STRUCTURAL VALIDITY OF THE EMOTIONAL QUOTIENT INVENTORY (EQi) WITHIN AN INSURANCE COMPANY

by

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LETTER OF DECLARATION

I, Melinda de Franca, declare that the thesis entitled “Structural Validity of the Emotional Quotient Inventory within Insurance Company” is my own unaided work both in content and execution. All the resources I used in this study are cited and referred to in the reference list by means of a comprehensive referencing system. Apart from the normal guidance from my study leader, I have received no assistance, except as stated in the acknowledgements.

I declare that the content of this thesis has never been used before for any qualification at any tertiary institution.

I, Melinda de Franca, declare that the language in this thesis was edited by Marisa F. Honey (MPhil Translation, 2006).

Melinda de Franca Date:

_____

Signature

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ABSTRACT

STRUCTURAL VALIDITY OF THE EMOTIONAL QUOTIENT INVENTORY (EQI) WITHIN AN INSURANCE COMPANY

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Degree : **M Com (Industrial Psychology)**

In the world of work, psychological instruments are often used for the purposes of selection and development (Van de Vijver & Rothmann, 2004). According to Van der Merwe (1999), psychological tests are commonly used to determine whether employees have the necessary skills for a specific job. However, much controversy still exists about the use of such instruments, particularly in the multicultural South African context, as not all psychometric tests accommodate individuals from different cultures and different socio-economic and educational backgrounds.

The objective of this study was to assess the structural validity of the Emotional Quotient Inventory (EQi) developed by Bar-On. The EQi measurement consist of 133 items and was completed by a total of 1 104 participants in the South African insurance sector drawn by means of convenient sampling. An exploratory factor analysis (EFA) was performed, from which only nine factor loadings resulted out of an anticipated fifteen. Overall, the factor loadings did not provide a good representation of the Bar-On theoretical model. In addition, a confirmatory factor analysis was conducted to test if the data fitted the Bar-On EQI theoretical model. The results suggest a poor fit and therefore the structural validity of the EQI can be questioned for the respondents from an insurance company.

KEY TERMS
Structural validity, emotional quotient inventory (EQi)

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

As business changes, so does the need to find competencies that can accommodate the increasingly complex workplaces. People in the 21st century are currently facing ongoing obstacles within their current environment, which include adaptation to external challenges, changing diversity and the improvement of individual learning to attain improved performance. Individuals are required to (1) deliver open-ended communication; (2) manage conflict by means of negotiating and resolving disagreements and by cooperating with others towards shared goals; and (3) form and transform interpersonal relationships.

In order for individuals to adapt to the environment it is necessary for them to have the capacity to thrive, to see problems as opportunities for growth, to experience challenges as opportunities for learning and development, and to demonstrate a dynamic self-renewal. Salovey and Mayer (1990) claim that emotions are a contributor to intelligence behaviour by influencing an individual's reaction to, and interpretation of, information. Therefore, emotional intelligence or EI has been cited as the reason why some individuals who possess high EI demonstrate the competence to identify, express and understand emotions; to assimilate emotions in thought; and to regulate both positive and negative emotions in themselves and others (Matthews, Zeidner & Roberts, 2002). It is also the reason why some individuals are more successful than others in terms of leadership (Day *et al.,* 2002) or aspects of workplace functioning, such as coping in high-pressure work environments (Caruso, 1999).

The interaction between emotions and intelligence has previously investigated these two elements as separate entities. According to various reviews (Izard, 1993; Mayer, Chabot & Carlsmith, 1997; Plutchik, 1984), emotions are recognised as three fundamental classes of mental operations, namely motivation, emotion and cognition. In order to carry out simple acts of survival and reproductive needs, motivation arises in response to internal bodily

states. The ability to respond to changes in the relationship between the individual and its environment is then associated with the second class of this triad: emotions. The third triad, cognition, denotes the use of reason or the cognitive capacity to solve problems in order to direct one's behaviour to understand one's own and others' emotional behaviour. Mayer and Salovey (1997, p.2) suggested that, although the "three areas are integrated in more complex personality functioning," the triad is no longer seen as separate elements, but rather as being multifaceted. Emotions modulate emotional responses to a specific precipitating event or circumstance by involving cognitive processes, physiological arousal and behavioural tendencies.

According to Kaplan and Sadock, intelligence is generally referred to as cognitive intelligence or the intelligence quotient (IQ). Some emerging definitions suggest that intelligence is the "aggregate capacity of an individual to act purposefully, to think rationally and to deal effectively with his or her environment" (Wechsler, 1975, p.18). Foxcroft and Roodt (2001, p.18) indicate that intelligence can be viewed as a "constantly active interaction between inherent ability and environmental experience". This implies that intelligence allows an individual to use reason or cognitive capacity to provide a solution to a problem.

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. Following on Salovey and Mayer's model, various researchers have developed and categorised different classes of EI theories and measurement tools over time (Brackett and Geher, 2006). According to Dulewicz and Higgs (1999), traditional measures of rational thinking (IQ tests) indicate the inability to predict life successes. Therefore, the concept of EI was developed in search of a measure to provide a more valid predictor of academic, occupational and life success (Fox & Spector, 2000). According to Goleman (2001), all models of EI on a global level endeavour to understand and measure elements that involve the recognition and regulation of one's emotions and the emotions of others. With the immense interest generated by EI and the plethora of alternative EI tools and theories, this conceptualisation soon became a source of debate and confusion regarding the nature of EI and the best way to measure it (Roberts, Zeidner & Matthews, 2001).

In the midst of the empirical and theoretical debate, the dimensions and competencies of EI appear to be distinct. Two views suggest that EI is more narrowly composed of distinct abilities related mostly to perception: identification, understanding and management of emotion (Mayer, Caruso & Salovey, 1999b; Mayer & Salovey, 1997), while others suggest that the properties of EI are more broadly inclusive of "critical competencies", focusing on factors such as empathy, decision making and teamwork (Bar-On, 1997; Cooper & Sawaf, 1997; Goleman, 1995). Although the concept of EI is still in its stage of active development, many definitions have been proposed to define the core concept of EI (see *Table 1*: Definitions of Emotional Intelligence).

Table 1: Definitions of Emotional Intelligence

Author	Definition
Wong and Law, (2002)	Social intelligence is the ability to understand and manage men and women, boys and girls – to act wisely in human relations.
Salovey and Mayer (1990)	Emotional intelligence is the subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions.
Gardner (1993)	Social intelligence is comprised of a person's interpersonal and intrapersonal intelligences. Intrapersonal intelligence relates to one's intelligence in dealing with oneself, and is the ability to symbolise complex and highly differentiated sets of feelings. Interpersonal intelligence relates to one's intelligence in dealing with others and is the ability to notice and make distinctions among other individuals and, in particular, among their moods, temperaments, motivations and intentions.
Bar-On (1997)	Emotional intelligence is an array of non-cognitive abilities, competencies and skills that influence one's ability to succeed in coping with environmental demands and pressures.
Mayer and Salovey (1997)	Emotional intelligence is a set of interrelated skills concerning the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth.
Martinez-Pons (1997)	Emotional intelligence is an array of non-cognitive skills, capabilities and competencies that influence a person's ability to cope with environmental demands and pressures.
Saarni (1997)	Emotional competence is defined as the demonstration of self-efficacy in emotion-eliciting social transactions.
Goleman (1998)	Emotional intelligence is the capacity for recognising our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships.
Eisenberg, Cumberland & Spinrad (1998)	Emotional competence is an understanding of one's own and others' emotions, the tendency to display emotion in a situationally and culturally appropriate manner, and the ability to inhibit or modulate experienced and expressed emotion and emotionally derived behaviour as needed to achieve goals in a socially acceptable manner.

Cooper and Sawaf (1997)	Emotional intelligence is the ability to sense, understand and effectively apply the power and acumen of emotions as a source of human energy, information and influence.
Fox and Spector (2000)	Emotional intelligence is a set of competencies that may enable people to use emotions advantageously to achieve desired outcomes.
George (2000)	Emotional intelligence is the extent to which people's cognitive capabilities are informed by emotions and the extent to which emotions are cognitively managed.
Martinez-Pons (2000)	Emotional intelligence is the self-regulatory routines by which individuals engage in emotion and behavioural control.
Wolmarans (2002)	Emotional intelligence is a meta-competency and includes competencies such as self-management, accessing emotional energy, emotional literary, change resilience, emotional honesty, vision, goal-directedness, balancing head and heart and the ability to motivate oneself and others.

The predominant language that appears throughout the definitions is that of cognitive, affective, conative and social aspects of EI. EI has been defined as the practical application of the learned abilities and knowledge-building attitudes related to the cognitive, affective, conative and social aspects of EI, in active interaction with one's environment.

The definition of emotional intelligence differs among the different researchers, who questioned whether the construct emotional intelligence is a new naming convention for existing constructs, such as personality and general cognitive ability (Ali, 2011).

An exploration of the psychometric properties of emotional intelligence measures is necessary to determine whether the construct is measuring what it is supposed to be measuring. The accurate measurement of emotional intelligence may prove to be advantageous for selection and training in organisations.

The Bar-On Emotional Quotient assessment (EQi) is a prominent EI questionnaire frequently utilised in personnel selection in South Africa. The theoretical structure of the EQi model was based on Bar-On's (1997) literature studies, which identified underlying factors that focus on recognising how individuals function effectively and successful within a demanding environment.

The EQi produces a total emotional quotient (EQ) score, five composite scale scores, and 15 sub-scale scores, defined by Bar-On (1997). Developing a high level of emotional intelligence allows individuals to build sound values, which, in turn, forms attitudes that enable individuals to make rational choices within any given demanding situation or environment. The development of the Bar-On model and measure of emotional intelligence proceeded in six major stages over a period of 17 years, as presented in *Table 2*.

Table 2: Six development stages as described by Bar-on (2006)

Stage 1
Identification and logical clustering of a variety of emotional and social competencies related to or that may have an influence on effectiveness and psychological welfare. This was based on the experience of Dr Reuven Bar-On as a clinical psychologist and a thorough review of the literature.
Stage 2
Defining the individual key clusters of competencies, skills and facilitators that surfaced.
Stage 3
Initially, Bar-On generated around 1 000 items based on his own professional experience, a thorough review of the literature and input from experienced healthcare practitioners who were requested to produce questions they would ask in an interview situation guided by definitions given by Dr Bar-On.
Stage 4
Determining the inclusion of 15 primary scales and 133 items in the published version of the instrument based on a combination of theoretical considerations and statistical findings generated by item analysis and factor analysis.
Stage 5
Originally norming the final version of the instrument on 3 831 adults in North America in 1996.
Stage 6
Ongoing norming and validation of the instrument across cultures.

While Bar-On indicated the development of a model that promotes an understanding of the components of EI, there has been much criticism of the same, particularly towards the clustering of these 15 factors (Matthews *et al.,* 2002; Palmer *et al.,* 2003). According to the stated researchers (Matthews *et al.,* 2002; Palmer *et al.,* 2003), the Bar-On EQi appears to have a factor structure ranging from a six to three primary factors structure, and not the proposed fifteen-factor structure. Bar-On also reported a 13-factor solution after two factors collapsed into one factor.

Therefore, the factorial structure of the EI model of Bar-On is seen as questionable, with significant differences in factor number and composition emerging across different studies (Matthews *et al.,* 2002; Palmer *et al.,* 2003).

1.2 PROBLEM STATEMENT

Schutte *et al.* (1998) claimed that, in order for the concept of emotional intelligence (EI) to make theoretical advances in terms of its nature and development, a reliable and valid measure was necessary to contribute to our understanding of an individual's EI within an ongoing changing environment.

Hassan and Sader (2005) suggest that EI has become an important area of research in the educational and psychological arena. Various models and measures of EI have been developed since Salovey and Mayer conceptualised EI in 1990 (HighBeam Research, 2010). However, one could question whether the different models of EI actually still measure what they are supposed to be measuring, and more specifically, whether they focus on the structural validity of the measurement. If EI can be developed, would the dimensions of the EI measurement still be deemed reliable and valid? If the environment is continuously changing, are individuals monitoring and discriminating their emotions differently? Given these questions, it is important to re-examine the psychometric properties of the EI construct.

The Bar-On EQi (Bar-On, 1997) measurement was one of the first validated instruments in the market and focused on measuring emotional intelligence in terms of the social and EQ capabilities of a person. Bar-On (1997) illustrated that the dimensional structure of his model, the Emotional Quotient Inventory (EQi), signifies a hierarchical model. On the basis of a theory and statistical analysis, the EQi represents a 1-5-15 structure. The 1 represents the total EQ score; the 5 represents the five composite scores and the 15 represents the 15 sub-scale scores.

However, the Bar-On EQi psychometric properties were subjected to criticism when Palmer et al. (2003) found that the dimensional structure of the EQi comprised a general factor and six sub-dimensions. Matthews *et al.* (2002) conducted a factor analysis on the basis of the normative correlations provided by Bar-On (1997), and the results demonstrated that the reliable variance of the EQi could only be attributed to three (instead of fifteen) constructs, namely self-esteem, empathy and impulse control. Other researchers have found that the EQi items tend to cluster into one general factor (Brackett & Mayer, 2003; Petrides & Furnham, 2000). As a resultant, the concern emerges regarding why there are anomalies in the factor analytic structure of the Bar-On EQi measurement. There are also a number of issues concerning the interpretation of the factor solution that best represents the dimensional structure of the EQi.

In the field of human resources/industrial psychology, the proposed study aims at determining the structural validity of the emotional quotient inventory measure, as there is little research to date that has examined the dimensional structure of the existing measure of EI in the SA context. As such, the current study will attempt to replicate the factor structure of the EQi.

1.3 RESEARCH OBJECTIVES

The objective of the study aims to determine the structural validity of the Bar-On Emotional Quotient Inventory Questionnaire developed by Bar-On (1997). In achieving this objective it is important to address the following:

- To understand the concept of emotional intelligence
- To understand the relationship between emotional intelligence and related or relevant external variables
- To evaluate the emotional quotient inventory with respect to the factorial validity of the instrument

1.4 SIGNIFICANCE OF THE STUDY

Today, companies worldwide routinely look through the lens of EI when hiring, promoting and developing their employees. EI will determine whether the individual has good social skills, will be able to manage conflict and stress appropriately in the workplace, as well as interact with and handle others in the workplace. Mastery of these personal and interpersonal skills will allow an individual to perform optimally in a high-pressure environment. EI is an important ability in any career due to the increasing importance of adaptive interpersonal skills and the effective management of people on all levels of a company, and is a key to working with people (Murphy, 2006). EI concerns the controlling of emotions, thereby indicating a relationship between cognitive control and emotional reactions (Palmer *et al.,* 2003).

According to Palmer *et al.* (2003), EI is a construct that can be learnt and taught, which suggests that an improved understanding of the cognitive contributions to EI could facilitate the learning of how to implement EI in a complex situation. EI has been widely advertised as a self-help tool, with a number of websites and EI organisations offering EI testing and workshops to measure and improve EI (Murphy, 2006). However, debates surrounding EI and its validity and the core definitions of the underlying constructs are questioned, as Pérez, Petrides and Furnham (2005) state that EI is a construct that is difficult to measure and define due to the variability involved in defining subjective abilities. According to Petrides and Furnham (2000), the existence of a coherent research domain of EI has not yet been demonstrated, and this still holds true today.

Reuven Bar-On designed the first EQ test in the world, which is known as the Reuven Bar-on EQi. This assessment has been classified as a psychological test by the Medical and Dental Council of South Africa. However, limited studies have been undertaken to provide further research on the factorial validity of the EI measure in order to dispel concerns regarding its validity. According to Crocker and Algina (1986, p.1), “for the EQi to exhibit construct validity, their factor structure should reflect the theorized factor structure”. That being said, the substantiation of a five-factor model, as proposed by the EQi model, should support the theory behind each measure. It is evident that Bar-On (2000) failed to find

theoretically sound support for the 15-factor structure of the EQi when using exploratory principal component analysis, as well as confirmatory factor analysis. This study will also provide a basis for a similar investigation of the factor structure of the EQi and will create a platform for more research to be undertaken.

1.5 CHAPTER OVERVIEW

Chapter 2 serves to review the literature surrounding emotional intelligence (EI). It describes the construct by tracing the historical roots of EI; reviewing the different models of the construct and the measures used to assess them; and understanding why EI is providing new insights as an integral part of psychological wellbeing. Furthermore, the literature review will cover the criticisms and controversies surrounding EI.

Chapter 3 presents the methodology used in the present study. The purpose of the analyses, the steps taken in the research and the research strategy are explained in this chapter. Statistical techniques are discussed in detail, as well as how sampling was undertaken.

Chapter 4 provides and discusses the statistical analysis in detail. All statistical tables and figures are demonstrated in this section. This chapter also concludes with the limitations of the study and recommendations for further studies.

CHAPTER 2

EMOTIONAL QUOTIENT INVENTORY

2.1 INTRODUCTION

Individuals' experiences have been influenced by changes in the economic, technological and business environment (Barnett & Bradley, 2007). Finding a new way of operating to accommodate these challenges and one's own personal dynamism would require high levels of emotional intelligence (EI) for effective performance-driven performances.

An underlying assumption within EI theories is that EI involves the capacity to perceive emotions, assimilate and understand emotion-related feelings and the ability to manage emotions (Mayer, Salovey & Caruso, 2000). The acknowledgement of EI as a differentiated concept led researchers to further refine EI as a whole new theory and as a theory other than cognitive intelligence, which contributes to the success of personal goals (Van der Merwe, Coetzee & De Beer, 2005). Other contributions came from Bar-On who contributed to the phrase "emotional quotient" or "EQ" by developing the theoretical framework for an "Emotional Quotient Inventory" (EQi). In 1990, Salovey and Mayer coined the phrase "emotional intelligence" then the concept of Emotional Intelligence (EQ) was popularized largely by Goleman (1995) in his publication "*Why It Can Matter More than IQ*".

Within our demanding environment, individuals are required to accumulate information, refine processes and align current systems with future possibilities, which place a higher level of stress on constantly make the right emotional judgment. Therefore, EI is another way of saying 'human effectiveness' (Vermeulen, 2006) and provides the basis for the development of competencies that establishes an individual's performance.

