The Relationship Between Personality, Cognition and Emotional Intelligence

by

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DECLARATION

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I declare that the thesis entitled "**The Relationship Between Personality, Cognition and Emotional Intelligence**" is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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SIGNATURE DATE

Mrs Zazél Sale

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SUMMARY

Increased attention has been given to the interaction of emotions with personality and intelligence that has flowed from the personality–intelligence interface, hence emotional intelligence. The accepted body of knowledge regarding emotional capability is under scrutiny and middle ground is yet to be found.

The general aim of this research was to gain an understanding of the relationship between independent variables (personality and cognition) and a dependent variable (emotional intelligence). The study was descriptive in nature, as the relationship between the variables was described rather than assumed. A quantitative, empirical study investigated independent variables and statistically analysed the results.

This study found that 28% of the variance in EQ can be explained by personality and only 6.4% by cognition. The variance percentage increases to 30.4% when personality and cognition are combined. However, it seems that personality still carries most of the weight in this combination.**Keywords:** Organisational Psychology; Personnel Psychology; humanistic existential approach; descriptive research; quantitative empirical study; emotional intelligence; personality; cognition; Occupational Personality Questionnaire (OPQ); Cognitive Process Profile (CPP); Bar-On EQ-i

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CHAPTER 1: INTRODUCTION, BACKGROUND AND RESEARCH RATIONALE

1.1 INTRODUCTION

Excellent business sense or being a genius in a certain field does not automatically guarantee success (Vredenburg, Hendrick & Zackowitz, 2000). Therefore, as organisations become more global and integrated, human resource strategies are motivated to become more flexible. Specific competencies that support the identification, selection and development of talent are becoming more prominent, as this contributes to an organisation's competitive advantage (Ryan, Emmerling & Spencer, 2009). Effectiveness in organisations is a driving force in understanding talent and the capability of employees (Boyatzis, 2009).

Central to the study of individual differences is the question of whether personality traits and intellectual abilities are related, and if so, how? The original theorists have been entangled in the debate from the beginning (e.g. Cattell, Spearman and Wechsler, to name a few). During the last few years, there has been an increased emphasis on the interaction of emotions with personality and intelligence theories that has flowed from the personality–intelligence interface (Murphy, 2008).

In human resource and organisational development fields, the concept of emotional intelligence has been used as an organising framework to characterise the various skills that are important in the workplace, adding to the specific job-related competencies required (Lane & Pollermann, 2002).

Since the 1960s, the term "emotional intelligence" has been used, but without a clear definition of what it might mean or how to measure it. It took a while for research to venture into the emotional intelligence arena and only when cognition and affect, its neighbouring fields, focused on specific relations between passion and reason, emotional intelligence could be logically analysed (Mayer, 2002).

1.2 BACKGROUND

1.2.1 Emotional intelligence

Emotional intelligence has become an interesting topic for the general public, but more specifically the commercial world, as well as the scientific community. It encapsulates self-awareness and understanding, and addresses the perceived imbalance between intelligence and emotion. Emotional intelligence also talks to several areas of psychological science – neuroscience of emotion, self-regulation theory and metacognition – as well as the search for human cognitive abilities beyond what is traditionally known as academic intelligence (Matthews, Zeidner & Roberts, 2002).

Emotionally intelligent individuals are seen as socially effective. Definitions therefore include personality and social functioning, which may or may not be associated with various skills and abilities within the emotional arena (Lane & Pollermann, 2002; Matthews et al., 2002). Emotional intelligence is also viewed as a mental ability rather than broad social competency (Lane & Pollermann, 2002).

1.2.2 Emotional intelligence and personality

Emotions can also be seen as real-time indications of our perceptions of and effective dealings with our surroundings. They therefore provide valuable information about ourselves, other people and dynamic interactions within our environment. Through being aware of

these emotional reactions we can alter our thinking and behaviour, which will allow us to be more adaptable to our surroundings and perform more optimally. It is suggested that emotional intelligence reflects a blend of the personality traits associated with major personality dimensions, such as the Big Five, because of high correlations with the Bar-On EQ-i. However, it seems that the concept of emotional intelligence adds nothing to the existing personality theory (Matthews et al., 2002).

The modern formation of traits still holds that some degree of consistency should be present for defining the aspects of personality. Personality can be viewed as a summary description of various behaviours that people display with some degree of consistency and, therefore, predictability. This approach has added much value to the study of human functioning. However, the focus on consistency is limiting as it takes the focus away from the aspects of human functioning that are more changing and fluid in nature (Larsen, 1989).

Personality tests of emotional intelligence are appearing at a fast rate as self-assessment tests are easier to produce than ability tests. The item content of emotional intelligence tests is very similar to standard personality scales, even though test developers claim differently. It is thought that the extent to which traits are associated with emotional intelligence is underestimated and that emotional intelligence actually represents abilities rather than qualitative styles of behaviour (Matthews et al., 2002).

1.2.3 Emotional intelligence and cognitive ability

Matthews et al. (2002) reviewed the literature on human cognitive abilities and concluded that there are various different forms of intelligence and each makes a unique contribution towards a scientific model, one of which is emotional intelligence.

Cognitive psychology is embedded in the broader field of cognitive science, which is a modern-day approach that explores the nature of knowledge, its components, its development and its uses. Cognitive science can be seen as interdisciplinary as it includes different fields of psychology, linguistics, anthropology, philosophy, neuroscience and artificial intelligence, economics and sociology. However, it seems that cognitive scientists do not attach value to emotions or differences between individuals (Matlin, 1994).

According to Lane and Pollermann (2002), past studies show that cognitive and emotional neural systems work together to inform and reconcile intelligent strategic behaviour. One of the central purposes of emotion is to assist cognitive processing and initiate strategic behaviour.

Healy (1989) states that there is an increased focus on cognitive processes as the basis of personality, especially looking at the way in which these processes influence how individuals deal with life tasks. Therefore, the emotional processes should be studied more closely as these can have an influence on major life tasks.

1.3 RESEARCH RATIONALE

Personality and intelligence have long been seen as the two pillars of differential psychology and they have stood separately, but with the growing interest in interactionist models of behaviour the two concepts are more useful when studied together to discover any associations and interactions that give reason for shared variance when used to predict human behaviour (Matthews, Deary & Whiteman, 2009).

There are numerous arguments to view emotional intelligence as either a type of mental ability or an ability–personality mix, but this is not clear-cut. Well-specified constructions of

cognition supporting emotional skills are scarce. The scoring procedure and an accepted body of knowledge regarding emotional capability are under scrutiny and middle ground has not yet been found (Matthews et al., 2002).

Dr Reuven Bar-On conducted a comprehensive study on the various factors that determine success in people's lives and came to the realisation that cognitive intelligence cannot predict success on its own (MHS, 2007). Goleman (1995) also argues against the fact that our lives are set by our genetic IQ (aptitude) and believes that there must be something that we can do to be better in life. He looks to *emotional intelligence* as the differentiating factor.

1.4 PROBLEM STATEMENT

The research conducted focused on contributing to the existing body of knowledge by exploring whether there is a relationship between personality and emotional intelligence, and cognition and emotional intelligence.

1.5 AIM

Corresponding to the research question, the following aims can be distinguished:

1.5.1 General aim

The general aim of this research is to explore the relationship between personality and emotional intelligence, and cognition and emotional intelligence.

1.5.2 Specific theoretical aims of the literature review

The specific theoretical aims of the literature review are to gain an understanding of

- emotional intelligence as conceptualised in literature
- personality as conceptualised in literature
- cognition as conceptualised in literature

1.5.3 Specific aims of the empirical study

The specific aims of the empirical study are to determine the relationship between

- personality and emotional intelligence
- cognition and emotional intelligence

1.6 PARADIGM PERSPECTIVE

The research operates in the Industrial and Organisational Psychology discipline with the focus on Personnel Psychology as a subdiscipline.

Personnel Psychology focuses on the development of assessment tools for the selection, placement, classification and promotion of employees, validation of measuring instruments, analysis of job content, development and implementation of selection programmes, optimisation and placement of personnel, identification of management potential, employee well-being counselling and career counselling and guidance.

Personality, cognition and emotional intelligence are becoming significant in informing and influencing job performance, decision making, promotion and succession planning opportunities. A humanistic existential approach will be used to investigate whether there is

a statistically significant relationship between personality and emotional intelligence, and cognition and emotional intelligence.

"Humanism is a philosophical movement that emphasizes the values and personal worth of the individual" (Friedman & Schustack, 2003, p. 339). A key force within humanistic psychology is that of personal intentionality. Basic points of view are shared with existentialism, that is, the human being's position within the world; an individual distinguishing his or her own existence; and taking control of his or her direction in life (Cartwright, 1974). Too often the melancholic aspect of human nature was stressed and therefore humanistic psychologists focus on the *healthy person*. Each individual experience is seen and appreciated as unique (Friedman & Schustack, 2003).

1.7 RESEARCH DESIGN

1.7.1 Type of research

This study is descriptive in nature, as the relationship between the variables are described rather than assumed (Mouton & Marais, 1991). A quantitative empirical study was used to investigate the relationship between the variables and hypotheses were tested by measuring the variables (using psychometric assessment instruments) and statistically analysing the results. The specific design is the cross-sectional survey design.

1.7.2 Research variables

The research deals with exploring the relationship between the independent variables (predictor variables) and dependent variables (Mouton & Marais, 1991).

For the current research, the independent variables were

- Personality, as measured by the Occupational Personality Questionnaire (OPQ32r)
- Cognition, as measured by the Cognitive Process Profile (CPP)
- Nuisance variables (e.g. age, race, gender).

The dependent variable was emotional intelligence, as measured by the Bar-On EQ-i.

1.8 THE RESEARCH METHOD

1.8.1 Phase 1: Literature review

The literature review focused on the following:

- Emotional intelligence as conceptualised in literature
- Personality as conceptualised in literature
- Cognition as conceptualised in literature

1.8.2 Phase 2: Empirical study

The empirical study was a quantitative investigation into the relationship between personality and emotional intelligence, and cognition and emotional intelligence.

1.8.3 Population and sample

The sample for this study consisted of 352 participants from an engineering and construction organisation in South Africa and was selected using a random probability sampling technique. The mean age of the sample was 38.81, with a minimum age of 23 and a maximum age of 63. The sample consisted of 22.2% African, 0.6% Coloured, 7.7% Indian and 69.6% White participants, of which 90.3% were male and 9.7% female. The data was gathered during a high-potential identification project of middle management, as well as individuals applying for recruitment positions and individuals being assessed for purposes of development and training.

1.8.4 Measuring instruments

Consent from the organisation at which the candidates have completed the assessments has been obtained in order to include assessment results in the research. All data were used in an anonymous way and no individuals were identified during the study.

Participants completed the battery of measuring instruments for purposes of recruitment, selection, succession, promotion or development. All assessments were completed in a supervised testing environment and administered by a trained and qualified psychometrist (independent practice) under ethical testing conditions.

1.8.4.1 Bar-On Emotional Intelligence (EQ-i)

Bar-On (1997, p. 17, as per MHS, 2007) states that "[t]he EQ-i measures the emotional, personal and social aspects of intelligence and the results distinguish between those who are able to successfully cope with environmental demands and pressures and those who have difficulty in coping". It is also important to understand that emotional intelligence (EQ) is not cognitive intelligence (IQ), aptitude, achievement, vocational interest or personality (MHS, 2007).

The EQ-i comprises 133 items to be answered on a 5-point Likert response scale and is suitable for individuals 16 years and older (MHS, 2007). EQ-i material includes Question Booklets or EQ-i Data Entry Sheets and Individual Summary, Development, Resource, Leadership, Group or Business reports can be generated for assessments completed.

Even though this version of the EQ-i can be completed unsupervised, candidates completed the assessment in a supervised environment in order to ensure that testing conditions are consistent and controlled for all and the Resource Report is generated.

The EQ-i measures 20 dimensions: 5 composite scales with 15 subscales as described in Table 1.1. below.

Table 1.1
Composite scales and subscales of the EQ-i (MHS, 2007, p. 31)

Composite scales	Subscales	EI competencies and skills assessed by each scale
Intrapersonal		Inner self. In touch with feelings and feel good about self, positive about what they are doing, independent and confident in conveying ideas and beliefs
	Self-Regard	To accurately perceive, understand and accept oneself

	Emotional Self-Awareness	To be aware of and understand one's emotions
	Assertiveness	To effectively and constructively express one's emotions and oneself
	Independence	To be self-reliant and free of emotional dependency on others
	Self-Actualization	To strive to achieve personal goals and actualize one's potential
Interpersonal		Responsible and dependable individuals, with good social skills and ability to interact and relate well with others
	Empathy	To be aware of and understand how others feel
	Social Responsibility	To identify with one's social group and cooperate with others
	Interpersonal Relationship	To establish mutually satisfying relationships and relate well with others
Stress Management		Ability to withstand stress without losing control Generally calm, rarely impulsive and work well under pressure
	Stress Tolerance	To effectively and constructively manage emotions
	Impulse Control	To effectively and constructively control emotions
Adaptability		Generally flexible, realistic, effective in understanding problematic situations and competent in arriving at adequate solutions
	Reality Testing	To objectively validate one's feelings and thinking with external reality
	Flexibility	To adapt and adjust one's feelings and thinking to new situations
	Problem Solving	To effectively solve problems of a personal and interpersonal nature
General Mood		Ability to enjoy life, overall outlook on life and feeling of contentment
	Optimism	To be positive and look at the brighter side of life
	Happiness	To feel content with oneself and life in general

1.8.4.1.1 Validity and reliability

For the EQ-i, the standard scores with a mean of 100 and a standard deviation of 15 is used (MHS, 2007). Internal consistency and test–retest reliability were carried out on the EQ-i. The average Cronbach Alpha coefficients are higher for all subscales, ranging from a "low" of 0.69 to a "high" of 0.86. The overall average internal consistency coefficient for the EQ-i is 0.76 (MHS, 2007). For retest reliability, two South African subject groups were retested, one group after one month and the second group after four months. The average retest reliability coefficient for the one-month group was 0.85 and for the four-month group it was 0.75 (MHS, 2007).

The following validity studies were conducted and yielded positive results, and thus indicate the validity of the EQ-i (MHS, 2007):

- Content (numerous series of item analysis were done in order to select the best items for inclusion)
- Factorial (factor analysis was used to strengthen the development process, as well as the construct validity)
- Construct (studies were carried out by correlating the inventories subscale scores with various scale scores of other measures)
- Convergent (studies included employment of self-assessments and observer ratings, and measures of acculturation, attributional style, coping with occupational stress, job performance and work satisfaction)
- Divergent
- Criterion Group
- Discriminant
- Predictive

1.8.4.1.2 Norms

Taylor, van Rooyen and Partners (2006) report a total number of 9 892 participants included in the normative sample for South Africa, where 36.4% of participants were female, 63.6% male, 32.8% younger than 30 years of age, 38.7% in the age group 30–39, 21.5% in the age group 40–49, 6.8% 50 years of age or older and 0.2% did not report their age. The race demographics for the normative sample were 69.5% White, 18.3% Black, 8.3% Indian and 3.9% Coloured, and 0.02% did not state their race.

North American norms were used to calculate the standard EQ-i scores for the South African sample. Each scale was compared to the North American sample by administering a one-sample t-test where each scale's standard score was 100. Significant differences were achieved for all scales except for the Interpersonal EQ composite scale. When compared to the North American sample, South African respondents showed marginally higher scores for Impulse Control. All other scales were found to be significantly higher than the North American norms, and Social Responsibility and Empathy showed reversed patterns. Total EQ, Intrapersonal EQ, Assertiveness, Self-Regard, Self-Actualization, Adaptability EQ, Problem Solving, Reality Testing, Flexibility and Stress Tolerance showed notable differences, where the large sample size contributed to group differences being negligible, yet statistically significant (Taylor, van Rooyen & Partners, 2006).

Several age and gender differences were found for numerous EQ-i scales and it was suggested that separate age and gender norms for South Africa be used (Taylor, van Rooyen & Partners, 2006).

"The EQ-i represents a well-constructed tool that measures a clearly defined and important concept; the results obtained from this inventory will provide valuable information regarding the respondent's ability to be successful in dealing with environmental demands and pressures" (Bar-On, 2009, p. 8).

1.8.4.2 Occupational Personality Questionnaire (OPQ32r)

The OPQ32r assessment assists with understanding how a person will behave in certain situations and is a work-related questionnaire. The OPQ family is designed to assess the typical or preferred behaviour of individuals in a way that is relevant to the world of work. It is based on the definition of personality being a person's typical or preferred way of behaving, thinking and feeling (SHL, 2007).

Personality is concerned with three main areas/domains in the questionnaire (SHL, 2007):

- *Relating Domain* – how an individual relates to others (e.g. Assertiveness, Outgoingness and Empathy)
- *Thinking Domain* – how an individual typically thinks (e.g. Conservatism, Abstract Thinking and Detail Consciousness),
- *Feeling Domain* – the emotions (e.g. Anxiety, Tough-Mindedness and Optimism),
- Potentially there is a fourth area – Vigor, Competitiveness and Decisiveness.

SHL (2007) explains that when scoring the OPQ, raw scores need to be converted to stens, so that responses can easily be interpreted. This can be achieved either by transferring scores onto a pre-normed profile chart or by entering scores into a computer-based expert system. OPQ scores are represented on a profile in the form of sten scores. The sten scores run from 1 to 10 where the mean is 5.5 and the standard deviation is 2. The sten scale is normally distributed, therefore sten scores of 6 are typical of most people.

For the purpose of the study, internet-based administration was used. Even though this version of the OPQ32r can be completed unsupervised, candidates completed the assessment in a supervised environment in order to ensure that testing conditions are consistent and controlled for all. Candidates included in the study completed the OPQ32r and the norm group against which the candidates were measured was the SA OPQ32r General Population norm group. The OPQ Profile Report was generated for each individual and the descriptions of the 32 scales can be found in Table 1.2. below.

Table 1.2
OPQ32r scale descriptions (SHL, 2007)

Low scores	Descriptor	High scores
	Influence	
Rarely pressures others to change their views, dislikes selling, less comfortable using negotiation	Persuasive	Enjoys selling, comfortable using negotiation, likes to change other people's views
Happy to let others take charge, dislikes telling people what to do, unlikely to take the lead	Controlling	Likes to be in charge, takes the lead, tells others what to do, takes control
Holds back from criticising others, may not express own views, unprepared to put forward own opinions	Outspoken	Freely express opinions, makes disagreement clear, prepared to criticise others
Accepts majority decisions, prepared to follow the consensus	Independent Minded	Prefers to follow own approach, prepared to disregard majority decisions
Sociability		
Quiet and reserved in groups, dislikes being centre of attention	Outgoing	Lively and animated in groups, talkative, enjoys attention
Comfortable spending time away from people, values time spent alone, seldom misses the company of others	Affilliative	Enjoys others' company, likes to be around people, can miss the company of others
Feels more comfortable in less formal situations, can feel awkward when first meeting people	Socially Confident	Feels comfortable when first meeting people, at ease in formal situations
Empathy		

Makes strengths and achievements known, talks about personal success	Modest	Dislikes discussing achievements, keeps quiet about personal success
Prepared to make decisions without consultation, prefers to make decisions alone	Democratic	Consults widely, involves others in decision making, less likely to make decisions alone
Selective with sympathy and support, remains detached from others' personal problems	Caring	Sympathetic and considerate towards others, helpful and supportive, gets involved in others' problems
	Analysis	
Prefers dealing with opinions and feelings rather than facts and figures, likely to avoid using statistics	Data Rational	Likes working with numbers, enjoys analysing statistical information, bases decisions on facts and figures
Does not focus on potential limitations, dislikes critically analysing information, rarely looks for errors or mistakes	Evaluative	Critically evaluates information, looks for potential limitations, focuses on errors
Does not question the reasons for people's behaviour, tends not to analyse people	Behavioural	Tries to understand motives and behaviour, enjoys analysing people
	Creativity and Change	
Favours changes to work methods, prefers new approaches, less conventional	Conventional	Prefers well-established methods, favours a more conventional approach
Prefers to deal with practical rather than theoretical issues, dislikes dealing with abstract concepts	Conceptual	Interested in theories, enjoys discussing abstract concepts
More likely to build on than generate ideas, less inclined to be creative and inventive	Innovative	Generates new ideas, enjoys being creative, thinks of original solutions
Prefers routine, is prepared to do repetitive work, does not seek variety	Variety Seeking	Prefers variety, tries out new things, likes changes to regular routine, can become bored by repetitive work
Behaves consistently across situations, unlikely to behave differently with different people	Adaptable	Changes behaviour to suit the situation, adapts approach to different people
	Structure	
More likely to focus on immediate than long-term issues, less likely to take a strategic perspective	Forward Thinking	Takes a long-term view, sets goals for the future, more likely to take a strategic perspective
Unlikely to become preoccupied with detail, less organised and systematic, dislikes tasks involving detail	Detail Conscious	Focuses on detail, likes to be methodical, organised and systematic, may become preoccupied with detail
Sees deadlines as flexible, prepared to leave some tasks unfinished	Conscientious	Focuses on getting things finished, persists until the job is done
Not restricted by rules and procedures, prepared to break rules, tends to dislike bureaucracy	Rule Following	Follows rules and regulations, prefers clear guidelines, finds it difficult to break rules
	Emotion	

Tends to feel tense, finds it difficult to relax, can find it hard to unwind after work	Relaxed	Finds it easy to relax, rarely feels tense, generally calm and untroubled
Feels calm before important occasions, less affected by key events, free from worry	Worrying	Feels nervous before important occasions, worries about things going wrong
Sensitive, easily hurt by criticism, upset by unfair comments or insults	Tough-Minded	Not easily offended, can ignore insults, may be insensitive to personal criticism
Concerned about the future, expects things to go wrong, focuses on negative aspects of a situation	Optimistic	Expects things will turn out well, looks to the positive aspects of a situation, has an optimistic view of the future
Wary of others' intentions, finds it difficult to trust others, unlikely to be fooled by people	Trusting	Trusts people, sees others as reliable and honest, believes what others say
Openly expresses feelings, finds it difficult to conceal feelings, displays emotion clearly	Emotionally Controlled	Can conceal feelings from others, rarely displays emotion
	Dynamism	
Likes to take things at a steady pace, dislikes excessive work demands	Vigorous	Thrives on activity, likes to be busy, enjoys having a lot to do
Dislikes competing with others, feels that taking part is more important than winning	Competitive	Has a need to win, enjoys competitive activities, dislikes losing
Sees career progression as less important, looks for achievable rather than highly ambitious targets	Achieving	Ambitious and career-centred, likes to work to demanding goals and targets
Tends to be cautious when making decisions, likes to take time to reach conclusions	Decisive	Makes fast decisions, reaches conclusions quickly, less cautious

1.8.4.2.1 Validity and reliability

Two studies looked at the convergent and divergent validity of the OPQ when correlated with Five-Factor Model (FFM) questionnaires. The average convergent correlations ranged from 0.32 to 0.55, well above the near-zero values, and also exceeded the heterotrait–heteromethod divergent correlations. Criterion-related validity is in the range of 0.15 and 0.40. The findings across varied studies and data sets provide measures of personality which are internally and externally consistent and highly reliable (Bartram, Brown, Fleck, Inceoglu & Ward, 2007).

