08	.224
Item 3	←	Optimism	0.72	(0.17)	0.36	***
Item 22	←	Optimism	1.42	(0.27)	0.63	***
Item 14	←	Optimism	1.06	(0.23)	0.44	***
Item 2	←	Optimism	1.24	(0.24)	0.57	***
Item 10	←	Optimism	1.32	(0.26)	0.53	***
Item 12	←	Optimism	1.74	(0.32)	0.65	***
Item 27	←	Utilisation	1.16	(0.22)	0.53	***
Item 31	←	Utilisation	1.44	(0.25)	0.64	***
Item 20	←	Utilisation	1.69	(0.28)	0.78	***
Item 21	←	Optimism	1.31	(0.27)	0.50	***
Item 19	←	Optimism	1.32	(0.25)	0.57	***
Item 23	←	Optimism	1.82	(0.34)	0.65	***
Item 28	←	Optimism	0.50	(0.17)	0.22	.003
Item 24	←	Optimism	0.98	(0.19)	0.56	***
Item 16	←	Optimism	0.98	(0.21)	0.45	***
Item 1	←	Optimism	1.00		0.36	Na
Item 26	←	Appraisal	1.44	(0.27)	0.51	***
Item 30	←	Appraisal	1.34	(0.23)	0.66	***
Item 13	←	Appraisal	1.56	(0.28)	0.57	***
Item 9	←	Optimism	1.31	(0.26)	0.55	***
Item 5	←	Social skills	1.00		0.42	
Item 18	←	Social skills	1.15	(0.19)	0.72	***
Item 15	←	Social skills	0.95	(0.18)	0.50	***
Item 25	←	Social skills	1.29	(0.21)	0.72	***
Item 29	←	Social skills	1.26	(0.21)	0.67	***
Item 11	←	Appraisal	1.98	(0.35)	0.60	***
Item 8	←	Appraisal	1.61	(0.30)	0.54	***
Item 6	←	Appraisal	0.70	(0.16)	0.38	***
Item 32	←	Social skills	0.92	(0.17)	0.57	***
Item 4	←	Appraisal	1.00		0.44	Na
Item 17	←	Utilisation	1.34	(0.23)	0.69	***
Item 7	←	Utilisation	1.00		0.41	Na

***p < .001
Na: No p-values listed for these variables as they were constrained to one

Figure F6: Three factor oblique model of emotional intelligence identified in the present study (2006)

Standardised solution (n=282)



Model fit = (χ^2_{374} = 871.497, Bollen-stine p = .004 GFI = .82, AGFI = .79, CFI = .77, TLI = .75, RMSEA = .069, SRMR = .074)

Table F7: Unstandardised and standardised parameter estimates, and significance levels for the three factor oblique model identified in the present study in Figure F6

(Standard errors in parentheses, n=282)

Measurement Model Estimates			Unstandardised		Standardised	*p*
Item 3	←	Optimism	0.78	(0.19)	0.36	***
Item 23	←	Optimism	2.04	(0.39)	0.69	***
Item 14	←	Optimism	1.34	(0.28)	0.52	***
Item 2	←	Optimism	1.26	(0.26)	0.54	***
Item 7	←	Optimism	1.07	(0.27)	0.34	***
Item 10	←	Optimism	1.35	(0.28)	0.51	***
Item 16	←	Optimism	1.04	(0.23)	0.44	***
Item 1	←	Optimism	1.00		0.34	Na
Item 12	←	Appraisal	1.15	(0.14)	0.62	***
Item 19	←	Appraisal	0.96	(0.12)	0.61	***
Item 9	←	Appraisal	1.00		0.62	Na
Item 33	←	Social Skills	0.51	(0.21)	0.17	.013
Item 32	←	Social Skills	1.20	(0.21)	0.54	***
Item 29	←	Social Skills	1.68	(0.27)	0.66	***
Item 6	←	Optimism	1.00	(0.22)	0.45	***
Item 4	←	Social Skills	1.00		0.43	Na
Item 15	←	Social Skills	1.44	(0.25)	0.55	***
Item 5	←	Social Skills	1.20	(0.26)	0.36	***
Item 18	←	Social Skills	1.54	(0.24)	0.71	***
Item 25	←	Social Skills	1.67	(0.26)	0.68	***
Item 30	←	Social Skills	1.25	(0.21)	0.60	***
Item 8	←	Appraisal	0.87	(0.16)	0.38	***
Item 22	←	Appraisal	1.15	(0.12)	0.75	***
Item 21	←	Appraisal	0.80	(0.13)	0.44	***
Item 20	←	Optimism	1.74	(0.34)	0.63	***
Item 31	←	Optimism	1.94	(0.37)	0.67	***
Item 24	←	Optimism	0.96	(0.20)	0.52	***
Item 28	←	Optimism	0.36	(0.16)	0.15	.029
Item 17	←	Optimism	1.44	(0.29)	0.58	***

***p < .001
Na: No p-values listed for these variables as they were constrained to one

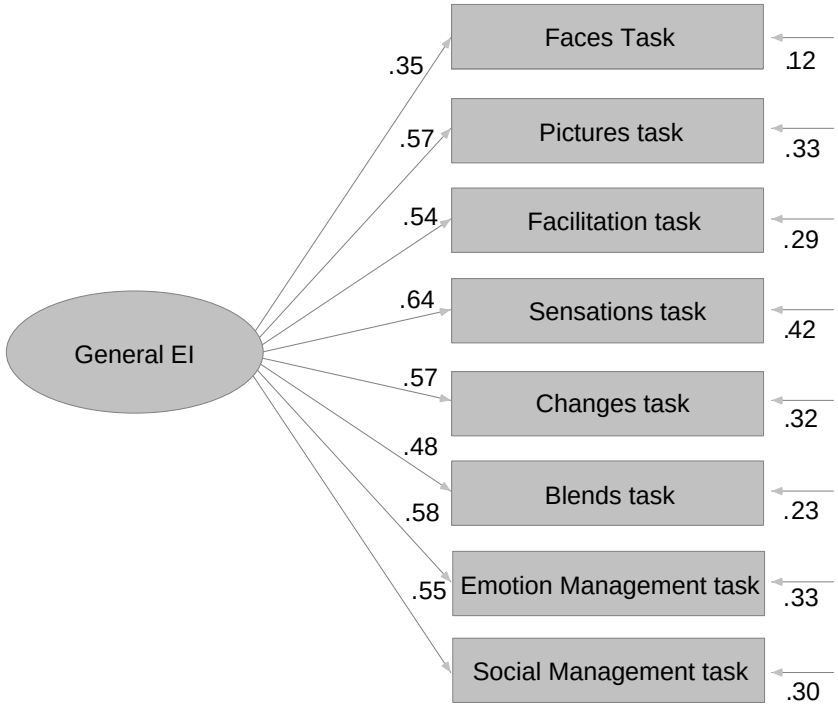
Appendix F - Section 2: Path diagrams and parameter estimates for the hypothesized models of the MSCEIT (Section 5.2.2.1)