The purpose of the literature study is to provide a solid theoretical basis for the research questions that this study explores. An investigation of previous literature and research provides insight into the theories that preceded the concept under review. This included

tracing the historical roots of EI, and reviewing the different models of the construct and the measures used to assess them. As part of the literature review, efforts to determine whether the EI model actually measures what the proposed theories say it will are dependent on both empirical and theoretical support. The measures will include undertaking a statistical analysis of the structural validity of the construct being measured, and research that demonstrates the relationship of the construct with external measures/variables also contributes to a better understanding of the construct (Articlesbase, 2012). Lastly, an overview is given regarding the criticisms and controversies surrounding EI.

As such, research that demonstrates the relationship of the construct with external measures/variables also contributes to a better understanding of the construct. Lastly, an overview is given regarding the criticisms and controversies surrounding EI.

2.2 HISTORICAL ROOTS OF EMOTIONAL INTELLIGENCE

The roots of emotional intelligence were pursued in the lines of the intelligence testing movement (Bradberry & Su, 2006). For decades, the focus on the intelligence quotient (IQ) was the main stream of intelligence. David Wechsler (1943, p.3), the originator of an IQ test, proposed that intelligence involves more than cognitive intelligence and emphasised that “non-intellective aspects of general intelligence” should be incorporated into any complete measurement. In terms of this, intelligence can be defined as “the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his (or her) environment” (Wechsler, 1958, p.1). In 1983, Howard Gardner further proposed a theory of multiple intelligences, which included conceptualising personal intelligence as an intrapsychic ability and interpersonal skill.

However, a new ideology arose as early as 1920, when Thorndike (as cited by Hedlund & Sternberg, 2000, p.1) proposed that all individuals possess several types of intelligence and focused solely on aspects of cognitive and behavioural components, termed social intelligence – “the ability to act wisely in human relations”. However, the concept of social intelligence became problematic, as it became too complex to be measured and the

concept was too much of a multidimensional construct (Jones & Day, 1997; Marlowe, 1986; O'Sullivan & Guilford, 1975). Given these problems within the concept of social intelligence, the EI model began to emerge as a prominent framework within the psychology paradigm as EI arose from the assumption that the concept of intelligence alone required more than mere cognitive intelligence.

Researchers Salovey and Mayer (1990) introduced the term emotional intelligence and described EI as a cognitive ability that is based on one's emotions to be operationalised in one's social environment. Therefore, EI is defined as the "the ability to perceive emotions, integrate emotion to facilitate thought, understand emotions, and to regulate emotions to promote personal growth" (Mayer & Salovey, 1997, p.12). However, it was Goleman (1995) who popularised EI in the mainstream public. Goleman adapted the model of Salovey and Mayer (1990) and split EI into personal and social competence, stating that "emotional competence is defined as a learnt capability on emotional intelligence that results in outstanding performance at work" (Cherniss & Goleman, 2001, p.1). Bar-On (1997, p.1) identified EI as a mixture of emotion-related competencies and personality traits and proposed a slightly different viewpoint of EI, defining EI as "an array of non-cognitive (emotional and social) capabilities, competencies and skills that influence one's ability to succeed in coping with environmental demands and pressures". He hereby stating that EI is an important predictor of an individual's success in life and general well-being. Despite the discrepancies between the definitions of EI, early theorist such as Thorndike (1920) and Gardner (1999) helped current experts conceptualise the field of EI and move away from the standard intelligence or IQ ideology.

Tracing the historical roots of EI, this chapter also serves to review more recent models of the emotional intelligence construct and the importance of distinguishing between these competing models.

2.3 COMPETING MODELS OF EMOTIONAL INTELLIGENCE

Interest in the interaction of EI and the concept of EI originated from the notion of social intelligence. Thorndike (1920) presented a broader view of the concept of social intelligence, which he referred to as the "capacity to understand other individuals and act appropriately during social interaction". Gardner (1993, p.3) further included both the intrapersonal and interpersonal facets in the concept of social intelligence. As a subset of social intelligence, Salovey and Mayer (1990, p.189) popularised the term EI, which represented "the capacity of individuals to appraise, monitor, discriminate, identity, utilise, and regulate emotions", thereby focusing on the following four facets: accurate perception, appraisal, expression of emotions and the capacity to generate suitable feelings. Goleman's (1995, p.1) theory of EI further distinguishes between the "awareness of the self, motivating the self, management of emotions, empathy, and handling relationships".

EI has encompassed a plethora of published and unpublished literature to operationally define the construct and its associated measures. Assuming that emotional intelligence is significant, the question of assessment and measurement becomes predominantly important. There are a myriad of tests available to measure EI, including those developed by Lane *et al.* (1990), Boyatzis *et al.*(1999), Mayer *et al.* (2002), Jordan *et al.* (2002), Schutte *et al.* (1998), Dulewicz and Higgs (1999), Wong and Law (2002), Petrides and Furnham (2003) and Tett, Fox and Wang (2005). Given the variability of the constructs within the various models, each model employs different learning techniques and development initiatives (Emmerling, Shanwal & Mandal, 2008).

On the basis of a comprehensive amalgamation of information among a host of academic journals, technical reports, books, unpublished papers and manuscripts, the EI models most commonly referred to in the literature are definitions by Goleman (1995), Bar-On (1997) and Mayer and Salovey (1997). The consensus within literature states that EI can be viewed as an ability (Mayer & Salovey, 1997), a set of traits and abilities (Bar-On, 2005) or a combination of skills and personal competencies (Goleman, 1998).

On the basis of the development of this ideology of EI, a variety of competing measures have been developed: those assessing abilities and others involving self-reporting of emotional experiences. MacCann and Roberts (2008) suggested that an optimal test of EI should fulfil four key criteria. First, EI tests should relate positively to other types of intelligence tests. Second, EI tests should relate strongly to other EI tests. Third, EI measures should relate to emotion-related behaviour and, lastly, EI test scores should correlate with personality independently, i.e. at .30 or less (Ackerman & Heggestad, 1997), thereby demonstrating that EI is in fact an intelligence concept, rather than a personality factor. Therefore, the following review analyses the ability and mixed models of EI in terms of conceptualisation, measurement approaches and MacCann and Roberts (1998) criteria (*Table 3)*.

Table 3: ***MacCann and Roberts (2008) criteria***

Criteria 1	Criteria 2	Criteria 3	Criteria 4
EI measurements are related positively to other forms of intelligence	EI measurements are related positively to other measures of EI	EI measurements predict behaviours that are related to emotions	EI measurements are relatively independent of personality

2.3.1 COMPARISON OF ABILITY AND MIXED MODELS

Models of EI have been arranged into two general categories, ‘ability’ and ‘mixed’. According to Petrides and Furnham (2000), an ability model views EI as a form of intelligence that is measured objectively on performance-based scales. One such a model, which represents an example of an ability-based model, is the Mayer *et al.* (2000) model. On the other hand, MacCann *et al*. (2003) suggest that EI is an arrangement of capabilities and skills, all-encompassing of dispositional, motivational and situational variables, thus stating that a mixed model takes on a more inclusive approach and can be subjectively measured through a self-report questionnaires or multi-rater methods. Two examples of mixed models are those of Goleman (1995) and Bar-On (2006).

2.3.1.1 ABILITY MODEL

Peter Salovey and John Mayer (1990) first formulated the term “emotional intelligence” and mentioned the idea that individuals process EI in social contexts. They defined EI as “the ability to monitor one’s own and other’s feelings and emotions, to discriminate among them and to use this information to guide one’s thinking and actions” (Salovey & Mayer, 1990, p.184). Mayer, Salovey and Caruso (2002) state that EI is in line with traditional theories of intelligence, thus associating with cognitive and emotional systems that allow the individuals to have the ability to process and relate to information of an emotional nature and to a wider cognitive level, therefore having the ability to (a) evaluate emotion in oneself and others, (b) understand emotional experience and (c) recognise, identify with and regulate emotions in oneself and in others. The Mayer *et al.* (2000) model proposes that EI and the psychological processes supporting it can be grouped into four branches of abilities, as represented in *Table 4.*

Table 4: Salovey, Mayer and Caruso EI model (Mayer *et al*., 2000)

BRANCHES	***EMOTIONAL INTELLIGENCE AS A MENTAL ABILITY***
1	Emotional perception and identification
2	Emotional facilitation of thought
3	Emotional understanding
4	Emotional regulation

The four-branch model consists of levels of abilities and asserts that those who have a higher EI have the capability to process emotional information and to use core abilities (Mayer *et al.,* 2000) to progress through each of these stages (i.e. branches) quicker than those with a lower level of EI (Mayer & Salovey, 1997). The first branch, *emotional perception*, is the identification of emotions in oneself and in others, which refers to identifying one’s own and others’ physical states, feelings and thoughts. The second branch, *emotional facilitation*, is the ability to distinguish, prioritise and identify among the different emotions that one is feeling and that influence thought processes. The third branch, *emotional understanding*, is the ability to understand complex emotions and recognise transitions between the words and emotions. Lastly, the fourth branch,

emotional regulation, is the ability to connect or disconnect from an emotion, depending on its usefulness in a given situation (Mayer & Salovey, 1997).

Consistent with this theoretical framework, Mayer, Salovey and Caruso (1999a), while still exploring the significance of EI, conducted a comprehensive study to develop a valid measure, called the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), and its precursor, the Multi-Factor Emotional Intelligence Scale (MEIS), which measures the four emotion-related abilities shown in *Table 4.* Mayer *et al.* (1999a) state that the MSCEIT serves to establish the criteria for a performance-based measure of EI because: (a) its factor structure is congruent with the four abilities; (b) the four abilities exemplify unique variance and are significantly related to other constructs of mental abilities; (c) the four abilities are objectively measured; (d) the measurement forecasts behavioural conditions and (e) the measurement illustrates age-related differences. Mayer *et al.* (2000) believe that portions of personality, including mental abilities, skills and capacities, represent the term “emotional intelligence” and are of the opinion that the concept of intelligence is processed from emotions. However, theorist such as Goleman (1995) and Bar-On (1997) associate EI with certain personality attributes or abilities (Mayer *et al.,* 2000).

Criterion 1:

Barchard (2001) demonstrated that the MSCEIT scales illustrated a low to moderate correlation with measures of general intelligence (e.g. verbal ability, verbal closure and inductive reasoning). Verbal intelligence, assessed by the WAIS-III vocabulary subscale, further suggests that a moderate correlation exists (0.39) with the Understanding branch of the MSCEIT (Lopes, Salovey & Straus, 2002). The MSCEIT suggests that the measurement assesses a type of intelligence, therefore criterion 1 is supported.

Criterion 2:

According to Brackett and Mayer (2003), correlations are .21 with the Bar-On Emotional Intelligence Scale and .29 with the Trait Meta Mood Scale (Gohm & Clore, 2002) in relation to the MSCEIT. Criterion 2 is supported, as the performance on the MSCEIT tends to correlate modestly with other measures of emotional intelligence.

Criterion 3:

Brackett and Mayer (2003) also tested a moderate correlation with psychological well-being. Furthermore, performances on the MSCEIT are associated with various measures of social and psychological functioning, as can be seen in the study of Tsaousis and Nikolaou (2005). Therefore, criterion 3 is supported, as the MSCEIT relates meaningfully to other emotion-related variables.

Criterion 4:

The initial research by Barchard (2001) and Day and Carroll (2004) on the MSCEIT and personality resulted in a low or statistically non-significant correlation. Livingstone and Day (2005) support Mayer *et al.*'s (1999a) contention that EI is distinct from personality, as the results that they obtained for the personality factors accounted for very little variance in each of the four MSCEIT scale scores. Therefore, criterion 4 is fully supported, as the MSCEIT scores do not correlate strongly with personality

2.3.1.2 MIXED MODELS

Goleman's (1995) interest in EI positioned his own EI model within performance-based theory and designed his model within the application of the organisational context. In other words, he used the model of Salovey and Mayer (1990) and adapted it to explore the impact of EI on work life. Goleman (2001) operated under the assumption that social and emotional abilities had an influencing factor on the development of individual effectiveness in the workplace as well as in leadership positions. Therefore, he defined EI as "a learned capability based on emotional intelligence that results in outstanding performance at work" (Goleman, 2001, p.16). Goleman (2001) states that for one to be emotionally competent one will need to have certain emotional competencies, which include having specific skills and abilities to help strengthen one's EI and performance within the workplace. Boyatzis, Goleman and Rhee (2000) further state that EI brings understanding of how individuals translate intelligence into "on-the-job capabilities". *Table 5* provides the framework of emotional competencies conceptualised by Goleman (2001).

Table 5: Framework of Goleman's Emotional Competence Inventory (Goleman, 2001)

	Self (Personal competence – the ability to manage oneself)	**Other (Social competence – how an individual manages his/her relationship with others)**
Recognition	Self-awareness Emotional self-awareness Accurate self-assessment Self-confidence	Social awareness Empathy Service orientation Organisational awareness
Regulation	Self-management Emotional self-control Trustworthiness Conscientiousness Adaptability Achievement drive Initiative	Relationship management Developing others Influence Communication Conflict management Visionary leadership Catalysing change Building bonds Teamwork and collaboration

The Emotional Competency Inventory (ECI) was developed to address Goleman's (1995) model of EI and to assess competencies regarding work-related situations. The ECI is a 360-degree assessment inventory that gathers information from the self, subordinate, peer and supervisor on twenty social and emotional competencies (Goleman, 2001). However, in an important critique of the Goleman Model, Mayer and Salovey (1997, p.1) stated that "Goleman bases his work on anecdotal evidence", thereby disapproving of Goleman's attempt to conceptualise everything but IQ under the phrase EI. Mayer *et al.* (2000, p.330) accused Goleman of redefining and re-describing the concept of EI by "including a somewhat different set of personality attributes" and challenged Goleman to provide empirical validity evidence for what he defined as EI. The next mixed model to receive consideration is that of Bar-On.

Criterion 1:

According to a study by Byrne (2003), only three of 20 ECI scales are significantly related to scores on the Watson-Glaser Critical Thinking Appraisal, a measure of cognitive ability. Van Rooy and Viswesvaran (2004) also indicated that mixed models of EI measures (such as the ECI) demonstrate a mean correlation of .09, thereby suggesting that mixed models

tend to be unrelated to general cognitive ability. Therefore, the ECI suggests that the measurement does not assess a type of intelligence, thereby supporting criterion one.

Criterion 2:

According to Tumasjan *et al.* (2005), the ECI was measured against the Wong and Law scale (2002) to determine convergent validity. The ECI measurement correlated highly ($r = .41$, $p < .001$) with the Wong and Law instrument (2002), indicating a moderate degree of convergent validity. Criterion two is supported, as the ECI is positively related to other measures of EI.

Criterion 3:

The Byrne (2003) study demonstrated that the ECI self-ratings were unrelated to academic performance (undergraduate GPA (grade point average) and the GMAT (Graduate Management Admission Test) scores. These correlations ranged from -.08 to +.08 and none reached statistical significance (all p values > .29). Therefore, criterion three is not supported, as the ECI self-ratings are independent of academic performance and general mental ability.

Criterion 4:

According to the Byrne (2003) study, the relationship between the personality and ECI constructs indicated that the ECI self-ratings for all four clusters were negatively correlated with neuroticism, but were positively correlated with the other four personality factors. The strongest correlation was between extraversion and ECI social skills ($r = .57$); the remaining correlations ranged between .20 and .40. These correlations are said to be similar to the meta-analytic correlations between EI and personality reported in Van Rooy and Viswesvaran's (2004) study. Therefore, criterion four is fully supported, as the ECI scores did not correlate strongly with personality.

Bar-On (1997), a pioneer in the field of EI (also termed "Emotional Quotient" (EQ)), sought to identify constructs that identified successful social functioning and positive emotional health. He subsequently identified EI as an underlying construct for emotional and social intelligence and therefore defining EI as "an array of non-cognitive (emotional and social)

capabilities, competencies and skills that influence one's ability to succeed in coping with environmental demands and pressures" (Bar-On, 1997, p.1). In other words, having emotional intelligence allows one to have the ability to be aware of emerging environments; to intuitively grasp what others want and need; to understand one's own and others' strengths and weaknesses; and to have the aptitude to remain unflustered by stress. It therefore reflects a process-orientated multi-factorial model, which demonstrates the *potential* to succeed rather than success itself (Bar-On, 1997).

Bar-On (1997) posited a model that overlooks aspects of personality traits and their application to personal well-being. The Bar-On model is operationalised by the Bar-On EQi measurement instrument and identifies five composite scales: intrapersonal, interpersonal, adaptability, stress management and general mood, and each of these components comprises a number of sub-components, which are reflected in *Table 6.* According to Bar-On (1997), the five main components of the Bar-On model suggest that the *Intrapersonal EQ Scale* assesses the individual's understanding and development of the inner self. Well-developed individuals have the potential to be in touch with their feelings and are confident in expressing their ideas and beliefs. *The Interpersonal EQ scale* assesses interpersonal skills and functioning. Individuals who have a high interpersonal score have the ability to be responsible and dependable and have good social skills, which allow them to interact and relate well with others. *The Adaptability EQ scale* demonstrates how one can cope with environmental demands and problematic situations by realistically sizing up situations. High scores on this scale indicate one's ability to be flexible, realistic and effective when understanding problematic situations and having the ability to create adequate solutions. *The Stress Management EQ scale* demonstrates the ability to withstand stress or lose control. Individuals who receive high scores on this component tend to be calmer and are able to work well under pressure without being impulsive. Lastly, the *General Mood EQ scale* measures one's ability to enjoy life and one's overall level of gratification. Individuals who are well developed in this component are able to look at the brighter side of life and maintain a positive disposition.