Internal consistency reliabilities are reported for a number of large data sets drawn from a range of different countries, including South Africa. Results for the OPQ32 are represented as Cronbach Alphas and Standard Errors of Measurements. A large South African data set shows comparable reliabilities for the data from white respondents (median reliability of 0.80), but lower reliabilities for one ethnic subset (where the median reliability falls to 0.69). However, a mixed ethnic group produced a median reliability of 0.81. The overall median reliability of the scales in the instrument can be considered to be in the range of 0.75 to 0.80. The SEm for all scales across language versions can be considered to be one sten score or less (Bartram et al., 2007).

1.8.4.2.2 Norms

The OPQ norms allow the report to establish where an individual's score lie on a standard scale by comparing the magnitude of the response to that of other people. There are two norm groups for the OPQ: Managerial and Professional norms and General Population norms. People vary markedly in their qualities, therefore the norm group against which an individual is compared is of crucial importance (Bartram et al., 2007).

SHL (2011) established norms for the general work population (4 880 participants; N ≥ 4 880) and for managerial/professional (1 267 participants; N ≥ 1 267). Generally the gender ratio of male to female is about 60:40.

The OPQ32 was mapped to the FFM, as both measure personality as follows: (1) Outgoing, Socially Confident, Affiliative, Emotionally Controlled (reversed), Persuasive and Controlling were mapped to Extraversion; (2) Caring, Democratic, Independent Minded (reversed), Trusting, Competitive (reversed) were mapped to Agreeableness; (3) Conscientious, Detail Conscious, Vigorous, Forward Thinking and Achieving were mapped to Conscientiousness; (4) Worrying (reversed), Relaxed, Tough-Minded, Socially Confident, Optimistic were mapped to Emotional Stability (negative Neuroticism); and (5) Innovative, Conventional (reversed), Conceptual, Variety Seeking and Behavioural were mapped to Openness to Experience (Bartram & Brown, 2005).

As the 32 OPQ scales can be adopted to the FFM factors by using an IP formula, it was decided to decrease the number of dimensions used and use only the FFM dimensions of Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness to Experience.

1.8.4.3 Cognitive Process Profile (CPP)

The CPP was included in the test battery to measure cognitive ability and cognitive competencies. The CPP measures how an individual solve problems in unfamiliar environments. It is a supervised assessment (Magellan, 2001).

The CPP measures cognitive ability, level of work and learning ability, as well as how an individual solve problems in unfamiliar environments. The motivation behind the CPP is to move beyond the concept of general intelligence as per the IQ approach. The CPP report measures a number of constructs in an integrated way (Magellan, 2001):

- *Cognitive Styles* (i.e. a person's general approach to problem solving – particularly in new and unfamiliar situations)
- *Work-related Processing Aspects* (e.g. indicating the levels of work complexity an individual is cognitively equipped to deal with)
- *Cognitive Processes/Competencies* (i.e. the performance processes used to manage task material)
- *Speed/Timing* (pace of problem solving)
- *Learning Potential* (the capacity of a person to benefit from instruction or mediated learning)
- *Additional Observations* (based on the person's profile combinations)

Magellan (2001) further states that while doing the test, a person explores, links, structures, transforms, remembers, clarifies and monitors his or her actions on the computer screen by using a mouse. All the "movements" made on the computer screen are saved as the person works through the assessment and at the end of each task, the person types his or her

interpretations as a story of the symbolic message represented. A “scoring system” then integrates all these movements and story interpretations.

The 14 dimensions that are measured are presented in Table 1.3 below. For the purpose of this study the Standard Report was used.

Table 1.3
Cognitive competencies (Magellan, 2001)

Construct	Descriptor	Definition
Exploration	Pragmatic	Practical orientation – “Will it work in practice?” Determining relevance in structured contexts
	Exploration	Effectiveness, depth and width of exploration
	Analytical	Systematic, detailed and precise in differentiating and linking
Analysis	Rule Oriented	A rules focus
	Categorisation	Creating external order, categories and reminders – structuring tangibles
	Integration	Synthesis of ambiguous/discrepant/conflicting information
Structuring	Complexity	The preferred level of complexity. The unit of information used
	Logical Reasoning	The disciplined, logical following through of reasoning processes
Transformation	Verbal Abstraction	Unusual, creative, abstract verbalisation and conceptualisation
	Use of Memory	Tendency to rely on memory/concentration/degree of effort
Memory	Memory Strategies	Effectiveness of memory strategies
	Judgement	Using judgement to clarify unstructured and vague information
Metacognition	Learning 1	Quick insight learning
	Learning 2	Gradual improvement/experiential learning

Note. Cognitive competencies (Magellan, 2001)

1.8.4.3.1 Validity and reliability

Magellan (2001) has conducted the following studies: concurrent validity with intelligence tests: WAIS ($r = 0.6$, $p = 0.001$); GSAT ($r = 0.37$, $p > 0.01$); CRTB ($r = 0.3$ to 0.4); and CPA ($r = 0.45$, $p = 0.0$). Personality tests: MBTI (complex but significant relationship); 16PF (the B-Factor – “intelligence”/“concrete” versus “abstract thinking” $r = 0.6$, $p > 0.001$); 15FQ+ (findings, although significant, conclusions are still awaited) and emotional intelligence tests (EIQ: factor C, “motivation” on self-rating $p < 0.01$; indicator B “emotional resilience” on self-rating $p < 0.05$). Bar-On EQ-i data has not yet been submitted for statistical analysis., Predictive validity (in accounting, telecommunications, business consulting and retail

industry, significant correlations were found between the CPP and certain criteria for job performance), construct validity ("goodness of fit" of 0.9 was found), face validity (has low transparency) and cross-cultural validity (no significant differences in terms of cognitive "style", "information processing competencies", "current level of work" and "potential level of work" were obtained for race and gender).

Coefficient Alpha, Internal Consistency Reliability, Spearman-Brown Split Halves Reliability and Kuder-Richardson 20 all exceeded scores of 0.96 for the "focusing and selecting", "linking", "structuring", "transforming", "retention and recall" and "metacognition" dimensions.

1.8.4.3.2 Norms

The CPP processing package consists of a built-in norm creator which facilitates fast and relatively easy processing of normative statistics. The selection of norm groups becomes easier as the CPP database grows and expands (Magellan, 2001). According to M. Prinsloo (personal communication, 19 October 2014), the CPP norm group is 3 000 people strong and is an international norm group where the majority of the sample is South African.

M. Prinsloo (personal communication, 19 October 2014) further states that "conventional normalisation and standardisation, as used in psychometrics, transform a variable's values by subtracting each observed value from the mean of all observed values and dividing this difference by the standard deviation of the values. The rescaling implemented here is meant to preserve the relativity between each variable's observations while rescaling the raw magnitudes into a common metric. However, the relative magnitudes of the scores are to some extent distorted by this standardisation technique. The commonly used normalisation approach has nevertheless been followed for the purpose of comparing and manipulating CPP data which consists of variables whose measurement metric is not the same (multiple variables with different ranges). In other words, normalisation allowed the rescaling of each variable's values into a convenient common metric which could then be compared and used in algorithms to calculate increasingly higher-order CPP scores".

M. Prinsloo (personal communication, 19 October 2014) agrees that the aforementioned normalisation technique may not be ideal and therefore they will experiment further with the CPP data looking at alternative rescaling approaches. The data used for the current study is based on typical normalisation techniques.

The CPP can be used for career guidance and/or career path planning, succession planning, identifying potential, person–job profile matching for selection and placement, diagnostic purposes and intellectual capital solutions within organisations. The CPP can be represented in standard, developmental, executive summary, introductory and customised reports (Magellan, 2001).

1.8.5 Data collection and administration

Participants completed the battery of measuring instruments for the purposes of recruitment, selection, succession, promotion or development. All assessments were completed in a supervised testing environment and administered by a trained and qualified psychometrist (independent practice) under ethical testing conditions.

The Profile Report for the OPQ, the Standard Report for the CPP and the Resource Report for the EQ-i were generated for all research participants.

1.8.6 Statistical analysis

The IBM SPSS Statistics 20 system was used for the statistical analysis and descriptive statistics and regression analysis was done. The data (OPQ32r, CPP and EQ-i) was analysed by calculating Product-moment correlations and doing multiple regression analysis.

1.9 RESULTS

The data was analysed and the results were reported on and presented graphically. The relationship between the variables were statistically explored and interpreted to indicate whether there is a significant relationship between the variables.

1.10 CHAPTER LAYOUT

The study comprises the following chapters:

Chapter 1: Introduction, background and research rationale
The first chapter presents a scientific overview of the current research. The background, research rationale, problem statement, aims, research paradigm, research design and research method have been set out.

Chapter 2: Emotional intelligence, personality and cognition
The second chapter explores emotional intelligence as conceptualised within the literature. It identifies two models; the mixed model (advocated by Bar-On and Goleman) and the trait model (advocated by Mayer and Salovey). Emotion and intelligence are explored as part of emotional intelligence. Personality and its relationship to emotional intelligence is explored, as well as cognition and its relationship to emotional intelligence

Chapter 3: Research article

Chapter 4: Conclusions, recommendations and limitations
The fourth chapter contains the conclusions, recommendations and limitations of the study conducted.

1.11 CHAPTER SUMMARY

The current research was designed to investigate the relationship between personality, cognition and emotional intelligence. This chapter presented a scientific overview of the research. The background, research rationale, problem statement, aims, research paradigm, research design and research method were also stated. The next chapter will provide an overview and literature review of the variables under consideration.

CHAPTER 2: EMOTIONAL INTELLIGENCE, PERSONALITY AND COGNITION

2.1 INTRODUCTION

Davies, Stankov and Roberts (1998) ask a prominent question about emotional intelligence: What is left of emotional intelligence when personality and intelligence have been measured? Zeidner, Matthews and Roberts (2009) state that it is difficult to study the concept of emotional intelligence if you do not know what it is. To date there still seems to be no agreement on a satisfactory definitional framework and there are still many definitions for the construct of emotional intelligence. The definitions are almost over-inclusive and can be seen as somewhat of a "laundry list". Zeidner et al. (2009) ask another important question: How should emotional intelligence be aligned with personality and ability?

Since the influential scientific work on emotional intelligence (Salovey & Mayer, 1990), different approaches to the conceptualisation and measurement of emotional intelligence have come to light. This has also brought confusion about the nature and boundaries of emotional intelligence. The banner of emotional intelligence flies over competencies such as "non-cognitive" capabilities and emotional abilities (Palmer, Gignac, Ekermans & Stough, 2008). Daniel Goleman's best-selling book *Emotional Intelligence: Why It Can Matter More Than IQ* (1995) received immense international media attention and perhaps propelled emotional intelligence into the spotlight. He is of the opinion that emotional intelligence is more powerful than IQ, even though IQ has a long history of research and the concept of emotional intelligence has not been around for that long.

This chapter serves to explore a definition and model framework of emotional intelligence, personality and the relationship thereof with emotional intelligence, cognition and the relationship thereof with emotional intelligence, and the relationship between personality and emotional intelligence, and cognition and emotional intelligence, as conceptualised in literature.

2.2 EMOTIONAL INTELLIGENCE

There has been a growing interest in emotional intelligence (hereafter referred to as EQ) in the last few years, seemingly because of the emerging importance of emotional management. It is stated that a person can be trained in EQ and thus fare better in various social contexts (i.e. occupational, educational and interpersonal situations) (Joseph & Newman, 2010; Matthews et al., 2002).

EQ is also viewed as a present-day zeitgeist and refers to so many of the current competing interests (Mayer, Salovey & Caruso, 2000). "*Zeitgeist* is a German word that, translated literally, means 'the spirit of the times'. In a freer sense, the term has come to refer to the intellectual climate of an era or the world view, that is, the pervasive frame of reference or perspective that shapes the way people think about things" (Pronko, 1988, p. 243). In some contexts, EQ can be viewed as the integration component between the emotional and rational aspects of human beings. From this perspective, an emotionally intelligent society can be seen as one who understands what it means to integrate emotion and reason (Mayer et al., 2000).

A possible reason for EQ's success and acceptance so far is the common resentment towards intellectual intelligence (valid or invalid) as a concept and how it is measured. The misuse and misinterpretation of the results of IQ tests that many have had to bear, may be the cause of this resentment. Goleman (1995) points out how high-IQ individuals are at times emotionally incompetent. It seems that currently, intellect is viewed as being

overvalued and that this overemphasis has led to emotions being neglected and therefore individuals with low EQ lack self-understanding and have relationships which lack depth (Matthews et al., 2002). It is well established within the concept of psychological approaches that intellectual abilities are the best predictors of success, for example at school, with further studies and in the job market. However, intelligence tests have carried the brunt of many and seem to have lost some of its credibility (Hedlund & Sternberg, 2000; Sjöberg, 2001).

Therefore, EQ has both positive and negative sides. EQ emphasises both non-intellectual abilities and intellectual abilities, as well as other attributes (e.g. emotional understanding, adaptive coping, awareness, adaptive adjustment and regulation) as important factors for success in life (the positive side), whereas placing a higher importance on emotional abilities than on intellectual intelligence drives against the world view of many (the negative side). EQ puts forward that not only intellectual ability is necessary for success in life, but that there is a bouquet of other factors contributing to attaining fulfilment in one's life (e.g. social competencies, emotional sensitivity, emotional adjustment, motivation, practical intelligence, character and self-control) (Matthews et al., 2002).

The term "EQ" is seen as somewhat of a paradox, as emotions are likened to irrational passions, whereas intelligence is seen as rationality and reasonableness. The relationship between these two constructs is regularly viewed as in conflict and from two opposing psychological forces (Matthews et al., 2002), where standards of intelligence are linked to cognitive performance and standards of adaptation are linked to emotional reactions (Mayer & Salovey, 1995).

An alternative view is that EQ is a type of intelligence that anyone can acquire (Goleman, 1995). From this viewpoint, an emotionally intelligent society is one where everyone, even the individual who was thought of as less intelligent, can be intelligent. Whether the mentioned uses of the term "EQ" is appropriate or not, can only be answered once a more scientific understanding of what EQ really is about, is investigated (Mayer et al., 2000).

There have been renewed attempts to define, measure and understand the concept of EQ and some even refer to this area of research as *emotional and social intelligence* (Bar-On, 2000). EQ has the potential to assist us in understanding how individuals behave and adapt in their social environment and have influence on our decision-making and social problem solving, and so in helping us to revisit our definition of "smart" people (Emmerling, 2008).

Some suppose that EQ comes from the broader construct of social intelligence (Bar-On, 2000; Gardner, 1983; Goleman, 1995) which has its roots in Thorndike's (1920) tripartite division of intelligence in three broad classes:

(1) *abstract-scholastic intelligence* (ability to understand and manage ideas);
(2) *mechanical-visuospatial intelligence* (ability to understand and manipulate concrete objects); and
(3) *social (practical) intelligence* (ability to understand and manage people, as well as act wisely within social contexts) (Roberts, Zeidner & Matthews, 2001).

The study of social intelligence focused mostly on how people made judgements regarding others and the accuracy of social judgements during the 1930s. By the 1950s, two distinct traditions had emerged: firstly, an intelligence tradition interested in the perception ability of people; and secondly, a social-psychological tradition, focusing on the social determinants of person perception. In recent times, these two distinct domains seem to have come together and therefore researchers from the individual differences domain have become more interested in social facets of ability, and social psychologists have shown interest in cognitive determinants of perceptions (Mayer & Geher, 1996).

Even though there is notable interest in defining and measuring social intelligence, it seems that attempts to do so have been problematic over the last eight decades. From the three broad classes of intelligences that exist, social intelligence has been studied the least. The difficulty to distinguish between general intelligence and social intelligence, together with problems in choosing external criteria against which to validate experimental scales, infused the decline in social intelligence research, until EQ started receiving attention (Roberts et al., 2001).

There is also a strong correspondence between EQ and Gardner's (1983) concept of social intelligence (i.e. *personal intelligence*) (Crowne, 2012; Davies et al., 1998; Joseph & Newman, 2010). Processing affective information does indeed make out part of Gardner's definition of personal intelligence. Mayer, Caruso and Salovey (2000b) conceptualises EQ as focusing on an individual's ability to accurately identify, assess and distinguish between emotions in themselves and others; understand emotions; incorporate emotions in thought; and regulate positive and negative emotions in themselves and others.

Gardner's (1983) definition of multiple intelligences describes the following subtypes of personal intelligence, which include the conceptualisation of Mayer (2002) and colleagues: (1) *intrapersonal intelligence* (i.e. the ability to assess one's own feelings and to represent them symbolically; and (2) *interpersonal intelligence* (i.e. the ability to discern the moods, desires and intentions of others. Therefore, EQ's current definition and conceptualisation (as a cognitive ability) has noteworthy common characteristics with Gardner's conception of personal intelligence, taking both intrapersonal and interpersonal forms of intelligence into account (Goleman, 1995; Hedlund & Sternberg, 2000; Matthews & Zeidner, 2000; Matthews et al., 2002; Mayer et al., 2000b; Roberts et al., 2001; Taylor & Bagby, 2000; Zeidner et al., 2009).

2.3 ATTEMPTING TO DEFINE AND CONCEPTUALISE EMOTIONAL INTELLIGENCE

2.3.1 Definitions and models of emotional intelligence

With overbearing international media attention, EQ has become a new and growing area of behavioural investigation. It seems that, in general, "EI refers to the competence to identify and express emotions, understand emotions, assimilate emotions in thought, and regulate both positive and negative emotions in the self and in others" (Matthews et al., 2002, p. 3).

The confusion around the concept, definition and measurement of EQ can be attributed to having three accepted approaches/models:
(1) ability models (which look at EQ as a set of related conceptual mental abilities regarding emotions and the processing of emotional information, advocated by Mayer, Salovey and Caruso);
(2) trait models (which look at EQ as an assortment of socio-emotional traits, advocated by Bar-On); and
(3) competency models (emotional competencies defined as learnt capabilities based on EQ, advocated by Goleman) (Caruso, 2008; Sjöberg, 2001).