Table F8: Assessment of normality of MSCEIT task scores used in confirmatory factor analysis

Unstandardised MSCEIT data	**Min**	**max**	**skew**	**c.r.**	**kurtosis**	**c.r.**
RawScore_H (Emotional relationships)	.117	.541	-0.976	-5.950	.214	.653
RawScore_D (Emotional management)	.149	.507	-1.084	-6.611	1.476	4.499
RawScore_G (Blends)	.184	.611	-0.843	-5.140	.627	1.910
RawScore_C (Changes)	.308	.680	-0.671	-4.089	-.079	-.240
RawScore_F (Sensations)	.100	.617	-1.318	-8.032	1.166	3.555
RawScore_B (Facilitation)	.127	.584	-1.063	-6.482	1.178	3.591
RawScore_E (Pictures)	.034	.635	-1.411	-8.602	1.496	4.559
RawScore_A (Faces)	.123	.666	-0.636	-3.877	-.522	-1.592
Multivariate					**16.025**	**9.459**
Standardised MSCEIT scores	**Min**	**max**	**skew**	**c.r.**	**kurtosis**	**c.r.**
Standardised Score_H (Emotional relationships)	55.078	134.32	-0.06	-0.363	0.8	2.438
Standardised Score_D (Emotional management)	69.126	157.579	0.935	5.698	4.028	12.278
Standardised Score_G (Blends)	64.4	128.62	0.039	0.237	0.057	0.175
Standardised Score_C (Changes)	64.327	140.201	0.901	5.491	1.59	4.847
Standardised Score_F (Sensations)	58.235	132.275	-0.063	-0.387	-0.329	-1.004
Standardised Score_B (Facilitation)	62.523	133.36	-0.259	-1.577	-0.14	-0.425
Standardised Score_E (Pictures)	23.529	120.229	-1.043	-6.359	3.485	10.624
Standardised Score_A (Faces)	47.997	143.255	0.594	3.622	-0.146	-0.445
Multivariate					**21.444**	**12.658**

Figure F7: One general factor of the MSCEIT based on the eight *unstandardised* observed task scores

Standardised solution (n=223)



Model fit = (χ^2_{20} = 55.922, Bollen-stine p = .005 GFI = .94, AGFI = .89, CFI = .89, TLI = .84, RMSEA = .090, SRMR = .060)

Table F9: Unstandardised and standardised parameter estimates, and significance levels for the *unstandardised* one general factor model identified in Figure F7

(Standard errors in parentheses, n=223)

Measurement Model Estimates			Unstandardised		Standardised	*p*
RawScore_A (Faces)	←	General EI	1.00		0.35	Na
RawScore_E (Pictures)	←	General EI	1.55	(0.37)	0.58	***
RawScore_D (Emotional management)	←	General EI	0.78	(0.18)	0.58	***
RawScore_H (Emotional relationships)	←	General EI	1.16	(0.28)	0.55	***
RawScore_G (Blends)	←	General EI	0.81	(0.21)	0.48	***
RawScore_F (Sensations)	←	General EI	1.58	(0.36)	0.65	***
RawScore_B (Facilitation)	←	General EI	0.95	(0.23)	0.54	***
RawScore_C (Changes)	←	General EI	0.85	(0.20)	0.57	***

***p < .001
Na: No p-values listed for these variables as they were constrained to one

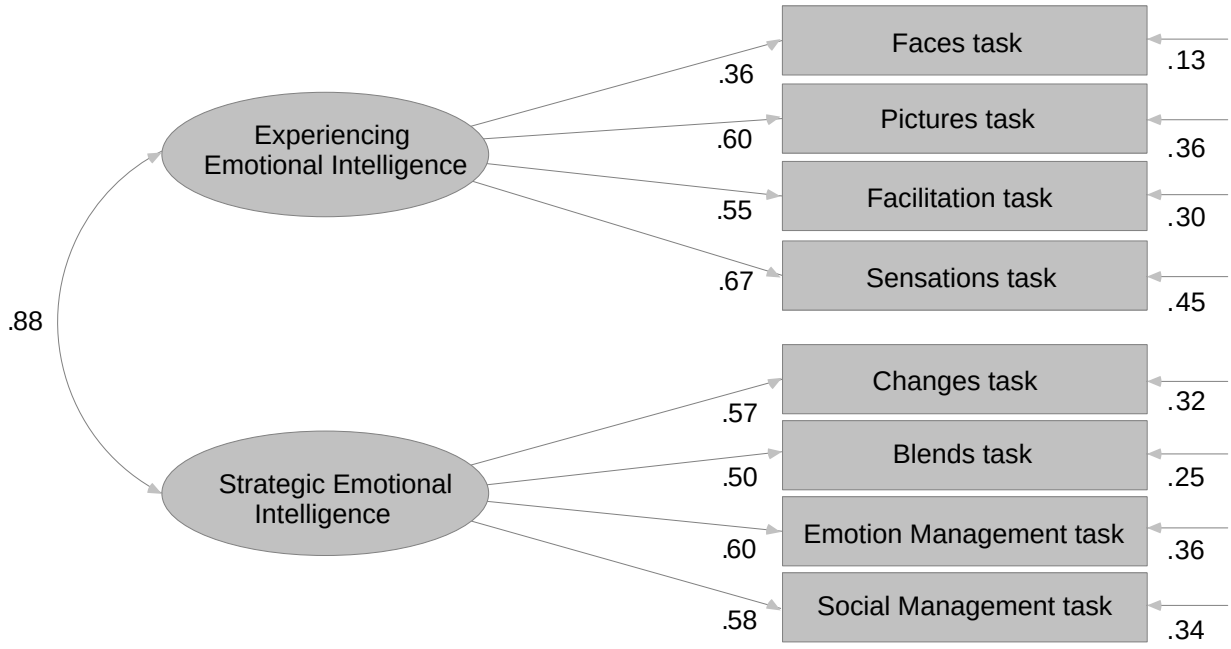
Table F8: Unstandardised and standardised parameter estimates, and significance levels for the *standardised* one general factor model