Table 6: Components of Emotional Intelligence Measured by the Bar-On EQi (Van Rooyen and Partners, 2000)

INTRAPERSONAL COMPOSITE SCALE (RAeq) Concerned with the inner self
Self-regard (SR): The ability to look at and understand oneself, respect and accept oneself, accepting one's perceived positive and negative aspects as well as one's limitations and possibilities. ***Emotional self-awareness (ES)***: The ability to recognise and understand one's feelings and emotions, differentiate between them, know what caused them and why. ***Assertiveness (AS)***: The ability to express feelings, beliefs and thoughts and defend one's rights in a non-destructive way. ***Independence (IN)***: The ability to be self-reliant and self-directed in one's thinking and actions and to be free of emotional dependency. ***Self-actualisation (SA)***: The ability to realise one's potential capacities and to strive to do that which one wants to do and enjoys doing.
INTERPERSONAL COMPOSITE SCALE (EReq) Concerned with interpersonal skills and functioning.
Empathy (EM): The ability to be attentive to, to understand and to appreciate the feelings of others. It is being able to "emotionally read" other people. ***Interpersonal relations (IR)***: The ability to establish and maintain mutually satisfying relationships that are characterised by intimacy and by giving and receiving affection. ***Social responsibility (RE)***: The ability to demonstrate oneself as a co-operative, contributing and constructive member of one's social group.
ADAPTABILITY COMPOSITE SCALE (Adeq) Concerned with the ability to size up and respond to a wide range of difficult situations.
Problem solving (PS): the ability to identify and define problems as well as to generate and implement potentially effective solutions. ***Reality testing (RT)***: The ability to assess the correspondence between what is experienced (the subjective) and what in reality exists (the objective) ***Flexibility (FL)***: The ability to adjust one's emotions, thoughts and behaviours to changing situations and conditions.
STRESS MANAGEMENT (SEeq) Concerned with the ability to cope with and understand stress
Stress tolerance (ST): The ability to withstand adverse events and stressful situations without falling apart by actively and confidently coping with stress. ***Impulse control (IC)***: The ability to resist or delay an impulse, drive or temptation act.
GENERAL MOOD (GMeq) Concerned with the ability to enjoy life as well as the person's outlook on life and overall feeling of contentment
Happiness (HA): The ability to feel satisfied with one's life, to enjoy oneself and others, and to have fun. ***Optimism (OP)***: The ability to look at the brighter side of life and to maintain a positive attitude even in the face of adversity.

There was concern about the 'mixed model' conceptualisation, as some researchers criticised the conceptualisation of the model as being overly broad (Mayer *et al.,* 2000). Mayer *et al.* (2000) noted that the 'mixed model' ideology focused more on non-cognitive factors, such as personality traits, while Petrides and Furnham (2003) held the opinion that

the theoretical model of Bar-On (1997) tapped more into the sphere of 'trait EI' and concurred that the factors related significantly more to personality factors.

Criterion 1:

According to Bar-On (2004), the EQi has been administered with various measures of cognitive intelligence, namely the Wechsler Adult Intelligence Scale, the Progressive Raven Matrix and the General Adult Mental Ability Scale. The results demonstrated a minimal overlap between the EQi and tests of cognitive intelligence, suggesting that EQi assesses a type of intelligence and not a type of performance. These studies are said to be similar to the meta-analytic findings confirmed by David van Rooy and his colleagues (Van Rooy & Viswesvaran, 2004; Van Rooy, Pluta & Viswesvaran, 2004), who suggested that no more than 4% of the variance of the EQi was explained by cognitive intelligence. Consequently, criterion 1 is supported, as the EI measurement is partially related to other forms of intelligence.

Criterion 2:

To determine whether a correlation exists between the EQi and other EI instruments, Bar-On (2004) summarised the findings of 13 studies, which indicated a large overlap (36%) between the EQi and other measures of EI. Therefore, criterion 2 is supported, as the EQi is describing key aspects of emotional-social intelligence, rather than other psychological constructs such as cognitive intelligence.

Criterion 3:

According to Bar-On (1997), Goleman (1995) and Mayer *et al.* (1999a), EQi scores are related to both job and life satisfaction scores. However, Bar-On (2004, p.120) noted that "the incremental variance explained in job and life satisfaction may have been driven by the Mood scale, because it was the only scale to uniquely predict job and life satisfaction". Therefore, criterion 3 is supported, as the EQi relates meaningfully to other emotion-related variables.

Criterion 4:

Consistent with past and recently published studies, the EQi has been shown to correlate with a number of personality measures, these being the Neuroticism scale on the Big Five, anxiety on the 16PF, depression with the BDI, and alexythymia (Dawda & Hart, 2000; Newsome, Day & Cantano, 2000; Parker, Taylor & Bagby, 2001). However, based on Van Rooy's personal communication from April 2003, and as indicated in his most recent meta-analysis, he has suggested that the degree of overlap between the EQi and personality tests is no more than 15%, thereby claiming that EQi is not measuring personality traits. Taking into account Van Rooy's recent research, criterion 4 is supported, as the EQi is independent from personality traits.

2.3.1.3 CONCLUSION

Besides the differences in the conceptualisation of emotional intelligence, the available tests of emotional intelligence differ widely, not only in their theoretical conceptualisation, but also in their methods of measurement. Because of these differences, problems and shortcomings arose within the development of the EI paradigm, as there was no clear definition of the term EI and there was an overlap with existing constructs. Firstly, Mayer *et al.* (2000) proclaimed that their ability model focuses on establishing a theory on a new form of intelligence in an effort to clarify that the individual has the ability to recognise, understand, express, control and reflect on emotion and emotional information. They therefore emphasise that their ability model is based on mental abilities and cognitive processes and relies on objective measures and on performance-based scales that look at maximum performance.

In contrast, the Bar-On (1997) model explicitly includes non-ability traits and focuses on the educational environment in an effort to explain differences in emotional behaviour. Goleman's model (2001) reflects a framework in which the skills of self-awareness, self-management, social awareness and relationship management are acknowledged. Different from the definitions of Goleman, Bar-On and Mayer and Salovey, all three models share an inclusive understanding and measurement that involves the acknowledgment and regulation of one's own emotions and that of others (Goleman, 2001). Therefore,

further investigation is required to provide greater clarity on this debate, as the advantages and disadvantages of both approaches are unlimited.

There is growing interest in the construct of emotional intelligence, as the theory shows that individuals with high levels of emotional intelligence are more likely to experience success than individuals with low levels of emotional intelligence (Abraham *et al.,* 2009).The following section will focus on integrating the literature review of EI with that of psychological wellbeing.

According to Saarni (2000, p.72), "emotional competence includes an effective skill to manage one's emotions; a sense of subjective wellbeing, together with adaptive resilience when faced by stressful circumstances". Against this backdrop, a number of studies have since demonstrated how EI has been deemed to aid in the conceptualisation of psychological wellbeing.

2.4 EI AND RELATED EXTERNAL VARIABLES

According to Bar-On (2010), emotional intelligence should be considered as an integral part of positive psychology, as EI is concerned with how individuals manage the demanding pressures of internal and external emotional stimuli (Martinez, 1997). Various researchers have reaffirmed the notion that EI is an integral part of positive psychology, and empirical findings have demonstrated that EI has a significant impact on (a) wellbeing; (b) human performance and (c) self-actualisation (i.e. having meaning in one's life), which are of interest to the positive psychology paradigm.

2.4.1 THE RELATIONSHIP BETWEEN EI AND WELLBEING

The relationship between EI and wellbeing suggest that individuals who are able to maintain a positive mental state through their ability to manage their emotions are likely to experience a higher level of psychological wellbeing (Mayer & Salovey, 1997; Salovey & Mayer, 1990). The literature has theorised that EI is a potential predictor of emotional wellbeing (Bar-On, 2005; Saarni, 1999; Salovey *et al.,* 1995; Schutte *et al.,* 2002).

Individuals who are able to maintain better emotional health and have a positive outlook on life are able to understand and adjust their emotions. They therefore have "the ability to understand and accept [their] emotions and [themselves] in general … the ability to strive to set and achieve personal goals … and … the ability to verify [their] feelings" as these contribute to their state of wellbeing (Bar-On, 2005, p. 14). In a study conducted by Bar-On (2005), the impact of EI on wellbeing was examined. The relationship between EI and wellbeing was examined using multiple regression analysis, which resulted in the two constructs being highly correlated (0.76).

In summary, Bar-On (2010) states that those who possess high emotional self-awareness, positive self-regard, self-actualisation and effective reality testing have an atypically well-developed sense of wellbeing. Other researchers have provided additional evidence in support of this proposition.

Schutte *et al.* (2002) are of the opinion that two aspects of individual emotional wellbeing, characterised as mood and self-esteem, are components that evaluate the self. Two studies were conducted to examine the relationship between EI and positive affect (i.e. mood) and EI and self-esteem. In the first study, participants completed an EI measurement by Schutte *et al.* (1998) and the PANAS measurement (Positive Affect and Negative Affect Schedule) of Watson, Clark and Tellegen (1988), which measures positive and negative affect. The results indicated that the participants' average emotional intelligence score was 130 (SD = 14.99), with a range of 97 to 154, and that their average characteristic positive mood score on the PANAS was 39.95 (SD = 5.74), with a range of 28 to 50. This indicates that individuals who have higher emotional intelligence would experience a higher level of positive affect (i.e. mood), with r (39) = 0.55, $p < .0001$. In the next study, the participants completed an EI measurement by Schutte *et al.* (1998) and the Rosenberg Self-Esteem Scale (Rosenberg, 1989). The results indicate that the participants' average emotional intelligence score was 133.46, SD = 14.62, with a range of 93 to 157; and their average self-esteem score was 34.00, SD = 5.60, with a range of 21 to 40. This indicates that individuals who have higher emotional intelligence will experience a higher level of self-esteem, with r (49) = 0.57, $p < .0001$. The results of these studies

indicate possible connections between EI and emotional wellbeing – EI is characteristically related to positive moods and self-esteem.

Another indicator associated with wellbeing is life satisfaction. The findings of Palmer, Donaldson and Stough (2002) indicate that trait EI illustrated incremental validity in the prediction of life satisfaction (r= 0. 26, p <0.01), which confirms the findings of Ciarrochi, Chan and Caputi (2000), where the EI construct related to life satisfaction. Kulshresth and Sen (2006) were able to reveal that EI depicts a significantly positive correlation with subjective wellbeing. Subjective wellbeing was measured with the positive and negative affect scale by Bradburn (1969), and with the life satisfaction scale by Andrews and Withey (1976), and EI was measured by using the Emotional Quotient Test of Chadha (2001). *Table 7* and *Table 8* illustrate a correlation coefficient matrix between emotional intelligence, positive and negative affect and life satisfaction.

Table 7: Correlation coefficient of emotional intelligence with positive and negative affect

Positive affect	+.6350 **
Negative affect	-. 6542 **

**p .001

Table 8: Correlation of emotional intelligence with different dimensions of life satisfaction

Dimensions	Correlation
Satisfaction with personal life (A)	. 4738*
Satisfaction with standard and achievement (B)	.8129*
Satisfaction with lifestyle (C)	. 7669*

* p .001

The results therefore conclude that there is a correlation between EI and positive affect and the different dimensions of life satisfaction. The above studies provide a clear indication that there is a significant positive correlation between emotional intelligence and subjective wellbeing, and that emotionally intelligent people are likely to engage in a greater level of psychological wellbeing.

2.4.2 THE RELATIONSHIP BETWEEN EI AND SELF- ACTUALISATION

Self-actualisation is a concept that is defined as the ability to realise one's potential, to search for a more meaningful life and to set and achieve personal goals to actualise one's inner potential. The literature suggests that individuals who experience high levels of EI experience more career achievements, stronger personal relationships and the ability to motivate themselves (Bar-On, 1997; Cooper and Sawaf, 1997). Herbst (2003, p. 56) asserts that "both emotionally intelligent and self-actualising people are involved in continuous learning and growth, which help them to perform effectively to realise their personal and team goals." *Table 9* illustrates Herbst's (2003) attempt to illustrate similarities between the underlying constructs of EI and self-actualisation, which are categorised into intrapersonal, interpersonal and work-related characteristics.

Table 9: Theoretical similarities between emotional intelligence and self-actualisation *(from Barnard & Herbst, 2005).*

	Emotional intelligence	Self-actualisation
Intrapersonal characteristics	• Emotional self-awareness (Van Rooyen, 1999) • Interpersonal relationships and stress tolerance (Van Rooyen, 1999) • Reality testing (Bar-On, 2000; Van Rooyen, 1999) • Flexibility (Van Rooyen, 1999) • Problem-solving ability (Van Rooyen, 1999) • Self-directed and self-controlled (Covey, 1989; Van Rooyen, 1999)	• Emotional self-awareness (Maslow, 1971) • Positive regard for and understanding of others (Rogers, 1961) • Stress tolerance (Allport , 1961) • Reality perception (Maslow , 1971) • Openness to experience (Rogers, 1959) • Problem-solving ability (Ellis, 1983; Maslow, 1971) • Inner directedness (Ellis, 1983; Maslow, 1971)
Interpersonal characteristics	• Empathy (Bar-On, 2000) • Social responsibility (Van Rooyen, 1999) • Interpersonal relationships (Van Rooyen, 1999)	• Empathy (Covey, 1989; Maslow, 1971) and altruism (Antonovsky, 1985) • Acceptance of self and others (Maslow, 1971) • Good interpersonal relationships (Allport, 1961; Maslow , 1971)
Work-related characteristics	• Personal goals (Stein & Book, 2001) • Constructive, productive (Jourard & Landsman, 1980) and continuous learning and growth (Goleman, 1998)	• Total involvement, commitment and internalised goals (Frankl, 1969) • Growth motivated (Maslow , 1971)

Bar-On (2010) conducted a study in South Africa on a sample of 67 university students who completed an EQi as well as a self-actualisation assessment measurement known as the Personal Orientation Inventory. The results confirmed a significant relationship between EI and self-actualisation (0.64) (Bar-On, 2006). Three additional studies, based on large samples from the Netherlands (*n* = 1 639), Israel (*n* = 2 702) and North America (*n* = 3 831), illustrate a positive correlation coefficient of 0.78, 0.75 and 0.80 for the Dutch, Israeli and American samples respectively.

Barnard and Herbst (2005) conducted a study that investigated the relationship between emotional intelligence and self-actualisation. Taken from their study, they conducted a Pearson correlation between the EQi (Bar-On, 1997) and the Personal Orientation Inventory (POI) composite scales. The POI measures self-actualisation behaviour. The results indicate that most of the constructs showed a significant relationship between some of the EI factors and the self-actualisation factors. The adaptability and intrapersonal behaviour factors indicated a predominantly positive correlation with the self-actualisation factors. The results therefore conclude that there is a positive relationship between EI and self-actualisation. In conclusion, individuals who have a higher EI are more driven, more committed and more likely to achieve their own goals (Bar-On, 2006).

2.4.3 THE RELATIONSHIP BETWEEN EI AND JOB PERFORMANCE

Recent studies (Ashkanasy & Daus, 2002; Fulmer & Barry, 2004; Humphrey, 2002, 2006; Humphrey, Pollack & Hawver, 2008; Jordan *et al.,* 2002) have highlighted the importance of EI as a predictor in the domains of performance. O'Boyle *et al.*'s (2010, p.2) meta-analysis study elaborated on these prior studies by determining "whether EI accounts for unique variance in predicting job performance". Bar-On and his colleagues (Bar-On, 1997; Bar-On, Handley & Fund, 2005; Handley, 1997; Ruderman & Bar-On, 2003) have also conducted six studies investigating the relationship between EI and job performance. All of these authors agree that having the ability to identify and manage one's emotions and those of others may contribute to effective social interaction as well as effective emotional labour. Emotional labour is the ability to alter one's emotional expressions (Ashforth & Humphrey, 1993; Diefendorff, Croyle & Gosserand, 2005; Hochschild, 1979; Pugh, 2001;

Rafaeli & Sutton, 1990). Grandey (2003, p.3) also defines emotional labour as "the degree to which workers are expected to express positive emotion and hide negative emotions as part of the job". Having the ability to recognise their own emotions may help leaders alter their emotional expressions, which will influence the moods, motivations and performance of their subordinates (Humphrey, 2008; Humphrey *et al.,* 2008). Having the ability to recognise emotions in others may also help one know when to perform emotional labour.

According to research done by Joseph and Newman (2010), the relationship between EI and job performance varies on the level of emotional labour. Joseph and Newman's (2010) meta-analysis indicated that there is a high correlation between EI and job performance in high emotional labour professions, but that the same is not true in low emotional labour professions. In conjunction with their study, cognitive ability and personality were controlled and the results indicated that the relationship of EI to job performance was positive for high emotional labour jobs but negative for low emotional labour jobs. Therefore Joseph and Newman (2010, p.78) suggested that the "use of EI measures should only be used to select applicants into high emotional labour jobs; otherwise there may be negative impact".

To guide O'Boyle *et al*.'s (2010) analyses, Ashkanasy and Daus's (2005) theoretical model was used to examine the three streams of EI research (the three streams are: ability-based, self-report-based on ability models and mixed models). The results of O'Boyle *et al.* (2010), illustrated in *Table 10*, advocate that the data support their hypothesis, indicating that the overall relationship between EI and job performance demonstrates a positive and significant relationship ($r_c = 0.28$, $p < 0.001$). However, no significant differences between the streams were determined, as can be seen in *Table 10.*

Table 10: Overall results for EI and job performance

Job performance	*K*	*n*	*r*	r_c	Observed variance	Corrected variance	90% credibility interval	95% confidence interval	% var SE
All streams	43	5795	.236*	.278	.014	.020	.094; .378	.201; .272	47
Stream 1	9	700	.206*	.238	.027	.036	.008; .405	.100; .313	45
Stream 2	7	1134	.256*	.298	.008	.011	.181; .331	.192; .320	72
Stream 3	27	3961	.235*	.281	.013	.019	.095; .375	.191; .278	46

*p < .001

Note: O'Boyle *et al.* (2010) classified their EI studies into three streams: (1) ability-based models that use objective test items; (2) self-report or peer-report measures based on the four-branch model of EI; and (3) ''mixed models'' of emotional competencies.

Handley (1997) and Bar-On *et al.* (1995) investigated whether US Air Force recruiters were able to meet their annual recruitment quotas based on their ability. Based on these studies, the recruiters could be divided into those who were able to meet 100% of their annual quota (high performance) and those who could only meet less than 80% of their annual quotas (low performance). The results show that a high relationship existed between EI and job-related performance, as the discriminant analysis indicated that the EQi scores were able to accurately distinguish between high and low performances.

Two other studies conducted by Bar-On *et al.* (2005) measured a sample of 335 regular combat soldiers in the Israeli Defence Force (IDF) and a sample of 240 soldiers in an elite IDF unit. Both studies equally demonstrated that there was a relationship between EI and work-related performance, as the predictive validity of the former study was 0.55 and it was 0.51 in the latter.

