CONFIRMING THE FACTOR STRUCTURE OF THE 41-ITEM VERSION OF THE SCHUTTE EMOTIONAL INTELLIGENCE SCALE

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Commercii in Industrial Psychology at the North-West University (Potchefstroom Campus)

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LIST OF ABBREVIATIONS

APA: American Psychological Association

EI: Emotional Intelligence/ Afrikaans: Emosionele Intelligensie

SEIS: Schutte Emotional Intelligence Scale/ Afrikaans: Schutte Emosionele Intelligensieskaal

EQI: Emotional Quotient Inventory

DECLARATION OF AUTHENTICITY OF RESEARCH

DECLARATION

With this, I, Salemon Marais Bester, solemnly declare that the study on confirming the factor structure of the 41-item version of the Schutte Emotional Intelligence Scale is my own work. The outlooks, views and opinions articulated in this research are those of the author and of the relevant literature references as shown in the reference list. The content of this study will not be submitted for any other qualification at any other tertiary institution.

S.M. Bester
NOVEMBER 2012

COMMENTS

The following should be kept in mind whilst reading the mini-dissertation:

- The format laid down by the Publication Manual (6th ed.) of the American Psychological Association (APA) was used as a guideline pertaining to the editorial style as well as the references referred to in this mini-dissertation. This complies with the policy set by the Programme in Industrial Psychology of the North-West University in January 1999 that all documents should follow the American Psychological Association's format.

- This mini-dissertation, submitted in the form of a research article, used the editorial style specified by the South African Journal of Industrial Psychology who has similar guidelines to that of the APA. APA guidelines were adhered to in constructing all the tables.

ABSTRACT

Topic: Confirming the factor structure of the 41-item version of the Schutte Emotional Intelligence Scale

Keywords: Emotional Intelligence (EI), Schutte Emotional Intelligence Scale (SEIS), psychometric properties, reliability, validity.

The research on Emotional Intelligence (EI) has advanced considerably over the past 20 years because of the construct's scientific and practical relevance. However, in South Africa, a measurement instrument of EI that is valid, reliable, standardised, has a consistent factor structure, in a homogeneous working sample and that can be utilised for research and practical purposes is still elusive. EI plays a fundamental role in the quality of service rendered by nurses (Murphy & Janeke, 2009). According to Ogillska-Bulik (2005) the ability to manage one's own emotions, while having the ability to identify others' emotions, is very important in the nursing environment. The Schutte Emotional Intelligence Scale (SEIS) has been found as a reliable brief scale for measuring trait EI (Schutte & Malouff, 1998). However, there are different results regarding the factor structure of the S.

The first objective of this research study was to conceptualise EI and the factor structure of the SEIS through a literature review. Salovey and Mayer (1990) define EI as a mental ability pertaining to the relationship between emotion and cognition. Other researchers' definition of EI states that EI is the ability to be conscious of one's emotions, to evaluate and develop one's emotions to assist thinking, to comprehend emotions and emotional information, and to manage emotions to sustain emotional and intellectual development in oneself (Bar-On, 2000; Goleman, 1998; Salovey & Mayer 1997). Murphy and Janeke (2009) state it is important that reliable and valid measures of EI must be used in the workplace. Numerous research has been done on the most appropriate, valid and reliable approach for the measurement of EI (Petrides & Furnham, 2000; Van Rooy & Viswesvaran, 2005). The SEIS is the leading brief scale for measuring EI (Petrides & Furnham, 2000). However, there are problems with its factor structures. To summarise:

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a) Schutte et al. (1998) report a unifactorial structure for the SEIS,

b) Austin, Saklofske, Huang, and McKenny (2004) report a three-factor structure.

c) Petrides and Furnham (2000); Ciarrochi, Chan, and Bajar (2001); Ciarrochi, Chan, Caputi, and Roberts (2001) and Saklofske, Austin, and Minski (2003) report a four-factor structure.

d) Jonker and Vosloo (2009) reported a six-factor structure.

The second objective of this study was to investigate the factor structure of the 41-item version of the Schutte Emotional Intelligence Scale within a South African nursing environment by means of a confirmatory factor analysis. A quantitative research design was used in this study. A cross-sectional survey design was used for this study. An availability non-probability sample *(N* = 290) was taken from hospitals in the Gauteng and North-West Provinces of South Africa. The Schutte Emotional Intelligence Scale was applied as measuring scale. An exploratory factor analysis (principal component analysis) was performed on the data. The data did not fit a uni-factor, two-factor or three-factor model based on the model of Austin, Saklofske, Huang, and McKenney (2004). The data fitted the original model of Emotional Intelligence of Mayer and Salovey (1990), best explaining 58.52% of the variance. The results supported a five-factor structure of the Schutte Emotional Intelligence Scale. The five factors were named: Emotion Utilisation; Emotion Management; Emotion Awareness; Emotion Perceiving and Emotion Integration.

Recommendations were made for future research.

OPSOMMING

Onderwerp: Bevestiging van die faktor struktuur van die 41-item weergawe van die Schutte Emosionele Intelligensie Skaal.

Kernwoorde: Emosionele Intelligensie (EI), Schutte Emosionele Intelligensie Skaal (SEIS), psigometriese eienskappe, geldigheid, betroubaarheid.

Die navorsing oor die onderwerp van Emosionele Intelligensie (EI) het baie gevorder oor die afgelope 20 jaar as gevolg van die konstruk se wetenskaplike en praktiese waarde. Daar is egter nog nie 'n meetinstrument in Suid-Afrika wat op 'n homogene werkende steekproef toegepas kan word wat as geldig, betroubaar en met 'n betroubare faktorstruktuur in Suid-Afrika beskou kan word nie. EI is 'n kerneienskap waaroor verpleegsters moet beskik om kwaliteitdiens te kan lewer (Murphy & Janeke, 2009). Volgens Oginska-Bullik (2005) is die vermoë om jou eie emosies te bestuur sowel as ander mense se emosies korrek te identifiseer baie belangrik binne die verpleegkonteks. Die Schutte Emosionele Intelligensie Skaal (SEIS) is gevind as 'n kort en betroubare skaal vir die meting van EI. Daar is egter verskeie verskillende resultate met betrekking tot die skaal se faktorstruktuur.

Die eerste navorsingsdoelwit van hierdie studie was om EI en die SEIS te konseptualiseer deur middel van 'n literatuurstudie. Salovey en Mayer (1990) definieer EI as 'n kognitiewe vermoë wat betrekking het tot die verhouding tussen emosie en kognisie. Op hul beurt definieer ander navorsers EI as die vermoë om bewus te wees van jou eie emosies; om jou emosies op so 'n manier te ontwikkel dat dit deel raak van jou denkpatroon; om emosies en emosionele inligting te kan verstaan; en uiteindelik om emosies so te bestuur sodat dit verder tot emosionele en intellektuele ontwikkeling sal lei (Bar-On, 2000; Goleman, 1998; Salovey & Mayer 1997). Murphy en Janeke (2009) voer aan dat dit baie belangrik is dat betroubare en geldige meetinstrumente van EI beskikbaar sal wees vir gebruik in die werksomgewing. Verskeie navorsingstudies is gedoen rakende die meetinstrument wat die meeste eienskappe van geldigheid en betroubaarheid het (Petrides & Furnham, 2000; Van Rooy & Viswesvaran, 2005). Die SEIS is as 'n kort en betroubare skaal vir die meting van EI bevind (Petrides & Furnham, 2000). Daar is egter probleme met die skaal se faktorstruktuur. Om op te som:

a) Schutte et al. (1998) het 'n eenfaktorstruktuur gevind

b) Austin, Saklofske, Huang en McKenny (2004) 'n driefaktorstruktuur gevind.

c) Petrides en Furnham (2000), Ciarrochi, Chanen Bajar (2001), Ciarrochi, Chan, Caputi, en Roberts (2001), Saklofske, Austin en Minski (2003) het 'n vierfaktorstruktuur gevind.

d) Jonker en Vosloo (2009) het 'n sesfaktorstruktuur gevind.