(Standard errors in parentheses, n=223)

Measurement Model Estimates			Unstandardised		Standardised	*p*
StdScore_A (Faces)	←	General EI	1.00		0.31	Na
StdScore_E (Pictures)	←	General EI	0.95	(0.25)	0.54	***
StdScore_D (Emotional management)	←	General EI	0.82	(0.22)	0.52	***
StdScore_H (Emotional relationships)	←	General EI	1.00	(0.26)	0.57	***
StdScore_G (Blends)	←	General EI	0.82	(0.22)	0.53	***
StdScore_F (Sensations)	←	General EI	1.19	(0.31)	0.60	***
StdScore_B (Facilitation)	←	General EI	1.05	(0.29)	0.48	***
StdScore_C (Changes)	←	General EI	1.03	(0.26)	0.65	***
***p < .001 Na: No p-values listed for these variables as they were constrained to one						

Figure F8: Two factor model of the MSCEIT based on the eight *unstandardised* observed task scores

Standardised solution (n=223)



Model fit = (χ^2_{19} = 55.922, Bollen-stine p = .005 GFI = .94, AGFI = .89, CFI = .89, TLI = .84, RMSEA = .090, SRMR = .060)

Table F9: Unstandardised and standardised parameter estimates, and significance levels for the *unstandardised* two factor model identified in Figure F8

(Standard errors in parentheses, n=223)

Measurement Model Estimates			Unstandardised		Standardised	*p*
RawScore_A (Faces)	←	Experiencing EI	1.00		0.36	Na
RawScore_E (Pictures)	←	Experiencing EI	1.56	(0.36)	0.60	***
RawScore_B (Facilitation)	←	Experiencing EI	0.93	(0.22)	0.55	***
RawScore_F (Sensations)	←	Experiencing EI	1.59	(0.36)	0.67	***
RawScore_C (Changes)	←	Strategic EI	1.00		0.57	Na
RawScore_G (Blends)	←	Strategic EI	0.99	(0.18)	0.50	***
RawScore_D (Emotional management)	←	Strategic EI	0.95	(0.16)	0.60	***
RawScore_H (Emotional relationships)	←	Strategic EI	1.43	(0.24)	0.58	***

***p < .001
Na: No p-values listed for these variables as they were constrained to one

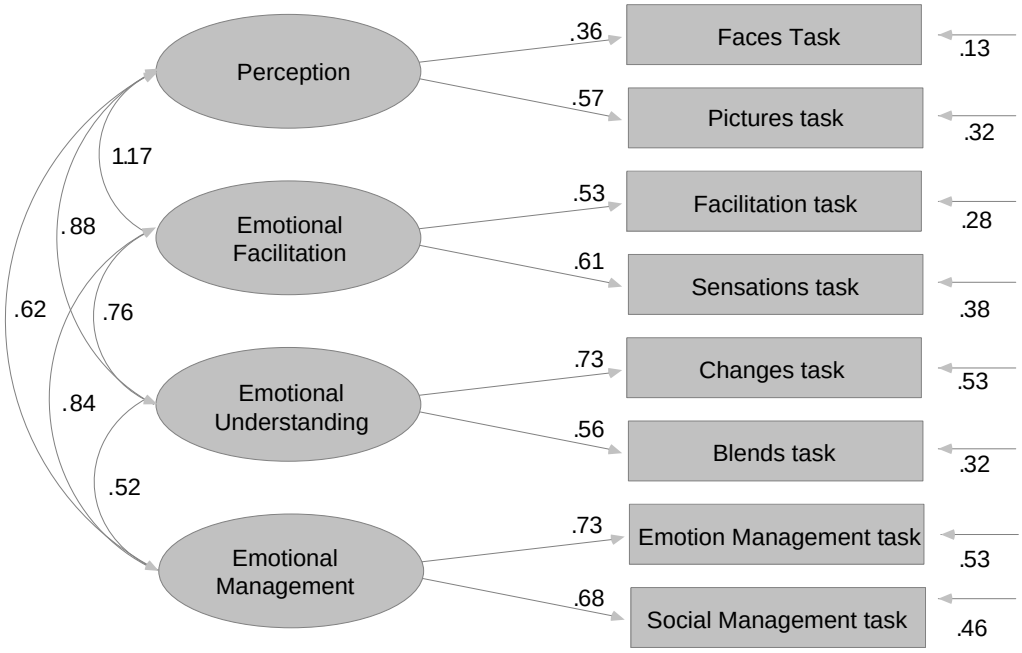
Table F10: Unstandardised and standardised parameter estimates, and significance levels for the *standardised* two factor model

(Standard errors in parentheses, n=223)

Measurement Model Estimates			Unstandardised		Standardised	*p*
StdScore_A (Faces)	←	Experiencing EI	1.00		0.38	Na
StdScore_E (Pictures)	←	Experiencing EI	0.89	(0.20)	0.62	***
StdScore_B (Facilitation)	←	Experiencing EI	0.89	(0.22)	0.50	***
StdScore_F (Sensations)	←	Experiencing EI	1.07	(0.24)	0.66	***
StdScore_C (Changes)	←	Strategic EI	1.00		0.70	Na
StdScore_G (Blends)	←	Strategic EI	0.79	(0.12)	0.56	***
StdScore_D (Emotional management)	←	Strategic EI	0.78	(0.12)	0.54	***
StdScore_H (Emotional relationships)	←	Strategic EI	0.94	(0.14)	0.59	***

***p < .001
Na: No p-values listed for these variables as they were constrained to one

Figure F9: Four factor model of the MSCEIT based on the eight *unstandardised* observed task scores *Standardised solution* (n=223)



Model fit = (χ^2_{14} = 17.901, Bollen-stine p = .363 GFI = .98, AGFI = .95, CFI = .99, TLI = .98, RMSEA = .035, SRMR = .035)