All of the studies of Bar-On and his colleagues (Bar-On, 1997; Bar-on *et al.,* 2005; Handley, 1997; Ruderman & Bar-On, 2003) show that the average predictive validity coefficient for the studies described demonstrated a 0.54 validity coefficient, meaning that nearly 30% of the variance in job-related performance is based on EI as described by the Bar-On model. The findings of the above studies suggest that (a) the ability to be aware of and accept oneself; (b) the ability to be aware of others' feelings; (c) the ability to manage emotions; (d) the ability to be realistic; and (e) the ability to have a positive and optimistic disposition are important EI contributors to job-related performance (Bar-On, 2006).

Based on O'Boyle *et al.*'s (2010) meta-analyses, the Bar-on model is seen as a mixed model (stream 3), which explains a maximum of 13, 2% of the total amount of explainable variance. In contrast, cognitive measures explain 69% of the variance (*Table 11)*. The independent meta-analysis reports an average correlation coefficient of 0.23 to 0.28 in respect of mixed methods EQ measures over 27 studies (17 studies included the EQi). However, Bar-On's model obtained validity coefficients ranging from 0.51 to 0.55. Therefore, there appear to be large anomalies in terms of the level of the validity of EQ measures.

Table 11: Relative importance of emotional intelligence

	EI stream 1		**EI stream 2**		**EI stream 3**	
	Raw relative weights	**Relative weights as a % of R^2**	**Raw relative weights**	**Relative weights as a % of R^2**	**Raw relative weights**	**Relative weights as a % of R^2**
Cognitive ability	.313	73.5	.331	69.7	.339	69.0
Neuroticism	.005	1.3	.005	1.1	.008	1.5
Extraversion	.006	1.3	.004	.9	.005	1.0
Openness	.016	3.7	.019	4.0	.021	4.3
Agreeableness	.004	.9	.004	.8	.004	.8
Conscientiousness	.055	12.8	.047	9.9	.050	10.2
Emotional intelligence	.027	6.4	.065	13.6	.065	13.2
	R^2 =.427		R^2= .474		R^2= .491	

Note: O'Boyle *et al.* (2010) classified their EI studies into three streams: (1) ability-based models that use objective test items; (2) self-report or peer-report measures based on the four-branch model of EI; and (3) ''mixed models'' of emotional competencies.

The above studies have suggested in their own right that EI makes a unique and important contribution in predicting job performance. However, O'Boyle *et al.*'s (2010) meta-analyses included a data set of 65% more studies that examine the relationship between EI and job performance.

This study has provided the most comprehensive meta-analysis to date, including a noticeably greater number of studies included than in previous meta-analyses. Therefore O'Boyle *et al.*'s (2010) findings are indicative that EI compares quite favourably in predicting job performance.

2.4.4 OTHER APPROACHES REGARDING THE IMPORTANCE OF EMOTIONAL INTELLIGENCE IN MAINTAINING PSYCHOLOGICAL WELLBEING OF INDIVIDUALS

Various studies confirm the importance of emotional intelligence as an integral part of aiding the conceptualisation of psychological wellbeing in individuals:

- A study conducted by Slaski and Carthwright (2003) confirmed that EI can be taught, learnt and applied as a technique for reducing stress and improving health, well-being and performance.
- Sheehan (1999) proposed that the development of EI would allow managers to manage different sets of skills in order to become more effective in their multiple roles. In other words, managers would have the ability to be aware of their own needs and the needs of others.
- Ciarroshi *et al.* (2000) showed that individuals with higher EI were able to manage their moods and prevent their moods from biasing their social judgement. The results of the study indicated that individuals with high EI tended to recall more positive memories than people with a low EI.
- A study done by Ciarrochi, Deane and Anderson (2002) hypothesised that EI would make a contribution in understanding the relationship between stress and mental health. Individuals who were able to manage their own emotions indicated the ability to adapt better to stress, with less depression, hopelessness and suicidal ideation.
- A study conducted by Vakola, Tsaousis and Nikolaou (2004) indicated that people with high EI were able to develop positive attitudes towards change and had an increased ability to cope with change.
- Ashkanasy and Dasborough (2003) incorporated emotions and EI concepts into an undergraduate leadership course and indicated that teaching emotions and EI can affect team performance and individual performance.

2.4.5 CONCLUSION

To sum up, it seems that much research concludes that EI possesses conceptual links through related external variables. Therefore, the puzzle why some people have better emotional wellbeing than others, despite their divergent talents, abilities and skills, can be solved by concluding that individuals with higher EI have the capability to manage stressors and maintain a functional level of coping.

Empirical studies indicate that EI has emerged as one of the most highly profiled psychological construct due to the influx of a great deal of academic research and media exposure. Whilst the concept of EI has grown exponentially, with many different claims being made to differentiate EI from academic intelligence (Mayer & Salovey, 1993), many theorists (Barrett, 2000; Conte 2005; Davies, Stankov & Roberts, 1998; Landy, 2005; Locke, 2005; Matthews *et al.,* 2002) are in disagreement that the concept of EI is not scientifically credible. A general critique of the value of the EI construct will now be provided.

2.5 A CRITICAL EVALUATION OF THE EI CONSTRUCT

According to Bedwell (2003), the definition of EI, its empirical relationship to personality and traditional cognitive abilities and its best practices have been subjected to countless debates. Against this sustained interest in the concept, a number of competing views have evolved regarding whether personality provides the context in which EI functions. Davies *et al.* (1998), Matthews *et al.* (2002) and Roberts *et al.* (2001) further state that tests of EI that assess general dispositions (e.g. assertiveness, optimism, impulse control) are in actual fact tapping into the composition of personality, which then questions the legitimacy of whether EI constitutes a new type of intelligence. Researchers such as Gignac (2005), Malouff, Thorsteinsson (2005) and Dawda and Hart (2000) purport that the self-report EI measures have been found to correlate with the five-factor personality dimensions. More specifically, Extraversion and Neuroticism indicated a larger significant correlation in relation to self-report EI. Van Rooy, Viswesvaran and Pluta (2005) also assert that there still is no clear understanding of the exact nature of the relationship between personality

and the EI constructs. A correlation study on the Bar-On EQi and NEO Five-factor Inventory (a self-report measure assessing personality dimensions) was conducted and indicated a correlation of 0.4 and above for all the Big Five factors, with the exception of openness to experience (Dawda & Hart, 2000). The situation becomes problematic, as it is not clearly defined what the EI construct is essentially measuring and whether there is direct correspondence between the construct and the sphere of personality (Betty, 2005).

According to Landy (2005), the EI construct is represented in the discredited research of social intelligence and this author is of the opinion that there is a lack of scientific examination in terms of the EI measure. Landy (2005) also criticises the fact that research on EI presents itself with no substantial predictive value and that there is very few incremental validity over traditional models of personality in relation to social and organisational behaviour.

Locke (2005, p.2) also argues that the construct is inadequately defined and that the EI construct is advocated through political rather scientific reasoning, with an egalitarianism agenda “redefining what it means to be intelligent so that everyone will, in some form, be equal in intelligence to everyone else”. His views are opposed by Ashkanasy and Daus (2005, p.13), as they believe that Locke (2005) “fails to acknowledge more recent trends and research in emotions”.

Mayer (1999, p.50) defines EI as “the capacity to reason with emotion…”, while Locke (2005) refutes this ideology, stating that reason and emotion are two opposing cognitive processes that perform different psychological functions. Reason involves the ability to gain and validate one’s knowledge, while emotions entail an automatic process based on one’s stored beliefs and values. In other words, it is through reason that one identifies what emotion one is experiencing.

Conte (2005) discusses the deficiencies in the psychometric measures of EI. When reviewing four measures of EI (Emotional Competence Inventory, Emotional Quotient Inventory, Multifactor Emotional Intelligence Scale and the Mayer–Salovey–Caruso Emotional Intelligence Test), the following evidence indicates that validity evidence for EI

measure was lagging behind reliability evidence. Due to the vague theoretical development of many of the measures, content validity was lacking, and construct validity in terms of convergent and discriminant validity was also lacking. According to Conte (2005, p.5), these absent psychometric properties could have arisen because "EI measures failed to converge on a common construct", or because the self-report measure of EI appears to review existing personality characteristics of emotional competencies and not concepts of intelligence.

Other researchers, such as Eysenck (2000), argue that EI could not be recognised as a form of intelligence. Eysenck (2000) states that Goleman's depiction of EI contains assumptions about intelligence in general and believes that Goleman's theory is not built on scientific basis. Becker (2003) also criticises whether the existing measures of emotional intelligence are adequately developed, and whether they are rooted in reality or imagination. Davies *et al.* (1998), on the other hand, question the qualities of the construct, stating that it is no more than a set of personality variables.

However, Ashkanasy and Daus (2005) view emotional intelligence as a tool to be applied by I/O psychologist and scholars of organisational behaviour and not as some form of social intelligence or substitute for intellectual intelligence. Ashkanasy and Daus (2005) argue that the construct of EI should be carefully understood by taking the time to read the emotion literature that underpins the concept of EI and discuss the roles that emotions play in the organisational context.

The complexity of understanding these issues is exacerbated by the fact that emotions in the individual are subject to different experiences, which causes the EI measurement to undergo further changes and development. McEnrue and Groves (2006) indicate that, in order to effectively understand the complex issues pertaining to the measurement of the EI abilities, longitudinal cross-disciplinary studies should be undertaken to effectively advocate the EI psychometric properties.

Although the concept of EI generally is a popular one, Crocker and Algina (1986, p.1) have indicated that its validity is dubious and that for any model to demonstrate construct validity, a "factor structure should reflect its theorised factor structure".

2.5.1 BAR-ON'S MULTIFACTOR MODEL

To date, few published studies have examined the measurement structure of the EQi at item level. According to Bar-On's (1997) initial factor analytical study based on a varimax rotation, a 13-factor solution afforded the most theoretically meaningful interpretation. However, essential differences were recognised between the theoretical structure and the one that surfaced as a result of exploratory factor analysis. These differences suggested that a) two factors emerged from the Impulse Control items; (b) although Self-regard, Self-actualisation, Optimism and Happiness represent four separate scales, most of their items loaded onto two factors; (c) although Assertiveness and Independence are considered to be two separate subscales, items from both subscales loaded onto one factor. Impulse control was treated at one factor as opposed to two factors, as factor 3 and factor 8 suggest the same naming convention (see *Table 12*). A confirmatory factor analysis was initially applied to determine whether it was possible to treat Self-regard, Optimism, Happiness and Self-actualisation as separate factors. A four-factor oblique model was tested and all four factors were highly significant for items with their appropriate factors. Given the magnitude of the association between the Assertiveness and Independence factors, two confirmatory factor analyses were applied. A uni-dimensional model and a two-factor model were compared by testing the difference in chi-squares and the results indicated that the two-factor model demonstrated significantly better fit that the one-factor model. Therefore, in conclusion, Assertiveness and Independence should be measured as separate factors.

Table 12: The Output Factors and Their EQi Subscale Equivalents *(Bar-On, 1997)*

Factor	Name Based on Factor Analysis	EQi Subscale Content
1	Self-contentment	Primarily Self-regard with some Happiness, Optimism and Self-actualisation
2	Social responsibility	Social responsibility
3	Impulse control	Impulse control (a)
4	Problem solving	Problem solving
5	Emotional self-awareness	Emotional self-awareness
6	Assertiveness/independence	Assertiveness and independence
7	Flexibility	Flexibility
8	Anger control	Impulse control (b)
9	Stress tolerance	Stress tolerance
10	Enjoyment	Some Happiness and Self-actualisation
11	Interpersonal relationship	Interpersonal relationship
12	Empathy	Empathy
13	Reality testing	Reality testing

Palmer *et al.* (2003) examined the measurement structure of the EQi using an Australian sample of 377 participants. An exploratory factor analysis was performed with the items that made up the 15 subscales of the EQi. Their findings recommend a more conclusive interpretation of the Bar-On dimensional structure, as their study proposed that most items loaded onto a single factor supporting a general EI dimension. Their scree test also suggested that an oblique six-factor solution was subsequently a better fit. Palmer *et al.* (2003) suggested that the six factors demonstrated the following:

- The first factor, “emotional disposition”, was primarily made up of items measuring self-regard and happiness
- The second factor, “interpersonal EQ” ,included items measuring interpersonal relationships, social responsibility and empathy
- The third factor ,“impulse control”, consisted of all items from the impulse control subscale, along with one item from reality testing
- The fourth factor, “problem solving”, included predominately problem-solving items
- The fifth factor, “self-awareness”, included predominately self-awareness items
- The last item included items measuring flexibility and independence and was labelled “ character”

Other researchers have also confirmed that the EQi items tend to cluster onto one general factor (Brackett & Mayer, 2003; Livingstone & Day, 2005; Petrides & Furnham, 2001) and fail to support Bar-On's theoretically based 15-factor structure. Livingstone and Day (2005) explored the construct and criterion-related validity of the EQi in a sample of 211 Canadian military personnel. The CFAs did not support the theoretically driven five-factor model for the EQi. An exploratory principal components analysis was further performed and their scree test indicated the presence of three factors.

The five-factor model presented no clear pattern, and all the subscales weighted highly on the one-factor model. However, Livingstone and Day (2005, p.17) suggested that a one-factor model "may not be beneficial in examining and understanding the EI construct". According to the Petrides and Furnham (2001) study, a second-order confirmatory factor analysis with maximum likelihood estimation was performed to test the 15-5-1 structure of the EQi model. High correlations were indicative between the five second-order factors, and an alternative nested model with 15 scales and one first-order factor (total trait EI) was performed by setting the instabilities of the five second-order factors in model 1 at zero. Conclusions from the Petrides and Furnham (2001, p.437) study indicated that the second-order factors of the EQi composites constituted "a redundant layer in the structure". Their study demonstrated a single-factor model with the 15 variables as indicators of one broad latent variable.

Given the extent to which the Bar-on model is used internationally and locally, no studies available to date have reported on the same structure validity as the Bar-On model. With correlations ranging as high as 0.80 between the 15 scales of the Bar-On model, concerns have escalated (Matthews *et al*., 2002) as to whether the scales truly discriminate between the distinct trait constructs.

Matthews *et al*. (2002) have questioned Bar-On's (1997) factor analytic method in which he forced factors to be independent of one another. Matthews *et al*. (2002, p.180) re-analysed Bar-On's (1997) own data, and stated that "70 percent of the variation in the EQi scales could be explained by just three factors, relating to self-reported positive mood, self-esteem and stress resistance". Matthews *et al*. (2002, p.192) also indicated that, when

scale unreliability was taken into account, the three factors illustrated 80 to 90 percent of the scale variance, stating that “the 15 factors described by Bar-On do not exist as separate trait dimensions”. Though the confirmatory factor analysis process, Bar-On’s (2000, 2004) factor structure supported a 10-factor solution. Self-regard explained more of the variance than any other factor. Matthews *et al*. (2002) also criticised Bar-On’s failure to report on crucial statistics, i.e. goodness of fit or factor correlations, with which to properly evaluate the adequacy of the data. Therefore, due to the poor factor structure it is unclear what constructs are measured by the EQi model.

It is evident that the Bar-On model encompasses a broad constellation of different interpretations. Researchers have consistently found that the 15 conceptual components of the EQi model have loaded onto a single higher-order EI factor (Brackett & Mayer, 2003; Livingstone & Day, 2005; Petrides & Furnham, 2001), thereby suggesting that the inter-correlations among the EQi subscales are attributable to a cohesive latent variable of EI (Laura *et al.,* as cited in Stough *et al.,* 2009).

2.6 CONCLUSION

Intelligence has been a popular concept in psychology and psychological assessment. However, the concept of EI has materialised in the current literature as one of the most widely discussed aspects of intelligence (Matthews *et al.,* 2002). The construct has matured to such an extent that EI claims to play an important role in modern society by determining real-life outcomes beyond those predicted by general intellectual (IQ) ability and personality factors. EI is also recommended as being embedded in competencies that enable individuals to demonstrate the intelligent use of their emotions in perceiving, assimilating, understanding and working effectively with others (Boyatzis, 1982; Goleman, 1996; Goleman *et al.,* 2002).

However, the concept of EI at this stage has been considered to be a vague exploratory construct, and there has been a lack of consensus between the different models that attempt to articulate this elusive construct. Therefore, further research is needed to investigate the potential assumptions, principles and behaviours that guided the research in the development of the EI paradigm. Chapter 3 contains a detailed discussion of the research design and methodology for the present study, as well as the statistical analyses that were employed.

CHAPTER 3

RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

The intention of this study was to conduct a structural validity investigation of Bar-On's (1997) second-order five-factor structure of the EQi instrument in a professional group in an insurance company. To analyse the structure of the EQi instrument, it was examined through an exploratory factor analysis (EFA), from which only nine factor loadings resulted out of an anticipated fifteen. The structure was tested by using factor analytical techniques. This chapter will explain the methodology used to pursue this objective.

3.2 RESEARCH METHOD

In this chapter, the methods applied in the current investigation, the research design and the sampling methods are discussed. A non-experimental design, using an ex post facto approach, was used. This is a design for measurements taken at one point in time (cross-sectional designs) and the researcher will not observe change over time. The measuring instruments are presented together with the process used to gather the research data, and the statistical procedures followed to process this data.

3.3 RESEARCH DESIGN

The research design explains how the goals of a research project can be accomplished. Key features of any research design are procedure, samples, the collection and analysis of the data, along with the instruments to be used.

The objective of the proposed research was to use exploratory and confirmatory factor analysis to empirically investigate the structure validity of the EQi as a psychological measure that is widely used within the South African workplace context.

3.3.1 RESEARCH PROCEDURE

The Bar-On EQi was administered through item booklets and response sheets, as well as online. Through the paper and pencil administration, the respondents were invited to complete the assessment tool at the assessment centre at the insurance company under study.

Written consent was obtained before the administration of the assessment tool. The administrators provided the candidates with a short rationale for administering the tool. The assessment centre provided the candidate with a quiet setting that was free from distractions. The administrator ensured that the respondents supplied one response to each of the items of the inventory. No time limit was set, although Bar-On (1997) states that the respondents should be able to complete the inventory within 30 to 40 minutes. Bar-On (1997) also claims that respondents should complete the inventory in one sitting. Once the respondents had completed the inventory, the administrator ensured that no items were incomplete and that the pencil marks were dark enough for scoring. The response sheets (raw data) were then faxed to the test distributor for scoring. The service provider provides the administrator with the written reports.