Die tweede doelstelling van die studie was om navorsing te doen rakende die faktorstruktuur van die Schutte Emosionele Intelligensie Skaal binne die Suid-Afrikaanse verpleegkonteks deur middel van bewysende faktoranalise. 'n Kwantitatiewe navorsingsontwerp is gebruik in die studie. 'n Dwarsdeursnee-opname ontwerp met 'n beskikbaarheidsteekproef *(N* =290) is van hospitale in die Gauteng en Noord-Wes Provinsies van Suid Afrika geneem. Die Schutte Emosionele Intelligensie Skaal is gebruik as meetinstrument. 'n Eksploratiewe faktoranalise (basiese komponentanalise) is op die data toegepas. Die data het nie 'n een-, twee-, of driefaktormodel wat op die model van Austin, Saklofske, Huang en McKenney (2004) gebaseer is, ondersteun nie. Die data het die oorspronklike model van Emosionele Intelligensie van Mayer en Salovey (1990) die beste gepas en 58.52% van die variansie verduidelik. Die resultate ondersteun 'n vyffaktorstruktuur van Emosionele Intelligensie. Die vyf faktore is benoem as Emosiegebruik; Emosiebestuur; Emosiebewustheid; Emosieherkenning en Emosie-integrasie. Aanbevelings is gemaak vir toekomstige navorsing.

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I would hereby like to convey my deepest appreciation to the following exceptional individuals, without whom this mini-dissertation would not have been possible:

CHAPTER 1

INTRODUCTION

INTRODUCTION

This mini-dissertation focuses on the factor structure of the 41-item version of the Schutte Emotional Intelligence Scale: Confirmatory factor-analysis within a nursing environment. In this chapter, the research objectives and specific objectives are discussed. The research design and research method are explained, followed by the chapter summary and the division of chapters.

1.1 PROBLEM STATEMENT

1.1.1 Overview of the problem

During the past 20 years, Emotional Intelligence (EI) has become an increasingly popular topic within the fields of psychology and management (Mayer, Roberts, & Barsade, 2008; Mayer & Salovey, 1995). Mayer and Geher (1996) state that EI includes the ability to perceive emotions accurately, to access and generate emotions in order to assist thoughts, to understand emotions and emotional knowledge, and to regulate emotions reflectively, in order to promote emotional and intellectual growth. In places like the nursing environment, EI plays a fundamental role in the establishment and management of employee relationships (Akerjordet, 2009; Elfenbein & Ambady, 2002; Winstanley & Whittington, 2004). Employees with high levels of EI are able to master their interactions with diverse others in a more effective manner and, as a result, maintain a more positive attitude towards diversity (Dimitriades, 2007; Gignac & Ekermans, 2010).

Employees with high levels of EI are often happier, more engaged, fulfilled, content, exert less stress and are able to manage relationships. Employees with high levels of EI are known for their good people-management skills and often are promoted quite easily (Antonakis, Ashkanasy, & Dasborough, 2009; Murphy & Janeke, 2009). Having EI in the workplace is thus very important. The conclusion can therefore be drawn that it is very important to measure EI in the workplace and to have adequate measurements to measure EI with.

The impressive growth of EI in scholarly work (Downey, Papageorgiou, & Stough, 2006; Matthews, Roberts, & Zeidner, 2002) has been partially influenced by claims that EI is as strong a predictor of job performance as is IQ (Goleman, 1995; Goleman, 2005). Schutte, Malouff, Hall, Haggerty, Cooper, et al. (1998) state that the assessment of EI has not kept up with the interest in the construct in general. Hakanen (2004) and Murphy and Janeke (2009) state that research on the measurement of EI has advanced significantly, because of the realisation of the benefits of using EI when developing employees. In a practical sense, the apparent relationship between EI and work performance has also stimulated interest among human resource practitioners, who have made EI measurement a widely used tool for personnel hiring and training. Research on these measuring instruments in order to improve and develop their use in the workplace is needed to ensure fair assessments (Fineman, 2004).

Over the past ten to fifteen years quite a number of measurement tools concerning the measurement of EI have been developed (Ciarrochi, Chan, Caputi, & Roberts, 2001; Mayer, Salovey, & Caruso, 2008). There remains, however, a large amount of criticism regarding the credibility of the psychometric properties of EI tests (Goleman 2005; Schutte, Thorsteinsson, Hine, Foster, Cauchi, & Binns 2010). Dimitriades (2007) states that a major weakness regarding the extent of EI research literature is the lack of scientifically sound, objective measures of the EI construct. He says there is still no brief, objective, theoretically grounded measure of EI that enjoys acceptable reliability or validity. Schutte and Malouff (1998) state that reliable and valid measures of EI and its components are of paramount importance to influence advancement in the theoretical and scientific areas of EI. The process of validating an EI measure requires convincing empirical evidence that a measure of EI predicts career success or other important on-the-job criteria. Tsaousis (2008) agrees to this and contributes by stating that there is a need for validated instruments that are based on a comprehensive and economical model. A number of researchers (Bar-On, 1997; Goleman, 2005; Salovey & Mayer, 1990; Schutte et al., 1998) have thus attempted to develop self-report measures of the construct EI. However, there is, as discussed, a number of raised concerns. To summarise, many of the measures have weak reliabilities, weak validities and indifferences in their factor structures. In order to determine the influence that EI has on organisational outcomes, reliable and valid tools of measurement must be used (Polit & Beck, 2008).

One method of testing trait EI that has widely been used in research and in practice both internationally and in South Africa, is the Schutte Emotional Intelligence Scale (SEIS) (Carmeli, 2003; Ciarrochi, Chan, Caputi, & Roberts, 2001; Dimitriades, 2007; Grant & Cavanagh, 2007; Hakanen, 2004; Jonker & Vosloo, 2008; Petrides & Furnham, 2000; Saklofske, Huang, & McKenney, 2004; Schutte et al., 2010). The SEIS is one of the most widely used trait EI measures based on the earlier ability model of EI by Salovey and Mayer, (1990). It contains the perception and appraisal of emotion and reflective regulation of emotions. The SEIS assesses perception, understanding, expression, regulating and harnessing of emotion in the self and others (Schutte et al., 1998). Potential uses of the scale in theoretical research involve exploring the nature of EI, the effect of EI, as well as whether EI could be enhanced (Schutte et al., 1998).

Using the SEIS in research and in the public sector can radically enhance the knowledge of a person's EI and must thus be a valid and reliable measure. However, there has been a lot of inconsistency in the research and usage of the SEIS. At present, two versions of the scale are available. The more commonly used 33-item scale comprises 33 self-reverencing statements (items) and requires subjects to rate the extent they agree or disagree with each statement on a five-point Likert scale, but it has been criticised for having no reverse-keyed items (Petrides & Furnham, 2000). A 41-item scale was developed by Austin, Saklofske, Huang, and McKenney (2004) as an improvement on the problematic 33-item version. The SEIS has been found to have between one-, three-, four- or six-factor structures, which means that no consistent valid and reliable factor structure could yet be found, especially for use in a South African work context (Jonker & Vosloo, 2008; Petrides & Furnham, 2000).

Although international findings from studies of the SEIS suggest that it provides a reliable and valid trait EI measure, no study has been done in South Africa to determine the reliability, validity and factor structures on the 41-item scale in a South African work context. The only study that came close to closing this gap was the study by Jonker and Vosloo (2008) that found a six-factor structure on the 33-item scale. The fact that there are problems, as mentioned above, with the items of the 33-item scale and the fact that this six-factor model is not consistent with the authors of the SEIS's one-factor model (Schutte et al., 1998), is reason for concern. Jonker

and Vosloo (2008) recommend that better results could be obtained by a confirmatory factor analysis, by using structural equation modelling. The results of their study could serve as a standard for measuring the EI of Economic Science students in a higher educational institution, but not necessarily for the public sector and working adults. Therefore, a valid, reliable, standardised, consistent factor in a homogeneous working sample that can be utilised for research purposes, is still elusive. Next, the literature review will explore EI and the psychometric properties of the SEIS.