Table F11: Unstandardised and standardised parameter estimates, and significance levels for the *unstandardised* four factor model identified in Figure F9

(Standard errors in parentheses, n=223)

Measurement Model Estimates			Unstandardised		Standardised	*p*
RawScore_G (Blends)	←	Emotional Understanding	0.87	(0.16)	0.56	***
RawScore_C (Changes)	←	Emotional Understanding	1.00		0.73	Na
RawScore_A (Faces)	←	Perception	1.00		0.36	Na
RawScore_E (Pictures)	←	Perception	1.48	(0.33)	0.57	***
RawScore_B (Facilitation)	←	Emotional Facilitation	1.00		0.53	Na
RawScore_F (Sensations)	←	Emotional Facilitation	1.62	(0.25)	0.61	***
RawScore_H (Emotional relationships)	←	Emotional Management	1.45	(0.23)	0.68	***
RawScore_D (Emotional management)	←	Emotional Management	1.00		0.73	Na
***p < .001, Na: No p-values listed for these variables as they were constrained to one						

Table F12: Unstandardised and standardised parameter estimates, and significance levels for the *standardised* four factor model

(Standard errors in parentheses, n=223)

Measurement Model Estimates			Unstandardised		Standardised	*p*
StdScore_G (Blends)	←	Emotional Understanding	0.74	(0.12)	0.60	***
StdScore_C (Changes)	←	Emotional Understanding	1.00		0.80	Na
StdScore_A (Faces)	←	Perception	1.00		0.43	Na
StdScore_E (Pictures)	←	Perception	0.91	(0.21)	0.70	***
StdScore_B (Facilitation)	←	Emotional Facilitation	1.00		0.50	Na
StdScore_F (Sensations)	←	Emotional Facilitation	1.06	(0.18)	0.59	***
StdScore_H (Emotional relationships)	←	Emotional Management	1.20	(0.19)	0.71	***
StdScore_D (Emotional management)	←	Emotional Management	1.00		0.66	Na
***p < .001, Na: No p-values listed for these variables as they were constrained to one						

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Table F13: Unstandardised and standardised parameter estimates, and significance levels for the hierarchic *standardised* model

(Standard errors in parentheses, n=223)

Measurement Model Estimates			Unstandardised		Standardised	*p*
Experiencing EI		General EI	6.75	(0.97)	0.87	***
Strategic EI		General EI	6.75	(0.97)	0.94	***
Perception		Experiencing EI	1.00		0.81	Na
Emotional Facilitation		Experiencing EI	1.11	(0.31)	1.14	***
Emotional Understanding		Strategic EI	1.00		0.81	Na
Emotional Management		Strategic EI	0.80	(0.16)	0.78	***
StdScore_G (Blends)	←	Emotional Understanding	0.76	(0.13)	0.61	***
StdScore_C (Changes)	←	Emotional Understanding	1.00		0.79	Na
StdScore_A (Faces)	←	Perception	1.00		0.42	Na
StdScore_E (Pictures)	←	Perception	0.93	(0.22)	0.71	***
StdScore_B (Facilitation)	←	Emotional Facilitation	1.00		0.48	Na
StdScore_F (Sensations)	←	Emotional Facilitation	1.16	(0.21)	0.61	***
StdScore_H (Emotional relationships)	←	Emotional Management	1.24	(0.20)	0.72	***
StdScore_D (Emotional management)	←	Emotional Management	1.00		0.65	Na
***p < .001, Na: No p-values listed for these variables as they were constrained to one						

Appendix F - Section 3: Detailed results for differences in emotional intelligence and thinking styles for groups with differing demographic characteristics (Section 5.4.3)

Table F14: Pearson's correlation matrix for age on the total scale and subscales of the SSREIT and the subscales of the TSI

Scales	N	Pearson Correlation	Sig. (2-tailed)
SSREIT			
Overall EI Score	282	.008	.898
Optimism	282	.024	.684
Appraisal	282	.020	.739
Utilisation	282	.032	.596
Social Skills	282	-.046	.446
TSI			
Legislative	308	-.073	.199
Executive	308	-.047	.407
Judicial	308	-.057	.317
Global	308	.019	.734
Local	308	.036	.529
Liberal	284	.020	.735
Conservative	308	-.024	.677
Internal	308	.047	.409
External	308	-.026	.646
Hierarchic	308	-.016	.783
Monarchic	308	-.017	.770
Oligarchic	292	-.084	.151
Anarchic	308	-.010	.858

Table F15: Generational differences on the total scale and subscales of the SSREIT and the subscales of the TSI

Scale	Generation Y		Generation X		Baby Boomers		ANOVA	Effect size (eta)
	M	SD	M		M	SD		
SSREIT	n=106		n=156		n=19			
Overall EI Score	134.99	13.31	135.03	12.66	135.89	10.48	F (2,279) = 0.042, p = .959	.04
Optimism	4.32	0.42	4.30	0.42	4.40	0.32	F (2,279) = 0.517, p = .597	.06
Appraisal	3.92	0.58	3.98	0.57	3.96	0.48	F (2,279) = 0.383, p = .682	.05
Utilisation	3.95	0.65	3.97	0.55	4.06	0.55	F (2,279) = 0.307, p = .736	.05
Social Skills	3.96	0.56	3.90	0.62	3.82	0.45	F (2,279) = 0.563, p = .570	.06
TSI	n=139		n=186		n=26			
Legislative	5.01	1.02	5.07	0.94	4.70	0.80	F (2,281) = 1.669, p = .190	.11
Executive	4.77	0.97	4.69	1.06	4.57	0.78	F (2,281) = 1.226, p = .295	.09
Judicial	4.63	1.39	4.74	1.27	4.18	1.10	F (2,281) = 2.861, p = .059	.14
Global	3.73	1.16	4.00	1.13	3.68	1.05	F (2,281) = 1.590, p = .206	.11
Local	4.33	1.14	4.37	1.16	4.34	1.00	F (2,281) = 0.124, p = .883	.03
Liberal	4.92	1.13	5.05	1.04	5.03	0.89	F (2,281) = 0.498, p = .608	.06
Conservative	4.11	1.14	4.16	1.23	3.84	0.82	F (2,281) = 1.201, p = .302	.09
Internal	3.84	1.25	4.09	1.10	3.89	1.09	F (2,281) = 0.508, p = .602	.06
External	5.31	1.19	5.32	1.13	5.23	0.91	F (2,281) = 0.561, p = .571	.06
Hierarchic	5.34	1.16	5.39	1.17	5.21	1.02	F (2,281) = 0.488, p = .614	.06
Monarchic	3.68	1.25	3.79	1.14	3.49	1.32	F (2,281) = 0.802, p = .450	.08
Oligarchic	4.35	1.04	4.23	1.13	4.00	0.71	F (2,281) = 1.347, p = .262	.10
Anarchic	4.56	1.01	4.63	1.07	4.43	1.03	F (2,281) = 0.315, p = .730	.05