Through online administration, the respondents complete the inventory via the internet and are provided with the following information by the administrator at the assessment centre: instructions on how to complete the inventory and a group login ID and password. Once the respondents have completed the EQi online, the raw data is sent to the service provider and reports are generated for the administrator.

3.3.2 SAMPLE

The sampling procedure used by the researcher was convenience sampling. The sample for the present study was derived from a database that was accumulated for the Emotional Quotient Inventory over a period of about three years; therefore, secondary data was used.

The database currently consists of approximately 1 104 participants. No specific sections or department were involved in the collection of data, and the respondents (of any qualification) completed the Bar-On EQi questionnaire. The sample comprised more women (55.89%) than men (44.11%).

Of the sample, the majority of the respondents who filled in the questionnaire were white (517), 335 were black, 220 were Indian, 31 were coloured and one was 'other'.

Most of the participants (62.23%) were 25 to 35 years old. Furthermore, 25,36% were 36 to 45 years old, 6.34% came from the 46 to 55 age group, 5.62% from the 24 and younger age group and 0.45% the from 56 and older age group. The mean age was 40.15, with a standard deviation of 12.26.

Table 13 gives the demographic information of the respondents.

Table 13: Demographic information of the respondents

Characteristic	Frequency	Percent
Gender		
Male	487	44.11
Female	617	55.89
Ethnic group		
White	517	46.83
Black	335	30.34
Indian	220	19.93
Coloured	31	2.81
Other	1	0.09
Age group		
24 years and younger	62	5.62
25-35 years	687	62.23
36-45 years	280	25.36
46-55 years	70	6.34
56 years and older	5	0.45

3.4 MEASUREMENT INSTRUMENTS

3.4.1 BAR-ON EQI MEASUREMENT

Bar-On, an internationally renowned expert and pioneer in the field of emotional intelligence, coined the term “EQ” (“Emotional Quotient”) in 1985. Bar-On created the first test of emotional intelligence, known as the *Bar-On Emotional Quotient Inventory* (the *EQi*), which was published by a psychological test publisher (Bar-On, 1997) and peer-reviewed in the *Buros Mental Measurement Yearbook* (Plake & Impara, 1999). It is said to be the most widely used measure of emotional-social intelligence to date (Bar-On, 2004). The Bar-On EQi is a self-report measure, which describes EI as a cross-section of interrelated emotional and social competencies that have an impact on intelligent behaviour. The theoretical model comprises a total EQ score, which encapsulates how successful the individual is in coping with environmental demands, and presents a “snapshot “of his or her present emotional well-being.

The EQi comprises five higher-order EQ composite scores (Intrapersonal intelligence, Interpersonal intelligence, Adaptability, Stress management, and General mood), which further render into 15 subscale scores as per Table 3 (Bar-On, 2003). Bar-On (1997) reported that a number of factor solutions were examined for interpretability. Specifically, 12-, 13- and 14-factor solutions were examined (although, in a more recent book chapter (Bar-On 2000), this number increases to include a 15-factor solution), and it was reported that a 13-factor varimax rotated solution “…afforded the most meaningful interpretation theoretically” (Bar-On, 2000, p.1).

EQi provides an index of the 1–5–15 hierarchical model of emotional and social intelligence. The Bar-On EQi consists of 133 items in short sentence format, and the scale used is a five-point Likert response scale ranging from “Very seldom or not true of me” to “Very often true of me or True of me”. The completion time is between 30 and 40 minutes, although no time constraints are given. The EQi is appropriate for individuals of both genders who are 16 years of age and older. The EQi has been translated into 30 different languages and the data collection took place in various countries around the world (Bar-

On, 2006). Scores for the EQi are generated by computer and the raw scores are automatically tabulated and converted into standard scores based on a mean of 100 and a standard deviation of 15 (Bar-On, 2006).

The interpretation of the EQi scale scores (*Table 14*) helps determine whether the individual scored within the average range, which indicates effective functioning. In this case, the respondent functions efficiently, handling situations and meeting environmental demands. Above average scores indicate exceptional functioning and a high score indicates that, at the present time, the individual is well developed, strong and efficient in the factor being measured. Below average scores indicate that, at the present time, the individual could do better in meeting environmental demands, and low scores identify skills that need to be improved to increase overall functioning and chances for success (Bar-On, 2006).

Table 14: Interpretive Guidelines for EQi Scale Scores

Standard score	***Interpretive guideline***
130+	Markedly High – atypically well-developed emotional capacity
120-129	Very High – extremely well-developed emotional capacity
110-119	High – well-developed emotional capacity
90-109	Average – adequate emotional capacity
80-89	Low – under-developed emotional capacity, requiring improvements
70-79	Very Low – extremely under-developed emotional capacity, requiring improvement
Under 70	Markedly Low – atypically impaired emotional capacity, requiring improvements

Bar-On, 1997.

Table 15 below demonstrates the variables per scale for the Bar-On Emotional Quotient Inventory five-factor model, which comprises 18 to 40 items per scale.

Table 15: Items per factor for the Bar-On Emotional Quotient Inventory

***SR** = Self-regard; **ESA** = Emotional Self-awareness; **A** = Assertiveness; **SA** = Self-actualisation; **IN** = Independence; **IR** = Interpersonal Relationships; **SRes** = Social Responsibility; **E** = Empathy; **IC** = Impulse Control; **ST** = Stress Tolerance; **PS** = Problem Solving; **RT** = Reality Testing; **F** = Flexibility; **H** = Happiness; and **O** = Optimism*

Intrapersonal	***Interpersonal***	***Stress Management***	***Adaptability***	***General Mood***
SR_eq11	IR_eq10	IC_eq13	PS_eq1	H_eq2
SR_eq24	IR_eq23	IC_eq27	PS_eq15	H_eq17
SR_eq40	IR_eq31	IC_eq42	PS_eq29	H_eq31
SR_eq56	IR_eq39	IC_eq58	PS_eq45	H_eq47
SR_eq70	IR_eq55	IC_eq73	PS_eq60	H_eq62
SR_eq85	IR_eq62	IC_eq86	PS_eq75	H_eq77
SR_eq100	IR_eq69	IC_eq102	PS_eq89	H_eq91
SR_eq114	IR_eq84	IC_eq117	PS_eq118	H_eq105
SR_eq129	IR_eq99	IC_eq130	RT_eq8	H_eq120
ESA_eq7	IR_eq113	ST_eq4	RT_eq35	O_eq11
ESA_eq9	IR_eq128	ST_eq20	RT_eq38	O_eq20
ESA_eq23	SRes_eq16	ST_eq33	RT_eq53	O_eq26
ESA_eq35	SRes_eq30	ST_eq49	RT_eq68	O_eq54
ESA_eq52	SRes_eq46	ST_eq64	RT_eq83	O_eq80
ESA_eq63	SRes_eq61	ST_eq78	RT_eq88	O_eq106
ESA_eq88	SRes_eq72	ST_eq93	RT_eq97	O_eq108
ESA_eq116	SRes_eq76	ST_eq108	RT_eq112	O_eq132
A_eq22	SRes_eq90	ST_eq122	RT_eq127	
A_eq37	SRes_eq98		F_eq14	
A_eq67	SRes_eq104		F_eq28	
A_eq82	SRes_eq119		F_eq43	
A_eq96	E_eq18		F_eq59	
A_eq111	E_eq44		F_eq74	
A_eq126	E_eq55		F_eq87	
SA_eq6	E_eq61		F_eq103	
SA_eq21	E_eq72		F_eq131	
SA_eq36	E_eq98			
SA_eq51	E_eq119			
SA_eq66	E_eq124			
SA_eq81				

SA_eq95				
SA_eq110				
SA_eq125				
IN_eq3				
IN_eq19				
IN_eq32				
IN_eq48				
IN_eq92				
IN_eq107				
IN_eq121				

Source: Bar-On, 1997.

The Bar-On Emotional Quotient Inventory was introduced at the American Psychological Association's annual convention in Toronto, Canada in 1996. It was based on an inventory containing data from more than 20 countries, and the more than 50 000 subjects constitute a very big normative database (Bar-On, 1997).

3.4.2 RELIABILITY OF THE BAR-ON EQI

In the Bar-On EQi training manual (Bar-On, 1997), the psychometric analyses of the EQi model indicated that it has good internal reliability and test–retest reliability. The 15 sub-scales are reported to have average-to-high internal consistency coefficients, with Cronbach's alphas ranging from $\alpha = 0.69$ for Social Responsibility to $\alpha = 0.86$ for Self-regard. Similarly, with a South African sample ($n = 44$), the average stability coefficient of the 15 sub-scales after a one-month period was found to be $r = 0.85$, and with a smaller sub-set of this sample ($n = 27$) was found to be $r = 0.75$ after a four-month period.

3.5 STATISTICAL ANALYSIS

To replicate and extend previous research on the EQi model, its dimensionality was explored through the use of factor analysis in order to determine whether the structural aspect of the instrument is valid (Dimitrov, 2010).

3.5.1 FACTOR ANALYSIS

This section looks at factor analysis, a method that categorises groups or clusters of variables. Given that the factor structure of the EQi provides an index with a 1-5-15 composition, the statistical method employed is to understand the structure of the variables, as well as to minimise underlying dimensions in order to determine which variables will cluster together in a more manageable and understandable size.

When conducting a factor analysis, the researcher will first have to determine whether the particular data set is suitable for factor analysis by determining the strength of the sample size and the relationships among the variables. To address the strength of the inter-correlations among the variables, the Kaiser-Meyer-Olkin of sampling adequacy (KMO) and Bartlett's test of sphericity were used. The Kaiser-Meyer-Olkin of sampling adequacy (KMO) represents the ratio of the squared correlation between variables to the squared partial correlation between variables (Field, 2005). The KMO index ranges from 0 to 1. A value close to 1 advocates that the pattern of correlations is relatively compact, thus indicating that factor analysis is likely to be appropriate. Kaiser (1974) specified that values greater than .5 are barely acceptable, values between .5 and .7 are mediocre, values between .7 and .8 are good, values between .8 and .9 are great and values above .9 are superb. Bartlett's test of sphericity scrutinises whether the population correlation matrix looks like an identity matrix. If the population correlation matrix *resembles* an identity matrix, it would suggest the every correlation coefficient is close to zero; however, if it *were* an identity matrix then it would mean that all variables are perfectly independent of one another (all correlation coefficients are zero). Therefore, Bartlett's test of sphericity should be statistically significant at $p < .05$.

To analyse the structure of the EQi instrument, the instrument was examined through an exploratory factor analysis (EFA). An EFA is used to determine the number of factors that account for the covariation between variables when there is insufficient evidence to form a hypothesis in terms of the number of factors underlying the data.

When using EFA, it is important to ask the following questions:

1. How many meaningful dimensions are present?
2. What is the structure of those dimensions?

According to Hurley *et al.* (1997), EFA is suitable for scale development, thus determining the smallest number of factors that can be used to best represent the interrelations among the sets of variables. This suggests that the most critical decision when using the EFA method is the number of factors to be retained. Researchers need to ensure that specifying too few factors and specifying too many factors may lead to poor factor loading and interpretations of the data set (Velicer *et al.,* 2000). Retaining too few factors may lead to a loss of information in the data, and retaining too many factors includes trivial and random information. Principal axis factoring (PAF) was the preferred method used to extract the number of underlying factors. On a conceptual level, the principal axis factoring seeks linear combinations of variables, called *factors*.

After determining the reliability of the factor analysis, the next step would be to verify the proportion of common variance presented in the data. In the first-order factor analysis, we estimated the amount of common variance by estimating communality values for each variable (known as principal axis factoring) (Field, 2005). This was done by squaring the multiple correlations (SMC) of each variable. Squared multiple correlation values of 0.7 and higher indicate that the observed variables account for substantial variance in the factor score (Tabachnick & Fidell, 2007).

The next step within the exploratory approach is to determine how many factors to retain that would best describe the underlying relationship between the variables. According to Field (2005), factors with large eigenvalues should be retained, and Kaiser's criterion should be used, where eigenvalues = 1.00 are identified. However, one should bear in mind that the disadvantage of using eigenvalues is that they are inclined to overestimate. The eigenvalue of a factor represents the amount of the total variance explained by that factor. A joint parallel analysis/scree test was applied to determine the factor solution that best represented the data. The scree test was used to identify clear breaks between the eigenvalues ≥ 1.00, and Cattell (1966) has suggested that the cut-off point for selecting

factors should be at the point of inflexion of the curve. The parallel analysis technique involves comparing the size of the eigenvalues with those obtained from a randomly generated data set of the same size. The parallel analysis technique was used, as it has been proved to be the most accurate and reliable method (Choi *et al.,* 2001; Stober, 1998) to determine the number of significant factors. Therefore, only eigenvalues that surpass the corresponding values from the random data set are retained. By graphing the eigenvalues, the relative importance of each factor becomes apparent.

Once the factors had been determined, the next step was to calculate the loading of the variables on each factor. In order to determine to what degree the variables load onto these factors, factor rotation was used. Two methods that can be used for rotation are the orthogonal (uncorrelated) and the oblique (correlated) approach. An oblimin rotation was used, which is an oblique rotational technique to correlate factors. Because of the high inter-correlation found between the factors, a principal-axis factoring extraction method employing oblimin rotation was used (Field, 2005).

Factor loadings of 0.30 and higher can generally be considered acceptable (Tabachnik & Fiddell, 2001). While evaluating the results of the principal-axis factoring analysis, it was decided that a variable would be selected if:

- a loading ≥ 0.30 would be accepted
- a loading that did not comply with the ≥ 0.30 factor loading criterion would be rejected

Confirmatory factor analysis (CFA) was used to fit the measurement model to the data. The maximum likelihood estimation model was used, as it assumes multivariate normal distribution.

The Mardia coefficient was used to test for the normality assumption. The Mardia coefficient showed that there was a violation of the normality assumption, as seen in *Table 16*. Therefore, a less sensitive statistic to the normality assumption was needed. EQS robust statistics (Satorra-Bentler scaled chi-square and related fit indexes), which are known to be less sensitive to the normality assumption, were used.

Table 16: EQS Output for Model Estimation and Test Statistic Information

	MULTIVARIATE KURTOSIS
MARDIA'S COEFFICIENT (G2, P) =	50.7979
NORMALISED ESTIMATE =	34.9377

The data was then analysed by means of confirmatory factor analysis (CFA) to investigate the measurement model as derived from the sample to determine how well the observed structure fits the data obtained through the EFA. The model was then tested with a series of fit indexes to determine whether the pattern of variances and covariances in the data is consistent with the postulated theoretical model (Garson, 2008). Structural equation modelling with maximum likelihood analyses was used in this study to conduct CFA, as the former focuses on validating the measurement model by obtaining estimates of the parameters of the model and by assessing whether the model itself provides a good fit to the data (Garson, 2008).

Therefore, the following indexes were used in this study:

- the Satorra-Bentler scaled chi-square,
- the normed fit index (NFI; Bentler & Bonnet, 1980)
- the comparative fit index (CFI; Bentler, 1990)
- the root mean square error of approximation (RMSEA; Steiger & Lind, 1980)

A general guideline for the interpretation of the NFI and CFI is that values of 0.95 and higher indicate a satisfactory fit between the postulated theoretical model and the observed data (Hair *et al.,* 2006). For the interpretation of the RMSEA, values of 0.05 and smaller indicate a close fit between the theoretical model and the observed data. Values of 0.08 and smaller indicate a reasonable fit, while values greater than 0.08 or equal to 1 indicate an unsatisfactory fit (Browne & Cudeck, 1993).

3.6 CONCLUSIONS

All methodological details were given in this chapter, which discussed the population, method of sampling, the design of the instrument and the statistical methods used in the study. It was determined that a non-experimental design, using an ex post facto approach, would be used. The data gathering procedure was described as the use of a secondary data set from which the sample of 1 104 respondents was drawn. This chapter focused mainly on the factor analysis applications involved in uncovering the sub-dimensions of the construct being measured. The results of the factor analysis are presented in the next chapter.

CHAPTER 4

RESULTS AND FINDINGS

4.1 INTRODUCTION

The previous chapter provided a theoretical discussion of the research and statistical methodology. This chapter focuses on the results generated by the research on the structure validity of the Emotional Quotient Inventory in a South African context. To determine whether a factor analysis could be performed or not, the test of sampling adequacy and Bartlett's test of sphericity were conducted. For the purposes of this study, both exploratory and confirmatory factor analytical methods were applied. Tinsley and Tinsley (1987) have specified that the validation of a hypothesised factor structure may be attained through the confirmatory factor analysis process, and that the EFA can produce a strikingly different solution to the hypothesised factor structure that might prove valid when CFA is applied. Therefore, this study applied a more rigorous process using both methods in the analysis of data, instead of applying a single method, to provide a statistically more adequate test of the structural model (Schaap & Basson, 2003).

4.2 STATISTICAL ANALYSIS

The statistical techniques used include descriptive statistics, where the means, standard deviations, skewness and kurtosis coefficients were calculated. In statistics, the mean determines the average of the scores by calculating the 'central' value of a set of numbers. The standard deviation describes the dispersion of the scores from the mean and gives the researcher an indication of the areas under the normal curve. The skewness and kurtosis were analysed in order to understand the symmetry and peakedness of the data distribution. Skewness determines the degree to which a distribution of data is asymmetrical, while kurtosis evaluates the peakedness of the data distribution (Hair *et al.,*

1998). *Table 17* illustrates the descriptive statistics of the Bar-On Emotional Quotient Inventory instrument for the 15 extracted factors.