There is a clear lack of agreement on how to define EQ as a construct and therefore numerous theoretical models exist (Papadogiannis, Logan & Sitarenios, 2009) as it seems that the term EQ means different things to different people (Caruso, 2008).

2.3.1.1 Goleman and Bar-On and mixed models

Goleman (1995, p. 34) defines EQ as follows: "Emotional intelligence [includes] abilities such as being able to motivate oneself and persist in the face of frustrations; to control impulse

and delay gratification; to regulate one's moods and keep distress from swamping the ability to think; to empathize and to hope."

In his definition, Goleman (1995) speaks of qualities that can clearly be recognised from the personology field (study of personality traits) and in this he seems to refer to Judeo-Christian ethical values when he states that "character" is another word for the body of skills encapsulated within EQ (Matthews et al., 2002). According to Matthews et al. (2002), Goleman creates exclusiveness from his definition when he states that all positive qualities that are represented in EQ are *not* in IQ. It seems that his conceptualisation of EQ rests on constructs such as motivation, personality, emotions, neurobiology and intelligence. Therefore, such a viewpoint is generally referred to as a "mixed model" of EI, which captures both cognitive and non-cognitive processes.

Goleman's name is generally associated with making the concept of EQ popular, but another important key player is Reuven Bar-On, who developed the first commercially available operational index for EQ assessment. Bar-On's EQ outset is close to that of Goleman, as it cites personality traits. Bar-On (1997, p. 17) defines EQ as "an array of non-cognitive capabilities, competencies, and skill that influences one's ability to succeed in coping with environmental demands and pressures".

Bar-On's EQ-i assessment falls into the mixed-model category and assesses five broad subtypes of EQ. The five higher-order components are measured by subcomponents (defined by pools of items) and grouped together, and in turn these subcomponents produce each higher-order construct. The higher-order constructs, with their subcomponents are:
(1) *Intrapersonal Intelligence* (Emotional Self-Awareness, Assertiveness, Self-Regard, Self-Actualisation and Independence);
(2) *Interpersonal Intelligence* (Empathy, Interpersonal Relationship and Social Responsibility);
(3) *Adaptability* (Problem Solving, Reality Testing and Flexibility);
(4) *Stress Management* (Stress Tolerance and Impulse Control); and
(5) *General Mood* (Optimism and Happiness) (Joseph & Newman, 2010; Matthews et al., 2002; Roberts et al., 2001; Sjöberg, 2001; Stough, Saklofske & Parker, 2009; Zeidner et al., 2009).

2.3.1.2 Mayer and Salovey and trait models

Salovey and Mayer (1990, p. 189) define EQ as "the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions". A revised and more complex definition by Mayer and Salovey (1997) identified four vital components:

(1) the perception, appraisal and expression of emotion;

(2) emotional facilitation of thinking;

(3) understanding and analysing emotions and employing emotional knowledge; and

(4) reflective regulation of emotions to promote emotional and intellectual growth (Davies et al., 1998; Emmerling, 2008; Papadogiannis et al., 2009; Taylor & Bagby, 2000).

This conceptualisation of EQ is an example of a trait model (Matthews et al., 2002; Roberts et al., 2001; Sjöberg, 2001; Zeidner et al., 2009), which assumes that EI mirrors other ability forms in terms of assessment vehicles, concepts, developmental routes, empirical instantiations and lawful occurrences connected to patterns of interrelationships with other measures.

Mayer et al. (2000a, p. 267) state that EQ refers to “an ability to recognize meanings of emotions and their relationships and to reason and problem-solve on the basis of them. Emotional Intelligence is involved in the capacity to perceive emotions, assimilate emotion-related feelings, understand the information of those emotions, and manage them” (as conceptualised in Mayer & Salovey, 1997; Salovey & Mayer, 1990).

2.3.3 Emotional intelligence moving forward

Two opposing camps have emerged in the battle to conceptualise and define EQ: Bar-On (1997) and Goleman (1995) who view EQ as including all components related to success which is not measured by IQ; and Mayer et al. (2000b) who argue for a more restrictive view of EQ as the ability to perceive and understand emotional information. A recent study by Davies et al. (1998) suggests that EQ may represent a limited construct once one has accounted for personality and general cognitive intelligence.

According to Davies et al. (1998), EQ might be of psychological importance, as some researchers view the capacity to process affective information as a “mental ability” (i.e. aptitude). EQ, on a conceptual level, seems to capture some important types of abilities, particularly social and crystallised intelligence.

Matthews, Emo, Roberts and Zeidner (2006) argue that without a sufficient definition of EQ, it is difficult to postulate reliable and valid measures of EQ. Therefore, an in-depth understanding of EQ, which focuses on interventions for real-world problems, may improve current practice and suggest new techniques to withstand problems (Matthews et al., 2002).

2.4 HISTORY OF EMOTIONAL INTELLIGENCE

Zeidner et al. (2009) state that the concept of EQ did not appear out of nowhere. It is rooted in past psychological thinking, research and practice and stems from dissatisfaction with conservative theories of intelligence. It has been advocated by researchers and the like, who believed that an IQ score alone does not encapsulate the potential an individual may have.

Murphy and Sideman (2006) state that there is a long history regarding the concept of EQ. Intelligence has scope for abilities and skills that relate to processing, managing and using information about one’s own and others’ emotions. Wechsler, in his development of ability tests, gave serious consideration to successful behaviour (Kaufman & Kaufman, 2001). EQ was considered as part of a general intelligence by Binet and was seen as crucial for adaptation within a social environment. Thorndike (1920) suggested that some people had more ability than others to tend to and use emotional information to attain success in social situations (i.e. social intelligence) (Murphy & Sideman, 2006).

The classic virtue of temperance puts forward that items of intellect are ruled by passions and the Stoic philosophy supports the notion that emotion should not cloud judgement. In the 1960s, the romantic philosophy placed more value on the heart than the head. A contemporary zeitgeist favours free emotional expression and this is, in part, driven by a technocratic Western society where the emphasis is on formal academic qualifications, standardised testing and reliance on statistical data in policymaking (Zeidner et al., 2009).

The first mention of EQ was in 1966 in a German article, “Emotional Intelligence and Emancipation” (translated), by Leuner from the journal *Praxis der Kinderpsychologie und Kinderpsychiatrie*. The article describes how adult women reject their social roles owing to low EQ. As a treatment to improve EQ, the women were administered the hallucinogenic drug LSD-25 while undergoing psychotherapy (Matthews et al., 2002; Mayer et al., 2000b; Zeidner et al., 2009). Thankfully this treatment did not survive (Zeidner et al., 2009). Payne (1986, as cited in Matthews et al., 2002; Zeidner et al., 2009) appears to be the first to use the term “EI” in English in an unpublished doctoral dissertation.

EQ was first mentioned nearly 40 years ago within the psychological literature, but it was only when Daniel Goleman's book appeared among the *New York Times* best-sellers in 1995, the same year that the *Time Magazine* devoted a detailed article to the topic, that everyone started to take note of EQ (Caruso, 2008; Hedlund & Sternberg, 2000; Matthews et al., 2002; Mayer et al., 2000b; Papadogiannis et al., 2009; Zeidner et al., 2009). However wide the popular interest in EQ may be, a scientific investigation to clearly define the construct of EQ is rare (Matthews et al., 2002).

Even though Goleman appears to be first in line to receive credit for popularising the concept of EQ, he admits without restraint that the work of Jack Mayer, Peter Salovey and colleagues (among them David Caruso) was most influential in his scientific origins. These researchers were the first to publish wide-ranging, peer-reviewed accounts of EQ in scientific journals. They also remain the most fruitful in the scientific literature (Matthews et al., 2002; Roberts et al., 2001).

Salovey and Mayer (1990) related EQ to personality factors (i.e. warmth and outgoingness) in their initial conceptualisation. But since then, they have reviewed their comments and argued that EQ should be distinguished from personality variables and be defined more strictly as an ability (specifically the ability to recognise the meanings of emotions and using that knowledge to reason and solve problems). Despite the growing interest in EQ, the measurement of the construct has come under wide scrutiny (Matthews et al., 2002).

Reuven Bar-On conducted research for his doctorate in South-Africa from 1983 to 1986 and drove a comprehensive study on the factors that determine success in people's lives. He came to the realisation that cognitive intelligence is not enough to predict success and introduced the concept of *Emotional Quotient* (EQ). The EQ-i® was the first EQ assessment accepted by the Institute of Mental Measurements (Buros) and Bar-On officially introduced the EQ-i® in August 1996 in Toronto, Canada at the American Psychological Association's Annual Convention (MHS, 2007).

2.5 EMOTION AS PART OF EMOTIONAL INTELLIGENCE

Emotions can influence thinking, taking some basic principles into account: when an individual is in a negative mood, he or she is likely to rather focus on negative aspects of a situation. When we are in a positive mood, we are likely to see more possibilities and generate more ideas (Caruso, 2008).

Ancient Greeks looked at emotions as primal and likened them to irrational passions which needed to be brought under control. Modern theories of emotion state that emotions are adaptations which assist individuals to survive (Lazarus, 1991; Zeidner et al., 2009), and theories can be attributed to Charles Darwin who suggested that emotions are prevalent across cultures as well as species (Caruso, 2008).

Emotions count just as much as thought when we need to make decisions and decide on a course of action. The rational (that which IQ measures) has been in the spotlight far too long and emotions need to be recognised for what they bring to the table. EQ is a "master aptitude", a capacity that affects all our other abilities when our emotions enhance the ability to think or plan, assist in our motivation levels to attain a certain goal, solve problems and help us to determine how we handle life (Goleman, 1995).

There seems to be a feeling of ambivalence among psychologists regarding the concept of emotion. Young (1943) suggested that emotions cause people to "lose control", that there is no purpose to experiencing emotions and that they are definitely not adaptive (Caruso, 2008). Mowrer (1960, as cited by Caruso, 2008) suggested that emotions themselves can be seen as a higher order of intelligence.

A broader conception of EQ posits that EQ may have cognitive, motivational and feeling elements. Ben Ze'ev (1997) states that there is an interplay between emotion and intellectual thought within EQ. He argues that emotion and intelligence simply refer to different styles of cognition. It seems that most of the theory on emotion is very much concerned with emotions as embedded in specific interactions with the environment. From this stems the difficulty in that actual content-of-emotion measures often assess general feelings, instead of feelings *about* a particular event (Matthews et al., 2002).

2.6 INTELLIGENCE AS PART OF EMOTIONAL INTELLIGENCE

Sternberg (1985, p. 45) defines intelligence as "purposive adaptation to, and selection and shaping of, real-world environments relevant to one's life". He has also moved away from traditional conceptualisations of intelligence and goes beyond IQ to stress that various aspects of intellectual functioning are not that different from EQ (e.g. practical intelligence) (Matthews et al., 2002; Zeidner et al., 2009).

The theory consists of three subtheories:

(1) ***intelligence and the internal world of the individual*** (i.e. *componential* subtheory which points to states and processes that underlie intelligent thought. This subtheory can be broken down into three more parts

> (a) *performance components*: inference, mapping, encoding;
>
> (b) *metacomponents*: plan what one is going to do, monitor the ongoing process andevaluate once completed;
>
> (c) *knowledge acquisition components*: learn how to do what the metacomponents and performance components eventually do);

(2) ***intelligence and experience*** (i.e. processes involving tasks and situations are best to measure intelligence and there are two subtheories here

> (a) *ability to automate information processing*: the process of reading, for example, can be practised and highly automated, and more intelligent people read faster;
>
> (b) *ability to deal with novelty*: non-entrenched and not previously solved tasks are easily solved by intelligent individuals);

(3) ***intelligence and the external world of the individual*** (i.e. intelligent behaviour portrayed by the individual to reach certain goals. There are three *contextual subtheories*, which are directed at attaining certain goals

> (a) *adaptation to the environment*: differences, because of culture for instance, result in individuals defining intelligence differently because of different environments as well as how adaptation is viewed;
>
> (b) *shaping the environment*: if an individual cannot adapt to a certain environment, he or she will try to *change* or *shape* that environment;
>
> (c) *selection of a new environment*: if adaptation and shaping fail, intelligent behaviour will be portrayed by leaving one environment for another) (Matthews et al., 2002; Zeidner et al., 2009).

Gardner's theory postulates that there is more than one intelligence and he has identified eight possible criteria which a construct must meet in order to be considered an intelligence within his theory. Educationalists and psychometricians, who no longer have interest in the

single-factor models of intelligence, are supporters of Gardner's theory (Matthews et al., 2002; Zeidner et al., 2009).

There are seven individual intelligences within Gardner's theory and each of them comes from his subjective categorisation of human abilities.. The seven intelligences are:

(1) *linguistic intelligence* (ability to understand spoken and written words);

(2) *spatial intelligence* (ability that assists an individual in reading a map – getting from point A to point B. There is evidence that spatial intelligence overlaps with visual intelligence (Gv));

(3) *logical-mathematical intelligence* (ability that assists an individual to solve mathematical problems and perform statistical analyses);

(4) *musical intelligence* (ability used when singing a song or composing a piece of music or the appreciation of a complex piece of music);

(5) *bodily kinaesthetic intelligence* (ability that is displayed when an individual dances or plays sports);

(6) *interpersonal intelligence* (ability that is used when we relate to others and relates strongly to EI); and

(7) *intrapersonal intelligence* (ability that assists us in understanding ourselves and that is also related to EI) (Matthews et al., 2002; Zeidner et al., 2009).

The ability to attain knowledge (of oneself or of others), managing others or managing tasks, can be categorised as a facet of intelligence as it necessitates cognitive processes (e.g. encoding critical information from the environment and recognising relations between newly acquired information and existing information). Whether this is called EQ or not, will largely be dependent on an individual's perspective. It is therefore of key interest that the relations among these constructs be assessed and incorporated into an amalgamated model (Hedlund & Sternberg, 2000).

It seems then that EQ is thought to be an intelligence and therefore has gained a reputation of an intelligence that anyone can have (Goleman, 1995). EQ seems to be less constrained by socio-economic and biological factors, unlike traditional cognitive-ability measures which correlate with socio-economic status and educational background (Matthews et al., 2006). Goleman (1995) further argues that individuals with low emotional competencies are able to better those abilities, which is not the case with academic intelligence.

2.7 PERSONALITY

As individuals, we believe that our personality is unique in some way. The same attributes can be found in different people, but each person owns a specific set of characteristics that differentiates them from others. Therefore, **personality** can be summarised as a specific set of attributes that is likely to change in reaction to different circumstances (Schultz & Schultz, 1994).

Psychologists vary in terms of the importance they attach to an acceptable definition of personality (Pervin, 1990). Researchers and theoreticians are often on opposite sides of the spectrum when trying to explain the construct (Dumont, 2010; Cartwright, 1979). No one takes into question that personality exists, but trying to grasp personality as something tangible often results in it just evaporating right there and then (Maddi, 1989). A point that psychologists do agree on is that personality concerns the whole person (Cartwright, 1979).

Cartwright (1974, p. 1) postulates that "[t]he individual human being *is* a personality, and that is what makes each one unique, different from other human beings".

Cattell's (1950, p. 2) definition postulates that "[*p*]*ersonality is that which permits a prediction of what a person will do in a given situation".* He believed that when the word "personality" is used, it refers to the entire individual; the explicit and hidden behaviour a person exhibits. Individual differences make out the foundation of personality studies and differences between individuals are most certainly going to be found on any characteristic that the psychologist chooses to research (Brody, 1972).

Referring to an individual's personality in laymen's terms can mean two things. Firstly, you are referring to the individual's prominent characteristics and, secondly, you are referring to the impact that that individual's existence is having on those around them. When talking about others, we often use words such as *temperament* (i.e. an individual's distinctive emotions and moods, which are related to physiological functioning) and *character* (which is developed by social training and based on the regularity with which an individual follows corrective and moral rules). It seems that using emotional and moral features to describe an individual's personality has become acceptable (Cartwright, 1979).

Understanding personality is therefore imperative if individuals want to gain insight into themselves and others. Understanding what is real, and not just a mask people put up, can assist in living life in a more realistic way. When individuals have a handle on what is real, they can choose the right direction for themselves and grow towards realising their full potential. If we understand ourselves in such a way, we can then start helping others to reach their potential and grow within themselves (Cartwright, 1974).

2.7.1 Personality as a trait

When we try to describe the personality of a person, we typically mention characteristics (e.g. thoughts, feelings or actions) that stand out and that is unique to that person (Cartwright, 1974; 1979; Dumont, 2010; Johnson, 1997). The unique set of traits will then determine the consistent behaviour of the individual in different situations (Carducci, 2009; Cartwright, 1979; Friedman & Schustack, 2003; Pervin, 1990).

Psychologists may believe that behavioural (i.e. outer) traits are descriptions that need further explanation and emotional and cognitive (i.e. inner) traits generate and therefore explain behavioural traits. The interaction between emotional and cognitive traits may determine behavioural traits. When psychologists try to provide explanations for emotional and cognitive traits, they may turn to genetic and physiological bases, developmental histories and roots of the evolutionary aspect of the human species (Johnson, 1997).

According to Ashton (2007, p. 27), a personality trait refers to "*differences among individuals in a typical tendency to behave, think, or feel in some conceptually related ways, across a variety of relevant situations and across some fairly long period of time".* Dumont (2010) argues that traits cannot necessarily be observed and are not real entities. Traits are descriptive in nature and can be seen as a product of human reason and imagination. They help us to create conceptual order in our world and help us to comprehend things better than we would have without them. Traits are a way of thinking about personality.

During the early days of personality studies, it seems that personality was studied from the vantage point of what was wrong with an individual. Gordon Allport and Raymond B. Cattell followed a very different approach; they studied personality from an emotionally healthy vantage point, known as the trait approach to personality. Their data came from observing people in an academic laboratory setting and not from psychotherapy practice, as was the practice in the past (Cartwright, 1974; Schultz & Schultz, 1994).

Allport believed that each person is unique (Cartwright, 1974; Friedman & Schustack, 2003) and this is captured perfectly by his discussion on *motives*. Motives are individualistic systems made up of *impulses*, personal *imagery,* goal *anticipation*, past experience *reflection* and the incorporation of personal *capacity* into a *style* of conduct that is characteristic of an individual in moving towards a goal. He believes that no two people are the same in a specific trait. However, ample similarities can be present between two individuals, especially when they come from the same culture or society (Cartwright, 1974).

Cattell (1950, p. 2) defined personality as "that which permits a prediction of what a person will do in a given situation". Cattell was interested in predicting human behaviour and his approach is based on using empirical data combined with a statistical formula. Just like Allport, Cattell defined different categories of traits and the effect they have on an individual's behaviour.

Hans Eysenck also contributed significantly to the trait viewpoint of personality. Unlike Cattell, he did not rely only on factor analysis to assist in identifying personality structure, he used what he thought to be the dimensions of personality and what they should look like as a starting point and then used factor analysis to identify those dimensions. He arranged traits according to the influence they showed:

- *specific responses* (i.e. actions showing clear influence in a certain situation; *habitual responses* (i.e. actions showing clear influence in quite a few situations;
- *traits* (i.e. a grouping of traits showing a clear influence in quite a few situations and forms); and
- *types* (a collection of traits showing a clear influence in the form of a general style of behaviour) (Carducci, 2009).

Psychological measurement is the anchor for modern trait theory and consists of ratings, tests, questionnaires and projective techniques (Cartwright, 1974; 1979). Using such instruments can assist the individual in uncovering patterns of interests in certain occupations in which they would flourish. These measurements can also assist in tracking progress within clinical programmes (e.g. psychotherapy) or social programmes (e.g. parole halfway houses) (Cartwright, 1974).

Many different viewpoints on personality traits exist, but the guiding principles in them all are that the nature of personality can be defined by traits which can then be used to differentiate between individuals, as differences do exist, and traits can be expressed differently by different individuals (Carducci, 2009; Friedman & Schustack, 2003).

2.7.2 The Five-Factor Model

The Five-Factor Model (hereafter referred to as FFM) of human personality finds its origins in the 1930s when Thurstone developed the first version (Thurstone, 1934, as cited in Dumont, 2010). Allport played a significant role in fathering the model and it is used to portray the structural nature of the arrangement of traits (Carducci, 2009; Costa & McCrae, 1997; Eder & Mangelsdorf, 1997). The five factors that make up the model are: *neuroticism; extraversion; openness; agreeableness;* and *conscientiousness* (Carducci, 2009; Costa & McCrae, 1997; Dumont, 2010; Eder & Mangelsdorf, 1997; Loevinger, 1997; McAdams, 1997; Wiggins & Trapnell, 1997).