Table F16: Length of time with the company - differences on the total scale and subscales of the MSCEIT, SSREIT and the subscales of the TSI

Scale	In the last 6 months		6-12 months		1-2 years		2-5 years		5-10 years		More than 10 years	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
MSCEIT *(Standardised scores)*	n=57		n=39		n=41		n=37		n=27		n=12	
Overall EI Score	91.07	14.55	92.67	10.15	89.04	11.53	89.99	14.92	86.29	14.97	90.42	13.51
Perception Branch	93.13	14.45	94.66	11.43	93.00	15.16	95.37	20.26	89.10	14.55	99.78	17.37
Facilitation Branch	97.58	16.00	100.53	17.65	97.72	13.73	97.57	14.37	93.24	19.47	98.28	14.73
Understanding Branch	93.94	12.50	94.56	9.89	92.31	10.24	92.27	13.61	88.80	12.02	87.24	10.36
Managing Branch	93.53	13.17	94.99	11.06	89.73	10.50	92.84	14.13	89.56	9.94	91.73	9.89
MSCEIT *(Unstandardised scores)*												
Overall EI Score	.46	.07	.48	.05	.46	.06	.46	.06	.45	.07	.48	.07
Perception Branch	.48	.11	.50	.09	.48	.12	.48	.10	.46	.12	.53	.12
Facilitation Branch	.46	.09	.47	.09	.46	.07	.46	.07	.44	.11	.48	.08
Understanding Branch	.51	.07	.52	.06	.51	.06	.50	.07	.50	.08	.49	.09
Managing Branch	.40	.08	.42	.06	.39	.08	.40	.09	.40	.07	.42	.06
SSREIT	n=75		n=19		n=51		n=51		n=54		n=32	
Overall EI Score	137.9	11.5	135.5	13.1	132.6	13.8	131.8	11.9	135.5	13.2	138.0	13.4
Optimism	4.37	0.35	4.38	0.37	4.18	0.51	4.29	0.40	4.27	0.42	4.41	0.42
Appraisal	4.04	0.55	3.92	0.56	3.96	0.57	3.77	0.58	4.07	0.49	4.03	0.63
Utilisation	4.06	0.58	3.94	0.63	3.96	0.59	3.79	0.58	4.02	0.57	4.13	0.46
Social Skills	4.06	0.51	3.85	0.64	3.87	0.64	3.78	0.50	3.91	0.62	4.01	0.70
TSI	n=57		n=52		n=61		n=20		n=39		n=79	
Legislative	5.08	0.91	5.09	1.07	5.24	0.83	4.81	1.00	4.81	1.08	5.06	0.73
Executive	4.76	1.08	4.66	1.02	4.83	0.93	4.52	0.98	4.65	1.11	5.06	0.67
Judicial	4.81	1.14	4.60	1.44	4.98	1.22	4.50	1.40	4.37	1.48	4.44	0.99
Global	3.80	1.14	3.96	1.23	4.14	0.98	3.69	1.14	3.78	1.17	3.90	1.21
Local	4.49	1.12	4.27	1.20	4.54	1.13	4.11	1.05	4.17	1.25	4.62	0.93
Liberal	5.05	1.08	5.04	1.11	5.16	1.03	4.86	1.05	4.84	1.10	4.94	1.02
Conservative	4.00	1.13	4.10	1.26	4.28	1.07	4.00	1.11	4.17	1.42	4.46	0.93
Internal	3.95	1.14	3.75	1.19	4.23	0.97	3.99	1.27	3.90	1.31	4.24	0.95
External	5.39	1.00	5.44	1.25	5.53	0.95	4.98	1.25	5.09	1.31	5.44	0.87
Hierarchic	5.44	1.08	5.26	1.26	5.53	1.02	5.13	1.21	5.28	1.26	5.65	0.97
Monarchic	3.70	1.12	3.55	1.21	4.01	1.13	3.69	1.19	3.74	1.44	3.64	1.13
Oligarchic	4.19	1.09	4.40	0.99	4.42	1.09	4.14	1.01	4.18	1.21	4.20	1.10
Anarchic	4.74	0.86	4.55	1.18	4.82	0.93	4.30	1.08	4.46	1.21	4.65	0.94

Scale	ANOVA	Effect size (eta)
MSCEIT *(Standardised scores)*		
Overall EI Score	F (5,207) = 0.841, p = .522	.14
Perception Branch	F (5,207) = 0.833, p = .528	.14
Facilitation Branch	F (5,207) = 0.661, p = .654	.13
Understanding Branch	F (5,207) = 1.390, p = .230	.18
Managing Branch	F (5,207) = 1.266, p = .280	.17
MSCEIT *(Unstandardised scores)*		
Overall EI Score	F (5,207) = 0.668, p = .648	.12
Perception Branch	F (5,207) = 0.693, p = .629	.13
Facilitation Branch	F (5,207) = 0.372, p = .867	.09
Understanding Branch	F (5,207) = 0.660, p = .654	.13
Managing Branch	F (5,207) = 0.722, p = .607	.13
SSREIT		
Overall EI Score	F (5,276) = 2.112, p = .064	.19
Optimism	F (5,276) = 2.047, p = .072	.19
Appraisal	F (5,276) = 1.934, p = .089	.18
Utilisation	F (5,276) = 1.736, p = .126	.17
Social Skills	F (5,276) = 1.804, p = .112	.18
TSI		
Legislative	F (5,278) = 0.948, p = .450	.13
Executive	F (5,278) = 0.747, p = .589	.11
Judicial	F (5,278) = 1.244, p = .289	.15
Global	F (5,278) = 1.247, p = .287	.15
Local	F (5,278) = 0.568, p = .724	.10
Liberal	F (5,278) = 0.642, p = .668	.10
Conservative	F (5,278) = 1.071, p = .377	.14
Internal	F (5,278) = 0.806, p = .546	.12
External	F (5,278) = 2.116, p = .064	.19
Hierarchic	F (5,278) = 0.423, p = .833	.09
Monarchic	F (5,278) = 1.532, p = .180	.16
Oligarchic	F (5,278) = 0.498, p = .778	.09
Anarchic	F (5,278) = 1.129, p = .345	.14