Emotional Intelligence (EI)

Salovey and Mayer (1990) originally conceptualised Emotional Intelligence (EI) as a mental ability involving the relationship between emotion and cognition, described as intelligence in the "traditional" sense. Mayer et al. (2004) conceptualise the concept of EI as the capacity to reason about emotions, and of emotions to enhance thinking. Considerable debate has evolved concerning the most appropriate, valid and reliable approach for the measurement of the EI constructs (Petrides & Furnham, 2000; Van Rooy & Viswesvaran, 2005).

The different models of EI measurement differ in terms of two patterns of thought. The first approach states that EI is a cognitive ability. The ability-based approach conceptualise EI as a set of emotion-related cognitive skills not much different from other aspects of cognitive intelligence (Mayer et al., 2008). Like other mental abilities, ability-based EI is measured through problem solving-performance tests. These tests ask respondents to reason about emotions by using emotional information. The problem that ability EI tests have overcome is the inherent subjectivity of emotional experience (Sedmar, Robins, & Ferris, 2006; Spain, Eaton, & Funder, 2000; Watson, 2000). Unlike standard cognitive ability tests, tests of ability EI cannot be scored objectively because, in most cases, there are no clear-cut criteria for what constitutes a correct response. Despite the advantages of using ability-based measures of EI, there are some problems with respect to their psychometric properties (Austin, 2005; Matthews, Roberts, & Zeidner, 2004). In addition, the practicality of employing these performance-based instruments is limited in that these tests are lengthy to administer, taking between 45 and 60 min to complete,

and the costs for the use of these tests, even for research purposes, are high (Saklofske, Austin, & Minski, 2003; Van Rooy & Viswesvaran, 2005).

The second approach, which in turn tends to rely on self-report techniques, suggests that EI is primarily dispositional (i.e. representing a conglomerate of cognitive, personality, motivational and affective attributes). Respondents in the trait EI tests are asked to report on their typical beliefs, feelings and behaviours (Bar-On, 1997; Petrides & Furnham, 2000; Polit & Beck, 2008). In contrast to problem-solving performance tests, self-reported EI tests have been found to have incremental validity, accounting for unique variance in outcomes (happiness, life satisfaction, loneliness and depression) not accounted for by personality. There is a lot of evidence in support of the discriminant and incremental validity of trait EI tests (Petrides & Furnham, 2000). An example of a valid and reliable trait EI test that has been used in South Africa is the Schutte Emotional Intelligence Scale (SEIS) (Schutte et al., 1998).

Schutte Emotional Intelligence Scale (SEIS)

The implementation of the SEIS in international studies has shown it to be a reliable and a valid trait EI measure as a global factor (Grant & Cavanagh, 2007). A valid measure is one that measures what it intends to measure (Barchard & Hakstian, 2004). The SEIS shows some face, construct, predictive, discriminant and criterion validity (Ciarrochi et al., 2002; Petrides & Furnham, 2000; Petrides & Furnham, 2003). Before any other form of validity of an EI measure can be tested empirically, the construct validity of the EI measure must first be established (Akerjordet & Severinsson, 2004). One method of determining a scale's construct validity is that a measure's factor structure can be examined. The measure's factor structure should comprise the theorised number and pattern of factors (Grant & Cavanagh, 2007; Petrides, Perez-Gonzalez, & Furnham, 2007).

A reliable measure is one that consistently measures a construct over time, individuals and situations. Internal consistency, which addresses the homogeneity of a single test form, is very important in any psychometric measure (Barchard & Hakstian, 2004). Studies conducted by Ciarrochi et al., (2002) indicate that the reliability of the SEIS factors are considerably lower

than the reliability of the full measure, which has proven to be very reliable. The SEIS has demonstrated high internal consistency (Cronbach alpha ranging from 0. 87 to 0.90) and good two-week test-retest reliability (r = 0. 78) (Schutte et al*.,* 1998). A valid measure must be reliable, but a reliable measure does not need to be valid. Both reliability and validity can be assessed statistically (Barchard & Hakstian, 2004; Geher, Warner, & Brown, 2001).

The SEIS has emerged as the leading brief scale for assessing EI because at 33 or 41 items, it is considerably shorter than the other major trait EI scales: the 133-item Bar-On (1997) and the Emotional Quotient Inventory (EQI) (Austin et al., 2004). Its psychometric properties have been analysed in several papers (Austin et al., 2004; Jonker & Vosloo, 2008; Petrides & Furnham, 2000; Saklofske et al., 2003) and it has been found to have many different factor structures. The 33-item model of the SEIS has been criticised for a lack of reverse-keyed items (Petrides & Furnham, 2000) which could potentially lead to a confounding of SEIS score with agreeable responding (Austin et al., 2004). Due to this, a revised version of the 33-item scale of Schutte et al. (1998) was constructed, in which reversed wordings were devised for nine of the original 30 forward-keyed items. In addition, eight new items were included. This resulted in the 41-item scale, which had 20 forward-keyed and 21 reverse-keyed items (Austin et al., 2004).

The items in the SEIS were constructed to sample relatively evenly from the three primary content domains of Salovey and Mayer's (1990) original conceptualisation of the EI construct: the appraisal and expression of emotion, the regulation of emotion, and the utilisation of emotion. These components, along with emotional knowledge, also form the core of Mayer and Salovey's (1997) revised ability model and are central pieces in Goleman's (1995) and Bar-On's (1997) EI models; therefore, the SEIS taps a construct congenial to several conceptions of EI. Studies which used British (Petrides & Furnham, 2000), Australian (Gannon & Ranzijn, 2005) and Canadian (Saklofske et al*.,* 2003) comparison samples have elicited nearly identical factor structures of SEIS. When Biswal, Deller, Mandal and Sharma (2009) used German and Indian comparison samples in a study of the SEIS, only nine items were shared between the two samples within the given factor structures of SEIS proposed by Ciarrochi et al. (2002). In these nine items common to the factor structures of both India and Germany, only three fell into the same factor of the factor structure found by other researchers (Petrides & Furnham, 2000).

Within the diverse context that South Africa has it is important to use a version of the SEIS that is reliable, valid and has a homogeneous factor structure.

The SEIS might have been found as a valid and reliable trait EI measure, but the debate over the SEIS's factor structure is still reason for concern. The discussion started due to Schutte et al. (1998)'s conclusion that the SEIS total score measured a general EI construct and they settled for a proposed uni-factorial structure for the SEIS. This was because the 33 items comprising the final version of the scale all loaded on a first component in a varimax rotated principal components analysis (PCA) and because Schutte et al. (1998) obtained a high scale alpha (0.87).

Petrides and Furnham (2000) noted that this did not necessarily suggest a general factor, because the varimax rotation distributes variance away from a common (i.e. general) factor and across orthogonal factors. Their factors could be described as Optimism/Mood Regulation, Appraisal of Emotions, Social Skills and Utilisation of Emotions. Researchers started looking at different possible factor structures that could solve this problem. Austin et al. (2004) identified a three-factor structure for the SEIS. These factors could be described as Optimism/Mood Regulation, Utilisation of Emotions and Appraisal of Emotions.

In separate studies by Petrides and Furnham (2000); Ciarrochi, Chan, and Bajar (2001) and Ciarrochi, Chan, Caputi, and Roberts (2001), the researchers all settled on a four-factor solution. Some researchers also found evidence of two-factor and even ten-factor structures, while stating that they might have overestimated the number of factors (Petrides & Furnham, 2000). Similarly, Saklofske et al. (2003) replicated a four-factor solution, but not all the items loaded on the same factors. Results attained by Chan (2004) with an exploratory-item factor analysis indicated that the 33 items emerged in meaningful clusters, describing four dimensions of perceived EI.