Over the years, many researchers have duplicated research originally conducted by Allport, Eysenck and Cattell, and consistently the results showed the above factors (see Dumont, 2010; Friedman & Schustack, 2003; Schultz & Schultz, 1994). McCrae and Costa (1991) seem to be the researchers who have won most acclaim in this area. These five factors are shown to be differentiating components of personality through consistent demonstration by

assorted assessment procedures (Carducci, 2009; Friedman & Schustack, 2003; McAdams, 1997; Schultz & Schultz, 1994). The factors are described in Table 2.1 (Friedman & Schustack, 2003; Schultz & Schultz, 1994) below.

Table 2.1
McCrae's and Costa's five robust factors of personality

Personality Factors	Descriptor
Neuroticism	Worried, insecure, nervous, highly strung
Extraversion	Sociable, talkative, fun loving, affectionate
Openness (to experience)	Original, independent, creative, daring
Agreeableness	Good-natured, soft-hearted, trusting, courteous
Conscientiousness	Careful, reliable, hardworking, organised

The Neuroticism and Extraversion factors from the McCrae-Costa model resemble the similarly named factors from Eysenck's theory. Agreeableness and Conscientiousness may correspond to the opposite spectrum of Eysenck's Psychoticism dimension. Openness (to experience) corresponds to a great extent to intelligence and Agreeableness corresponds to Adler's social interest concept (McCrae & Costa, 1991).

2.7.3 Conclusion

Personality seems to talk to what or how the individual is or will act. It talks to the characteristics, behaviour and unique attributes of an individual. It is now widely accepted that there are individual differences between people and that personality is relatively stable over time. Various personality models exist, but the FFM was focused on for this study. Personality is defined by traits and this assists us in describing individuals with more accuracy. In essence, personality helps psychologists to know more about a person and helps to predict how that person will behave in certain situations over time. However, the human personality is vast and some unchartered waters may still be hidden and waiting to be explored.

2.8 COGNITION

Cognition is imbedded in the field of cognitive psychology and is seen by many as a new field which is trying to solve old problems. Higher mental processes studied by structuralists and methods made perfect by neo-behaviourists are seen as the roots of cognitive psychology. In addition to these roots, computer science, language and information theory have lend concepts and techniques to the cognitive psychology field as well (Reynolds & Flagg, 1983).

This mix-and-match perspective came from dissatisfaction with established theory and human experimental psychology experienced a paradigm shift which led to the birth of a new cognitive approach. The core of this new approach is that humans are active, information-seeking and information-using beings and not passive receivers of information, as previously believed. In its broadest form, cognitive psychology is the entire comprehension of human

behaviour (Reynolds & Flagg, 1983), or the short version is that it is the branch of psychology committed to scientific study of the mind (Braisby & Gellatly, 2005).

"**Cognition**, or mental activity, involves the acquisition, storage, retrieval, and use of knowledge" (Matlin, 1994, p. 2). Various mental processes are needed every time we need to use cognition to acquire information, store it, retrieve it, or use it as knowledge. An interrelated term, **cognitive psychology**, is at times used as a synonym for cognition or when exploring the mental processes that make up cognition (Matlin, 1994).

The cognitive approach postulates that humans are inquisitive and that we proactively seek information from our environment. Perception, pattern recognition, attention, memory, imagery, language functions, developmental psychology, thinking and problem solving, human intelligence and artificial intelligence are seen as the ten principal research areas from which contemporary cognitive psychology draw its theories and techniques (Solso, 1988).

2.8.1 Cognition and emotion

It seems that we tend to ignore our feelings and only at a later stage reflect on what we were really feeling, when it is too late. *Metacognition* is used to describe an individual's awareness of thought processes and *metamood* to indicate an individual's awareness of their own emotions (Goleman, 1995).

Bechara, Tranel and Damasio (2000) conducted studies that support the notion that EQ is a collection of emotional abilities that make up a form of intelligence, which can be distinguished from cognitive intelligence (i.e. IQ). Their studies show that EQ assists an individual to be more socially effective in certain aspects of social life than others. When they looked at patients with ventromedial prefrontal cortex lesions (i.e. individuals who suffer from a specific deficit in the ability to process emotional signals), it became very clear that good knowledge and high IQ alone could not assist these individuals in coping effectively with environmental and social demands. This informs the viewpoint that EQ is critical for overall intelligence within social life.

It can be said that humans have two minds: an emotional mind and a rational mind. The emotional mind works at a faster rate than the rational mind, jumping to action without always considering what it may be doing. The rational mind is characterised by deliberate, analytic reflection, which the emotional mind clearly does not stop to consider (Goleman, 1995).

It is believed that emotions, as displayed in early infancy (i.e. happiness or fear), involve moderately few cognitions and can be viewed as adaptive or maladaptive. As individuals experience more complex representations of situations, their emotional reactions are expected to merge with more complex thinking to develop cognitive-emotional functioning. The logical consistency of these emotional reactions will give a measure of the "intelligence" of their nature (Mayer & Salovey, 1995).

Many people are in agreement on what the different emotional states may mean. However, this does not imply that there is only one way to feel or interpret different emotional situations. Rather, this assists us in understanding how an individual reacts compared to how most people would respond in an emotional way to certain situations. Knowledge like this will assist us in understanding the general meaning of emotions in various relationships (Mayer, Salovey, Caruso & Sitarenios, 2001).

2.8.2 Conclusion

A range of psychological processes make up the field of cognitive psychology, that is, sensation, perception, pattern recognition, attention, memory, imagery, language, thinking

and concept formation (Matlin, 1994; Solso, 1988). Barsalou (1992) calls this information processing mechanisms. According to Solso (1988, p. 2), "[c]ognitive psychology deals with how we gain information of the world, how such information is represented and transformed as knowledge, how it is stored and how that knowledge is used to direct our attention and behaviour". Guenther (1998) puts it another way by saying that cognitive psychology is the inquisition into how knowledge is attained and used.

"Cognition is the *action* of knowing" (Benjafield, 2007, p. 8) and the study of cognition makes up a large segment within the study of human psychology and seems to have prevalent influence in other areas of psychology as well (Anderson, 1995; Matlin, 1994). Internal constructs have been attributed to humans, even though physical evidence was lacking, for example dynamic forces, such as the ego and the id from the Freudians; traits, such as extroversion and aggressiveness from the personality theorists; attitudes, such as being against deforestation from social psychologists; and mental states, such as belief and knowledge from philosophers. In our everyday lives, we use emotion, motive and other states to describe and calculate the behaviours of others. The use of internal states can be seen as an essential human activity in ordinary and scientific associations (Barsalou, 1992).

2.9 THE RELATIONSHIP BETWEEN PERSONALITY AND EMOTIONAL INTELLIGENCE

When personality is considered, one can question whether EQ should be used to describe the whole of personality. When we briefly look at the make-up of personality (*motivation, emotion, cognition* and *consciousness*), it is clear that the constructs used to describe EQ are also used to describe personality (Mayer et al., 2000). Matthews et al. (2002) also refer to this overlap between personality and EQ, specifically mentioning Bar-On's (1997) EQ-i measure which can be explained by personality traits.

Matthews et al. (2002) review Bar-On's (2000) claim that emotional and social intelligence can be seen as a multifactorial collection of interconnected emotional, personal and social abilities that plays a role in an individual's ability to successfully cope with the pressures and demands of daily life. What Bar-On is then really referring to is that the personality dimensions that share likeness with EQ are actually ability-like aspects (Matthews et al., 2002). Psychologists, on the other hand, generally think of personality traits as behaviour styles, which are neither good nor bad. Should we then say that EQ is rather the learnt ability to direct our temperamental qualities in order to attain personal and social success (Zeidner et al., 2009)?

EQ has brought about much confusion and is usually viewed through either a "mixed" or a "trait" model lens. The mixed-model perspective is the view that EQ consists of abilities and aspects of personality and can be measured by a questionnaire. However, some caution should be used here, as self-report questionnaires of ability are not always valid. The other view of EQ is that it is a distinctive personality trait which broadens the scope of the current personality field. Concerns arise with this approach as well: Can EQ be separated from traits such as extraversion, emotional stability, agreeableness, openness and conscientiousness? Can it be that EQ is in fact part of personality, but that researchers have neglected to include traits relating to emotional competence, that is, insight into one's own and others' emotions (Zeidner et al., 2009)?

Recent research identifies extraversion-introversion and neuroticism as the two traits that relate most to emotion. Further, personality also influences cognitive processes which, in turn, may influence emotions (Zeidner et al., 2009). Bar-On (1997) and Goleman (1995) have included motivational, desirable, intra-psychic and interpersonal attributes to EQ, thus broadening its scope so that it looks a lot like personality traits (McCrae, 2000).

Emotions can be seen as a key role player in most personality theories. However, it is somewhat peculiar that personality psychologists have had so much patience for the indistinctness regarding the nature of emotions. It can therefore be concluded that a better understanding of the variety, organisation and principles of emotions is needed before progress and possible merging with personality theory can be achieved (Averill, 2000).

2.10 THE RELATIONSHIP BETWEEN COGNITION AND EMOTIONAL INTELLIGENCE

Much attention has been given to the trait approach of personality within the research field, which uses statistical techniques. These statistical techniques were initially developed for studying intelligence. Personality has been seen as *being*, whereas intelligence is the ability to *do* things. The study of intelligence is reasonably part of the study of personality, yet more complex (Friedman & Schustack, 2003).

When looking at cognitive psychology, it aspires to join emotion to the make-up of cognition. Appraisal theorists propose that emotions are intrinsically weaved into computational operations. When you analyse a stimulus as threatening, an anxious emotion will follow. When an individual is emotionally intelligent, he or she may have more accurate evaluations of stimuli, or even be biased towards stimuli evaluation as either positive or negative, which leads to qualities such as happiness, positive self-beliefs and optimism. The other side of the coin, when looking at appraisal theory, is how emotion, after it has been formed, feeds back into cognition and in turn influences behaviour (Matthews et al., 2002).

Friedman and Schustack (2003) look to Gardner's (1983) theory of "multiple intelligences". The theory states that individuals possess at least seven different intelligences and that the degree to which these intelligences are present, will differ from individual to individual. These seven intelligences "include knowing the world through language, logical-mathematical analysis, spatial representation, musical thinking, bodily-kinesthetic intelligence (control of one's body as a gymnast might have), and understanding of the self and others" (Friedman & Schustack, 2003, p. 245). Therefore, if you possess cognitive skills and the ability to be empathetic, influential, sensitive, compassionate, inspiring, et cetera, you can be called socially intelligent. This formation involves cognitive skills which, supposedly, can be learnt to a certain degree. Within this idea, personality can, to some degree, be changed through training (Friedman & Schustack, 2003).

One could even try and combine concepts of non-traditional types of intelligence with concepts of non-verbal social skills, which refer to "social intelligence" or "EQ". Therefore, individuals have characteristic ways in which they respond to others, but they also have specific social and emotional abilities in dealing with others (Friedman & Schustack, 2003). Dumont (2010) argues that emotion and thinking cannot be separated. He states that "[e]very idea is clothed with a feeling" (Dumont, 2010, p. 314).

It should be noted that not all emotions are related to cognition and vice versa. It is the way individuals appraise their circumstances that establishes the emotional state. Appraisals, again, are significantly influenced by personality variables (e.g. two individuals can be in a similar situation, but emotionally experience and react to it very differently). It is then quite understandable that in trying to understand emotion, researchers are looking to cognition for answers (Smith & Lazarus, 1990).

Averill (2000, p. 278) points out an important dilemma with which the concept of EQ is faced: "the focus on the intelligent use of emotions, or on emotions as a form of intelligence". The first relates to the traditional view that emotions are primitive, mechanical responses; the second is slightly more radical in that it supposes that the same processes responsible for forms of intelligent behaviour are responsible for emotional responses. It seems, then, that

some cognitive processes support intelligent behaviour (i.e. concept formation) and some emotional behaviour (i.e. sensitivity to interpersonal cues).

2.11 CHAPTER SUMMARY

Averill (2000) states that emotions give individuals the ability to distinguish between various situational cues (i.e. know-how of social norms and standards that give rise to appropriate behaviour and expression of certain emotions) and provide individuals with the capacity to cope with environmental demands and pressures (McCallum & Piper, 2000). In the above exploration, EQ has been discussed as a zeitgeist (cultural movement of the times), a synonym for personality and an intelligence/cognitive process concerned with dealing with emotions (Mayer et al., 2000).

Debate regarding EQ has been ongoing (McCallum & Piper, 2000; Zeidner et al., 2009) since the publication of Goleman's (1995) book on the popular term. Even after research and measurement, agreement on how EQ should be conceptualised, measured and applied, has not been reached yet. The future of the concept can be viewed from both a negative and a positive perspective. On the negative side, EQ may be seen as a candle which will fizzle out shortly. On the positive side, it is still a new concept and research on the concept is young. As research continues, false impressions can be identified, the science can grow into stronger empirical evidence and researchers may even reach agreements (Zeidner et al., 2009).

It seems, then, that there is little consensus on what EQ is and how the construct should be defined. However, researchers have recognised specific constructs that are conceptually coherent and may improve understanding of emotional functioning. EQ may still demonstrate constructive assistance in our understanding of personality and cognitive ability (Zeidner et al., 2009). EQ, as a combination of abilities dealing with emotions (in self and others), constitutes belief that it deserves persistent attention (McCrae, 2000).

This chapter explored EQ as it is conceptualised within the literature. It identified two models: the mixed model (advocated by Bar-On and Goleman) and the trait model (advocated by Mayer and Salovey). Emotion and intelligence were explored as part of EQ. Personality and its relationship to EQ were looked at, as well as cognition and its relationship to EQ. In summary, EQ still seems to be an evasive concept that requires further scientific research.

CHAPTER 3

RESEARCH ARTICLE

The Relationship Between Personality, Cognition and Emotional Intelligence

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ABSTRACT

Orientation: Emotional intelligence (EQ) has become a popular concept. However, it is suggested that after personality and cognition have been accounted for, it is an elusive concept.

Research purpose: The purpose of this study is to explore the relationship between personality, cognition and emotional intelligence.

Motivation for the study: In recent years, it has been stated that EQ has become more important for job success than IQ. However, there is no agreement on what EQ is and the components that contribute to this concept have been in dispute.

Research design, approach and method: A quantitative study was conducted using descriptive statistics to explore the relationship between personality and EQ and cognition and EQ. Convenience sampling was used and 352 participants were included in the study. The measuring instruments used were the Occupational Personality Questionnaire (OPQ32r), Cognitive Process Profile (CPP) and the Bar-On Emotional Intelligence Questionnaire (EQ-i).

Main findings: Almost all of the Five-Factor Model (FFM) personality constructs showed statistically significant correlations with the constructs as measured by the Bar-On EQ-i. This indicates that most of what makes up Bar-On's EQ can be likened to personality factors. Cognition showed no statistically significant results, which gives weight to Bar-On's claim that his measure of EQ is a non-cognitive measure. 28% of the variance of EQ can be explained by personality, 6.4% by cognition and 30.4% by personality and cognition combined.

The current research therefore contributes to the mixed-model theory in that EQ consists of constructs associated with personality It also supports Bar-On's definition of non-cognitive capabilities in that it does not show positive correlations with cognition.

Practical implementations: By understanding what EQ is and what it is not, professionals can make more informed decisions about using EQ as a determinant in recruitment, succession planning and the development of staff.

Contribution: This study contributes to the existing body of knowledge to determine what makes up the construct of EQ.

Keywords: Emotional intelligence; personality; cognition; Five-Factor Model; Cognitive Process Profile (CPP); Occupational Personality Questionnaire (OPQ32r); Bar-On EQ-i

INTRODUCTION

Vredenburg, Hendrick and Zackowitz (2000) state that being an intellectual in a certain field or having good business acumen, does not necessarily guarantee success. Therefore, human resource strategies should be motivated to be more flexible as organisations become more integrated and more global (Ryan, Emmerling, & Spencer, 2009). For an organisation to have a competitive edge, it should work towards identifying specific competencies that support the identification, selection and development of talent (Ryan et al. 2009). Boyatzis (2009) is of the opinion that understanding talent and the capability of employees will become the driving force in effective organisations.

In the study of individual differences an imperative question is asked: Are personality traits and intellectual abilities related, and if they are, how? The interaction of emotions with personality and intelligence theories has received increased attention during the last few years and this interest has flowed from the personality–intelligence interface (Murphy, 2008).

Within the workplace, specific job-related competencies are required to execute the work. In addition to these, the human resource and organisational development fields are including the concept of EQ as an organising framework in order to characterise the various skills that are important in the workplace (Lane & Pollermann, 2002).

The term "emotional intelligence" has been used since the 1960s, but to define and to measure the concept has not been that easy. EQ could only be logically analysed when its neighbouring fields, cognition and affect, started exploring the specific relations between passion and reason (Mayer, 2002).

Background to the study

EQ has enjoyed some time in the spotlight, seemingly because emotional management has been deemed as important. It is proposed that you could fare better in various social contexts (i.e. occupational, educational, and interpersonal), if you are trained in EQ (Joseph & Newman, 2010; Matthews, Zeidner & Roberts, 2002).

Intellectual abilities have been seen as the best predictors of success at school, in tertiary studies and in the job market. However, the misuse and misinterpretation of intellectual intelligence (IQ) and its measurement have received resentment and criticism (valid or invalid) and that could have contributed to EQ's success and acceptance to date (Hedlund & Sternberg, 2000; Sjöberg, 2001). Goleman (1995) has also pointed out how, even if an individual has a high IQ, it does not guarantee emotional competence. Intellect may be overvalued, which leads to the neglect of emotions and therefore individuals with low EQ have shallow relationships and no self-understanding (Matthews et al., 2002).

Mayer, Salovey and Caruso (2000) postulate that EQ can also be included in the present-day Zeitgeist. "*Zeitgeist* is a German word that, translated literally, means 'the spirit of the times'" (Pronko, 1988, p. 243). Put in a different way, a Zeitgeist refers to the intellectual climate of an era or the current world view. It is the perspective, lens or frame of reference that forms the way people think about things (Pronko, 1988). In some contexts, EQ can be seen as the integration component between the rational and emotional aspects of human beings (Mayer et al., 2000).

Trends from the literature review

Emotional intelligence

When personality and intelligence are measured, what is left of EQ? This is an important question posed by Davies, Stankov and Roberts (1998). You cannot measure a concept if

you cannot define it, and to date no agreement has been reached on a satisfactory definitional framework for the construct of EQ (Zeidner, Matthews, & Roberts, 2009).

Salovey and Mayer (1990) have done influential scientific work on EQ, but since then different approaches to the conceptualisation and measurement of EQ have been born. Competencies such as “non-cognitive” capabilities and emotional abilities have been put under the EQ banner (Bar-On 1997; Palmer, Gignac, Ekermans & Stough, 2008) and this has led to confusion as to the characteristics and borders of EQ (Salovey & Mayer, 1990). Intelligence/ cognition is characterised by rationalism and reasonableness, and emotions can be seen as irrational passions, therefore putting them together within the concept of EQ just adds to the confusion (Matthews et al., 2002; Mayer & Salovey, 1995).

In his best-selling book *Emotional Intelligence: Why It Can Matter More Than IQ*, Daniel Goleman (1995) states that EQ is more important that IQ. He further states that EQ is another type of intelligence which anyone can master, so that even an individual who is perhaps seen as unintelligent, becomes intelligent within the emotional space (Goleman, 1995).

Bar-On (2000), Gardner (1983) and Goleman (1995) all propose that EQ is imbedded in social intelligence, which is rooted in Thorndike’s (1920) three classes of the tripartite breakdown of intelligence: (1) the ability to manage and understand ideas (*abstract-scholastic intelligence)*; (2) the ability to understand and manipulate concrete ideas *(mechanical-visuospatial intelligence)*; and (3) the ability to understand and manage people, and also act wisely within social contexts *(social/practical intelligence)* (Roberts, Zeidner & Matthews, 2001).

Gardner’s (1983) concept of social intelligence also poses a strong correlation to EQ (Crowne, 2012; Joseph & Newman, 2010; Davies et al., 1998). Gardner’s definition of personal intelligence includes the processing of affective information. EQ is conceptualised by Mayer, Caruso and Salovey (2000b) as the ability of individuals to correctly identify, assess and distinguish among different emotions within themselves and others; understanding emotions; including emotions in thought processes; and then adjusting positive and negative emotions within themselves and others.