Table 17: Descriptive statistics (15 factors)

Variable	Mean	Std. dev.	Skewness (G1)	Kurtosis (G2)
SR	4.3703	0.5551	-0.9485	0.5879
ESA	4.0376	0.5965	-0.4750	-0.1228
A	4.0444	0.5995	-0.3669	-0.2579
IN	4.1525	0.5672	-0.5418	-0.0853
SA	4.3667	0.6506	-1.3964	1.2385
E	4.1492	0.6092	-0.7184	0.0492
IR	4.3297	0.5469	-0.6685	-0.3156
ST	4.0778	0.5954	-0.5974	0.1801
IC	3.9839	0.7062	-0.8838	0.2001
RT	4.1391	0.6226	-0.8518	0.1770
F	4.0455	0.5389	-0.3428	0.0860
PS	4.2905	0.5261	-0.6608	0.1120
O	4.2931	0.6880	-1.1801	0.7709
H	4.3883	0.4643	-0.7879	0.3074
SRes	4.4150	0.7410	-1.7792	2.3828

Notes: ***SR*** = *Self-regard;* ***ESA*** = *Emotional Self-awareness;* ***A*** = *Assertiveness;* ***SA*** = *Self-actualisation;* ***IN*** = *Independence;* ***IR*** = *Interpersonal Relationships;* ***SRes*** = *Social Responsibility;* ***E*** = *Empathy;* ***IC*** = *Impulse Control;* ***ST*** = *Stress Tolerance;* ***PS*** = *Problem Solving;* ***RT*** = *Reality Testing;* ***F*** = *Flexibility;* ***H*** = *Happiness; and* ***O*** = *Optimism.*

The variability of the means, standard deviation, skewness and kurtosis reflect how the participants responded to the different scales. From the table it is evident that the majority of the variables fell within the normal distribution, and that the average of the scores fell within a range of 4. The statistics indicate that the distribution of factors SA, O and SRes of the Bar-On Emotional Quotient instrument were negatively skewed.

4.3 FACTOR ANALYSIS

4.3.1 EXPLORATORY FACTOR ANALYSIS

The aim of this analysis was to determine the fundamental factors responsible for the majority of the variability in the dependent variable.

To determine the reliability of the measurement, the sample size and the relationships between the responses to the items were taken into consideration to determine whether the data were appropriate for factor analysis (Field, 2000; Habing, 2003). To assess the sampling adequacy of the data, Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure were applied. The number of subjects (1 104) was larger than five times the number of variables (132). According to Hair *et al.* (1992), the total number of items in a questionnaire should be multiplied by five in order to have a reliable sample size. The KMO and Bartlett's test confirmed that the properties of the correlation matrix of the item scores were suitable for factor analysis to continue. These results are displayed in *Table 18.*

Table 18: KMO and Barlett's Test of Sphericity

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.971
Bartlett's Test of Sphericity	Approx. Chi-square	68875.030
	df	6786
	Sig.	.000

The KMO recorded a value of .971, indicating that there were sufficient numbers of significant correlations among the items to justify undertaking a factor analysis (Pett *et al.,* 2003), as the KMO value is larger than 0.5. According to Hutcheson and Sofroniou (1999), the Bartlett's test of sphericity being significant (p = .000) and the KMO having an excellent value of 0.971 are indicative that these values are acceptable for factor analysis to continue.

EFA was carried out by means of principal axis factoring (PAF) and rotated using a direct oblimin rotation with Kaiser's normalisation to an oblique solution. This was performed to establish the linear components within the data set (the eigenvectors) to calculate the eigenvalues of the R-matrix (Field, 2009). This allows the researcher to determine the lowest number of factors that can account for the common variance in a set of variables. The 132 items of the preliminary questionnaire were intercorrelated and rotated to form a simple structure by means of the oblique rotation (direct oblimin with Kaiser normalisation). In *Table 19*, the eigenvalues associated with each factor represent the variance explained by that particular linear component.

Based on Kaiser's (1961) criterion (eigenvalues larger than unity), the analysis in *Table 19* indicated that twenty factors with eigenvalues above 1 and an accumulative variance of 61.712% were postulated. However, according to Horn's criteria (1965), nine factors were derived from the point of intersection of the random data set and the true data set (between factor 9 and 10).

The scree-plot presented in *Figure 1* suggests that the interaction series 1 (random data set) and series 2 (true data set) intersect at factor nine. According to Cattell's (1966) scree test, all factors can be extracted after the one factor that starts the elbow in the downward curve of the eigenvalue.

Table 19: Total Variance Explained

Factor		Initial eigenvalues		
	Random data set	Total	% of variance	Cumulative %
1	1.780	31.615	**27.021**	27.021
2	1.736	11.359	**9.709**	36.730
3	1.704	3.446	**2.945**	39.675
4	1.675	2.891	**2.471**	42.146
5	1.650	2.293	**1.960**	44.106
6	1.627	2.178	**1.862**	45.968
7	1.605	2.040	**1.744**	47.712
8	1.585	1.673	**1.430**	49.142
9	**1.565**	**1.578**	**1.348**	**50.490**
10	**1.547**	**1.400**	**1.196**	**51.686**
11	1.529	1.352	1.156	52.842

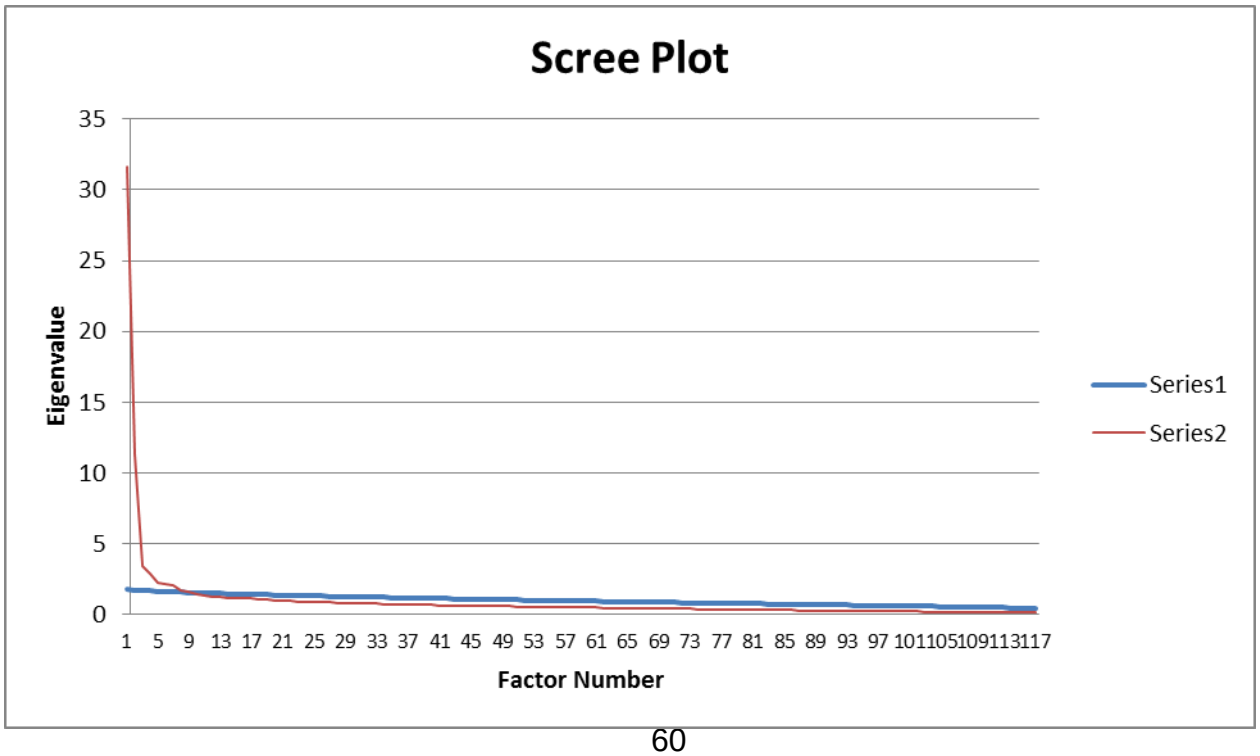
12	1.512	1.292	1.105	53.946
13	1.495	1.266	1.082	55.028
14	1.479	1.197	1.023	56.051
15	1.462	1.184	1.012	57.063
16	1.447	1.151	.984	58.047
17	1.432	1.134	.969	59.016
18	1.418	1.105	.944	59.960
19	1.403	1.045	.894	60.854
20	**1.389**	**1.004**	**.858**	**61.712**
21	1.375	.974	.833	62.545
22	1.361	.946	.808	63.353
23	1.348	.934	.798	64.151
24	1.335	.913	.780	64.931
25	1.322	.906	.774	65.705
26	1.309	.880	.752	66.457
27	1.296	.866	.740	67.197
28	1.284	.838	.716	67.913
29	1.272	.821	.701	68.614
30	1.260	.809	.691	69.306
31	1.248	.800	.684	69.990
32	1.236	.787	.672	70.662
33	1.225	.774	.662	71.324
34	1.213	.758	.647	71.971
35	1.202	.740	.632	72.603
36	1.191	.733	.626	73.230
37	1.179	.720	.615	73.845
38	1.169	.699	.597	74.442
39	1.158	.685	.586	75.028
40	1.148	.678	.580	75.608
41	1.137	.661	.565	76.172
42	1.127	.655	.560	76.732
43	1.116	.647	.553	77.285
44	1.105	.640	.547	77.832
45	1.095	.632	.540	78.372
46	1.085	.615	.526	78.898
47	1.075	.602	.515	79.412
48	1.065	.591	.505	79.917
49	1.055	.585	.500	80.417
50	1.046	.579	.495	80.912
51	1.036	.565	.482	81.394
52	1.026	.556	.475	81.870
53	1.017	.547	.467	82.337

54	1.007	.538	.460	82.797
55	.998	.534	.457	83.254
56	.988	.524	.447	83.701
57	.979	.515	.440	84.141
58	.970	.499	.427	84.568
59	.960	.498	.425	84.994
60	.951	.491	.420	85.414
61	.942	.487	.416	85.830
62	.933	.482	.412	86.242
63	.924	.474	.406	86.647
64	.915	.459	.392	87.039
65	.906	.454	.388	87.427
66	.897	.446	.381	87.808
67	.888	.440	.376	88.184
68	.880	.435	.372	88.556
69	.871	.430	.368	88.924
70	.862	.424	.363	89.287
71	.854	.411	.351	89.638
72	.845	.405	.347	89.984
73	.837	.399	.341	90.326
74	.828	.394	.337	90.662
75	.820	.379	.324	90.986
76	.811	.376	.321	91.307
77	.803	.372	.318	91.625
78	.795	.370	.316	91.941
79	.786	.357	.305	92.246
80	.778	.353	.302	92.548
81	.769	.342	.292	92.840
82	.761	.339	.290	93.130
83	.753	.332	.283	93.413
84	.744	.327	.279	93.693
85	.736	.325	.278	93.971
86	.728	.310	.265	94.236
87	.720	.303	.259	94.495
88	.711	.300	.256	94.751
89	.703	.294	.251	95.003
90	.695	.282	.241	95.244
91	.687	.278	.237	95.481
92	.679	.274	.234	95.715
93	.670	.270	.231	95.946
94	.662	.262	.224	96.169
95	.654	.256	.219	96.388

96	.645	.250	.214	96.602
97	.637	.245	.210	96.812
98	.629	.240	.205	97.017
99	.621	.234	.200	97.217
100	.612	.230	.197	97.414
101	.604	.225	.193	97.607
102	.595	.218	.187	97.793
103	.587	.211	.180	97.974
104	.578	.204	.175	98.149
105	.569	.202	.173	98.321
106	.560	.195	.167	98.488
107	.551	.194	.166	98.654
108	.542	.187	.160	98.814
109	.533	.176	.150	98.964
110	.523	.174	.148	99.113
111	.513	.167	.143	99.256
112	.503	.156	.133	99.389
113	.493	.153	.131	99.520
114	.482	.149	.127	99.647
115	.469	.146	.125	99.772
116	.456	.135	.116	99.888
117	.438	.131	.112	100.000

Extraction method: Principal axis factoring

Figure 1: Scree Plot



According to Horn's criteria and the scree plot curve, nine significant factors emerge. The 15-factor model could not be replicated.

The pattern matrixes of these data show all the loadings for the nine-factor and five-factor models. According to Hair *et al.* (1998), variables should have correlations of at least .30 and preferably of .50 to be measured as significant. *Table 20* and *Table 21* contain the rotated factor loadings that were extracted from the nine-factor and five-factor models. In this model the oblique rotation was used and all items with factor loadings less than 0.40 were omitted.

The first factor that emerged from the analysis accounted for more than half of the variance in the data set and had items loading at 0.4 and higher. The first factor consisted mainly of various EI measurement sub-scales and did not represent an identifiable construct. In the second factor, three item loadings were identified primarily from the flexibility sub-scale. In the third factor, three items loaded on empathy and one item on happiness. The factor appears to represent the construct empathy, although it is not well defined. It could be that if individuals are able to understand, interact with and relate well to others, then they generally are positive and optimistic in their environment (Bar-On, 1997). In the fourth factor, two dominant variables were prominent; these measures were impulse control, with two significant loadings, and reality testing, with three loadings. The factor is not well defined. In this case, the meaning of the factor could imply that the individual who has the ability to respond realistically and skilfully to an unknown environment should display impulse control and frustration tolerance. The fifth factor constitutes item loadings mostly on the emotional self-awareness sub-scale. In the sixth factor, item loadings were primarily from the self-regard sub-scale. The seventh factor constitutes independence measures, whereas the eighth factor constitutes item loadings on the stress management sub-scales. Finally, the ninth factor simply constitutes variables from the problem-solving sub-scales.

In summary, the results of the exploratory factor analysis failed to support the 15-factor structure of the EQi previously reported by Bar-On (1997). Although not strongly defined, the results of the current study suggest that there appear to be some identifiable factors,

namely factors of flexibility, empathy, impulse control, reality testing, emotional self-awareness, self-regard, independence, stress management and problem solving.

Table 20: Pattern Matrix (Nine Factors)

	Factor								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
SR_eq11 and O_eq11	-.025	.030	-.002	-.094	.064	-.132	.121	-.380	-.107
SR_eq24	.047	.295	-.093	-.018	.124	-.265	.277	-.060	-.006
SR_eq40	**.784**	-.060	-.006	-.052	-.072	-.207	-.014	.036	-.042
SR_eq56	**.788**	-.027	-.019	.017	-.063	-.317	.058	-.011	.135
SR_eq70	**.534**	.013	-.013	.052	-.010	-.389	.097	.012	.154
SR_eq85	-.087	.014	.077	-.028	.125	**-.519**	-.058	-.147	-.020
SR_eq100	.000	.024	-.071	.047	-.029	**-.688**	.052	.080	-.120
SR_eq114	-.009	.060	-.125	.014	.025	**-.690**	-.004	.016	-.127
SR_eq129	.034	.020	.173	.050	.034	**-.413**	-.010	-.218	-.010
ESA_eq7	**.653**	-.162	-.054	-.142	**.544**	.044	.017	.040	.017
ESA_eq9	-.014	-.095	.257	.059	.334	-.014	-.066	-.137	-.129
ESA_eq23 and IR_eq23	-.193	.138	-.107	.026	**.694**	.000	-.030	.000	.000
ESA_eq35 and RT_eq35	.065	-.079	-.002	.206	.299	-.266	.090	-.156	-.013
ESA_eq52	-.008	.107	-.063	.019	**.687**	-.028	.056	.036	-.023
ESA_eq63	-.001	-.021	.123	-.002	.286	-.275	-.072	-.167	-.122
ESA_eq88 and RT_eq88	-.003	.094	.179	.016	.031	.011	-.017	-.333	-.260
ESA_eq116	-.073	.034	-.011	.118	**.573**	-.107	.085	.038	-.007
A_eq22	.139	.149	.077	.020	.227	.011	.322	-.014	-.076
A_eq37	**.552**	-.124	-.173	-.138	.299	-.030	.140	-.063	-.187
A_eq67	.026	-.005	-.002	-.043	.250	.023	.216	-.211	-.144
A_eq82	-.190	.070	-.230	.138	.223	-.163	.258	-.056	-.121
A_eq96	**.746**	-.118	-.098	-.183	.231	-.046	.133	-.109	-.100
A_eq111	.234	.113	-.017	.001	.108	-.126	.383	.053	-.081
A_eq126	.046	.264	.011	-.016	.122	-.124	.389	.026	-.093
IN_eq3	-.142	.070	.129	.102	.102	.160	.243	-.212	.050
IN_eq19	**.685**	.057	.022	.026	-.059	.057	.175	.014	-.011
IN_eq32	**.423**	.060	.059	.079	.023	.005	.297	-.102	-.012
IN_eq48	.086	.163	.053	.020	.082	-.093	**.424**	-.143	-.037
IN_eq92	**.780**	.108	-.065	-.079	.002	.022	.324	.061	-.019
IN_eq107	-.104	.032	.079	.251	-.026	.057	.235	-.316	.013
IN_eq121	**.736**	.004	-.013	.119	-.111	.048	.158	-.065	.029
SA_eq6	**.815**	-.046	.052	-.058	-.024	-.110	-.082	-.003	-.047
SA_eq21	**.786**	.025	-.018	-.014	.015	-.053	.143	-.025	.029
SA_eq36	**.673**	-.052	.020	.038	-.019	-.119	.129	.039	.033