In the study by Jonker and Vosloo (2008), the following results were obtained: using the cross-sectional design, a six-dimensional factor structure of the SEIS explaining 45.24% of the variance was supported. The six factors were Positive Affect, Emotion-Others, Happy Emotions, Emotions-Own, Non-verbal Emotions and Emotional Management. Their findings of this six-factor model differ from other research in terms of the number of factors and what the factors

describe. Differences in the findings of Jonker and Vosloo (2008) and the findings of international researchers regarding the psychometric properties of the SEIS indicate that there is still some inconsistency when it comes to measuring EI in different groups. They found that having the SEIS only in the English language could lead to inconsistency in responses and to biasness. According to Jonker and Vosloo (2008), problems with some of the items may be related to words that some of the participants found difficult to understand and/or interpret.

In a study by Van der Merwe (2005) the following results were obtained while using a South African nursing population and testing the psychometric soundness of the SEIS. A simple factor analysis was conducted on the 33 items of the SEIS to determine the factor structure. A five-factor structure was identified on the SEIS, explaining 50.04% of the total variance. The five factors were labelled Positive State, Own Emotions, Negative Emotions, Emotions of Others and Emotional Management. The possible reason for the differing factor solutions for the two studies conducted in South Africa might be the study populations used. Jonker and Vosloo (2008) used students from the Faculty of Economic Sciences of the North-West University, while the study by Van der Merwe (2005) utilised a nursing population. The fact that nurses are involved in more emotional work than students were hypothesised as a possible factor in the different factors found.

The discussion over the version of the SEIS with the best factor reliability or validity is a major concern. This concern develops even further into the debate about which of the 33- or 41-item scale is more adequate to use. The implementation of the more popular, brief 33-item scale or the 41-item scale that eliminates reverse-keyed items has led to some inconsistency in research (Austin et al., 2004). Sufficient internal consistency, construct, predictive and discriminant validities of the SEIS were found in all of the mentioned studies.

The conclusion can be drawn that there are different results regarding the factor structure of the SEIS. To summarise, Schutte et al. (1998) reported an uni-factorial structure for the SEIS, Austin et al. (2004) reported a three-factor structure, while Petrides and Furnham (2000); Ciarrochi, Chan, and Bajar (2001); Ciarrochi, Chan, Caputi, and Roberts (2001); Saklofske et al. (2003) reported a four-factor structure. Jonker and Vosloo (2008) reported a six-factor structure. Against

this background, the goal of the study will be to determine the factor structure of the 41-item version of the SEIS. The reliability and validity of 41-item version of the SEIS is also important to be noted in a working population in the South African context. The following research questions can be formulated:

- How can Emotional Intelligence and the factor structure of the Schutte Emotional Intelligence Scale be conceptualised, based on a literature review?
- Is the 41-item version of the Schutte Emotional Intelligence Scale, as measured in a South African nursing population, a one-, two-, three- or five-factor model as determined by a confirmatory factor analysis?
- What is the reliability of the Schutte Emotional Intelligence Scale as measured by the 41-item version within a South African working population?
- What future recommendations regarding the use of the 41-item version of the Schutte Emotional Intelligence Scale, as measured in a South African nursing population, can be made?

1.2 RESEARCH OBJECTIVES

The research objectives are divided into a general objective and specific objectives.

1.2.1 General objective

The general objective of the research is to determine a factor structure, validity and reliability of the 41-item version of the SEIS in a South African working sample.

1.2.2 Specific objectives

The specific objectives of this research are:

- To conceptualise Emotional Intelligence and the factor structure of the Schutte Emotional Intelligence Scale through a literature review.
- To determine whether the 41-item version of the Schutte Emotional Intelligence Scale, as measured in a South African nursing population, has a one-, two-, three- or five-factor model as determined by confirmatory factor analysis.
- To determine the reliability of the Schutte Emotional Intelligence Scale as measured by the 41-item version within a South African working population.
- To make recommendations for future research and for future use of the 41-item version of the Schutte Emotional Intelligence Scale within a South African population.

1.3 RESEARCH METHOD

The research method will comprise two phases, namely a literature review and an empirical study. The results are presented in the form of a research article.

1.3.1 Phase 1: Literature review

In phase 1, a complete review regarding Emotional intelligence (EI), the Schutte Emotional Intelligence Scale (SEIS), psychometric properties, reliability, validity and the factor structure of the Schutte Emotional Intelligence Scale (SEIS) is implemented. The databases that are consulted include:

- Ebsco Host
- Emerald
- Sabinet Online
- SAePublications
- A – Z Magazine List
- Google Scholar

- Journals

- Books

1.3.2 Phase 2: Empirical study

The empirical study consists of the research design, participants, measuring battery and statistical analysis.

1.3.2.1 Research Design

The study is quantitative. According to Struwig and Stead (2001), research that is quantitative in nature is a form of conclusive research involving large representative samples and structured data-collection procedures. A cross-sectional research approach is utilised. A cross-sectional method examines numerous groups of people at one point in time (Salkind, 2009). Cross-sectional designs are used for simultaneously examining groups of subjects in various stages, while the survey describes a technique of data collection in which questionnaires are used to collect data about the identified population (Byrne, 2001). Relationships between variables are examined (Shaughnessy & Zechmeister, 1997). This approach is ideal for the study, due to economical and time effectiveness.

1.3.2.2 Participants

An availability sample (*N*=290) of a nursing environment was utilised. Different hospitals in the public and private sector are targeted. They are predominantly based within the Gauteng and North West Provinces of South Africa.

Contact is made with the management of each hospital in order to get consent to conduct the study on their premises. The hospital's HR practitioner accompanied the researcher at all times. A letter requesting participation is e-mailed to the individuals that are available to take part in the study. The letter explains the objectives and importance of the study. Participation in the study is voluntary, and the confidentiality and anonymity of participants are emphasised. All the

available nurses are asked to complete the questionnaire in the same hall. Once informed consent is given to the participants, test booklets are provided, which include the SEIS 41-item scale and an answer sheet. The participants are given an unlimited amount of time to complete the paper-based inventory. On completion of the questionnaires, the participants are asked to put their answer sheets into marked boxes according to their demographic characteristics. The different hospitals that participate in the study are be given comprehensive feedback via e-mail regarding the profile for EI in the health professions as well as information regarding employee assistant programmes.

1.3.2.3 Measuring Battery

Biographical questionnaire

A biographical questionnaire is used to determine the biographical characteristics of the participants. The respondents are asked to respond on a nominal scale. In this questionnaire there is a question regarding the age of the participants. The respondents are also asked to give their gender and place of birth. For reasons of differentiation, the language and ethnic groups of the participants will also be asked. The job profile and education level of the participants are measured.

The Schutte Emotional Intelligence Scale (SEIS)

The SEIS comprises of 41 items. Participants reply on a Likert scale and a total score is derived by summarising the item responses. The SEIS is one of the most widely used trait EI measures based on the earlier ability model of EI by Salovey and Mayer, (1990). It contains the perception and appraisal of emotion and reflective regulation of emotions. The SEIS assesses perception, understanding, expression, regulating and harnessing of emotion in the self and others (Schutte et al., 1998). Potential uses of the scale in theoretical research involve exploring the nature of Emotional Intelligence, the effect of Emotional Intelligence, and whether Emotional Intelligence could be enhanced (Schutte et al., 1998). In a study by Austin et al. (2004), when developing the 41-item version of the SEIS, they found the overall internal reliability to be 0.85. They found three factors and their internal reliabilities were 0.78, 0.68, and 0.76. Here are two examples of items loading on factor one: Item 29- "I motivate myself by imagining a good outcome to tasks I take on."; Item 38: "I use good moods to help myself keep trying in the face of obstacles." Here

are two examples of items loading on factor two: Item 34- "Emotions don't play a big part in how I deal with problems."; Item 23- "I don't believe that my emotions give any help in coming up with new ideas". Two examples of items loading on factor three are: Item 22- "I tend to misread peoples' facial expressions."; Item 36- "I don't know what others are feeling just by looking at them."