According to Gardner’s (1983) definition of multiple intelligences, personal intelligence consists of *intrapersonal intelligence*, which is the capability to evaluate your own feelings and to embody them symbolically, as well as *interpersonal intelligence*, which is the capability to differentiate the moods, desires and intentions of those around you. It is therefore postulated that Gardner’s personal intelligence, which looks at intrapersonal and interpersonal intelligence, has characteristics included in EQ’s definition and conceptualisation as a cognitive ability (Goleman, 1995; Hedlund & Sternberg, 2000; Matthews & Zeidner, 2000; Matthews et al., 2002; Mayer et al., 2000b; Roberts et al., 2001; Taylor & Bagby, 2000; Zeidner et al., 2009).

During the 1930s, social intelligence referred to how people came to make judgements about others and how accurate these social judgements were. Two distinct traditions emerged by the 1950s, namely an interest in the perception abilities of people (an intelligence tradition) and an interest in social determinants of person perception (a social-psychological tradition). The two traditions seem to have merged to a certain degree as researchers of individual differences have become interested in the social facets of ability and social psychologists have become interested in cognitive determinants of perception (Mayer & Geher, 1996).

Unfortunately, during the last eight decades, defining and measuring social intelligence have been problematic and it is also the domain of intelligence which has received the least interest and research. How to choose the criteria to use in order to validate experimental scales, as well as challenges in differentiating between general and social intelligence have contributed to the lack of research within this field (Roberts et al., 2001). In trying to conceptualise, define and measure EQ, two approaches can be considered: Mayer and Salovey and the trait models; and Goleman and Bar-On and the mixed models (Caruso, 2008; Sjöberg, 2001).

Mayer and Salovey and the trait models

The EQ definition put forward by Salovey and Mayer (1990, p. 189) states: "Emotional intelligence is 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." Mayer and Salovey (1997) revised their initial definition and pointed out four vital components of EQ: firstly, that emotion can be perceived, appraised and expressed; secondly, that thinking has an emotional facilitation component to it; thirdly, that one needs to understand and analyse emotions, which leads to using emotional knowledge; and lastly, in order to promote emotional and intellectual growth, one has to reflectively regulate emotion (Davies et al., 1998; Emmerling, 2008; Papadogiannis, Logan & Sitarenios, 2009; Taylor & Bagby, 2000). In this, EQ is conceptualised as a trait where EQ reflects other ability forms (i.e. developmental routes, assessment vehicles, empirical instantiations, as well as lawful occurrences which are connected to the blueprints of interrelationships with other measures) (Matthews et al., 2002; Roberts et al., 2001; Sjöberg, 2001; Zeidner et al., 2009).

Mayer et al. (2000a, p. 267) state that EQ refers to "an ability to recognize meanings of emotions and their relationships and to reason and problem-solve on the basis of them. Emotional Intelligence is involved in the capacity to perceive emotions, assimilate emotion-related feelings, understand the information of those emotions, and manage them" (as conceptualised in Mayer & Salovey, 1997; Salovey & Mayer, 1990).

Goleman and Bar-On and the mixed models

Goleman (1995, p. 34) states that "[e]motional intelligence [includes] abilities such as being able to motivate oneself and persist in the face of frustrations; to control impulse and delay gratification; to regulate one's moods and keep distress from swamping the ability to think; to empathize and to hope".

It seems that Goleman (1995) borrowed qualities from the study of personality traits (personology field) and that he may be referring to the Judeo-Christian ethical values in his statement that "character" is another way of explaining the body of skills that forms EQ. It further seems that EQ is an exclusive concept in that only positive qualities are ascribed to EQ and it is therefore not found in IQ (Matthews et al., 2002). His viewpoint is referred to as a "mixed model" as EQ is made up of constructs such as personality, motivation, neurobiology, intelligence and emotions (which are both cognitive and non-cognitive processes) (Matthews et al., 2002).

Even though Goleman is associated with bringing a renewed interest to the concept of EQ and making it popular, Dr Reuven Bar-On developed the first commercially available operational index for EQ assessment. Bar-On (1997, p.17) defines EQ as "an array of non-cognitive capabilities, competencies, and skills that influences one's ability to succeed in coping with environmental demands and pressures". Bar-On's EQ conceptualisation also alludes to personality traits and is often likened to Goleman's definition of EQ.

Bar-On's EQ-i assessment assesses five broad subtypes of EQ and falls into the mixed-model category. Components grouped together form subscales, which in turn measure five

main composite scales (e.g. domains). The first group is Emotional Self-Awareness, Assertiveness, Self-Regard, Self-Actualisation and Independence, and they form the main composite scale *Intrapersonal Intelligence*; the second is Empathy, Interpersonal Relationship and Social Responsibility, and they form the main composite scale *Interpersonal Intelligence*; the third group is Problem Solving, Reality Testing and Flexibility, and they form the main composite scale *Adaptability*; fourthly, Stress Tolerance and Impulse Control are combined to form the main composite scale *Stress Management*; and lastly, Optimism and Happiness form the main composite scale *General Mood* (Joseph & Newman, 2010; Matthews et al., 2002; Roberts et al., 2001; MHS, 2007; Sjöberg, 2001; Stough, Saklofske & Parker, 2009; Zeidner et al., 2009).

Personality

There still seems to be various acceptable definitions of personality (Pervin, 1990) and researchers and theoreticians often find themselves on opposing sides when efforts are made to elucidate the construct (Cartwright, 1979; Dumont, 2010). No one disputes the fact that personality exists. However, trying to conceptualise it as something tangible is a very difficult task (Maddi, 1989). Although initially there were different views, agreement has been reached among psychologists that personality encapsulates the whole person (Cattell, 1950; Cartwright, 1979). Cartwright (1974, p. 1) postulates that "[t]he individual human being *is* a personality, and that is what makes each one unique, different from other human beings".

It is therefore necessary to understand personality if we would like to obtain insight into others, and importantly, ourselves. Individuals need to distinguish between what is real and what is a mask put up by others so that life can be lived in a more realistic way. Once individuals grasp the real component, they can embark on growing themselves and utilising their potential. Only once we understand what is real about ourselves, we can assist others in reaching their potential and growing within themselves (Cartwright, 1974).

In trying to depict the personality of another person, characteristics such as thoughts, feelings or actions that are distinctive of that person, are often used (Cartwright, 1974; 1979; Dumont, 2010; Johnson, 1997). The specific set of traits of that person will then verify his or her consistent behaviour within various situations (Brody, 1972; Carducci, 2009; Cartwright, 1979; Cattell, 1950; Friedman & Schustack, 2003; Pervin, 1990). Johnson (1997) postulates that the interface between emotional and cognitive traits may in fact determine an individual's behaviour traits, in that psychologists consider that an individual's emotional and cognitive (i.e. inner) traits clarify the behaviour (i.e. outer) traits.

According to Ashton (2007, p. 27), a personality trait refers to "*differences among individuals in a typical tendency to behave, think, or feel in some conceptually related ways, across a variety of relevant situations and across some fairly long period of time".* Dumont (2010), on the other hand, postulates that traits are unobservable and cannot be deemed real entities. Traits are used as descriptors and are the outcome of human reasoning processes and imagination. Traits assist in creating conceptual order in our human world and they can be seen as the way we think about personality.

Even though there are various viewpoints on personality traits, it is agreed that traits can assist in defining personality, which leads to differentiating between individuals as individuals are different, and also that traits are used differently by different individuals (Carducci, 2009; Friedman & Schustack, 2003).

The Five-Factor Model

Thurstone (1934) developed the initial Five-Factor Model (FFM) of personality and it is utilised to render a structure in which traits can be arranged (Carducci, 2009; Costa &

McCrae, 1997; Dumont, 2010; Eder & Mangelsdorf, 1997). The model consists of the following five factors:

- *neuroticism* (worried, insecure, nervous, highly strung)*; extraversion* (sociable, talkative, fun loving, affectionate)*;*
- *openness* (original, independent, creative, daring);
- *agreeablenesss* (good-natured, soft-hearted, trusting, courteous); and
- *conscientiousness* (careful, reliable, hardworking, organised) (Carducci, 2009; Costa & McCrae, 1997; Dumont, 2010; Eder & Mangelsdorf, 1997; Loevinger, 1997; McAdams, 1997; Wiggins & Trapnell, 1997).

The original research on the FFM has been duplicated by many researchers and the results consistently produce the five factors that Thurstone postulated (see Dumont, 2010; Friedman & Schustack, 2003; Schultz & Schultz, 1994).

Cognition

When we process new information, retain it, call on it again, or create knowledge from it, we need to use various mental processes and therefore, "**[c]ognition**, or mental activity, involves the acquisition, storage, retrieval, and use of knowledge" (Matlin, 1994, p. 2). **Cognitive psychology** is an interconnected term or a synonym for cognition and refers to the exploration process of understanding the mental process which contributes to cognition (Matlin, 1994).

Solso (1988) puts forward that humans are inherently curious and will proactively search for information from the environment they find themselves in. Present-day cognitive psychology develops its theories and techniques from the ten key research areas surrounding cognition, which are perception, pattern recognition, attention, memory, imagery, language functions, developmental psychology, thinking and problem solving, human intelligence and artificial intelligence.

Goleman (1995) states that we as humans apply two minds in our daily activities: an emotional mind which facilitates quick action without considering the consequences, and a rational mind which follows a deliberate, analytical process of reflection which the emotional mind lacks.

In early infancy the emotions displayed (i.e. happiness or fear) engage a small number of cognitions and are often seen as adaptive or maladaptive. As individuals get older, increasingly more complex depictions of situations will be experienced, which will lead to emotional reactions being combined to allow more multifaceted thinking which will ultimately develop their cognitive–emotional functioning. The "intelligence" of an individual can then be measured by the commonsensical reliability of their reactions (Mayer & Salovey, 1995).

Studies conducted by Bechara, Tranel and Damasio (2000) found that one form of intelligence is made up of a grouping of emotional abilities (i.e. EQ), which is different from cognitive intelligence (i.e. IQ). The studies confirmed that certain aspects of social life can be navigated more successfully if an individual utilises EQ. One such study specifically looked at patients with ventromedial prefrontal cortex lesions (i.e. inability to process emotional signals), as good knowledge and high IQ did not result in these individuals successfully navigating themselves when faced with environmental and social demands. The viewpoint that EQ is a crucial component of intelligence which aids successful navigation in our day-to-day lives is supported by the studies of Bechara et al. (2000).

Research objectives

The objective of this study was to explore whether there is a relationship between personality and emotional intellignece, and cognition and emotional intelligence.

The specific aims of the empirical study were to determine the relationship between

- personality and emotional intelligence
- cognition and emotional intelligence

Research Hypotheses

The following hypotheses were explored in order to determine whether there is a statistically significant relationship between personality and emotional intelligence, and cognition and emotional intelligence:

H0: No relationship exists between personality, cognition and emotional intelligence.
H1: A relationship exists between personality and emotional intelligence.

H2: A relationship exists between cognition and emotional intelligence.

The potential contribution of the study

The current study aims to contribute to the existing body of knowledge as to what EQ is. It also aims to assist professionals in making more informed decisions as to whether or not to include EQ in recruitment, succession planning and development decisions.

RESEARCH DESIGN

Research approach

The relationship between the variables will be described and not assumed, and therefore the research is descriptive in nature (Mouton & Marais, 1991). The relationship between the independent variables (personality and cognition) and the dependent variable (EQ) was investigated by implementing a quantitative empirical study. Psychometric assessment instruments were used to gather data and test the formulated hypotheses, whereafter the statistical analysis system SPSS was used to statistically analyse the data, specifically using Pearson correlations and regression analysis. A cross-sectional survey design was used for the research.

Research method

Phase 1: Literature review

The literature review focused on the following:

- Emotional intelligence as conceptualised in literature
- Personality as conceptualised in literature
- Cognition as conceptualised in literature

Phase 2: Empirical study

The empirical study was a quantitative investigation into the relationship between personality and emotional intelligence, and cognition and emotional intelligence.

Research participants

A random probability sampling technique was used to select the 352 participants from an engineering and construction organisation in South Africa formed for this study. Data from individuals completing psychometric assessments as part of recruitment processes, succession and promotion planning, career development and training was included in this study. The mean age of the sample was 38.81, with a minimum age of 23 and a maximum age of 63 as shown in Table 1. The sample consisted of 90.3% males and 9.7% females as shown in Table 2. The sample consisted of 22.2% African, 0.6% Coloured, 7.7% Indian and 69.6% White participants as shown in Table 3.

Table 1
Descriptive statistics for age

N	Minimum	Maximum	Mean	Standard Deviation
352	23	63	38.79	8.686

Table 2
Descriptive statistics for gender

Gender	Frequency	%	Valid %	Cumulative %
Female (1)	34	9.7	9.7	9.7
Male (0)	318	90.3	90.3	100.0
Total	352	100.0	100.0	

Note. Gender was coded for use in nuisance variable analysis
Female (1) and Male (0)

Table 3
Descriptive statistics for race

Race	Frequency	%	Valid %	Cumulative %
African	78	22.2	22.2	22.2
Coloured	2	.6	.6	22.7
Indian	27	7.7	7.7	30.4
White	245	69.6	69.6	100.0
Total	352	100.0	100.0	

Note. Race was coded for use in nuisance variable analysis where
African, Coloured and Indian is Black (0) and White (1)

Measuring instruments

The organisation gave consent to the researcher for the data obtained from recruitment processes, succession and promotion planning, career development and training to be used in the research. All participants completed the assessments in a supervised environment and assessments were administered by a qualified psychometrist (independent practice)

under ethical testing conditions. No individuals were identified during the study as data was used anonymously.

The Occupational Personality Questionnaire (OPQ32r) from SHL was used to measure personality; the Cognitive Process Profile (CPP) from Magellan Consulting was used to measure cognition and the Bar-On EQ-i was used to measure EQ.

Bar-On Emotional Intelligence (EQ-i)

The Bar-On EQ-i measures the emotional, personal and social aspects of intelligence and the results distinguish between those who are able to successfully cope with environmental demands and pressures and those who have difficulty in coping" (Bar-On, 1997, p. 17, as per MHS, 2007). MHS (2007) further states that it is imperative to comprehend that EQ is not cognitive intelligence (IQ), vocational interest, personality, aptitude or achievement.

The Bar-On EQ-i is answered on a 5-point Likert response scale and is made up of 133 items. There are 20 dimensions where 5 main composite scales are made up of 15 subscales which all contribute towards Total EQ. The questionnaire can be completed by individuals 16 years and older (MHS, 2007). Question Booklets or EQ-i Data Entry Sheets can be used to complete the questionnaire and various reports can be generated, for example Individual Summary, Development, Resource, Leadership, Group or Business.

Although the EQ-i can be completed in an unsupervised manner (online), all participants completed the assessment in a supervised assessment centre to ensure consistent and controlled testing conditions. The Resource Report was generated for all research participants.

Table 4 describes the 20 dimensions of the EQ-i, where 5 main composite scales are made up of 15 subscales, which all contribute towards Total EQ.

Validity and reliability. Standard scores for the Bar-On EQ-i are used where the mean is a 100 and the standard deviation is 15. Reliability tests performed on the Bar-On EQ-i include internal consistency and test–retest reliability. Cronbach Alpha coefficients range from a "low" of 0.69 to a "high" of 0.86, which indicates a higher range for all subscales than the average Cronbach Alpha coefficient. An overall average of 0.76 for the internal consistency coefficient was obtained. Two South African subject groups were used for the test-retest reliability, where one group was retested after one month and obtained a retest reliability coefficient of 0.85. The second group was retested after four months and obtained an average retest reliability coefficient of 0.75. Positive results, which show validity, were obtained for all validity studies conducted for the EQ-i (MHS, 2007).

9 892 respondents make up the South African normative sample for the Bar-On EQ-i, where 36.4% were female and 63.6% were male, 32.8% were younger than 30 years, 38.7% were in the age group 30–39, 21.5% were in the age group 40–49, 6.8% were 50 years of age or older and 0.2% did not state their age. Of the South African normative sample, 69.5% of the participants were White, 18.3% Black, 8.3% Indian, 3.9% Coloured and 0.02% did not report their ethnicity (Taylor, van Rooyen & Partners, 2006).

For the South African sample, standard EQ-i scores were calculated based on North American norms. Each EQ-i scale underwent a one-sample t-test, where each scale's standard score within the South African sample to 100 was compared to the North American mean for each scale. Apart from the Interpersonal EQ composite scale, all scales showed significant differences. South African respondents showed marginally higher scores for Impulse Control compared to the North American average. Social Responsibility and Empathy showed reversed patterns, where all other scales were found to be significantly higher than the North American norms. The large sample size contributed to group

differences being negligible, yet statistically significant. However, notable differences were found for other groups (in the region of a third of a standard deviation) and include Total EQ, Intrapersonal EQ, Assertiveness, Self-Regard, Self-Actualization, Adaptability EQ, Problem Solving, Reality Testing, Flexibility and Stress Tolerance (Taylor, van Rooyen & Partners, 2006).

Table 4
Definitions of Bar-On EQ-i composite scales and subscales (MHS, 2007, p. 31)

Composite scales	Subscales	EI competencies and skills assessed by each scale
Intrapersonal		Inner self. In touch with feelings and feel good about self, positive about what they are doing, independent and confident in conveying ideas and beliefs
	Self-Regard	To accurately perceive, understand and accept oneself
	Emotional Self-Awareness	To be aware of and understand one's emotions
	Assertiveness	To effectively and constructively express one's emotions and oneself
	Independence	To be self-reliant and free of emotional dependency on others
	Self-Actualization	To strive to achieve personal goals and actualize one's potential
Interpersonal		Responsible and dependable individuals, with good social skills and ability to interact and relate well with others
	Empathy	To be aware of and understand how others feel
	Social Responsibility	To identify with one's social group and cooperate with others
	Interpersonal Relationship	To establish mutually satisfying relationships and relate well with others
Stress Management		Ability to withstand stress without losing control Generally calm, rarely impulsive and work well under pressure
	Stress Tolerance	To effectively and constructively manage emotions
	Impulse Control	To effectively and constructively control emotions
Adaptability		Generally flexible, realistic, effective in understanding problematic situations and competent in arriving at adequate solutions
	Reality Testing	To objectively validate one's feelings and thinking with external reality
	Flexibility	To adapt and adjust one's feelings and thinking to new situations
	Problem Solving	To effectively solve problems of a personal and interpersonal nature

General Mood		Ability to enjoy life, overall outlook on life and feeling of contentment
	Optimism	To be positive and look at the brighter side of life
	Happiness	To feel content with oneself and life in general

For the purposes of this study, intercorrelations were calculated for the Bar-On EQ-i, as shown in Table 5. The subscales of each composite scale were correlated and high intercorrelations were found. For the Intrapersonal composite scale the highest intercorrelation was for Assertiveness (r = 0.85) and the lowest was for Independence (r = 0.67). For the Interpersonal composite scale the highest intercorrelation was for Interpersonal Relationship (r = 0.86) and the lowest was for Social Responsibility (r = 0.82). For the Stress Management composite scale both subscales showed high intercorrelation for Impulse Control (r = 0.84) and for Stress Tolerance (r = 0.81). For the Adaptability composite scale the highest intercorrelation was for Reality Testing (r = 0.83) and the lowest was for Problem Solving (r = 0.77). For the General Mood composite scale both subscales showed high intercorrelations for Happiness (r = 0.88) and for Optimism (r = 0.84). The high intercorrelations of the EQ-i subscales with their composite scales have led to the decision to collapse the subscales and use only the composite scales for the purposes of this study, namely Total EQ, Intrapersonal, Interpersonal, Stress Management, Adaptability and General Mood, for further analysis.

Occupational Personality Questionnaire (OPQ32r)

The OPQ32r is a work-related questionnaire which gives an indication of the preferred or distinctive manner in which an individual will behave in certain situations. The definition of personality is clearly stated, as the person's preferred or distinctive way of thinking, feeling and behaving is looked at (SHL, 2007).

In order to interpret the responses on the OPQ32 with ease, the raw scores are converted into stens by either transferring the scores onto a pre-normed profile chart, or inputting the scores into a computer-based expert system. A profile made up of sten scores represents the OPQ scores where the sten scores range from 1 to 10, the mean is 5.5 and the standard deviation is 2. It follows a normal distribution and 5.5 is typical of most people (SHL, 2007). Theta scores were used for the statistical analysis for the purposes of this study.

Internet-based administration was used for the purposes of the study. Candidates completed the assessment in a supervised environment even though the OPQ32r can be completed unsupervised. This was done to ensure consistent and controlled testing conditions for all participants. The SA OPQ32r General Population norm group was used for all participants and the OPQ Profile Report was generated for all. The 32 scales of the Profile Report can be found in Table 6 below.