Table F17: Experience of the new joiner - differences on the total scale and subscales of the SSREIT and the subscales of the TSI

Scale	Graduate		Experienced hire with 1-2 years experience		Experienced hire with more than 2 years experience		ANOVA	Effect size (eta)
	M	SD	M	SD	M	SD		
SSREIT	n=93		n=39		n=150			
Overall EI Score	134.20	13.87	134.28	12.57	135.82	12.07	F (2,279) = 0.547, p = .579	.06
Optimism	4.29	0.43	4.28	0.41	4.34	0.40	F (2,279) = 0.469, p = .626	.05
Appraisal	3.90	0.62	3.86	0.53	4.02	0.54	F (2,279) = 1.940, p = .146	.12
Utilisation	3.93	0.64	4.02	0.53	3.98	0.57	F (2,279) = 0.373, p = .689	.05
Social Skills	3.91	0.60	3.94	0.60	3.91	0.58	F (2,279) = 0.067, p = .935	.00
TSI	n=104		n=43		n=161			
Legislative	4.94	.99	5.02	1.12	5.07	.90	F (2,281) = 0.170, p = .844	.03
Executive	4.75	1.03	4.67	1.00	4.70	1.00	F (2,281) = 0.506, p = .604	.06
Judicial	4.57	1.39	4.59	1.36	4.74	1.24	F (2,281) = 0.000, p = 1.000	.00
Global	3.80	1.21	3.76	1.22	3.94	1.08	F (2,281) = 0.076, p = .927	.03
Local	4.21	1.15	4.34	1.16	4.44	1.11	F (2,281) = 0.556, p = .574	.06
Liberal	4.90	1.11	4.82	1.07	5.11	1.03	F (2,281) = 1.863, p = .157	.11
Conservative	4.14	1.26	3.97	1.06	4.14	1.14	F (2,281) = 0.392, p = .676	.05
Internal	3.69	1.17	4.17	1.24	4.11	1.11	F (2,281) = 4.182, p = .016	.17
External	5.24	1.23	5.20	1.19	5.38	1.06	F (2,281) = 0.150, p = .860	.03
Hierarchic	5.33	1.19	5.15	1.26	5.42	1.09	F (2,281) = 0.473, p = .623	.05
Monarchic	3.64	1.30	3.74	1.19	3.77	1.13	F (2,281) = 0.137, p = .872	.03
Oligarchic	4.29	1.12	4.17	0.94	4.26	1.07	F (2,281) = 0.314, p = .730	.04
Anarchic	4.45	1.04	4.45	1.08	4.72	1.02	F (2,281) = 1.640, p = .196	.11

Table F18: Marital status - differences on the total scale and subscales of the MSCEIT, SSREIT and the subscales of the TSI

Scale	Single		Married		Co-habiting		Divorced		ANOVA	Effect size (eta)
	M	SD	M	SD	M	SD	M	SD		
MSCEIT *(Standardised scores)*	n=86		n=78		n=10		n=6			
Overall EI Score	92.36	14.33	89.79	12.15	94.84	12.05	92.07	11.82	F (3,176) = 0.765, p = .515	.11
Perception Branch	95.10	17.71	94.06	13.40	96.03	14.09	95.15	19.91	F (3,176) = 0.152, p = .929	.05
Facilitation Branch	99.43	15.27	96.69	15.51	101.31	9.77	99.30	21.76	F (3,176) = 0.575, p = .632	.10
Understanding Branch	94.75	12.58	89.62	10.47	100.13	10.06	91.08	6.77	F (3,176) = 4.145, p = .007	.26
Managing Branch	94.80	13.35	91.56	10.48	90.86	10.58	97.46	5.89	F (3,176) = 1.555, p = .202	.16
MSCEIT *(Unstandardised scores)*										
Overall EI Score	.47	.06	.47	.06	.49	.06	.49	.04	F (3,176) = 0.527, p = .665	.10
Perception Branch	.49	.11	.50	.10	.51	.12	.49	.12	F (3,176) = 0.158, p = .925	.05
Facilitation Branch	.47	.08	.47	.08	.49	.05	.47	.11	F (3,176) = 0.279, p = .840	.07
Understanding Branch	.51	.07	.51	.07	.55	.05	.53	.03	F (3,176) = 1.671, p = .175	.17
Managing Branch	.41	.07	.42	.07	.40	.07	.46	.03	F (3,176) = 1.382, p = .250	.15
SSREIT	n=136		n=118		n=15		n=13			
Overall EI Score	135.78	13.23	134.08	12.28	133.33	11.39	138.69	13.28	F (3,278) = 0.817, p = .485	.09
Optimism	4.32	0.42	4.30	0.42	4.35	0.29	4.35	0.39	F (3,278) = 0.097, p = .962	.03
Appraisal	3.97	0.57	3.95	0.56	3.71	0.58	4.15	0.49	F (3,278) = 1.488, p = .218	.13
Utilisation	4.00	0.61	3.91	0.56	3.91	0.64	4.25	0.50	F (3,278) = 1.539, p = .205	.13
Social Skills	3.98	0.59	3.84	0.58	3.84	0.51	3.96	0.69	F (3,278) = 1.254, p = .291	.11
TSI	n=152		n=125		n=17		n=14			
Legislative	5.08	1.01	4.93	0.92	5.02	0.93	5.07	0.87	F (3,280) = 2.505, p = .059	.16
Executive	4.74	1.02	4.73	0.99	4.52	1.24	4.51	0.81	F (3,280) = 0.502, p = .681	.07
Judicial	4.74	1.39	4.57	1.19	4.67	1.29	4.54	1.55	F (3,280) = 3.502, p = .016	.19
Global	3.84	1.23	3.90	1.04	3.80	1.29	3.94	1.00	F (3,280) = 0.225, p = .879	.04
Local	4.41	1.15	4.32	1.10	3.80	1.23	4.59	1.07	F (3,280) = 2.702, p = .046	.17
Liberal	5.11	1.00	4.87	1.10	5.11	1.45	5.06	0.86	F (3,280) = 1.159, p = .326	.11
Conservative	4.08	1.19	4.19	1.17	4.01	1.22	4.04	0.91	F (3,280) = 0.135, p = .939	.03
Internal	3.89	1.21	4.03	1.09	4.06	1.37	4.40	1.13	F (3,280) = 1.314, p = .270	.12
External	5.32	1.23	5.32	1.02	5.34	1.03	5.07	1.33	F (3,280) = 1.030, p = .380	.10
Hierarchic	5.32	1.23	5.41	1.01	5.55	1.31	5.06	1.31	F (3,280) = 1.299, p = .275	.12
Monarchic	3.69	1.27	3.80	1.10	3.45	1.21	3.80	1.24	F (3,280) = 0.426, p = .734	.07
Oligarchic	4.29	1.04	4.22	1.12	4.13	1.00	4.37	1.13	F (3,280) = 0.278, p = .841	.05
Anarchic	4.58	1.04	4.59	1.01	4.54	1.07	4.71	1.41	F (3,280) = 0.778, p = .507	.09