1.3.2.4 Statistical Analysis

The statistical analysis of this study is carried out with the SPSS program and the AMOS program (SPSS Inc., 2011; AMOS 5.0). Descriptive statistics (e.g. means, standard deviations, range, skewness and kurtosis) are used to analyse the data. A Cronbach-alpha coefficient is used to determine the internal consistency, homogeneity and uni-dimensionality of the measuring instrument (Clark & Watson, 1995). Coefficient alpha contains important information regarding the proportion of variance of the items of a scale in terms of the total variance explained by the particular scale (Nunnally & Bernstein, 1994). A coefficient of 0.70 indicates that the items are regarded as reliable (Nunnally & Bernstein, 1994).

Confirmatory Factor Analysis (CFA) by using Structural Equation Modelling (SEM) in (AMOS 5.0) is employed (Arbuckle, 2003). According to Kline (1998) CFA allows the testing of the hypothesis to establish if a relationship exists between the observed variables and their underlying latent construct(s). According to Byrne (2001), SEM is a powerful multivariate method allowing the evaluation of a series of simultaneous hypotheses about the impacts of latent and manifest variables on other variables, considering measurement errors. Statistically appraising the fit of a model to the covariance matrix is accomplished using a "goodness-of-fit" test referenced against the χ^2 distribution. Maximum likelihood estimation is used and the input for each analysis will be the covariance matrix (Byrne, 2001). To test the different factor structures of the SEIS several nested models will be compared by means of the $\chi2$ difference test. In addition, absolute and relative indices are computed to assess the goodness-of-fit of the different SEIS models. As recommended by Marsh, Balla, and Hau (1996), the following relative goodness of fit indices are computed: The Chi-Square analysis, Goodness-of-fit Indices (GFI); Parsimony Fit Indices (PGFI); Normed Fit Index (NFI); Incremental Fit Index (IFI);

Comparative Fit Index (CFI) and the RMSEA. As a rule of thumb, values of 0.90 or higher indicate good fit for all the relative fit indices (Byrne, 2001).

1.3.2.5 Ethical considerations

Ethics can be conceptualised as the discipline when dealing with good and bad, right and wrong, and moral obligations (Struwig & Stead, 2001). Research ethics involve the application of primary ethical principles to a variety of topics concerning scientific research. The following is applicable at all times to retain an ethical climate (Struwig & Stead, 2001):

- The researcher has the responsibility to secure the actual authorisation and interests of all those involved in the study.
- The researcher should not abuse any of the information discovered, and there should be a certain moral responsibility maintained towards the participants.
- The researcher has a duty to protect the rights of the participants in the study as well as their privacy and sensitivity.
- The confidentiality of those involved in the observation must be carried out, keeping their anonymity and privacy secure.
- Participation is voluntary.

1.4 CHAPTER DIVISION

The chapters in this mini-dissertation are presented as follows:

Chapter 1: Introduction.

Chapter 2: Research article.

Chapter 3: Conclusions, limitations and recommendations.

1.5 CHAPTER SUMMERY

Chapter 1 looks at the importance of having EI measures that are valid and reliable. The nursing environment is a place where EI is of much importance. An investigation of the term EI was undertaken. The different perspectives of measuring EI were looked at. The chapter also focuses

on the SEIS' psychometric properties and factor structure. This chapter gives guidance to rest of the study by stipulating the research questions, research objectives, research method and chapter division.

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CHAPTER 2

RESEARCH ARTICLE

Confirming the factor structure of the 41-item version of the Schutte Emotional Intelligence Scale

ABSTRACT

Orientation – This study explored the factor structure of the 41-item version of the Schutte Emotional Intelligence Scale within a South African nursing environment.

Research purpose – The main aim of this study was to investigate the factor structure of the 41-item version of the Schutte Emotional Intelligence Scale within a South African nursing environment.

Motivation for the study – The 41-item version of the Schutte Emotional Intelligence Scale is one of the leading brief Emotional Intelligence scales in the world. Presently, the 41-item version of the Schutte Emotional Intelligence Scale has not been tested on a South African population. In international research, there have been some different findings with regard to the scale's factor structure. The factor structure should be tested and investigated before applying it in the South African work context.

Research design, approach and method – A quantitative research design was used in this study. A cross-sectional survey design was used for this study. An availability non-probability sample *(N = 290)* was taken from hospitals in the Gauteng and North West Provinces of South Africa. The Schutte Emotional Intelligence Scale was applied as measuring scale.

Main findings – The data fitted the original model of Emotional Intelligence of Salovey and Mayer (1990), best explaining 58.52% of the variance. The results supported a five-factor structure of the Schutte Emotional Intelligence Scale. The five factors were named: Emotion Utilisation, Emotion Management, Emotion Awareness, Emotion Perceiving and Emotion Integration.

Practical / managerial implications – The findings of this current research study may possibly be set as a benchmark for using the Schutte Emotional Intelligence Scale as a five-factor structure within the South African nursing environment. This will assist the management of hospitals to select, place and develop nurses.

Contribution/value-add – This study expands on current theoretical knowledge of Emotional Intelligence, the measurement of Emotional Intelligence and the psychometric properties of the Schutte Emotional Intelligence Scale.

Key words: Industrial Psychology; psychometrics; Emotional Intelligence- measurement- 41-Item version of the Schutte Emotional Intelligence Scale-Quantitative-cross-sectional-South African nursing context.

OPSOMMING

Oriëntasie – Die studie het die faktor struktuur van die 41-item weergawe van die Schutte Emosionele Intelligensie Skaal binne 'n Suid-Afrikaanse verplegingskonteks bestudeer.

Navorsings doelwit - Die hoof doel van hierdie studie was om die 41-item weergawe van die Schutte Emosionele Intelligensie Skaal binne 'n Suid-Afrikaanse verpleegingskonteks te bepaal.

Motivering vir die studie – Die 41-item weergawe van die Schutte Emosionele Intelligensie Skaal is een van die mees algemeen gebruikte, kort meetinstrumente van Emosionele Intelligensie ter wêreld. Die 41-item weergawe van die Schutte Emosionele Intelligensie Skaal is egter nog nie getoets op 'n Suid-Afrikaanse populasie nie. In internasionale navorsing is verskillende bevindinge gevind rakende die faktor struktuur van die skaal. Die faktor struktuur moet getoets word en bestudeer word voordat die skaal toegepas kan word in 'n Suid-Afrikaanse konteks.

Navorsingsontwerp, -benadering en metode - 'n Kwantitatiewe navorsingsontwerp is gebruik in die studie. 'n Dwarsdeursnee-opname ontwerp met 'n beskikbaarheidsteekproef *(N =290)* is

van hospitale in die Gauteng en Noordwes Provinsies van Suid-Afrika geneem. Die Schutte Emosionele Intelligensie Skaal is gebruik as meetinstrument.

Hoof bevindenge - Die data het die oorspronklike model van Emosionele Intelligensie van Mayer en Salovey (1990) die beste gepas en 58.52% van die variansie verduidelik. Die resultate ondersteun 'n vyffaktorstruktuur van Emosionele Intelligensie. Die vyf faktore is benoem as Emosiegebruik, Emosiebestuur, Emosiebewustheid, Emosieherkenning en Emosie-integrasie.

Praktiese/bestuursimplikasies - Die bevindinge van hierdie studie kan moontlik gebruik word om die die Schutte Emosionele Intelligensie Skaal met 'n vyf-faktor struktuur as meetinstrument in die Suid-Afrikaanse verpleegingskonteks toe te pas. Hospitaalbestuur kan die skaal gebruik vir die selektering, plasing en ontwikkeling van verpleegsters.

Bydrae/ waardetoevoeging - Hierdie studie brei uit op die huidige teoretiese navorsing van Emosionele Intelligensie, die meting van Emosionele Intelligensie en die psigometriese eienskappe van die Schutte Emosionele Intelligensie Skaal.