Validity and reliability. Bartram, Brown, Fleck, Inceoglu and Ward (2007) report two studies using convergent and divergent validity of the OPQ correlated with the Five-Factor Model questionnaires. The average convergent correlations ranged well above the near-zero values, being between 0.32 and 0.55, and surpassed the heterotrait–heteromethod divergent correlations. When criterion-related validity was considered, the range was between 0.15 and 0.40. The assessment of personality has been found to be internally and externally consistent and extremely reliable across different studies and data sets (Bartram et al., 2007).

Cronbach Alphas and Standard Errors of Measurements are used for the OPQ results when looking at internal consistency reliabilities, which have been drawn from a range of large data sets from different countries, South Africa included. White respondents obtained

comparable reliabilities (median reliability of 0.80), lower reliabilities were obtained for the ethnic subset (median reliability of 0.69) however, a mixed ethnic group showed a median reliability of 0.81 when a large South African dataset was looked at. For the instrument, the range of the overall median reliability of the scales are 0.75 and 0.80. Across the various language versions of the instrument, the (Standard Error of the mean) SEm for all scales is one sten score or less (Bartram et al., 2007).

Norms. When the extent of the responses is compared to that of other people, the OPQ norms provide the report to ascertain where an individual's score will lie on a standard scale. The Managerial and Professional norm group and General Population norm group are the two norm groups used for the OPQ (Bartram et al., 2007).

In establishing norm groups for the general work population, a sample had to have at least 600 participants (N ≥ 600) and for more specific user norms it was 300 (N ≥ 300), for example the managerial and professional people and graduates. For most norm groups the gender ratio of male to female was 60:40 (SHL, 2011).

Table 5

Product-moment intercorrelations for Bar-On EQ-i

	TOTAL EQ	INTRA-PERSONAL	Self-Regard	Emotional Self-Awareness	Assertiveness	Independence	Self-Actualisation	INTER-PERSONAL	Empathy	Social Responsibility	Interpersonal Relationship	STRESS MANAGEMENT	Stress Tolerance	Impulse Control	ADAPTABILITY	Reality Testing	Flexibility	Problem Solving	GENERAL MOOD	Optimism	Happiness
TOTAL EQ	1	.912**	.715**	.684**	.746**	.630**	.743**	.702**	.468**	.545**	.662**	.747**	.744**	.510**	.882**	.756**	.733**	.653**	.760**	.682**	.642**
INTRA-PERSONAL	.912**	1	.782**	.748**	.857**	.676**	.788**	.539**	.274**	.341**	.599**	.592**	.692**	.310**	.745**	.662**	.617**	.534**	.705**	.648**	.582**
Self-Regard	.715**	.782**	1	.444**	.556**	.385**	.618**	.360**	.128*	.232**	.413**	.492**	.552**	.279**	.562**	.514**	.474**	.373**	.650**	.557**	.574**
Emotional Self-Awareness	.684**	.748**	.444**	1	.586**	.299**	.446**	.594**	.349**	.331**	.678**	.363**	.389**	.222**	.532**	.474**	.463**	.347**	.496**	.437**	.422**
Assertiveness	.746**	.857**	.556**	.586**	1	.578**	.575**	.412**	.210**	.220**	.498**	.463**	.579**	.203**	.620**	.550**	.520**	.448**	.517**	.516**	.394**
Independence	.630**	.676**	.385**	.299**	.578**	1	.459**	.243**	.107*	.207**	.235**	.524**	.623**	.267**	.580**	.514**	.452**	.463**	.406**	.435**	.284**
Self-Actualisation	.743**	.788**	.618**	.446**	.575**	.459**	1	.423**	.227**	.312**	.423**	.465**	.575**	.222**	.596**	.513**	.481**	.460**	.657**	.573**	.571**
INTER-PERSONAL	.702**	.539**	.360**	.594**	.412**	.243**	.423**	1	.853**	.826**	.862**	.317**	.298**	.227**	.511**	.416**	.442**	.377**	.529**	.395**	.512**
Empathy	.468**	.274**	.128*	.349**	.210**	.107*	.227**	.853**	1	.806**	.578**	.172**	.174**	.103	.327**	.261**	.240**	.297**	.323**	.265**	.291**
Social Responsibility	.545**	.341**	.232**	.331**	.220**	.207**	.312**	.826**	.806**	1	.467**	.307**	.239**	.262**	.447**	.371**	.321**	.398**	.305**	.266**	.261**
Interpersonal Relationship	.662**	.599**	.413**	.678**	.498**	.235**	.423**	.862**	.578**	.467**	1	.249**	.284**	.133*	.444**	.349**	.457**	.256**	.588**	.411**	.599**
STRESS MANAGEMENT	.747**	.592**	.492**	.363**	.463**	.524**	.465**	.317**	.172**	.307**	.249**	1	.811**	.840**	.730**	.651**	.577**	.539**	.453**	.468**	.335**
Stress Tolerance	.744**	.692**	.552**	.389**	.579**	.623**	.575**	.298**	.174**	.239**	.284**	.811**	1	.370**	.666**	.593**	.543**	.490**	.577**	.604**	.418**
Impulse Control	.510**	.310**	.279**	.222**	.203**	.267**	.222**	.227**	.103	.262**	.133*	.840**	.370**	1	.555**	.494**	.426**	.409**	.198**	.191**	.159**
ADAPTABILITY	.882**	.745**	.562**	.532**	.620**	.580**	.596**	.511**	.327**	.447**	.444**	.730**	.666**	.555**	1	.834**	.822**	.775**	.546**	.530**	.426**
Reality Testing	.756**	.662**	.514**	.474**	.550**	.514**	.513**	.416**	.261**	.371**	.349**	.651**	.593**	.494**	.834**	1	.503**	.518**	.464**	.429**	.385**
Flexibility	.733**	.617**	.474**	.463**	.520**	.452**	.481**	.442**	.240**	.321**	.457**	.577**	.543**	.426**	.822**	.503**	1	.456**	.473**	.432**	.393**
Problem Solving	.653**	.534**	.373**	.347**	.448**	.463**	.460**	.377**	.297**	.398**	.256**	.539**	.490**	.409**	.775**	.518**	.456**	1	.378**	.430**	.239**

GENERAL MOOD	.760**	.705**	.650**	.496**	.517**	.406**	.657**	.529**	.323**	.305**	.588**	.453**	.577**	.198**	.546**	.464**	.473**	.378**	1	.849**	.882**
Optimism	.682**	.648**	.557**	.437**	.516**	.435**	.573**	.395**	.265**	.266**	.411**	.468**	.604**	.191**	.530**	.429**	.432**	.430**	.849**	1	.504**
Happiness	.642**	.582**	.574**	.422**	.394**	.284**	.571**	.512**	.291**	.261**	.599**	.335**	.418**	.159**	.426**	.385**	.393**	.239**	.882**	.504**	1

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

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

Note. Intercorrelations for the Bar-On EQ-i were done in order to collapse the subscales and use only the composite scales.

Table 6
Occupational Personality Questionnaire scale descriptions

Low scores	Descriptor	High scores
Influence		
Rarely pressures others to change their views, dislikes selling, less comfortable using negotiation	Persuasive	Enjoys selling, comfortable using negotiation, likes to change other people's views
Happy to let others take charge, dislikes telling people what to do, unlikely to take the lead	Controlling	Likes to be in charge, takes the lead, tells others what to do, takes control
Holds back from criticising others, may not express own views, unprepared to put forward own opinions	Outspoken	Freely express opinions, makes disagreement clear, prepared to criticise others
Accepts majority decisions, prepared to follow the consensus	Independent Minded	Prefers to follow own approach, prepared to disregard majority decisions
Sociability		
Quiet and reserved in groups, dislikes being centre of attention	Outgoing	Lively and animated in groups, talkative, enjoys attention
Comfortable spending time away from people, values time spent alone, seldom misses the company of others	Affilliative	Enjoys others' company, likes to be around people, can miss the company of others
Feels more comfortable in less formal situations, can feel awkward when first meeting people	Socially Confident	Feels comfortable when first meeting people, at ease in formal situations
Empathy		
Makes strengths and achievements known, talks about personal success	Modest	Dislikes discussing achievements, keeps quiet about personal success
Prepared to make decisions without consultation, prefers to make decisions alone	Democratic	Consults widely, involves others in decision making, less likely to make decisions alone
Selective with sympathy and support, remains detached from others' personal problems	Caring	Sympathetic and considerate towards others, helpful and supportive, gets involved in others' problems
Analysis		
Prefers dealing with opinions and feelings rather than facts and figures, likely to avoid using statistics	Data Rational	Likes working with numbers, enjoys analysing statistical information, bases decisions on facts and figures
Does not focus on potential limitations, dislikes critically analysing information, rarely looks for errors or mistakes	Evaluative	Critically evaluates information, looks for potential limitations, focuses on errors
Does not question the reasons for people's behaviour, tends not to analyse people	Behavioural	Tries to understand motives and behaviour, enjoys analysing people

Creativity and Change		
Favours changes to work methods, prefers new approaches, less conventional	Conventional	Prefers well-established methods, favours a more conventional approach
Prefers to deal with practical rather than theoretical issues, dislikes dealing with abstract concepts	Conceptual	Interested in theories, enjoys discussing abstract concepts
More likely to build on than generate ideas, less inclined to be creative and inventive	Innovative	Generates new ideas, enjoys being creative, thinks of original solutions
Prefers routine, is prepared to do repetitive work, does not seek variety	Variety Seeking	Prefers variety, tries out new things, likes changes to regular routine, can become bored by repetitive work
Behaves consistently across situations, unlikely to behave differently with different people	Adaptable	Changes behaviour to suit the situation, adapts approach to different people
Structure		
More likely to focus on immediate than long-term issues, less likely to take a strategic perspective	Forward Thinking	Takes a long-term view, sets goals for the future, more likely to take a strategic perspective
Unlikely to become preoccupied with detail, less organised and systematic, dislikes tasks involving detail	Detail Conscious	Focuses on detail, likes to be methodical, organised and systematic, may become preoccupied with detail
Sees deadlines as flexible, prepared to leave some tasks unfinished	Conscientious	Focuses on getting things finished, persists until the job is done
Not restricted by rules and procedures, prepared to break rules, tends to dislike bureaucracy	Rule Following	Follows rules and regulations, prefers clear guidelines, finds it difficult to break rules
Emotion		
Tends to feel tense, finds it difficult to relax, can find it hard to unwind after work	Relaxed	Finds it easy to relax, rarely feels tense, generally calm and untroubled
Feels calm before important occasions, less affected by key events, free from worry	Worrying	Feels nervous before important occasions, worries about things going wrong
Sensitive, easily hurt by criticism, upset by unfair comments or insults	Tough-Minded	Not easily offended, can ignore insults, may be insensitive to personal criticism
Concerned about the future, expects things to go wrong, focuses on negative aspects of a situation	Optimistic	Expects things will turn out well, looks to the positive aspects of a situation, has an optimistic view of the future
Wary of others' intentions, finds it difficult to trust others, unlikely to be fooled by people	Trusting	Trusts people, sees others as reliable and honest, believes what others say
Openly expresses feelings, finds it difficult to conceal feelings, displays emotion clearly	Emotionally Controlled	Can conceal feelings from others, rarely displays emotion

Dynamism		
Likes to take things at a steady pace, dislikes excessive work demands	Vigorous	Thrives on activity, likes to be busy, enjoys having a lot to do
Dislikes competing with others, feels that taking part is more important than winning	Competitive	Has a need to win, enjoys competitive activities, dislikes losing
Sees career progression as less important, looks for achievable rather than highly ambitious targets	Achieving	Ambitious and career-centred, likes to work to demanding goals and targets
Tends to be cautious when making decisions, likes to take time to reach conclusions	Decisive	Makes fast decisions, reaches conclusions quickly, less cautious

The FFM also measures personality and the OPQ32 was mapped onto this model, as shown in Table 7 (Bartram & Brown, 2005). In order to decrease the number of scales (32 for the OPQ) used for the study, the FFM dimensions were used as the OPQ32 scales can be adopted to the FFM. The FFM dimensions are Extraversion, Agreeableness, Conscientious, Emotional Stability and Openness to Experience. Table 8 shows how the OPQ32 is mapped onto the Big Five.

Table 7
Derivation of OPQ32 scales on the Big Five

Big Five	OPQ32 scales
Extraversion	Outgoing, Socially Confident, Affiliative, Emotionally Controlled (reversed), Persuasive, Controlling
Agreeableness	Caring, Democratic, Independent Minded (reversed), Trusting, Competitive (reversed)
Conscientious	Conscientious, Detail Conscious, Vigorous, Forward Thinking, Achieving
Emotional Stability (negative Neuroticism)	Worrying (reversed), Relaxed, Tough-Minded, Socially Confident, Optimistic
Openness to Experience	Innovative, Conventional (reversed), Conceptual, Variety Seeking, Behavioural

Table 8
Product-moment intercorrelations for the OPQ32r derived from the Big Five

	Extraversion	Openness to Experience	Emotional Stability	Agreeableness	Conscientious
Extraversion	1	.310**	.491**	.217**	.209**
Openness to Experience	.310**	1	.137**	.018	-.110*
Emotional Stability	.491**	.137**	1	.271**	.249**
Agreeableness	.217**	.018	.271**	1	.124*
Conscientious	.209**	-.110*	.249**	.124*	1

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

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

Cognitive Process Profile (CPP)

The CPP measures cognitive competency and ability as it measures an individual's problem-solving skills in unfamiliar environments. The assessment is completed as a supervised assessment on a computer using a mouse, and during the test individuals will explore, link, structure, transform, remember and clarify their behaviour. The "movements" the individuals make on the screen with the mouse as they work through the test, are then saved on the computer. After completing each task, individuals have to type a story of their interpretation of the symbols encountered during the test. A "scoring system" then monitors their movements and stories written. The CPP looks to move beyond the general IQ approach, that is, general intelligence (Magellan, 2001).

There are 14 dimensions measured, which are presented in Table 9.

Table 9
Cognitive competencies of the Cognitive Process Profile

Construct	Descriptor	Definition
Exploration	Pragmatic	Practical orientation – "Will it work in practice?" Determining relevance in structured contexts
	Exploration	Effectiveness, depth and width of exploration
	Analytical	Systematic, detailed and precise in differentiating and linking
Analysis	Rule Oriented	A rules focus
	Categorisation	Creating external order, categories and reminders – structuring tangibles
	Integration	Synthesis of ambiguous/discrepant/conflicting information
Structuring	Complexity	The preferred level of complexity. The unit of information used
	Logical Reasoning	The disciplined, logical following through of reasoning processes
Transformation	Verbal Abstraction	Unusual, creative, abstract verbalisation and conceptualisation
	Use of Memory	Tendency to rely on memory/concentration/degree of effort
Memory	Memory Strategies	Effectiveness of memory strategies
	Judgement	Using judgement to clarify unstructured and vague information
Metacognition	Learning 1	Quick insight learning
	Learning 2	Gradual improvement/experiential learning

Note. Cognitive competencies (Magellan, 2001)

<u>*Validity and reliability*</u>. Concurrent validity studies were conducted with intelligence tests, personality tests and emotional intelligence tests. For intelligence tests, validity studies were conducted with the WAIS: ($r = 0.6$, $p = 0.001$); GSAT: ($r = 0.37$, $p > 0.01$); CRTB: ($r = 0.3$ to 0.4); and CPA: ($r = 0.45$, $p = 0.0$). For personality tests, validity studies were conducted with the MBTI: complex but significant relationship; 16PF: the B-Factor – "intelligence"/"concrete"

versus “abstract thinking” $r = 0.6$, $p > 0.001$; and 15FQ+ findings, although significant, conclusions are still outstanding. For emotional intelligence tests, validity studies were conducted with the EIQ: factor C, “motivation” on self-rating $p < 0.01$; indicator B “emotional resilience” on self-rating $p < 0.05$ (Magellan, 2001).

Predictive validity studies found significant correlations between the CPP and certain job performance criteria, specifically within accounting, telecommunications, business consulting and retail industries. Other validity studies include construction validity (a statistically significant correlation of 0.9 was found); face validity (which showed low transparency); and cross-cultural validity (no significant differences were found for race and gender in terms of cognitive “style”, “information processing competencies”, “current level of work” and “potential level of work”) (Magellan, 2001).

Reliability studies for “focusing and selecting”, “linking”, “structuring”, “transforming”, “retention and recall” and “metacognition” dimensions were conducted by using Coefficient Alpha, Internal Consistency Reliability, Spearman-Brown Split Halves Reliability and Kuder-Richardson 20. Results exceeded scores of 0.96 (Magellan, 2001).

Norms. Normative statistics are calculated with relative ease for the CPP as it possesses a built-in norm creator. As the CPP database enlarges, the selection of norm groups becomes easier (Magellan, 2001). The current CPP norm sample is based on a diverse international norm group of 3 000, where South Africa makes up the largest part of the norm group (M. Prinsloo, personal communication, 19 October 2014).

“Conventional normalisation and standardisation, as used in psychometrics, transform a variable’s values by subtracting each observed value from the mean of all observed values and dividing this difference by the standard deviation of the values. The rescaling implemented here is meant to preserve the relativity between each variable’s observations while rescaling the raw magnitudes into a common metric. However, the relative magnitides magnitude of the scores are to some extent distorted by this standardisation technique. The commonly used normalisation approach has, however, been followed for the purpose of comparing and manipulating CPP data which consists of variables whose measurement metric is not the same (multiple variables with different ranges). In other words, normalisation enabled the rescaling of each variable’s values into a convenient common metric which could then be compared and used in algorithms to calculate increasingly higher-order CPP scores” (M. Prinsloo, personal communication, October 19, 2014).

The data used for the current study is based on typical normalisation techniques. “The basic scores are normalised using t-score calculations. These normalised t-scores are then used in algorithms to calculate the CPP scores you find in the CPP report (we refer to them as T-scores). The T-scores in the CPP are not renormalised. They do not reflect t-scores and are just … scores. What we refer to as T-scores are thus not really t-scores. Our so-called T-scores are based on calculations using t-scores. Therefore the distribution curves of CPP T-scores marginally differ from bell curve t-score distributions with the CPP T-scores showing a tendency to be somewhat more leptokurtic than the normal bell curve / t-score distributions. Whereas most t-scores are distributed between 20 and 80, our T-scores that are calculated from t-scores, tend to be distributed from 25 to 75. There are still individuals who achieve T-scores of 100” (M. Prinsloo, personal communication, 19 October 2014).

The uses of the CPP are vast and include succession planning, identifying potential, career guidance and/or career path planning, person–job profile matching for selection and placement, intellectual capital solutions within organisations and for diagnostic purposes. There are various reports that can be generated for the CPP, that is Standard, Developmental, Executive Summary, Introductory and Customised reports (Magellan, 2001). For the purposes of this study the Standard Report was used.

Intercorrelations on the CPP constructs and descriptors were calculated for the current study in order to investigate the possibility to work with higher-order constructs of the CPP, as shown in Table 10. Intercorrelations for the descriptors on each of the constructs were very high. For Exploration: Pragmatic (r = 0.93), Exploration (r = 0.93) and Analytical (r = 0.92). For Analysis: Rule Oriented (r = 0.92), Categorisation (r = 0.82) and Integration (r = 0.95). For Structuring: Complexity (r = 0.92) and Logical Reasoning (r = 0.93). For Transformation: Verbal Abstraction (r = 0.93) and Use of Memory (r = 0.93). For Memory: Memory Strategies (r = 0.93) and Judgement (r = 0.90). For Metacognition: Learning 1 (r = 0.93) and Learning 2 (r = 0.76). The high intercorrelation scores have led to the decision to collapse the descriptors and use only the six higher-order constructs, namely Exploration, Analysis, Structuring, Transformation, Memory and Metacognition for the purposes of this study.