SA_eq51	-.029	.165	.117	.092	.031	-.292	.132	-.064	.008
SA_eq66	-.107	.144	.233	.028	.084	-.143	.199	-.004	-.059
SA_eq81	.288	.145	.174	-.057	-.060	-.222	.106	.012	-.196
SA_eq95	**.798**	-.131	.058	-.088	-.056	-.135	.026	.106	-.082
SA_eq110	.142	.016	.247	-.086	.003	-.258	.163	.121	-.323
SA_eq125	**.814**	.004	-.029	.030	-.002	-.121	.122	.049	.032
E_eq18	-.027	.062	.226	.125	.242	.061	.043	-.156	.044
E_eq44	**.675**	.003	.146	-.011	.177	.074	-.159	.047	-.117
E_eq55 and IR_eq55	**.711**	.054	.099	-.134	.061	.064	-.075	-.016	-.056
E_eq61 and SRes_eq61	.105	-.009	.363	-.057	-.010	.003	.050	-.079	-.131
E_eq72 and SRes_eq72	.097	.035	**.529**	.089	.080	.142	-.008	-.049	-.092
E_eq98 and SRes_eq98	**.736**	-.078	.255	.032	.076	.075	-.104	.118	-.113
E_eq119 and SRes_eq119	.001	-.057	**.507**	.066	.005	.003	.014	.057	-.167
E_eq124	**.603**	-.058	.292	.043	-.044	.063	-.123	.083	-.042
IR_eq10	-.019	.040	.202	.058	**.408**	.018	.007	.044	.001
ST_eq4	.326	-.036	-.012	-.095	.066	-.055	-.008	-.356	-.176
ST_eq20 and O_eq20	**.803**	-.042	-.045	-.105	-.063	-.020	.058	-.159	-.133
ST_eq33	**.539**	-.039	-.120	-.069	.035	-.005	-.092	-.387	-.094
ST_eq49	.143	.171	.017	.082	-.096	-.101	.098	**-.408**	-.017
ST_eq64	**.724**	-.008	-.050	.176	-.015	-.069	-.009	-.187	-.004
ST_eq78	-.031	.227	.020	.056	-.075	-.028	-.080	-.388	-.251
ST_eq93	-.182	.327	-.143	.056	.080	-.012	.197	-.215	-.056
ST_eq108 and O_eq108	**.827**	.024	.040	-.046	-.089	-.010	.068	-.060	-.116
ST_eq122	-.052	.060	-.045	.151	.026	-.174	-.015	**-.472**	.079
IC_eq13	**.743**	.082	-.063	.152	-.035	-.031	-.193	-.040	-.029
IC_eq27	**.504**	.072	-.094	.322	-.150	.070	-.032	.110	-.103
IC_eq42	**.703**	-.015	-.045	.277	-.025	-.064	-.089	.063	-.073
IC_eq58	**.659**	.026	-.001	.268	-.099	-.014	-.154	-.009	-.033
IC_eq73	**.498**	.217	-.123	.193	.040	-.067	-.238	.088	-.030
IC_eq86	-.053	.031	.020	**.504**	.094	-.058	-.036	-.045	-.152
IC_eq102	.200	.075	-.177	**.450**	.082	-.008	-.101	.064	-.130
IC_eq117	.106	.286	.050	.305	.075	-.152	-.214	-.078	-.006
IC_eq130	**.775**	.081	-.045	.198	-.057	-.079	-.186	-.056	.049
RT_eq8	**.717**	-.161	.021	.075	-.018	.059	.048	-.157	-.046
RT_eq38	-.031	-.191	.108	.316	.122	-.075	.133	-.097	.078
F_eq14	.082	.374	-.027	-.025	.100	-.045	.214	-.048	-.054
F_eq28	-.095	**.436**	-.026	.077	.124	.037	.097	-.185	-.017
F_eq43	**.630**	.238	-.089	.128	.078	.051	-.144	.043	-.036
F_eq59	**.563**	.316	-.066	-.168	.002	-.041	-.083	-.095	-.117
F_eq74	.049	.240	.027	.015	.084	-.054	-.064	-.108	-.145
F_eq87	.007	.392	.026	.107	.061	-.033	.118	-.020	-.047

F_eq103	-.062	**.465**	.009	.120	.059	-.025	.046	-.070	-.103
F_eq131	-.008	**.406**	-.040	-.022	.019	-.009	.047	-.060	-.079
PS_eq1	.005	-.060	.154	.049	.041	-.130	-.095	-.135	-.231
PS_eq15	**.548**	-.108	.059	.062	-.021	-.094	.010	.043	-.271
PS_eq29	-.051	-.054	.100	.119	.021	-.061	.049	.030	**-.542**
PS_eq45	-.072	.104	.092	.107	.018	-.025	-.002	-.108	**-.495**
PS_eq60	**.625**	-.043	.006	-.001	-.061	-.047	-.017	.007	-.348
PS_eq75	.172	.152	.003	.124	.036	-.011	.238	-.273	-.069
PS_eq89	-.054	.211	.076	.090	.025	-.020	.058	-.028	**-.491**
PS_eq118	**.799**	.031	-.026	.019	-.062	.029	.174	-.056	-.015
O_eq26	**.717**	.034	.099	-.076	-.046	-.088	-.008	.005	-.007
O_eq54	**.594**	-.006	.100	-.076	.016	-.063	-.119	.132	-.085
O_eq80	.046	.152	.139	-.008	-.075	-.183	.069	-.270	-.233
O_eq106	.019	.061	.221	-.034	.015	-.255	-.060	-.081	-.215
O_eq132	**.835**	.047	-.032	-.018	-.070	-.091	.107	-.002	.032
H_eq2	-.030	.185	.144	.024	.121	-.191	.036	-.112	.107
H_eq17	.220	.273	.235	.041	.135	-.145	-.008	.089	.111
H_eq31 and IR_eq31	**.666**	.001	.157	-.161	.084	-.108	-.139	-.106	.073
H_eq47	.164	-.162	.070	.074	.051	-.393	-.042	-.104	-.006
H_eq62 and IR_eq62	-.061	.379	.250	-.227	.211	-.172	-.061	-.103	-.007
H_eq77	**.682**	-.027	-.066	.109	-.065	-.184	.004	-.194	.187
H_eq91	.205	.044	.114	.145	-.027	-.344	.055	-.130	.163
H_eq105	.180	-.198	.341	.049	-.075	-.153	.005	-.108	-.063
H_eq120	-.001	.071	**.456**	-.119	.040	-.138	.046	.017	-.057
SRes_eq16	**.679**	.076	.234	-.078	.067	.018	-.119	.130	-.036
SRes_eq30	**.790**	-.038	.171	.129	-.036	.095	-.073	.101	.012
IR_eq39	.002	.349	.207	-.212	.296	-.090	-.038	-.032	.056
SRes_eq46	**.879**	-.073	.067	.026	-.075	-.005	.017	-.006	.034
RT_eq53	**.709**	.007	.018	.163	.167	-.084	-.023	.067	.082
RT_eq68	**.786**	-.054	-.001	.123	.011	-.063	.055	-.061	.051
SRes_eq76	.153	.037	.198	.247	.013	-.050	.030	-.011	-.033
RT_eq83	.011	-.062	.023	**.453**	.033	-.049	.105	-.101	-.023
IR_eq84	.081	-.031	.381	-.050	.053	-.127	.035	.015	-.083
SRes_eq90	.053	.127	.230	.034	.034	-.057	-.088	-.096	-.057
RT_eq97	.002	.155	.038	**.457**	-.028	-.064	.051	-.054	-.116
IR_eq99	**.583**	.039	.214	-.025	.045	-.120	-.074	-.036	-.107
SRes_eq104	**.820**	-.106	.099	.033	-.052	.009	-.063	.037	-.003
RT_eq112	**.757**	-.088	.078	-.058	-.056	.020	.036	-.040	-.126
IR_eq113	**.712**	.151	.196	-.170	.081	-.069	-.008	.066	.051
RT_eq127	.256	.172	-.012	.148	.018	-.169	.303	-.034	-.141
IR_eq128	-.105	.280	.212	.140	.211	-.156	.033	.057	.021
IR_eq69	**.850**	.044	.085	-.023	-.018	-.024	-.065	.031	.098

Extraction method: Principal axis factoring
Rotation method: Oblimin with Kaiser normalisation

Note: ***SR*** = *Self-regard;* ***ESA*** = *Emotional Self-awareness;* ***A*** = *Assertiveness;* ***SA*** = *Self-actualisation;* ***IN*** = *Independence;* ***IR*** = *Interpersonal Relationships;* ***SRes*** = *Social Responsibility;* ***E*** = *Empathy;* ***IC*** = *Impulse Control;* ***ST*** = *Stress Tolerance;* ***PS*** = *Problem Solving;* ***RT*** = *Reality Testing;* ***F*** = *Flexibility;* ***H*** = *Happiness; and* ***O*** = *Optimism.*

A five-factor loading was also derived according to the five-factor theory of Bar-On. In *Table 21*, oblique rotation was used and all items with factor loadings less than 0.40 were omitted. The first factor that emerged in the analysis also accounted for more than half of the variance in the data set and had items loading of 0.4 and higher. The first factor also constituted various EI measurements. In the second factor, a self-regard measure clustered with measures of the optimism, assertiveness, independence, problem-solving and stress-tolerance sub-scales. Therefore, the first and second factors did not represent an identifiable construct. In the third factor, the majority of the item loadings were on the empathy and social responsibility sub-scale, with two items from each of the problem-solving and happiness sub-scales and, lastly, one item from each of the following sub-scales: emotional self-awareness, self-actualisation, interpersonal relationship, reality testing and optimism. No identifiable construct could be identified in the third factor. In the fourth factor, two dominant variables were prominent; these measures were impulse control, with three significant loadings, and reality testing with two loadings. The factor is not well defined. In this case, the meaning of the factor could imply that the individual who has the ability to respond realistically and skilfully to an unknown environment should display impulse control and frustration tolerance. Finally, in the fifth factor, the majority of the items were loaded on the interpersonal relationship sub-scale, with three significant loadings on the emotional self-awareness sub-scale and one significant loading on the happiness sub-scale. Although not well defined, the pattern matrix does appear to form interpretable item clusters that support elements of the theoretical model proposed by Bar-On.

Table 21: Pattern Matrix (Five Factors)

	Factor				
	1	2	3	4	5
SR_eq11 and O_eq11	-.006	**.416**	.224	-.030	.012
SR_eq24	.129	**.442**	-.043	.039	.301
SR_eq40	**.846**	.007	.061	-.039	-.086
SR_eq56	**.867**	.107	-.029	.027	-.032
SR_eq70	**.628**	.154	-.021	.062	.060
SR_eq85	.020	.195	.308	.055	.155
SR_eq100	.184	.243	.184	.115	.064
SR_eq114	.170	.263	.174	.118	.107
SR_eq129	.106	.209	.363	.117	.062
ESA_eq7	**.654**	-.069	-.066	-.214	.391
ESA_eq9	-.035	-.052	.385	.039	.233
ESA_eq23 and IR_eq23	-.194	.023	-.080	.040	**.686**
ESA_eq35 and RT_eq35	.121	.218	.127	.194	.223
ESA_eq52	.006	.059	-.045	.003	**.682**
ESA_eq63	.046	.105	.352	.047	.239
ESA_eq88 and RT_eq88	-.030	.198	**.427**	.100	-.001
ESA_eq116	-.043	.072	.008	.079	**.555**
A_eq22	.156	.281	.053	-.023	.307
A_eq37	**.589**	.201	-.017	-.164	.156
A_eq67	.028	.323	.127	-.059	.179
A_eq82	-.123	.394	-.107	.140	.221
A_eq96	.780	.195	.012	-.209	.111
A_eq111	.301	.356	-.018	-.045	.198
A_eq126	.106	**.410**	.018	-.022	.293
IN_eq3	-.193	.246	.060	.061	.112
IN_eq19	**.689**	.100	-.054	-.002	-.022
IN_eq32	**.434**	.286	.023	.039	.053
IN_eq48	.125	**.492**	.064	-.003	.179
IN_eq92	**.813**	.248	-.154	-.122	.077
IN_eq107	-.135	.340	.095	.237	-.051
IN_eq121	**.735**	.126	-.083	.095	-.119
SA_eq6	**.843**	-.073	.109	-.038	-.052
SA_eq21	**.816**	.132	-.058	-.030	.031
SA_eq36	**.717**	.074	-.018	-.002	-.020
SA_eq51	.033	.236	.176	.132	.160
SA_eq66	-.073	.185	.253	.016	.207
SA_eq81	.350	.159	.312	-.016	.052
SA_eq95	**.851**	-.053	.100	-.124	-.098
SA_eq110	.228	.126	**.437**	-.103	.065

SA_eq125	**.863**	.083	-.072	.010	.021
E_eq18	-.069	.038	.195	.110	.249
E_eq44	**.652**	-.241	.176	-.001	.147
E_eq55 and IR_eq55	**.694**	-.100	.108	-.109	.069
E_eq61 and SRes_eq61	.088	.004	**.431**	-.078	.001
E_eq72 and SRes_eq72	.033	-.165	**.491**	.046	.114
E_eq98 and SRes_eq98	**.716**	-.294	.239	-.009	.040
E_eq119 and SRes_eq119	-.016	-.166	**.537**	.004	.023
E_eq124	**.575**	-.295	.246	.016	-.051
IR_eq10	-.035	-.097	.162	.016	**.427**
ST_eq4	.327	.252	.240	-.023	-.049
ST_eq20 and O_eq20	**.819**	.164	.080	-.079	-.137
ST_eq33	**.521**	.191	.092	.025	-.100
ST_eq49	.142	.395	.154	.186	-.061
ST_eq64	**.732**	.106	.011	.218	-.073
ST_eq78	-.050	.263	.301	.219	-.052
ST_eq93	-.177	**.424**	-.074	.148	.201
ST_eq108 and O_eq108	**.842**	.087	.097	-.031	-.095
ST_eq122	-.052	.339	.116	.253	-.016
IC_eq13	**.741**	-.127	-.025	.236	-.034
IC_eq27	**.501**	-.103	-.124	.343	-.130
IC_eq42	**.724**	-.123	-.022	.300	-.054
IC_eq58	**.653**	-.155	.008	.320	-.113
IC_eq73	**.508**	-.183	-.107	.303	.127
IC_eq86	-.050	-.003	.118	**.528**	.060
IC_eq102	.208	-.083	-.125	**.496**	.062
IC_eq117	.109	-.069	.111	**.443**	.203
IC_eq130	**.778**	-.117	-.042	.281	-.042
RT_eq8	**.702**	.056	.061	.044	-.155
RT_eq38	-.024	.085	.081	.220	.019
F_eq14	.104	.313	-.024	.043	.297
F_eq28	-.116	.278	-.013	.193	.311
F_eq43	**.617**	-.121	-.111	.217	.164
F_eq59	**.571**	.098	.044	-.022	.127
F_eq74	.051	.090	.159	.122	.171
F_eq87	.015	.191	.013	.188	.271
F_eq103	-.062	.190	.055	.248	.283
F_eq131	-.006	.188	-.001	.096	.216
PS_eq1	.020	.021	.391	.091	-.031
PS_eq15	**.589**	-.009	.224	.050	-.098
PS_eq29	-.006	.078	**.414**	.122	-.049

PS_eq45	-.055	.140	**.414**	.180	.003
PS_eq60	**.658**	.020	.220	.028	-.126
PS_eq75	.172	**.400**	.077	.158	.065
PS_eq89	-.028	.165	.351	.166	.085
PS_eq118	**.810**	.161	-.062	.003	-.059
O_eq26	**.740**	-.021	.102	-.061	-.009
O_eq54	**.615**	-.198	.128	-.066	.031
O_eq80	.075	.318	.399	.089	-.032
O_eq106	.066	.066	**.454**	.032	.052
O_eq132	**.873**	.109	-.067	-.014	-.032
H_eq2	-.007	.136	.143	.075	.245
H_eq17	.238	-.062	.131	.078	.343
H_eq31 and IR_eq31	**.670**	-.086	.184	-.121	.083
H_eq47	.245	.090	.237	.086	-.019
H_eq62 and IR_eq62	-.047	.090	.320	-.101	**.429**
H_eq77	**.710**	.136	-.078	.144	-.089
H_eq91	.265	.168	.126	.173	.043
H_eq105	.195	-.018	**.439**	.006	-.153
H_eq120	.014	-.030	**.482**	-.135	.150
SRes_eq16	**.670**	-.259	.185	-.073	.137
SRes_eq30	**.764**	-.257	.063	.095	-.042
IR_eq39	.003	.028	.190	-.128	**.503**
SRes_eq46	**.884**	-.053	.016	.001	-.109
RT_eq53	**.730**	-.098	-.058	.150	.176
RT_eq68	**.804**	.046	-.029	.107	-.030
SRes_eq76	.151	-.025	.191	.237	.045
RT_eq83	.015	.112	.041	**.417**	-.028
IR_eq84	.098	-.045	**.434**	-.085	.086
SRes_eq90	.039	-.036	.297	.092	.101
RT_eq97	.009	.097	.090	**.503**	.031
IR_eq99	**.601**	-.061	.308	.009	.067
SRes_eq104	**.819**	-.163	.068	.008	-.106
RT_eq112	**.763**	.007	.140	-.077	-.124
IR_eq113	**.726**	-.076	.126	-.152	.205
RT_eq127	.321	.369	.061	.158	.116
IR_eq128	-.082	.017	.177	.180	**.404**
IR_eq69	**.851**	-.128	-.005	-.011	.024

Extraction method: Principal axis factoring

Rotation method: Oblimin with Kaiser normalisation

Note: ***SR*** = *Self-regard;* ***ESA*** = *Emotional Self-awareness;* ***A*** = *Assertiveness;* ***SA*** = *Self-Actualisation;* ***IN*** = *Independence;* ***IR*** = *Interpersonal Relationships;* ***SRes*** = *Social Responsibility;* ***E*** = *Empathy;* ***IC*** = *Impulse Control;* ***ST*** = *Stress Tolerance;* ***PS*** = *Problem Solving;* ***RT*** = *Reality Testing;* ***F*** = *Flexibility;* ***H*** = *Happiness; and* ***O*** = *Optimism.*