Kernwoorde: Bedryfsielkunde; psigometrika; Emosionele Intelligensie-meting; 41-Item weergawe van die Schutte Emosionele Intelligensie Skaal; Kwantitatiewe navorsing; Dwardeursnee-opname; Suid-Afrikaanse verpleegingskonteks.

INTRODUCTION

During the past 20 years, Emotional Intelligence (EI) has become a very popular topic within the fields of psychology and organisational behaviour (Mayer, Roberts, & Barsade, 2008; Salovey & Mayer, 1995). Salovey and Mayer (1990) were the first researchers to conceptualise the construct of EI. Their conceptualisation comprises three mental abilities of emotion management: firstly, the appraisal and expression of emotions in oneself and others; secondly, the regulation of emotion in oneself and others; and thirdly, the utilisation of emotions to facilitate thought.

Mayer and Geher (1996) further state that EI includes the abilities to gain and understand emotional knowledge, to thoughtfully regulate emotions in order to support emotional growth and to promote intellectual well-being. Salovey and Mayer(1997) elaborated on their initial definition by stating that EI is the ability to recognise emotions, to evaluate and develop emotions to assist thought, to comprehend emotions and emotional knowledge, and to regulate emotions thoughtfully to encourage emotional and intellectual development.

According to Ogillka-Bulik (2005), the ability to manage your own emotions, while having the ability to identify others' emotions, is very important in the nursing environment. EI is a fundamental part in the quality of service rendered by nurses (Murphy & Janeke, 2009). EI plays a fundamental role in the establishment and management of relationships in the nursing environment (Akerjordet, 2009; Elfenbein & Ambady, 2002; Winstanley & Whittington, 2004). Nurses with high levels of EI are able to manage their relationships with diverse others and are also able to maintain a better attitude towards diversity and patient care (Dimitriades, 2007; Gignac & Ekermans, 2010). Nurses have to form and maintain relationships within environments where wide arrays of different emotions are prevalent (Bone, 2002). Within the nursing environment critical decisions, bound by professional ethics and codes of practice, unpredictable and chaotic conditions are part of everyday routine (Brunton, 2005). Emotions influence relationships with co-workers, have an effect on patient care and decision-making, and affect nurses at an intrapersonal level (Brunton, 2005). Research indicates that there is a positive link between high levels of EI and high levels of contentment, engagement and satisfaction that

nurses experience in their work (Antonakis, Ashkanasy, & Dasborough, 2009). The display of EI and the measurement of EI are thus very important in the nursing environment.

According to Roberts, Zeidner, and Matthews (2004) the application of EI measures for job selection and placement reasons has gained a lot of popularity within organisations. Organisations are starting to see the value of including EI as a vital component in the management of its human capital. The value of EI is best seen in the organisation when it is used for the evaluation and on-going functioning and the well-being of employees at critical stages of their careers. EI is thus very important in any organisational environment, especially an emotional one like the nursing environment.

Because EI is so important in places like the nursing environment, the academic research on this topic has also rapidly grown (Downey, Papageorgiou, & Stough, 2006; Matthews, Roberts, & Zeidner, 2002). Hakanen (2004) and Murphy and Janeke (2009) stated that research on the measurement of EI has advanced considerably because the realisation of using EI as an employee development tool has gained a lot of popularity. When Goleman (1995) first stated that EI is as strong a predictor of job performance as IQ, researchers started asking the question about the fundamental importance of the measurement of EI.

The measurement advantages of EI in the workplace have also caught the attention of human resource practitioners, who have made EI measurement a widely used tool for personnel hiring, training and development. Research on these EI measuring tools in order to improve and develop their use in the workplace is needed to ensure fair assessment in the workplace (Fineman, 2004). According to Downey, Papageorgiou, and Stough, (2006), the knowledge gained from researching EI as a measuring tool can develop the theoretical knowledge of the EI construct as well as help in the development and enhancement of EI measuring tools.

Once researchers and organisational management realised the importance of EI in the workplace they started looking at ways to identify, enhance and develop EI amongst employees. This meant that EI had to be measured (Hakanen, 2004). Over the past fifteen years quite a number of

measurement tools concerning the measurement of EI have been developed (Ciarrochi, Chan, Caputi, & Roberts, 2001; Mayer, Roberts, & Barsade, 2008).

In spite of all the research, a lot of criticism regarding the credibility of the psychometric properties and factor structures of some of these EI measurement tools still remain (Goleman 2005; Saklofske, Austin & Minski, 2003). Dimitriades (2007) states that this weakness in research; to find scientifically sound, objective measures of the EI construct, may have a negative effect on the promotion and development of EI in the workplace.

In this regard, Roberts, Zeidner, and Matthews (2004) state that the development of reliable and valid measures of EI is very important in order to influence positive development in the academic and scientific areas of EI as well as in the workplace. According to Arthur, Bell, Villado and Doverspike (2006), the process in developing and validating an EI measure requires convincing empirical evidence in order for the measure of EI to predict career achievement or other important, on-the-job criteria. A number of researchers (Bar-On, 1997; Salovey & Mayer, 1990; Schutte & Malouff, 1998) have thus developed self-report measures of the EI construct. Tsaousis (2007) adds to this by stating that there is a need for validated instruments that are based on an all-inclusive and economical model. Many of these measures, however, have weak reliabilities, weak validities and problems in their factor structures. Valid, reliable tools with satisfactory factor structures must be used in order to determine the impact that EI has on organisational outcomes (Polit & Beck, 2008).

Much research have been done on the psychometric properties of the Schutte Emotional Intelligence Scale (SEIS) (Austin, Saklofske, Huang, & McKenney, 2004; Carmeli, 2003; Ciarrochi, Chan, Caputi, & Roberts, 2001; Dimitriades, 2007; Grant & Cavanagh, 2007; Hakanen, 2004; Jonker & Vosloo, 2008; Petrides & Furnham, 2000; Schutte et al., 2010). The SEIS is based on the ability model of EI by Salovey and Mayer (1990). The SEIS measures the perception, understanding, expression, regulating and harnessing of emotion oneself and in other people (Schutte & Malouff, 1998). The measurement can be used in research by looking at EI in individuals, the effect of EI, as well as whether EI could be improved in the individual or

organisation (Schutte & Malouff, 1998). The developers claim that the usage of the SEIS is very beneficial within EI research and practice (Schutte & Malouff, 1998).

However, due to certain factors, there has been a lot of debate about the usage of the SEIS. There are two versions of the scale available, namely the 33-item version and the 41-item version (Petrides & Furnham, 2000). The 33-item version, the more widely used version, consists of 33 self-reverencing statements (items) where respondents rate the extent to which they agree or disagree with each statement on a five-point Likert scale. It has been criticised for having a lack of reverse-keyed items (Petrides & Furnham, 2000). The 41-item version was developed by Austin et al. (2004) as an improvement for the problematic 33-item version. There are certain problems with the 41-item version as well. Differences in factor structures have been found in both the 31 and 41-item versions of the SEIS. Research studies have found that the SEIS has anything between one to six factor structures (Jonker & Vosloo, 2008; Petrides & Furnham, 2000).

The revised version of the 33-item scale of Schutte et al. (1998) was constructed in which reversed wordings were devised for nine of the original 30 forward-keyed items. In addition, eight new items were included. The resulting 41-item scale had 20 forward-keyed and 21 reverse-keyed items (Austin et al., 2004). No studies have been done to find a consistent factor structure for the 41-item version of the SEIS and no research has been done in South Africa to determine the psychometric properties of the 41-item version in a South African working context.

The only study in South Africa that came close to filling this research void was that of Jonker and Vosloo (2008) that was done on Economic Sciences students. They found a six-factor structure on the 33-item version of the scale. As mentioned previously, there are problems with the items of the 33-item version of the scale and the six-factor model, which they found is not consistent with the authors of the SEIS's one-factor model (Schutte & Malouff, 1998). Jonker and Vosloo (2008) state that better results could be obtained by using confirmatory factor analyses on the 41-item version of the scale. The results of their study could serve as a standard for measuring the EI of Economic Science students at a higher educational institution, but not for

the working environment. Thus, a valid, reliable, standardised, consistent factor of the 41-item version of the SEIS in a nursing environment that can be utilised for research purposes is still elusive. The literature review will now follow where the construct of EI will be discussed and the psychometric properties of the SEIS will be reported on.