Table 10
Product-moment Intercorrelations for the Cognitive Process Profile

Construct	Descriptor	Pragmatic	Exploration	Analytical	Rule Oriented	Categorisation	Integration	Complexity	Logical Reasoning	Verbal Abstraction	Use of Memory	Memory Strategies	Judgement	Learning 1	Learning 2	Exploration	Analysis	Structuring	Transformation	Memory	Metacognition
Exploration	Pragmatic	1	.751**	.671**	.553**	.439**	.714**	.726**	.720**	.491**	.532**	.484**	.723**	.677**	.320**	.936**	.660**	.697**	.645**	.542**	.659**
	Exploration	.751**	1	.790**	.765**	.636**	.903**	.858**	.801**	.571**	.782**	.737**	.890**	.883**	.464**	.936**	.840**	.889**	.731**	.811**	.856**
Analysis	Analytical	.671**	.790**	1	.716**	.430**	.824**	.850**	.841**	.569**	.685**	.574**	.852**	.843**	.492**	.781**	.926**	.781**	.751**	.672**	.838**
	Rule Oriented	.553**	.765**	.716**	1	.787**	.793**	.718**	.675**	.536**	.770**	.885**	.717**	.831**	.476**	.704**	.926**	.853**	.644**	.883**	.775**
	Categorisation	.439**	.636**	.430**	.787**	1	.647**	.562**	.499**	.429**	.734**	.798**	.531**	.671**	.341**	.574**	.657**	.820**	.494**	.818**	.591**
Structuring	Integration	.714**	.903**	.824**	.793**	.647**	1	.924**	.876**	.765**	.825**	.786**	.909**	.937**	.500**	.864**	.873**	.954**	.874**	.860**	.898**
	Complexity	.726**	.858**	.850**	.718**	.562**	.924**	1	.955**	.717**	.835**	.673**	.921**	.922**	.465**	.846**	.846**	.922**	.890**	.805**	.884**
Transfor-mation	Logical Reasoning	.720**	.801**	.841**	.675**	.499**	.876**	.955**	1	.764**	.713**	.621**	.861**	.853**	.437**	.813**	.818**	.865**	.939**	.712**	.824**
	Verbal Abstraction	.491**	.571**	.569**	.536**	.429**	.765**	.717**	.764**	1	.545**	.574**	.633**	.681**	.292**	.568**	.596**	.709**	.939**	.598**	.615**
Memory	Use of Memory	.532**	.782**	.685**	.770**	.734**	.825**	.835**	.713**	.545**	1	.754**	.797**	.906**	.472**	.702**	.785**	.888**	.670**	.937**	.833**
	Memory Strategies	.484**	.737**	.574**	.885**	.798**	.786**	.673**	.621**	.574**	.754**	1	.656**	.806**	.427**	.652**	.788**	.837**	.636**	.937**	.723**
Meta-cognition	Judgement	.723**	.890**	.852**	.717**	.531**	.909**	.921**	.861**	.633**	.797**	.656**	1	.902**	.472**	.862**	.847**	.876**	.795**	.776**	.909**
	Learning 1	.677**	.883**	.843**	.831**	.671**	.937**	.922**	.853**	.681**	.906**	.806**	.902**	1	.536**	.833**	.904**	.939**	.817**	.914**	.934**
	Learning 2	.320**	.464**	.492**	.476**	.341**	.500**	.465**	.437**	.292**	.472**	.427**	.472**	.536**	1	.419**	.523**	.484**	.388**	.480**	.769**
	Exploration	.936**	.936**	.781**	.704**	.574**	.864**	.846**	.813**	.568**	.702**	.652**	.862**	.833**	.419**	1	.802**	.848**	.735**	.723**	.810**
	Analysis	.660**	.840**	.926**	.926**	.657**	.873**	.846**	.818**	.596**	.785**	.788**	.847**	.904**	.523**	.802**	1	.882**	.753**	.840**	.871**
	Structuring	.697**	.889**	.781**	.853**	.820**	.954**	.922**	.865**	.709**	.888**	.837**	.876**	.939**	.484**	.848**	.882**	1	.838**	.921**	.880**
	Transformation	.645**	.731**	.751**	.644**	.494**	.874**	.890**	.939**	.939**	.670**	.636**	.795**	.817**	.388**	.735**	.753**	.838**	1	.697**	.766**
	Memory	.542**	.811**	.672**	.883**	.818**	.860**	.805**	.712**	.598**	.937**	.937**	.776**	.914**	.480**	.723**	.840**	.921**	.697**	1	.831**
	Metacognition	.659**	.856**	.838**	.775**	.591**	.898**	.884**	.824**	.615**	.833**	.723**	.909**	.934**	.769**	.810**	.871**	.880**	.766**	.831**	1

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

Research procedure

The CPP is a supervised assessment and all participants completed the assessment at the organisation's assessment centre under the supervision of a registered psychometrist (independent practice). The two remaining instruments, the OPQ and the Bar-On EQ-i are online assessments which can be completed unsupervised. However, all participants completed the assessments in the organisation's assessment centre. All assessments were completed in the morning, as the CPP test regulations state that it must be completed in the morning.

Statistical analysis

The IBM SPSS Statistics 20 software system was used for the statistical analysis. Descriptive statistics, Product-moment correlations and multiple regression analysis were performed.

RESULTS

Presentation of results

Descriptive statistics for the independent variables (personality and cognition), the dependent variable (emotional intelligence) and nuisance variables (age, gender and race) will be shown in table format and interpreted in the following section. The results of the Product-moment correlation analysis and multiple regression analysis will then be discussed.

To interpret the results, Cohen's (1992) table of effect size magnitudes were used were < 0.10 is insignificant; 0.10 to 0.30 is small to medium; 0.30 to 0.50 is medium to large; and > 0.50 is large to very large.

Descriptive statistics

Independent variables

Personality

Personality was measured in this study by using the Occupational Personality Questionnaire (OPQ32r), as described in the previous section. Openness to Experience obtained the highest mean sten score (5.63) and Extraversion the lowest mean sten score (5.15). All mean sten scores were between 5 and 6. Descriptive statistics for personality is shown in Table 11.

Cognition

Cognition was measured in this study using the Cognitive Process Profile (CPP). For each composite the descriptor-scale T-scores were added together and an average was calculated. Transformation obtained the highest mean T-score (64.23) and Exploration obtained the lowest T-score (52.97). All mean scores ranged between 52 and 64. Descriptive statistics for cognition is shown in Table 11.

Dependent variable

Emotional intelligence

EQ was measured in this study using the Bar-On EQ-i. Stress Management obtained the highest mean of 108.12 and Interpersonal the lowest mean of 98.75. All means ranged between 98 and 109. Descriptive statistics for EQ is shown in Table 11.

Table 11
Descriptive statistics for personality, cognition and emotional intelligence

	N	Minimum	Maximum	Mean	Standard Deviation
Personality					
Extraversion	352	1.76	9	5.16	1.39
Openness to Experience	352	1.18	9.25	5.63	1.56
Emotional Stability	352	1	9.46	5.32	1.45
Agreeableness	352	1.96	9.08	5.24	1.35
Conscientious	352	1.59	8.48	5.39	1.38
Cognition					
Exploration	352	25.50	77.00	52.97	11.08
Analysis	352	19.50	91.50	60.27	17.17
Structuring	352	24.33	79.00	55.38	10.94
Transformation	352	15.50	91.50	64.23	16.37
Memory	352	30.00	85.00	60.23	11.92
Metacognition	352	25.67	79.33	56.69	11.11
Emotional intelligence					
Total EQ	352	73	134	105.32	13.43
Intrapersonal	352	58	131	104.68	13.58
Interpersonal	352	46	131	98.75	14.33
Stress Management	352	60	135	108.12	13.77
Adaptability	352	72	132	106.93	13.83
General Mood	352	52	127	103.37	12.58

Nuisance variables

Age, gender and race were included as nuisance variables to determine whether they potentially act as mediator variables while investigating the relationships between the OPQ32r, CPP and Bar-On EQ-i results, as shown in Table 12.

Age demonstrated some statistically significant relationships, but most relationships are of small effect sizes for EQ with Total EQ ($r = 0.13$; $p < 0.05$), Intrapersonal ($r = 0.13$; $p < 0.05$), Stress Management ($r = 0.11$; $p < 0.05$) and Adaptability ($r = 0.15$; $p < 0.01$). Statistically significant relationships of small effect sizes were also obtained between age and personality with Agreeableness ($r = 0.12$; $p < 0.05$) and Conscientious ($r = 0.10$; $p < 0.05$). Results of a larger effect size were obtained, although negative, between age and cognition with Exploration ($r = –0.26$; $p < 0.01$), Analysis ($r = –0.29$; $p < 0.01$), Structuring ($r = –0.28$; $p < 0.01$), Transformation ($r = –0.23$; $p < 0.01$), Memory ($r = –0.26$; $p < 0.01$) and Metacognition ($r = –0.26$; $p < 0.01$). All these relationships, however, had a small effect sizes.

Race demonstrated only one statistically significant relationship with EI, but of a small effect size, namely Adaptability ($r = –0.11$; $p < 0.05$). Only one statistically significant relationship of

a small effect size was obtained between race and personality, namely Agreeableness ($r = -0.15$; $p < 0.01$). Statistically significant relationships with small effect sizes were obtained between race and cognition with Exploration ($r = 0.18$; $p < 0.01$), Analysis ($r = 0.20$; $p < 0.01$), Structuring ($r = 0.23$; $p < 0.01$), Transformation ($r = 0.22$; $p < 0.01$), Memory ($r = 0.21$; $p < 0.01$) and Metacognition ($r = 0.20$; $p < 0.01$).

Gender demonstrated only one relationship of a small effect size that is statistically significant and that is with personality, with Conscientious ($r = 0.11$; $p < 0.05$). The details of relationships between the nuisance variables and other variables in the current study are shown in Table 12.

Based on the findings just discussed, it is clear that the nuisance variables can influence and act as mediator variables between the dependent and independent variables. This possible effect will be statistically controlled by using multiple regression analysis later in the study.

Correlations

For the purpose of the discussion only statistically significant correlations ($p < 0.05$ and $p < 0.01$) with Bar-On EQ-i main scales will be considered.

Personality

Product-moment correlations were used to measure the correlation between personality and EQ as shown in Table 12. Statistically significant relationships were obtained between all six of the Bar-On EQ-i main scales and the Big Five dimensions of Personality (see Table 12).

Total EQ demonstrated a statistically significant correlation of medium effect size with all of the personality scales: Extraversion ($r = 0.33$; $p < 0.01$), Openness to Experience ($r = 0.20$; $p < 0.01$), Emotional Stability ($r = 0.40$; $p < 0.01$), Agreeableness ($r = 0.20$; $p < 0.01$) and Conscientious ($r = 0.31$; $p < 0.01$).

Intrapersonal obtained four statistically significant correlations of a small to medium effect size, with Extraversion ($r = 0.42$; $p < 0.01$), Openness to Experience ($r = 0.22$; $p < 0.01$), Emotional Stability ($r = 0.41$; $p < 0.01$) and Conscientious ($r = 0.33$; $p < 0.01$).

Interpersonal obtained five statistically significant correlations of a small to medium effect size, with Extraversion ($r = 0.35$; $p < 0.01$), Openness to Experience ($r = 0.13$; $p < 0.05$), Emotional Stability ($r = 0.22$; $p < 0.01$), Agreeableness ($r = 0.38$; $p < 0.01$) and Conscientiousness ($r = 0.19$; $p < 0.01$).

Stress Management obtained three statistically significant correlations of a small to medium effect size, with Emotional Stability ($r = 0.31$), Agreeableness ($r = 0.13$; $p < 0.05$) and Conscientiousness ($r = 0.23$; $p < 0.01$).

Adaptability obtained five statistically significant correlations of a small to medium effect size, where Extraversion ($r = 0.15$; $p < 0.01$), Openness to Experience ($r = 0.15$; $p < 0.01$), Emotional Stability ($r = 0.27$; $p < 0.01$), Agreeableness ($r = 0.17$; $p < 0.01$) and Conscientious ($r = 0.31$; $p < 0.01$) were of medium effect sizes.

Table 12

Product-moment correlations for the independent, dependent and nuisance variables

	Age	Race	Gender	Total EQ	Intrapersonal	Interpersonal	Stress Management	Adaptability	General Mood	Extraversion	Openness to Experience	Emotional Stability	Agreeableness	Conscientious	Exploration	Analysis	Structuring	Transformation	Memory	Metacognition
Age	1	.256**	-.156**	.137*	.134*	.036	.114*	.158**	.089	.006	-.055	.021	.122*	.105*	-.267**	-.299**	-.288**	-.234**	-.269**	-.263**
Race	.256**	1	-.139**	-.083	-.080	-.077	-.086	-.116*	.024	-.032	.037	-.081	-.152**	-.044	.186**	.205**	.233**	.220**	.210**	.202**
Gender	-.156**	-.139**	1	.040	.037	.082	.030	.031	.074	.078	-.005	-.045	-.027	.119*	-.048	.022	.047	.009	.086	.031
Total EQ	.137*	-.083	.040	1	.912**	.702**	.747**	.882**	.760**	.333**	.203**	.402**	.206**	.319**	-.085	-.155**	-.101	-.119*	-.073	-.087
Intrapersonal	.134*	-.080	.037	.912**	1	.539**	.592**	.745**	.705**	.427**	.229**	.413**	.078	.332**	-.095	-.173**	-.123*	-.154**	-.090	-.105*
Interpersonal	.036	-.077	.082	.702**	.539**	1	.317**	.511**	.529**	.352**	.135*	.229**	.388**	.191**	-.056	-.083	-.069	-.078	-.042	-.027
Stress Management	.114*	-.086	.030	.747**	.592**	.317**	1	.730**	.453**	.029	.082	.319**	.136*	.232**	-.086	-.119*	-.066	-.077	-.051	-.079
Adaptability	.158**	-.116*	.031	.882**	.745**	.511**	.730**	1	.546**	.152**	.157**	.270**	.174**	.316**	-.104	-.177**	-.127*	-.124*	-.098	-.128*
General Mood	.089	.024	.074	.760**	.705**	.529**	.453**	.546**	1	.354**	.159**	.430**	.113*	.184**	.029	-.007	.031	.007	.034	.024
Extraversion	.006	-.032	.078	.333**	.427**	.352**	.029	.152**	.354**	1	.310**	.491**	.217**	.209**	-.062	-.067	-.071	-.036	-.062	-.033
Openness to Experience	-.055	.037	-.005	.203**	.229**	.135*	.082	.157**	.159**	.310**	1	.137**	.018	-.110*	.101	.138**	.172**	.133*	.195**	.167**
Emotional Stability	.021	-.081	-.045	.402**	.413**	.229**	.319**	.270**	.430**	.491**	.137**	1	.271**	.249**	-.030	-.074	-.048	-.002	-.060	-.045
Agreeableness	.122*	-.152**	-.027	.206**	.078	.388**	.136*	.174**	.113*	.217**	.018	.271**	1	.124*	-.071	-.112*	-.135*	-.059	-.169**	-.085
Conscientious	.105*	-.044	.119*	.319**	.332**	.191**	.232**	.316**	.184**	.209**	-.110*	.249**	.124*	1	-.143**	-.166**	-.178**	-.159**	-.182**	-.223**
Exploration	-.267**	.186**	-.048	-.085	-.095	-.056	-.086	-.104	.029	-.062	.101	-.030	-.071	-.143**	1	.802**	.848**	.735**	.723**	.810**
Analysis	-.299**	.205**	.022	-.155**	-.173**	-.083	-.119*	-.177**	-.007	-.067	.138**	-.074	-.112*	-.166**	.802**	1	.882**	.753**	.840**	.871**
Structuring	-.288**	.233**	.047	-.101	-.123*	-.069	-.066	-.127*	.031	-.071	.172**	-.048	-.135*	-.178**	.848**	.882**	1	.838**	.921**	.880**
Transformation	-.234**	.220**	.009	-.119*	-.154**	-.078	-.077	-.124*	.007	-.036	.133*	-.002	-.059	-.159**	.735**	.753**	.838**	1	.697**	.766**
Memory	-.269**	.210**	.086	-.073	-.090	-.042	-.051	-.098	.034	-.062	.195**	-.060	-.169**	-.182**	.723**	.840**	.921**	.697**	1	.831**
Metacognition	-.263**	.202**	.031	-.087	-.105*	-.027	-.079	-.128*	.024	-.033	.167**	-.045	-.085	-.223**	.810**	.871**	.880**	.766**	.831**	1

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

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

Note. Gender: Male (0), Female (1)
Race: Black (0), White (1)

General Mood obtained five statistically significant correlations of a small to medium effect size, with Extraversion ($r = 0.35$; $p < 0.01$), Openness to Experience ($r = 0.15$; $p < 0.01$), Emotional Stability ($r = 0.43$; $p < 0.01$), Agreeableness ($r = 0.11$; $p < 0.05$) and Conscientiousness ($r = 0.18$; $p < 0.01$).

Based on the above results, it is possible to reject the null hypotheses H0 and accept the alternative hypotheses H1 in that a statistically significant relationship exists between personality and emotional intelligence.

Cognition

Statistically significant results were obtained for four of the six Bar-On EQ-i main scales used to determine whether there is a statistically significant relationship between EI and cognition as shown in Table 12.

Total EQ obtained three statistically significant correlations of a small effect size, with Analysis ($r = –0.15$; $p < 0.01$), Structuring ($r = –0.10$; $p < 0.05$) and Transformation ($r = –0.11$; $p < 0.05$).

Intrapersonal obtained four statistically significant correlations of a small effect size, with Analysis ($r = –0.17$; $p < 0.01$), Structuring ($r = –0.12$; $p < 0.05$), Transformation ($r = –0.15$; $p < 0.01$) and Metacognition ($r = –0.10$; $p < 0.05$).

Stress Management obtained one statistically significant correlation of a small effect size with Analysis ($r = –0.11$; $p < 0.05$).

Adaptability obtained five statistically significant correlations of a small effect size, with Exploration ($r = –0.10$), Analysis ($r = –0.17$; $p < 0.01$), Structuring ($r = –0.12$; $p < 0.05$), Transformation ($r = –0.12$; $p < 0.05$) and Metacognition ($r = –0.12$; $p < 0.05$).

Interpersonal and General Mood obtained no statistically significant correlations with any of the cognition constructs.

Based on the above results, it is possible to reject the null hypotheses H0 and accept the alternative hypotheses H2 in that a statistically significant relationship exists between cognition and emotional intelligence. It is worth mentioning that most of these relationships were negative in nature and of a small effect size.

Regression analysis

Multiple regression analysis was done to determine the extent of the relationship of personality to EQ and cognition to EQ. The main objective of this analysis was also to control for the effect of the nuisance variables.

The report shows a derived integrated Total EQ score based on the five main scale scores of the Bar-On EQ-i, namely Intrapersonal, Interpersonal, Stress Management, Adaptability and General Mood, and their subscales scores. The derived integrated Total EQ indicator of the Bar-On EQ-i was shown as the dependent variable. The Total EQ was then regressed on personality and cognition to investigate the multivariate relationship between these constructs.

Multiple regression analysis was done by entering personality and cognition as variable sets in order to limit the number of regression analyses to report on.

Four models were used for the analysis where Total EQ was regressed on the variable set of nuisance variables to demonstrate the overall effect size of the nuisance variables with EQ (Model 1 as shown in Table 13). Total EQ was regressed on the total nuisance variables set and then personality was entered as a subset to demonstrate the effect size of personality

with EQ after the nuisance variables were controlled for (Model 2 as shown in Table 14). Total EQ was regressed on the total nuisance variables set and then cognition was entered as a subset to demonstrate the effect size of cognition with EQ after the nuisance variables were controlled for (Model 3 as shown in Table 15). Total EQ was regressed on the total nuisance variables set and then personality and cognition were combined to demonstrate the combined effect size of personality and cognition on EQ after the nuisance variables were controlled for (Model 4 as shown in Table 16).

Model 1 obtained a small uncorrected effect size (r = 0.19) and 3.6% of the variance of EQ can be explained by the nuisance variables (age, gender and race) . Only Age and Race made statistically significant contributions to the model, but all nuisance variables were entered as a variable set. Model 2 obtained a large effect size (r = 0.527) and 24.1% of the variance of EQ can be explained by personality after controlling for the nuisance variables. Model 3 obtained a small effect size (r = 0.252) with only 2.1% of the variance of EQ that can be explained by cognition after controlling for the nuisance variables . Model 4 obtained a large effect size (r = 0.551) and 26.8% of the variance of EQ can be explained by personality and cognition combined but still controlling for the nuisance variables.