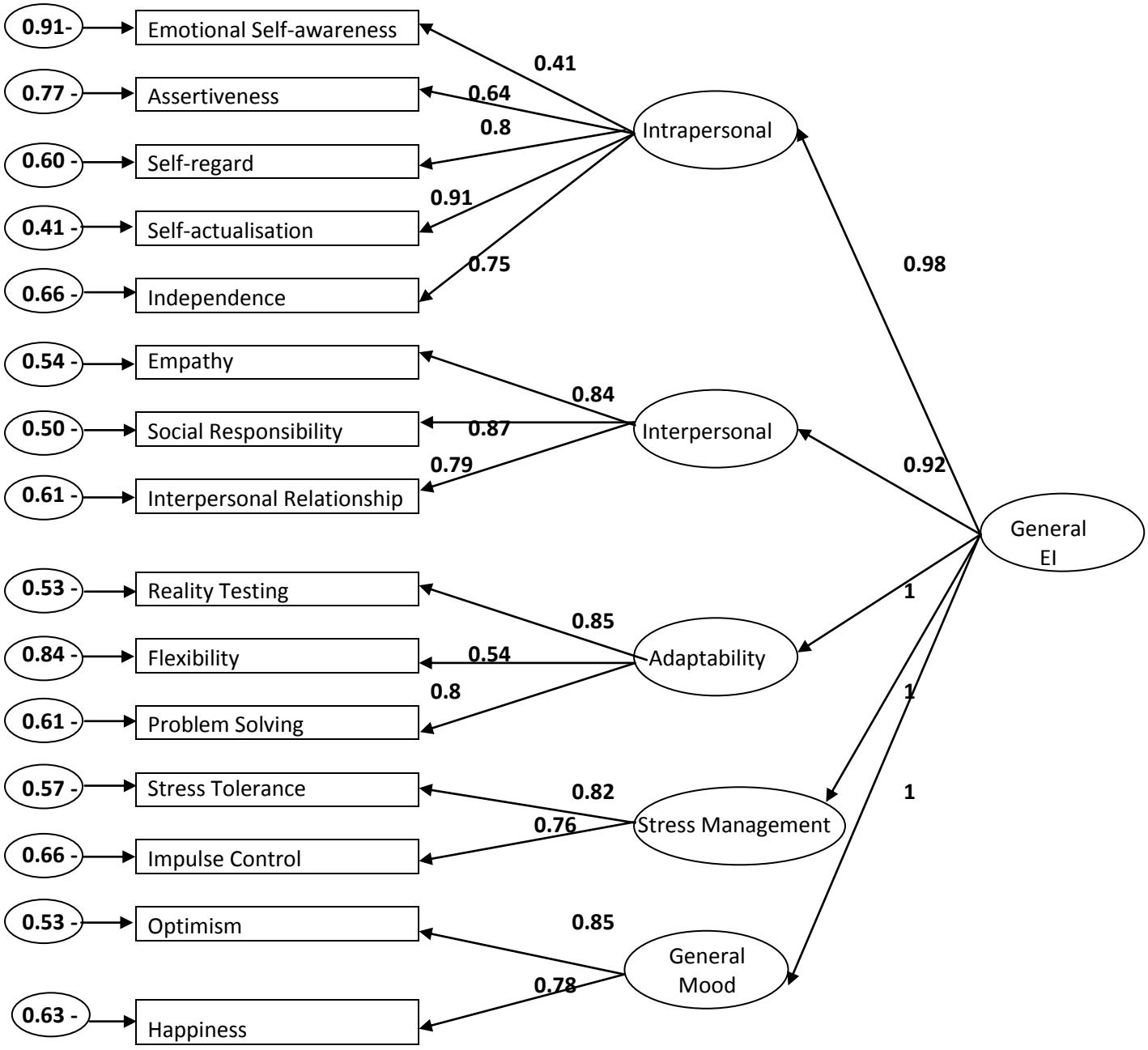
In further theoretical examination of the nine-factor and five-factor models, it became apparent that the variables that formulated the different factors did not make theoretical sense. Except for a few factors that were not well defined, namely one, four and three from the nine-factor loading, the five-factor loadings did not represent an interpretable construct in respect of the Bar-On model. Overall, the findings of the current study offered a different interpretation of the EQi dimensional structure. In agreement with Petrides and Furnham (2001), Brackett and Mayer (2003) and Livingstone and Day (2005), who produced empirical literature regarding the structural validity of the Bar-On model (as seen in *Chapter 2*), the current nine-factor and five-factor models have loaded on a single higher-order EI factor. The findings of the current study suggest that the sub-scales are not as clearly defined as Bar-On states, and that the current factor structure was not adequately representative of the Bar-On model. Therefore, the findings of the current study may suggest that the Bar-On model would not be significant (valid or reliable) when used in a South African context.

4.3.2 CONFIRMATORY FACTOR ANALYSIS

Confirmatory factor analysis was used to statistically test the significance of Bar-On's hypothesised factor model. This was done to test whether the sample data confirmed the model by determining which factors were correlated and which observed variable measured each factor *(Fig. 2).*

The theoretical model depicts a hierarchical model consisting of multiple second-order factors and one higher-order factor. The arrows consequently depict path coefficients from these observed variables to only one corresponding latent variable. Path coefficients for Intrapersonal varied between 0.41 and 0.91. For Interpersonal, the coefficients varied from 0.79 to 0.87. The results for Adaptability range from 0.54 to 0.85. Coefficients for Stress Management ranged in the 0.76 to 0.82 band, and for General Mood the coefficients varied from 0.78 to 0.85. All paths were significant ($p < .01$). The measurement errors are enclosed by smaller ellipses and indicate that each observed variable measures something other than the hypothesised factor. Self-actualisation, Social Responsibility, Reality Testing and Optimism were the variables with the lowest loadings, whereas

Emotional Self-awareness and Flexibility were the variables with the highest error variances, which may be problematic in terms of model fit.



E = Error Loadings

Figure 2: A confirmatory five-factor model of the Bar-On EQi determined by the current study

The second step within the confirmatory factor model is to fit the sample variance-covariance data to the specified model. If the fit of the model is good, then the specified

model is supported by the sample data. If the fit of the model is not good, then the specified model is not supported by the sample data, and further studies should be conducted to adjust the model to achieve a better fit (Field, 2005).

A CFA was conducted to examine whether the current five-factor structure better represented the dimensional structure of the EQi in comparison to Bar-On's (1997) proposed second-order five-factor model (*Fig. 3*). Bar-On's five-factor fit indexes represented the following indexes: CFI = .97, RFI = .95, RMSEA = .15.

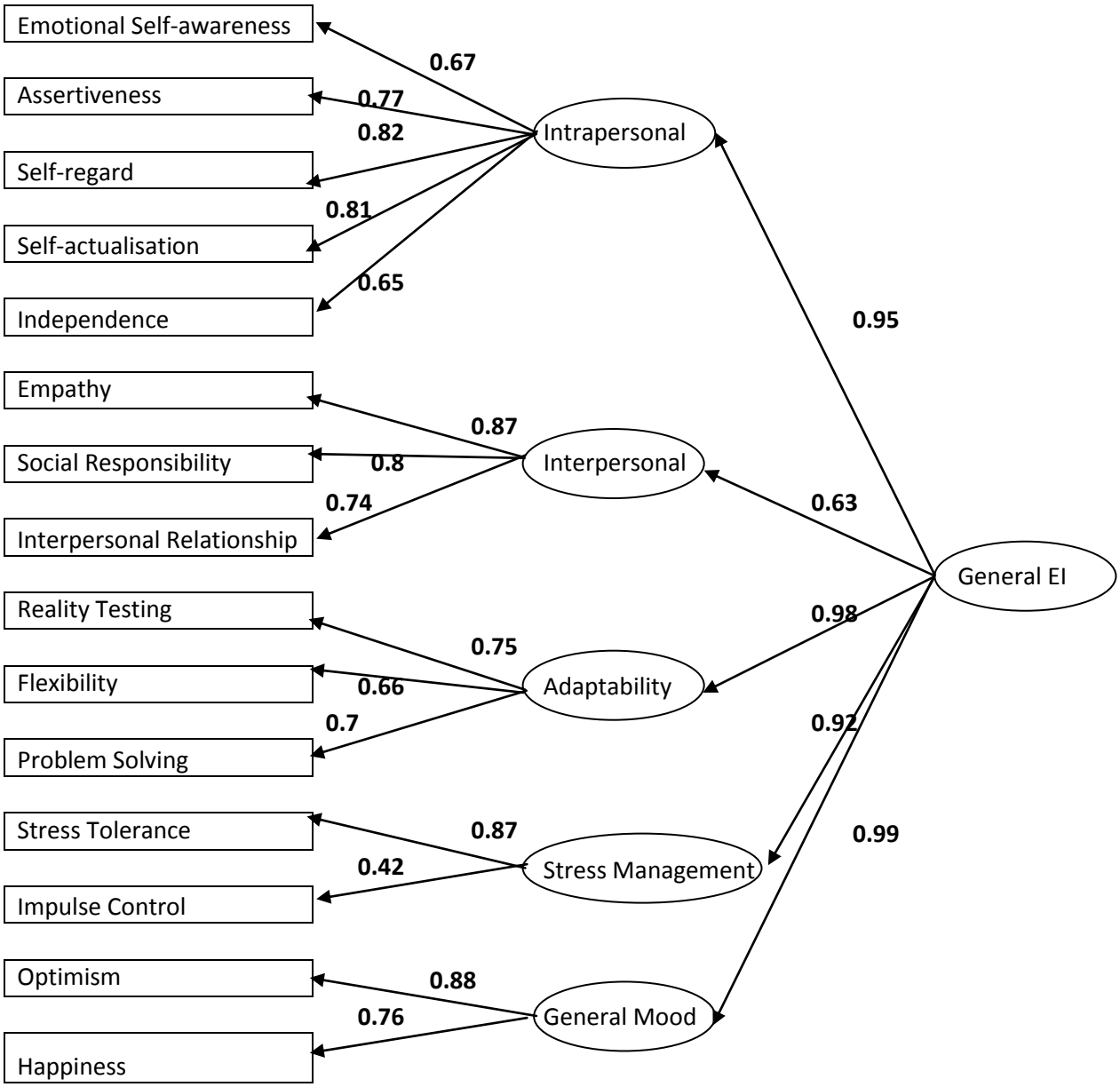


Figure 3: Bar-On's (1997) second-order five-factor model of EI

Maximum likelihood estimation and the Satorra-Bentler scaled chi-square test statistic were used, as the data was not normally distributed. In the model, Mardia's coefficient was equal to 50.7979, thus violating multivariate normality. The output for the model estimation and chi-squared test statistics are given in *Table 22*.

Table 22: Test Statistics and Fit Indices

GOODNESS OF FIT SUMMARY FOR METHOD = ROBUST

SATORRA-BENTLER SCALED CHI-SQUARE = 1342.7246 ON 85 DEGREES OF FREEDOM

PROBABILITY VALUE FOR THE CHI-SQUARE STATISTIC IS 0.00000

FIT INDICES

BENTLER-BONETT NORMED FIT INDEX	=	0.833
BENTLER-BONETT NON-NORMED FIT INDEX (NNFI)	=	0.804
COMPARATIVE FIT INDEX (CFI)	=	0.842
BOLLEN'S FIT INDEX (IFI)	=	0.842
MCDONALD'S FIT INDEX (MFI)	=	0.521

ROOT MEAN-SQUARE ERROR OF APPROXIMATION (RMSEA) = 0.124

90% CONFIDENCE INTERVAL OF RMSEA (0.118, 0.130)

The result of the Satorra-Bentler scaled chi-square statistical output was 1342.7246, with 85 degrees of freedom ($p = 0.00000$). The results indicate a poor overall fit of the five-factor model on the EQS. As indicated in Table 22, the NNFI, CFI and IFI values were 0.804, 0.842 and 0.842 respectively. A value of 0.95 is considered to be a good fit for all of the above indices (Hu & Bentler, 1999). None of these values met the guideline to be regarded as acceptable.

The RMSEA obtained a value of 0.124, with a 90% confidence interval in the 0.118 to 0.130 range. According to Browne and Cudek (1993), values of 0.05 and less will indicate a well-fitting model between the postulated model and the empirical data. This indicated that the RMSEA value did not deem the model a reasonable fit.

In testing statistically which model provided a better overall fit of the data, the Bar-On five-factor model yielded a chi-square value of 742.92 with 85 degrees of freedom. In contrast, the current study's five-factor model from the confirmatory factor analysis yielded a chi-square value of 1342.7246 with 85 degrees of freedom. As such, the Bar-On five-factor model provided a significantly better fit than the current study. However, the current study also indicated that the factor model could not be confirmed at this level, as the structure loaded on different factors and, through CFA, very bad fit indices had resulted. In essence, the data did not closely represent Bar-On's model and there was no purpose in running further analyses.

4.4 CONCLUSION

This chapter summarises the results of the statistical analysis that was performed on the sample. Both exploratory and confirmatory factor analytical methods were conducted on the data obtained. The scree plot, total variance explained and the rotated factor loadings (factor pattern matrix) all formed part of the exploratory factor analysis, thereafter, followed by the confirmatory factor analysis. The next chapter contains the conclusions of the research project. The limitations and also the recommendations for further research provided.

CHAPTER 5

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

There is increasing interest in developing a scale that best measures emotional intelligence. In a culturally diverse landscape such as South Africa, the development of an EI assessment is needed so that the different experiences of EI in various groups can be understood (Cara & Christel, 2008). Within this context, the measurement of emotional intelligence and the scales used in the present study were based on the examination of a South African insurance sample.

5.2 CONCLUSION

The objective of the study was to determine the structural validity of the Bar-On EQi for a South African insurance sample. In the current study, an oblique rotation procedure was used to interpret the dimensional structure of Bar-On's 15-factor model. The results indicate that there were factors that represented the Bar-On model, but these were not well defined, as only a few items would load significantly. The fit indices of the current study did not represent Bar-On's proposed hierarchal model. In the current study, a maximum of nine factors could be retained and no evidence of 15 factors could be determined. In contrast, Petrides and Furnham (2001), Brackett and Mayer (2003) and Livingstone and Day (2005) identified a single higher-order dimensional factor structure for the EQi. The findings of Palmer *et al.* (2003), in contrast, differed from those of the aforementioned three studies, with six factors identified: emotional disposition, interpersonal EQ, impulse control, problem solving, emotion self-awareness and the sixth factor, which loaded on items from the Flexibility and Independence sub-scales of the EQi. The results of the present and other studies mentioned show that the constructs measured by the EQi are clearly multidimensional.

The differences between the factors that emerged in the present South Africa sample and those that emerged from the standardisation sample used by the original author could possibly be ascribed to differences in educational, social and cultural backgrounds. The dilemmas that test developers are faced with are related to whether international tests should be adapted for use in the South African context, or whether suitable tests should be developed that encompass the unique societal composition of the group being studied.

5.3 LIMITATIONS

Among the factors that arose, a possible limitation that could have influenced the results of the current study is the issue of language, taking into consideration that linguistic barriers may inhibit the test performance of previously disadvantaged groups (Gregory, 2004). Foxcroft (2004) agrees with Gregory (2004) that there are a minimum number of tests that have been developed in a cross-cultural context and for the language groups of South Africa. Nell (2004) also states that language is an important mediating variable of test performance. He further explains that, if a test is conducted in a language with which the test-takers are not comfortable, it will be difficult to determine whether poor performance is a result of the language barrier or whether the test-taker has a low level of the construct being measured.

South Africa has 11 official languages and English is a second language for many South Africans. In the original research by Bar-On (1997), it could be assumed that the first language of the participants was English, while in this study the questionnaires were completed by multi-language groups. Therefore, one could question how the scale items and the specific words that were used in the questionnaire were understood and interpreted. Therefore, the effect of language could have a direct impact on the reliability of the scores obtained in the statistical analysis. Home language was not included as one of the biographical variables, however, so this is left to speculation.

Statistics South Africa (Stats SA) estimated that, in 2010, the mid-year population was 49,99 million. Africans are in the majority, constituting 79.4% of the total population. The white population is estimated at 9.2%, the Coloured population at 8.8% and the

Indian/Asian population at 2.6%. This broad racial classification, therefore, advocates that neither group is culturally or linguistically homogeneous.

Another consideration to be taken into account is that psychometric assessments that have been revealed to be valid in one cultural context do not necessarily produce good results in another cultural context. One would need to consider if the test has been standardised for use by all cultural groups through a representative sample (Van de Vijver & Rothmann, 2004); if this is not the case, then the use of these test can be discriminatory cross-culturally, and inferences drawn from these test results will have to be called into question (Wallis, 2004). Both Foxcroft (2004) and Bartam (2004, p.2) have stated strongly that there are a limited number of tests that have been developed across the "diverse cultural and language groups in South Africa", and that more cross-cultural studies need to be undertaken in the South Africa context.

For this study the EQi questionnaire was only available in one language: English. For future studies, it might be advisable to translate the questionnaire into a language in which the test-takers are proficient. The language used should also incorporate cultural concepts and constructs to enable all respondents to answer the questions effectively. This will ensure a comprehensive understanding of the questions and therefore provide more reliable research findings and conclusions for statistical analysis.

Other potential limitations of this study can be identified:

- Lack of representative sample; due to the sampling method being a convenience sample, some limitations of generalisation may exist. Future studies would benefit hugely in terms of a stratified random-sample design, which would ensure sufficient representation of the different groups in the total population.

- This research study was conducted in a single organisation and therefore cannot be generalised to other organisations or to the rest of the South African workforce.

- Some items have very low factor loadings, which could suggest that the items do not measure what they intend to measure. It is recommended that the current items

be revised in order to improve their factor loadings and to increase the quality of the items and of the test as a whole.

5.4 RECOMMENDATIONS

Although the results were not very good with the current set of items, it should be borne in mind that scale validation is an ongoing process. Continued refinement of the EQi model is thus suggested, and this should also include replicating the study by including a more heterogeneous sample across various occupational groups and industries to test the possible generalisation of this study. As the measuring instrument used in this study was only in English, it is recommended that, for future multicultural studies, this instrument be adapted and translated into other languages in order to establish more clarity and understanding of the content for the language groups, as well as to determine whether the cross-cultural applicability of the test has been take into consideration in order to achieve more reliable results. Future validation studies could also focus on improving the model fit of the theoretical model underpinning the measure of emotional intelligence used in this research. Another recommendation would be to analyse each cultural group separately and then to compare the factor structures in respect of equivalence.

5.5 CHAPTER SUMMARY

According to Bar-On (2006, p.4), being emotionally intelligent is having the capability to "manage personal, social and environmental change effectively by realistically and flexibly coping with the immediate situation, solving problems and making decisions".

The theoretical aim of the study was to conceptualise emotional intelligence. The discussion in Chapter 2 centred on understanding the concept of emotional intelligence, particularly how emotional intelligence has emerged as an influential framework in (organisational) psychology (Goleman, 2001). Secondly, it aimed to provide a view of the emotional intelligence construct, including its origin and development, its conceptual foundation, various emotional intelligence models and criticisms, as well as controversies surrounding emotional intelligence. Chapter 3 provided a detailed justification for the

chosen methodology, approach and design. Chapter 4 reported on the findings obtained, as well as provided the conclusions based on the findings of the study. It lastly also provided the limitations of the study and recommendations for future research.

From a South African perspective, the findings of this study do not demonstrate sufficient construct validity of the Emotional Quotient Inventory. Because research into emotional intelligence in South Africa has thus far been limited, this field in general and this measurement in particular require deeper exploration.

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