LITERETURE STUDY

Emotional Intelligence (EI)

Salovey and Mayer (1990) were the first to define Emotional Intelligence (EI). Their research has proven EI is a mental ability concerning the connection between emotion and cognition. Salovey and Mayer(1997) refined their original definition by claiming that EI is the aptitude to be aware of one's emotions, to appraise and generate one's emotions to assist in thinking, to understand emotions and emotional information, and to control emotions to support emotional and intellectual growth in oneself. Numerous research debate has developed concerning the most appropriate, valid and reliable approach for the measurement of EI (Petrides & Furnham, 2000; Van Rooy & Viswesvaran, 2005).

Models of EI measurement were developed and these models are grouped together under two schools of thought concerning the definition of EI. The one approach claims that EI is a cognitive ability, while the other approach believes that EI is part of an individual's disposition. Firstly, the cognitive ability approach claims that EI, like other forms of intelligence, is a set of cognitive skills (Mayer, Salovey, & Caruso, 2008). These ability-based EI measures measure EI by making use of problem-solving performance tests. Emotional information is used to reason about emotion. The problem that ability EI tests face is the intrinsic biasness of emotional experience (Sedmar, Robins, & Ferris, 2006; Spain, Eaton, & Funder, 2000; Watson, 2000). A problematic characteristic that these ability-based tests have is EI cannot be objectively scored because, in most cases, there are no standardised criteria for what comprises correct responses. This causes these measures to have problems with regard to their psychometric properties (Austin, 2005; Matthews, Roberts, & Zeidner, 2004). In addition, the practicality of administrating these performance-based measures is limited in that these tests are extensive to administer, taking between 45 and 60 minutes to complete, and the expense of using these tests, even for research purposes, is high (Saklofske et al., 2003; Van Rooy & Viswesvaran, 2005).

The second approach to EI measurement proposes that EI is mainly dispositional or a trait in an individual. These measurements rely on a self-report format where respondents are asked to demonstrate a multitude of cognitive, dispositional, motivational and emotional traits. While completing these trait measurements, respondents are asked to give information on their individual beliefs, feelings and behaviours (Bar-On, 1997; Petrides & Furnham, 2000; Polit & Beck, 2008). When comparing these trait EI measurements, using self-report measurements, to problem-solving performance measures, there were some major differences. Unlike problem-solving performance measures, self-reported EI tests were found to have incremental validity, reporting unique differences in outcomes (contentment, life satisfaction, solitude and depression) not accounted for by personality. Abundant research has been found to support the discriminant and incremental validity of trait EI tests (Petrides & Furnham, 2000). A self-report method of measuring trait EI that has been used in a multitude of research is the Schutte Emotional Intelligence Scale (SEIS) (Schutte & Malouff, 1998).

Schutte Emotional Intelligence Scale (SEIS)

Research on the SEIS in international studies has found that it is a valid and reliable measure of trait EI as a global factor (Grant & Cavanagh, 2007). When a measure is valid, it measures what it is intended to measure; in this case, trait EI (Akerjordet & Severinsson, 2004). The SEIS has been found to express some face, construct, predictive, discriminant and criterion validity (Petrides & Furnham, 2000; 2003). The construct validity of a measure must be determined before any other form of validity can be determined (Akerjordet & Severinsson, 2004). The best way of establishing a measurement's construct validity is by establishing what the factor structure of that measurement is. The measure's factor structure must entail the number of factors theorised by the literature and the pattern of the factors found (Grant & Cavanagh, 2007; Petrides, Perez-Gonzalez, & Furnham, 2007). As mentioned before, a measure must also be reliable.

When a measure is reliable, it measures a construct constantly across a certain timeframe, individuals and situations. In the case of the SEIS; measuring EI consistently. Internal reliability, which proposes the consistency of a single test form, is of much importance in any psychometric

measure (Akerjordet & Severinsson, 2004). In the research by Ciarrochi et al. (2001) it was found that the reliability of the factors of the SEIS was a lot lower than the reliability of the full measure, which has proven to be very reliable. According to the Cronbach alpha coefficient, the SEIS has demonstrated high internal consistency (Cronbach alpha ranging from 0.87 to 0.90) and sufficient two-week test-retest reliability (r = 0.78) (Schutte & Malouff, 1998). It is important to take into account that a valid measure must be reliable, but a reliable measure does not have to be valid. Both reliability and validity can be assessed statistically (Akerjordet & Severinsson, 2004; Geher, Warner & Brown, 2001).

The fact that the SEIS has only 33 or 41 items, has led to it becoming the leading short scale for measuring and conducting research on trait EI. Researchers and practitioners prefer it because it is much shorter in comparison to the other leading trait EI scales, namely the 133-item Bar-On Emotional Quotient Inventory (Bar-On EQ-I) (1997) and the 360-item Emotional Quotient Inventory (EQI) (Austin et al., 2004). Another reason that the SEIS is so popular is that, unlike these other major trait scales, it can be used in research. These leading trait scales are also used commercially and are often very expensive (Grant & Cavanagh, 2007). The SEIS's psychometric properties, items and factor structures have been researched in many studies (Austin et al., 2004; Jonker & Vosloo, 2008; Petrides & Furnham, 2000; Saklofske et al., 2003). However these studies found some differences and problems; firstly, with the items and secondly, it has been found to have a large majority of different factor structures for each study.

The more popular 33-item version of the SEIS has been condemned for having a shortage of reverse-keyed items (Petrides & Furnham, 2000) which could have a negative influence on the responses and the overall score of EI (Austin et al., 2004). Because of this problem with the 33-item of Schutte and Malouff (1998), a new version, in which reversed wordings were created for nine of the original 30 forward-keyed items, was developed by Austin et al. (2004). Eight new items were also integrated into this new version. This all added that a 41-item version of the SEIS, which had 20 forward-keyed and 21 reverse-keyed items, was developed and approved (Austin et al., 2004).

The items of both the 33-item version and the 41-item version of the SEIS were developed by basing them on the three primary content domains of Salovey and Mayer's (1990) original definition of the EI construct. These domains include the assessment and expression of emotion, the regulation of emotion, and the exercise of emotion. By combining Salovey and Mayer's (1997) revised-ability model, central pieces in Goleman's (1995) and Bar-On's (1997) EI models and emotional knowledge, the items of the SEIS cover most aspects of measuring trait EI. In research that used British (Petrides & Furnham, 2000), Australian (Gannon & Ranzijn, 2005) and Canadian (Saklofske et al., 2003) university students, comparative samples of nearly identical factor structures of the SEIS were found. The six factors found were Positive Affect, Emotion-Others, Happy Emotions, Emotions-Own, Non-verbal Emotions and Emotional Management. When taking into account that the SEIS showed consistent factor structures across borders, it can be said that the SEIS should show consistent factor structures within South Africa when looking at a working population.

The SEIS has been found to be reliable and valid and a 41-item version that addresses the problems of the 33-item version has been developed, but the research debate over the SEIS's factor structure still continues. Because the authors of the SEIS, Schutte and Malouff (2008), have proposed a uni-factorial structure for the SEIS due to findings that the SEIS total score measured a general EI construct, researchers started asking questions. The authors of the SEIS' findings could be explained that the 33 items comprising the final version of the scale all loaded on a first component in a varimax rotated principal components study (PCA) and because Schutte et al. (1998) obtained a high-scale alpha (0.87). This component was a general EI factor. Other researchers, however, did not find a general EI factor.