Table 13

Regression summary for Model 1 for Total EQ

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.190[a]	.036	.028	13.242

Note. a. Predictors: (Constant), Gender, Race, Age

Table 14

Coefficients for Model 1 for Total EQ

Model		Unstandardised coefficients		Standardised coefficients	T	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	97.014	3.335	-	29.093	.000	-	-	-
	Age	.272	.085	.176	3.201	.001	.137	.169	.168
	Race	-3.529	1.596	-.121	-2.211	.028	-.083	-.118	-.116
	Gender	2.280	2.432	.050	.938	.349	.040	.050	.049

Note. a. Dependent variable: TOTAL EQ

Table 15

Regression summary for Model 2 for Total EQ

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.190[a]	.036	.028	13.242	.036	4.341	3	348	.005
2	.527[b]	.278	.261	11.547	.241	22.932	5	343	.000

Note. a. Predictors: (Constant), Gender, Race, Age

Note. b. Predictors: (Constant), Gender, Race, Age, Openness to Experience, Emotional Stability, Conscientiousness, Agreeableness, Extraversion

Table 16

Coefficients for Model 2 for Total EQ

Model	Construct	Unstandardised coefficients		Standardised coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
2	(Constant)	58.339	4.892	-	11.924	.000	-	-	-
	Age	.207	.076	.134	2.736	.007	.137	.146	.126
	Race	-2.251	1.424	-.077	-1.581	.115	-.083	-.085	-.073
	Gender	1.358	2.161	.030	.628	.530	.040	.034	.029
	Extraversion	.847	.544	.087	1.556	.121	.333	.084	.071
	Openness to Experience	1.501	.423	.175	3.546	.000	.203	.188	.163
	Emotional Stability	2.353	.508	.254	4.632	.000	.402	.243	.213
	Agreeableness	.590	.488	.059	1.209	.228	.206	.065	.055
	Conscientiousness	2.216	.478	.228	4.640	.000	.319	.243	.213

Note. a. Dependent variable: TOTAL EQ

Table 17

Regression summary for Model 3 for Total EQ

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.190[a]	.036	.028	13.242	.036	4.341	3	348	.005
2	.252[b]	.064	.039	13.165	.028	1.678	6	342	.126

Note. a. Predictors: (Constant), Gender, Race, Age

Note. b. Predictors: (Constant), Gender, Race, Age, Transformation, Memory, Exploration, Metacognition, Analysis, Structuring

Table 18

Coefficients for Model 3 for Total EQ

Model	Construct	Unstandardised coefficients		Standardised coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
3	(Constant)	98.327	3.458	-	28.435	.000	-	-	-
	Age	.229	.091	.148	2.507	.013	.137	.134	.131
	Race	-2.987	1.686	-.102	-1.771	.077	-.083	-.095	-.093
	Gender	2.018	2.466	.044	.819	.414	.040	.044	.043
	Exploration	1.491	1.588	.104	.939	.348	-.085	.051	.049
	Analysis	-5.201	1.828	-.359	-2.846	.005	-.155	-.152	-.149
	Structuring	-.359	3.446	-.024	-.104	.917	-.101	-.006	-.005
	Transformation	-.933	1.493	-.065	-.625	.532	-.119	-.034	-.033
	Memory	2.479	2.244	.173	1.104	.270	-.073	.060	.058
	Metacognition	1.950	1.940	.126	1.005	.316	-.087	.054	.053

a. Dependent variable: TOTAL EQ

Table 19

Regression summary for Model 4 for Total EQ

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.190[a]	.036	.028	13.242	.036	4.341	3	348	.005
2	.527[b]	.278	.261	11.547	.241	22.932	5	343	.000
3	.551[c]	.304	.275	11.437	.026	2.102	6	337	.053

Note. a. Predictors: (Constant), Gender, Race, Age

Note. b. Predictors: (Constant), Gender, Race, Age, Openness, Emotional Stability, Conscientiousness, Agreeableness, Extraversion

Note. c. Predictors: (Constant), Gender Race, Age, Openness, Emotional Stability, Conscientiousness, Agreeableness, Extraversion, Exploration, Transformation, Memory, Analysis, Metacognition, Structuring

Table 20

Coefficients for Model 4 for Total EQ

Model	Construct	Unstandardised coefficients		Standardised coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
4	(Constant)	59.061	4.937	-	11.963	.000	-	-	-
	Age	.174	.080	.113	2.169	.031	.137	.117	.099
	Race	-1.847	1.491	-.063	-1.238	.216	-.083	-.067	-.056
	Gender	.929	2.189	.020	.424	.672	.040	.023	.019
	Extraversion	.817	.544	.084	1.502	.134	.333	.082	.068
	Openness to Experience	1.438	.428	.167	3.357	.001	.203	.180	.153
	Emotional Stability	2.298	.506	.248	4.540	.000	.402	.240	.206
	Agreeableness	.697	.489	.070	1.423	.156	.206	.077	.065
	Conscientiousness	2.319	.484	.239	4.791	.000	.319	.253	.218
	Exploration	1.219	1.385	.085	.880	.379	-.085	.048	.040
	Analysis	-4.634	1.598	-.320	-2.900	.004	-.155	-.156	-.132
	Structuring	-.152	3.002	-.010	-.051	.960	-.101	-.003	-.002
	Transformation	-1.582	1.302	-.111	-1.215	.225	-.119	-.066	-.055
	Memory	2.469	1.963	.172	1.258	.209	-.073	.068	.057
	Metacognition	2.464	1.718	.160	1.434	.152	-.087	.078	.065

Note. a. Dependent variable: TOTAL EQ

DISCUSSION

The aim of this study was to explore the relationship between personality and EQ, and cognition and emotional intelligence. The specific aims were to explore the relationship between personality and emotional intelligence (H1) as well as the relationship between cognition and emotional intelligence (H2).

Correlations

Personality

It is not surprising, and consistent with the literature, that this study found a number of statistically significant correlations between personality and EQ (Costa & McCrae, 1997). In the study Extraversion correlated with five of the six EQ scales; Openness to Experience correlated with four of the six EQ scales (McCrae, 2000); Emotional Stability correlated with all six EQ scales; Agreeableness correlated with three of the six EQ scales; and Conscientiousness correlated with all six EQ scales.

This further indicates that an individual with high Total EQ is likely to also score high on all five personality factors. Bar-On (1997) shows correlations of a large effect size (between 0.60 and 0.70) with Emotional Stability, whereas in this study Total EQ demonstrated only a medium effect size correlation with Emotional Stability. This finding is in line with the general claims that Agreeableness is the predominant predictor of pro-social (effective EQ) conduct, as made by Matthews et al. (2002).

The study also indicates that an individual with high Intrapersonal EQ is likely to also portray Extraversion, Openness to Experience, Emotional Stability and Conscientiousness (Paulhus, Bruce & Trapnell, 1995). In contrast Shafer (1999) also found medium effect size correlations between Empathy and Agreeableness and postulated that individuals who are able to show empathy towards others, should then also show agreeableness. In this study we found similar results to those of Shafer (1999), as Interpersonal EQ (of which Empathy is a subcategory) showed a medium effect size correlation with Agreeableness. This finding is also in line with the findings of Paulhus et al. (1995).

From the study, we found that an individual with high Stress Management EQ to likely also portray Emotional Stability and Conscientiousness (Paulhus et al., 1995). Matthews et al. (2002) postulate that low Emotional Stability (or Neuroticism) relates to poor Stress Management, which is a plausible link seeing that Stress Management EQ shows correlations with Emotional Stability.

Costa and McCrae (1997) as well as Mayer and Salovey (1997) postulate that traits associated with EQ appear to be most relevant to Openness to Experience. However, from this study, Extraversion had the highest correlation with Intrapersonal EQ and Emotional Stability had the highest correlation with Intrapersonal EQ and General Mood EQ.

Based on the above discussion and the general findings of the current study, the question posed by researchers as to whether EQ is really a different concept from the one we know as personality seems to be a valid one (Davies et al., 1998).

Cognition

Some negative but statistically significant correlations of a small effect size were found between cognition and EQ. Analysis correlated negatively with three of the six EQ scales and Transformation correlated negatively with one of the six EQ scales. This indicates that an individual with high Total EQ is likely to obtain lower scores for Analysis ; an individual with high Intrapersonal EQ is likely to obtain lower scores for Analysis and Transformation; and an individual with high Adaptability EQ is likely to obtain lower scores for Analysis.

Averill (2000) postulates that not all cognitive processes are important for emotional functioning. Some processes will aid what is believed to be intelligent behaviour (e.g. concept formation), while others may enhance emotional behaviour (e.g. sensitivity to interpersonal cues). However, there is no reason to assume this. From the current study it seems that Analysis is not a cognitive concept necessary for emotional functioning, this also holds true for Transformation as measured by the CPP.

Davies et al. (1998) conducted three separate studies where different tests measuring personality, cognition and EQ were applied. Their findings indicated that EQ, when measured by a self-reporting instrument, seems to load on factors of personality variables (e.g. extraversion, neuroticism and agreeableness). Emotional perception seemed to have been the only factor to be distinguished from personality. Davies et al. (1998) have therefore called for a more provisional EQ definition as it is not a single construct but rather assists in assimilating information.

Nuisance variables

In the correlation study statistically significant positive results of a small effect size were demonstrated for age that indicated that the older an individual is, the better they will be at managing their own emotions (Intrapersonal), managing their emotions when experiencing stress (Stress Management), and adapting their emotions to changing circumstances (Adaptability) (Mayer & Salovey, 1997). Statistically significant positive results of a small effect size were demonstrated for age on personality that indicated that the older an individual, the more likely they are to be Agreeable and Conscientious (McCrae et al., 1999; Sapolsky, 1998). Age demonstrated statistically significant negative results of a small effect size for cognition, which indicates that the younger an individual, the more likely they are to score on Exploration, Analysis, Transformation, Memory and Metacognition.

Race demonstrated a statistically significant negative relationship of a small effect size with Adaptability EQ, which indicates that black individuals are likely to be more adaptable than white individuals. Race demonstrated a statically significant negative result of a small effect size with Agreeableness, which indicates that black individuals are likely to be more agreeable than white individuals. Race demonstrated a statistically significant positive result of a small effect size with all the cognition scales, which indicates that white individuals are likely to obtain higher scores in Exploration, Analysis, Structuring, Transformation, Memory and Metacognition than black individuals.

The study found that gender had only two statistically significant positive results of a small effect size with the personality dimensions Agreeableness and Conscientiousness, which indicates that females are likely to be more caring and conscientious than males (Feingold, 1994).

Regression analysis

In the regression analysis only 3.6% of the variance in the Total EQ could be attributed to the nuisance variables age, gender and race. For each regression model, the nuisance variables were first entered and controlled for, and then the independent variables were added to the regression equation. Personality demonstrated the strongest relationship after controlling for the nuisance variable of shared variance with Total EQ. Although of a smaller magnitude, the shared variance between cognition and Total EQ can be a predictor for high EQ to a certain degree. However, cognition is not a very good predictor of high EQ. When personality and cognition are combined, a certain degree of high EQ may be predicted, with personality still carrying the most weight in such a prediction.

Bar-On's (1997) definition is therefore correct in the most part, as EQ is a non-cognitive capability as shown by the research.

At the beginning of this research paper a question by Davies et al. (1998) was posed: What remains of EQ after you have measured personality and cognition? From the above statistical analysis it seems that quite a lot of EQI can be explained by personality and somewhat less by cognition.

CONCLUSIONS

Continued attention to and research into the field of EQ are merited as the concept deals with the emotional abilities of self and others. Current measurements have done well, some more so than others, and therefore a call for further development and research into the relationship between EQ and personality can be made (McCrae, 2000).

Limitations of the study and recommendations for future research

Bar-On EQ-i is a self-reporting assessment and not an ability assessment (Hedlund & Sternberg, 2000). The research might obtain different results if another instrument of EQ is used. Some participants may have displayed a Hawthorne effect in that when individuals complete assessments for the purpose of recruitment, the possibility arises that they could have tried to present themselves in a better/more positive way than the way they really are (Krause, 2008).

If it can then be concluded that EQ maps successfully onto the FFM and correlates with the various factors in the way that it does, then it seems that EQ consists mainly of personality traits (McCrae, 2000).

Because of the large overlap between EQ and personality, it is challenging to conceptualise EQ as a cognitive ability (Roberts et al., 2001). Bar-On (1997) set out to develop a measure of non-cognitive abilities and his measure seemingly does measure mostly those factors of personality as postulated by the FFM (Hedlund & Sternberg, 2000; Mayer et al., 2000).

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CHAPTER 4: CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS

4.1 CONCLUSIONS

In this chapter, final conclusions from the current research study will be discussed. Limitations of the study will be mentioned and recommendations for future research will be made.

The purpose of the current research was to investigate whether there is a relationship between personality and EQ, and cognition and EQ. The researcher aimed to contribute to the existing body of knowledge in that greater understanding could be obtained as to what EQ is.

The purpose of the literature review was to gain an understanding of how each of the variables – personality, cognition and EQ – is formulated and defined, so as to determine the relationship between these variables.

It is inevitable to return to the imperative question asked by Davies et al. (1998) at the start of the research: What remains of the concept of EQI after personality and intelligence have been accounted for?

EQ seems to be somewhat of a confusing construct, as emotions are generally seen as irrational and intelligence (or cognition) is seen as logical. Bringing the two together in the concept of EQ seems unlikely (Matthews et al., 2002; Mayer & Salovey, 1995). What is further confusing is that it is stated that EQ can be learnt and that if you lack certain emotional skills, you can be trained in them to improve your social functioning (Bar-On, 1997; 2000; Goleman, 1995; Joseph & Newman, 2010; Matthews et al., 2002).

Bar-On (1997, p. 17) defines EQ as “an array of non-cognitive capabilities, competencies, and skill that influences one’s ability to succeed in coping with environmental demands and pressures”. Goleman’s (1995) definition states that “[e]motional intelligence [includes] abilities such as being able to motive oneself and persist in the face of frustrations; to control impulse and delay gratification; to regulate one’s moods and keep distress from swamping the ability to think; to empathize and to hope”. Bar-On (2000) and Goleman (1995) puts forward the notion that EQ is an extension of the social intelligence field postulated by Thorndike’s (1920) three classes of intelligence. Although this may seem plausible, research has yet to encounter fewer stumbling blocks in this regard (Roberts et al., 2001). This conceptualisation forms part of the mixed-model theory of EQ (Joseph & Newman, 2010; Matthews et al., 2002; Roberts et al., 2001; Sjöberg, 2001; Stough et al., 2009; Zeidner et al., 2009).

“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” is the definition put forward by Salovey and Mayer (1990, p. 189). A couple of years later, they revised the definition to incorporate four prominent components into their trait model of EQ (Mayer & Salovey, 1997). The conceptualisation of EQ by Mayer et al. (2002) can also be linked back to Gardner’s (1983) concept of personal intelligence. It is postulated that EQ is a trait and forms part of the trait-model theory. It encapsulates the ability to distinguish emotional meanings and link this to the outcome of reasoning processes and problem solving in emotional situations (Mayer et al., 2000b).

It is clear that Goleman’s (1995) best-selling book brought renewed attention to the concept of EQ. Although Bar-On (1997) developed the first commercially operational index for EQ measurement, it is the scientists Salovey and Mayer (1990; Mayer & Salovey, 1993; 1995) who made important contributions to the scientific field of EQ. The two opposing camps of mixed models and trait models seem to battle forth.

Personality also enjoys attention and researchers seem to still grapple with consensus on one definition. Definitions vary from personality being a set of attributes (Schultz & Schultz, 1994) to distinguishing factors that make us different from one another (Cartwright, 1974) to it being consistent across time (Cattell, 1950). It encapsulates an individual's characteristics (Cartwright, 1979) and is therefore often seen as a trait (Cartwright, 1974; 1979; Dumont, 2010; Johnson, 1997).

Traits, therefore, are the differences that set us apart from those around us (Ashton, 2007). Research has produced an acceptable model of traits called the Five-Factor Model (FFM) to assist us in structuring personality (Carducci, 2009; Costa & McCrae, 1997; Dumont, 2010; Eder & Mangelsdorf; 1997; Wiggins & Trapnell, 1997). McCrae and Costa (1991) seem to have contributed significantly to the established research on the FFM and the five factors are neuroticism (emotional stability), extraversion, openness (to experience), agreeableness and conscientiousness.

At the core of cognitive psychology is the notion that humans seek information and uses it actively, and are not passive in this regard as previously thought (Reynolds & Flagg, 1983). Cognition encapsulates processes of perception, pattern recognition, attention, memory, imagery, language functions, developmental psychology, thinking and problem solving, human intelligence and artificial intelligence (Solso, 1988). Goleman (1995) then postulates that our mind has two functions. The one is responsible for rational processes and analytical reasoning, and the other encapsulates our emotional responses and channels those into our behaviour.

The intention of the research was to determine, statistically, whether components that make up personality also contribute to what is deemed to be EQ, as well as whether components of cognition contribute to the construct of EQ. The researcher expected to find significant correlations with personality and insignificant correlations with cognition.

The research results indicate that there is a statistically significant relationship between personality and EQ. The nature of the relationship is positive and Total EQ, Interpersonal, Adaptability and General Mood correlated with all five factors of the FFM. Intrapersonal correlated with four of the five factors and Stress Management correlated with three of the five factors, in that Emotional Stability and Conscientiousness were common to both. The results then suggest that an individual deemed to be emotionally intelligent should also portray certain personality characteristics. It is then expected that an individual portraying Extraversion, Openness to Experience, Emotional Stability, Agreeableness and Conscientiousness should also have high EQ.

EQ demonstrated a negative statistically significant relationship with cognition where Analysis was the consistent correlating factor across the four EQ composite scales with which it demonstrated a relationship (Total EQ, Intrapersonal, Stress Management and Adaptability). Structuring correlated with three of the EQ composite scales, namely Total EQ, Intrapersonal and Adaptability. Transformation correlated with Total EQ, Intrapersonal and Adaptability. Metacognition correlated with Intrapersonal and Adaptability. Exploration correlated only with Adaptability. Interpersonal and General Mood indicated no statistically significant correlations with any of the cognition dimensions and Memory did not demonstrate any statistically significant correlations with any of the EQ composite scales either.

The nature of the relationship between EQ and cognition was negative, which will then propose, in a general sense, that an individual deemed to be emotionally intelligent is unlikely to portray cognitive-related competencies associated with Exploration, Analysis, Structuring, Transformation and Metacognition.

It is then not surprising that 28% of the variance in EQ can be explained by personality and only 6.4% by cognition. The variance percentage increases to 30.4% when personality and cognition are combined. However, it seems that personality is the significant contributor in such a combination.

The current research therefore contributes to the mixed-model theory in that EQ consists of constructs associated with personality (Bar-On, 1997; 2000; Goleman, 1995; Joseph & Newman, 2010; Matthews et al., 2002; Roberts et al., 2001; Sjöberg, 2001; Stough et al., 2009; Zeidner et al., 2009). It also supports Bar-On's (1997) definition of non-cognitive capabilities in that it does not demonstrate positive correlations with cognition.

However, it also raises a contradiction in that Bar-On (1997) and Goleman (1995) state that EQ can be learnt/trained, but if it correlates significantly with personality and personality is deemed to be stable over time (Cattell, 1950), how is one to then learn/train an individual to be more emotionally intelligent?

The empirical findings of this research then confirm the hypotheses that there is a relationship between personality and EQ (H1), and that there is a relationship (albeit negative) between cognition and EQ (H2). The following hypotheses can then be rejected: No relationship exists between personality, cognition and emotional intelligence (H0); No relationship exists between personality and emotional intelligence (H3); No relationship exists between cognition and emotional intelligence (H4).

4.2 LIMITATIONS AND RECOMMENDATIONS

A self-report instrument such as Bar-On's EQ-i can produce results associated with those of a Hawthorne effect, especially when individuals complete an assessment for recruitment purposes, as they may try to portray themselves in a way different from how they really are (Hedlund & Sternberg, 2000; Krause, 2008). The instrument further meets only some conventional psychometric criteria, as stated by Zeidner et al. (2009). The Bar-On EQ-i is but one instrument measuring EQ and another instrument measuring EQ should be considered for future research.

This research used data from the organisation for the purposes of recruitment and owing to the Hawthorne effect (Krause, 2008), data used for future research should perhaps exclude recruitment data.

The OPQ32r was used to measure personality. However; an instrument specifically measuring the factors of the FFM could be used for future research as the OPQ32r was mapped into the FFM for the purposes of this research.

Cognition was examined in this research due to Bar-On's (1997) definition referring to EQ as a non-cognitive ability. However, research incorporating intelligence tests (e.g. IQ) may be able to distinguish whether EQ really is an intelligence or not. That, however, was not part of the purpose of this study.

Research exploring the relationship between personality and EQ seems to be readily available. However, the same cannot be said about cognition. This posed a limitation in comparing the results of this study to an existing body of knowledge. The debate, it seems, is rather around whether EQ really is an intelligence or not. The focus of the study could have been solely to understand the extent of personality's influence on EQ and to not include cognition at all.

Age, gender and race (nuisance variables) were included in the study to control for adverse effects on EQ. The information was obtained from biographical information completed for the OPQ32r assessment. No other information could be extracted that would have deemed

relevant for the purpose of the study. Future research may benefit from including qualification level as a nuisance variable, as it may impact scores on cognition and EQ.

4.3 CHAPTER SUMMARY

Chapter 4, the final chapter of this research study, mentioned the main summarised points from the literature review and the main summarised points of the empirical study. Limitations of the current study as well as recommendations for future research were also outlined.

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