Table F19: Multiple regression of job satisfaction variables onto EI measures

SSREIT			MSCEIT		
Overall Job satisfaction					
$R^2_{adj\ (n=150)}$	-.008	Sig.	$R^2_{adj\ (n=117)}$	-.006	Sig.
F (4, 150)	0.684	.604	F (4, 113)	0.831	.508
β Optimism	.153	.195	*β Perception Branch*	-.155	.167
β Appraisal	.040	.708	*β Facilitation Branch*	-.018	.869
β Utilisation	-.068	.542	*β Understanding Branch*	.076	.477
β Social Skills	-.026	.783	*β Managing Branch*	-.060	.551
Overall satisfaction after a year					
$R^2_{adj\ (n=66)}$	.030	Sig.	$R^2_{adj\ (n=47)}$	-.016	Sig.
F (4, 62)	1.506	.211	F (4, 42)	0.819	.521
β Optimism	.081	.646	*β Perception Branch*	.029	.880
β Appraisal	.244	.123	*β Facilitation Branch*	-.284	.103
β Utilisation	.007	.968	*β Understanding Branch*	.014	.938
β Social Skills	-.019	.886	*β Managing Branch*	-.007	.964
Satisfaction with workforce					
$R^2_{adj\ (n=258)}$	.031	Sig.	$R^2_{adj\ (n=165)}$	.045	Sig.
F (4, 264)	3.158	.015	F (4, 164)	2.983	.021
β Optimism	.257	.001	*β Perception Branch*	.075	.410
β Appraisal	-.007	.931	*β Facilitation Branch*	-.156	.093
β Utilisation	-.059	.444	*β Understanding Branch*	-.111	.216
β Social Skills	-.044	.515	*β Managing Branch*	.259	.002
Satisfaction with present position					
$R^2_{adj\ (n=264)}$	.042	Sig.	$R^2_{adj\ (n=170)}$	.075	Sig.
F (4, 269)	4.026	.003	F (4, 169)	4.516	.002
β Optimism	.169	.030	*β Perception Branch*	-.036	.690
β Appraisal	.091	.228	*β Facilitation Branch*	-.034	.710
β Utilisation	.032	.669	*β Understanding Branch*	-.181	.040
β Social Skills	-.035	.605	*β Managing Branch*	.303	.000
Satisfaction with occupation					
$R^2_{adj\ (n=262)}$	.072	Sig.	$R^2_{adj\ (n=168)}$	.083	Sig.
F (4, 268)	6.314	.000	F (4, 167)	4.879	.001
β Optimism	.305	.000	*β Perception Branch*	.150	.093
β Appraisal	-.001	.986	*β Facilitation Branch*	-.119	.189
β Utilisation	-.034	.643	*β Understanding Branch*	-.199	.024
β Social Skills	.017	.792	*β Managing Branch*	.314	.000
Daily experience: Boring - Fun					
$R^2_{adj\ (n=104)}$	.026	Sig.	$R^2_{adj\ (n=75)}$	-.033	Sig.
F (4,102)	1.709	.154	F (4, 72)	0.400	.808
β Optimism	.086	.559	*β Perception Branch*	.026	.863
β Appraisal	.170	.216	*β Facilitation Branch*	-.033	.817
β Utilisation	.008	.950	*β Understanding Branch*	-.146	.279
β Social Skills	.019	.866	*β Managing Branch*	.019	.877

Daily experience: Unappreciated - Appreciated					
$R^2_{adj\ (n=104)}$	.000	Sig.	$R^2_{adj\ (n=75)}$	.007	Sig.
F (4,102)	1.003	.410	F (4, 72)	1.126	.351
β Optimism	.174	.241	*β Perception Branch*	-.079	.586
β Appraisal	-.003	.982	*β Facilitation Branch*	.061	.666
β Utilisation	-.027	.839	*β Understanding Branch*	-.187	.160
β Social Skills	-.186	.098	*β Managing Branch*	-.092	.453
Daily experience: Overworked - Challenged					
$R^2_{adj\ (n=104)}$	.005	Sig.	$R^2_{adj\ (n=75)}$	-.049	Sig.
F (4,102)	1.131	.346	F (4, 72)	0.105	.980
β Optimism	.052	.724	*β Perception Branch*	.076	.611
β Appraisal	.235	.091	*β Facilitation Branch*	-.033	.820
β Utilisation	-.105	.428	*β Understanding Branch*	-.042	.757
β Social Skills	-.087	.437	*β Managing Branch*	.042	.739
Daily experience: Uninspired - Passionate					
$R^2_{adj\ (n=104)}$	.050	Sig.	$R^2_{adj\ (n=75)}$	.006	Sig.
F (4,101)	2.388	.056	F (4, 71)	1.111	.358
β Optimism	.050	.732	*β Perception Branch*	.017	.906
β Appraisal	.216	.116	*β Facilitation Branch*	-.135	.342
β Utilisation	.113	.385	*β Understanding Branch*	-.153	.247
β Social Skills	-.113	.302	*β Managing Branch*	-.037	.764
Intent to stay					
$R^2_{adj\ (n=157)}$	-.005	Sig.	$R^2_{adj\ (n=124)}$	.068	Sig.
F (4,156)	0.815	.517	F (4, 119)	3.238	.015
β Optimism	.054	.639	*β Perception Branch*	.030	.774
β Appraisal	-.043	.693	*β Facilitation Branch*	-.275	.010
β Utilisation	.102	.347	*β Understanding Branch*	-.063	.530
β Social Skills	.045	.631	*β Managing Branch*	-.047	.622
Willingness to recommend					
$R^2_{adj\ (n=104)}$	-.011	Sig.	$R^2_{adj\ (n=75)}$	.000	Sig.
F (4,220)	0.714	.584	F (4, 72)	1.008	.409
β Optimism	.132	.377	*β Perception Branch*	.107	.464
β Appraisal	.018	.899	*β Facilitation Branch*	-.245	.088
β Utilisation	.024	.859	*β Understanding Branch*	-.011	.931
β Social Skills	-.146	.197	*β Managing Branch*	-.053	.663
Resignation status *(Logistic regression)*					
R^2	.051	Sig.	R^2	.053	Sig.
χ^2_8	14.442	.071	χ^2_8	9.616	.293
β Optimism	0.013	.977	*β Perception Branch*	-1.551	.499
β Appraisal	0.357	.299	*β Facilitation Branch*	5.493	.054
β Utilisation	0.010	.976	*β Understanding Branch*	-4.015	.258
β Social Skills	0.182	.518	*β Managing Branch*	-0.529	.860

F20: Differences on the total scales and subscales of the SSREIT for job functions that have more affective requirements than functions which have more technical requirements

Scale	Affective Requirements		Technical Requirements		T-Test	Effect size (eta)
	M	SD	M	SD		
SSREIT	n=144		n=112			
Overall EI Score	134.58	13.41	134.04	12.09	t (254)= 0.658 , p = .740	.02
Optimism	4.30	0.43	4.29	0.39	t (254)= 0.658 , p = .983	.00
Appraisal	3.93	0.59	3.92	0.55	t (254)= 1.789 , p = .952	.00
Utilisation	3.91	0.61	3.98	0.56	t (254)= 0.025 , p = .373	.06
Social Skills	3.94	0.60	3.83	0.57	t (254)= 0.343 , p = .139	.09

Table F21: Scores on the total scales and subscales of the MSCEIT, SSREIT and TSI for management versus non-management employees

Scale	Management		Non-management		T-Test	Effect size
	M	SD	M	SD		(eta)
MSCEIT *(MHS standardised scores)*	n=102		n=120			
Overall EI Score	89.77	13.37	93.85	12.02	t (210) = -1.446, p = .150	.10
Experiential Area	93.76	16.11	98.83	14.08	t (210) = -1.496, p = .136	.10
Strategic Area	90.75	11.98	91.02	8.61	t (212) = -0.108, p = .914	.01
Perception Branch	93.35	15.76	96.57	12.83	t (212) = -0.976, p = .330	.07
Facilitation Branch	97.42	16.33	100.00	13.11	t (210) = -0.759, p = .449	.05
Understanding Branch	92.65	11.94	91.07	9.87	t (212) = 0.633, p = .528	.04
Managing Branch	92.13	12.30	94.28	9.10	t (212) = -0.841, p = .402	.06
Faces Task	98.88	22.80	106.55	25.91	t (212) = -1.556, p = .121	.11
Pictures Task	94.01	13.13	94.29	8.19	t (213) = -0.105, p = .917	.01
Facilitation Task	103.47	15.77	104.96	14.53	t (210) = -0.448, p = .655	.03
Sensations Task	93.50	14.64	96.04	12.00	t (212) = -0.834, p = .405	.06
Changes Task	92.62	11.77	89.54	8.67	t (212) = 1.261, p = .209	.09
Blends Task	92.02	11.38	91.31	8.59	t (213) = 0.300, p = .764	.02
Emotion Management Task	93.86	11.71	94.10	8.72	t (212) = -0.101, p = .919	.01
Emotional Relationships Task	93.06	13.13	95.94	8.25	t (42) = -1.515, p = .137	.23
SSREIT	n=142		n=140			
Overall EI Score	134.91	12.68	135.98	13.15	t (280) = -0.511, p = .610	.03
Optimism	4.31	0.42	4.35	0.38	t (280) = -0.711, p = .478	.04
Appraisal	3.95	0.56	3.97	0.58	t (280) = -0.154, p = .877	.01
Utilisation	3.97	0.60	3.96	0.51	t (280) = 0.081, p = .936	.00
Social Skills	3.91	0.57	3.94	0.68	t (280) = -0.269, p = .788	.02
TSI	n=155		n=153			
Legislative	5.04	0.97	4.90	0.91	t (306) = 0.907, p = .365	.05
Executive	4.75	0.99	4.52	1.10	t (306) = 1.427, p = .155	.08
Judicial	4.68	1.30	4.55	1.35	t (306) = 0.603, p = .547	.03
Global	3.80	1.11	4.28	1.24	t (306) = -2.666, **p = .008****	.15
Local	4.41	1.12	4.02	1.19	t (306) = 2.158, **p = .032***	.12
Liberal	5.04	1.04	4.78	1.16	t (282) = 1.497, p = .135	.09
Conservative	4.13	1.14	4.06	1.33	t (306) = 0.351, p = .725	.02
Internal	3.99	1.20	3.90	0.93	t (74) = 0.561, p = .576	.06
External	5.32	1.15	5.24	1.09	t (306) = 0.423, p = .672	.02
Hierarchic	5.33	1.16	5.47	1.11	t (306) = -0.767, p = .444	.04
Monarchic	3.77	1.19	3.46	1.18	t (306) = 1.633, p = .103	.09
Oligarchic	4.29	1.05	4.08	1.16	t (290) = 1.214, p = .226	.07
Anarchic	4.61	1.04	4.47	1.07	t (306) = 0.821, p = .413	.05
***p < .001 **p < .01 *p < .05						