Petrides and Furnham's (2000) reaction to the findings of Schutte and Malouff (2008) was that their findings, that all the items loaded on a first component, did not essentially suggest a general factor because the varimax rotation distributes variance away from a general factor and across orthogonal factors. When they did a factor analysis, the factors that they found were: Optimism/Mood Regulation, Appraisal of Emotions, Social Skills and Utilisation of Emotions. Austin et al. (2004) has found a three-factor structure for the SEIS. These factors were defined as: Optimism/Mood Regulation, Utilisation of Emotions and Appraisal of Emotions.

In other individual studies by Petrides and Furnham (2000); Ciarrochi, Chan, and Bajar (2001), and Ciarrochi et al. (2001) all agreed on a four-factor result. These factors can be described as Optimism/mood regulation, Appraisal of emotions, Social skills and Utilisation of emotions. These researchers even found confirmation for two-factor and ten-factor structures, while admitting that they might have overestimated the amount of factors. Saklofske et al. (2003) have also identified a four-factor result, but found that not all the items loaded on the same factors. Results obtained with an exploratory factor analysis by Ciarrochi, Chan, and Bajar (2001) specified that the 33 items appeared in significant clusters, describing four dimensions of apparent EI.

Limited research has been done in South Africa on the SEIS. A South African study by Jonker and Vosloo (2008) among business sciences students yielded a six-dimensional factor structure of the SEIS, explaining 45.24% of the variance. The six factors could be described as Positive Affect, Emotion-Others, Happy Emotions, Emotions-Own, Non-verbal Emotions and Emotional Management. In their discussion, they found that having the SEIS in only the English language could lead to inconsistency in responses and would possibly lead to biasness. They stated that the problems with some of the items could be explained that respondents found it hard to comprehend and/or grasp some of the item wording. This is a possible explanation in the differences in the factor structures. When comparing these findings to those of international research it differs in terms of what the factors explain, as well as obviously the number of factors. The many different findings in the factor structures of the SEIS in international research and in the research of Jonker and Vosloo (2008) indicate that there is a need for research on a consistent factor structure of the 41-item version of the SEIS before it is used in any other research.

Apart from the study by Jonker and Vosloo (2008), the SEIS have been used by Van der Merwe (2005) in the nursing environment. Van der Merwe (2005) found a five-factor structure when they tested the psychometric properties and accuracy of the SEIS on a South African nursing population. They made use of a basic factor analysis on the 33-item version of the SEIS to establish the factor structure. This five-factor structure explained 50.04% of the total variance.

These five factors were categorised as Positive State, Own Emotions, Negative Emotions, Emotions of Others and Emotional Management. The likely reason for the opposing factor explanations for the two studies carried out in South Africa might be the research populations (students and nurses) used. The reality that nurses are embedded in more emotional work than students were theorised as a possible explanation in the diverse factors found. Another example of where the SEIS was used within a nursing environment was the impact of trait EI on nursing-team performance and cohesiveness. The SEIS measured a Cronbach alpha of 0.75 in the study by Quoidbach and Hansenne, (2009).

The conclusion can be drawn that there are different findings with regard to the factor structure of the SEIS. These different findings can be viewed in Table 1. According to Table 1, a uni-factorial structure for the SEIS was found by Schutte and Malouff (1998), a three-factor structure was found by Austin and colleagues (2004), a four-factor structure by both Petrides and Furnham (2000), and Ciarrochi, Chan and Bajar (2001). Ciarrochi et al. (2001), Saklofske et al. (2003) and Jonker and Vosloo (2008) reported a six-factor structure of the SEIS. When taking all of this into account, the goal of this research article will be to determine the factor structure of the 41-item version of the SEIS. Reliability and validity of the 41-item version will also be assessed within a nursing population in the South African context.

Table 1 explains the various studies pertaining to the Schutte Emotional Intelligence scale with altered factor structures, with their factor structures explained.

Table 1: *Various studies pertaining to the Schutte Emotional Intelligence Scale with altered factor-structures*

Item Version	Authors	Number of factors	Factor description
33	Schutte et al. (1998)	1	Uni-factoral
33	Petrides and Furnham (2000)	4	Optimism/Mood Regulation, Appraisal of Emotions, Social Skills and Utilisation of Emotions
41	Austin, Saklofske, Huang and McKenney (2004)	3	Optimism/Mood Regulation, Utilisation of Emotions and Appraisal of Emotions.
33	Ciarrochi, Chan, Caputi, and Roberts (2001)	4	Optimism/mood regulation, Appraisal of emotions, Social skills and Utilisation of emotions
33	Ciarrochi, Chan, and Bajar (2001);	4	Optimism/mood regulation, Appraisal of

			emotions, Social skills and Utilisation of emotions
41	Saklofske, Austin, and Minski (2003)	4	Positive Affect, Emotion-Others, Happy Emotions, Emotions - Own, Non-verbal Emotions and Emotional Management
41	Van der Merwe (2005)	5	Positive State, Own Emotions, Negative Emotions, Emotions of Others and Emotional Management
41	Jonker and Vosloo (2008)	6	Positive Affect, Emotion-Others, Happy Emotions, Emotions -Own, Non-verbal Emotions and Emotional Management

METHOD

Research design

A cross-sectional research approach was utilised. A cross-sectional method examines numerous groups of people at one point in time (Byrne, 2001). Cross-sectional designs are used for simultaneously examining groups of subjects in various stages, while the survey describes a technique of data collection in which questionnaires are used to collect data about the identified population (Byrne, 2001).The researcher undertook a quantitative research approach to answer the research questions and reach the goal of the study. Quantifiable data is created by quantitative research. This type of approach is principally concerned with observable and measurable phenomena concerning individuals, events or things and creating the correlation between variables making use of statistical measures (Polit and Beck, 2008). Quantitative research explores phenomena that need accurate measurement and quantification, often concerning exact and controlled design (Polit & Beck, 2008). Quantitative research often has to be fairly controlled in order to improve objectivity. Quantitative research mainly consists of numbers summarised into statistics in order to support the researcher to understand obtained data and reach conclusions (Polit & Beck, 2008).

Participants and procedure

An availability non-probability sample from (N = 290) of individuals from the nursing environment was used. Hospitals from the public and private sector within the North West and Gauteng Provinces of South Africa were targeted. Table 2 presents the characteristics of the participants

Table 2: *Characteristics of the participants* (*N* = 290)

Item	Category	Frequency	Percentage
Gender	Male	19	6.6
	Female	271	93.6
Ethnicity	White	144	49.7
	African	146	50.3
Language	Afrikaans	130	44.8
	English	65	22.4
	Sepedi	20	6.9
	Sesotho	28	9.7
	Setswana	47	16.2
Age	18-31	131	45.3
	32-42	64	22.1
	43-52	64	22.1
	53-60	21	7.3
	61-65	8	2.8
Province	Gauteng	207	71.4
	North-West	83	28.6
Sector	Private	152	52.4
	Public	138	47.6
Qualification	Lower than grade 10	19	6.6
	Grade 10	13	4.5
	Grade 12	18	6.2
	Technicon diploma	32	11.0
	Postgraduate degree	122	42.1
	Grade 11	49	16.9
	Technical college diploma	13	4.5
	University degree	23	7.9
	Other – specify	289	99.7

According to Table 2, the participants were predominantly female (93.6%). The sample furthermore consisted of Afrikaans (44.8%), English (22.4%), Sepedi (6.9%), Sesotho (9.7%) and Setswana (16.2%) participants of which there were more African (50.3%) participants. The languages Sepedi, Sesotho and Setswana made up a representation of 49%. The participants were also predominately from the Gauteng Province (71.4%), while only 28.6% were from the North West Province. The division between the percentage of participants from the private sector (52.4%) and the percentage from the public sector (47.6%) were rather even. The majority of the participants were between the ages of 18-31 (45.3%). As for the qualification level of the participants, most had a post graduate degree (42.1%). The percentage of the population that had a qualification lower than grade 10 was 6.6% and the percentage of the participants that had a university degree was 7.9 %.

Consent to conduct the study on the premises of each hospital was obtained from each hospital's management. Each hospital's Human Resources (HR) practitioner was present throughout the researcher's presence on the hospital's premises. A letter, requesting participation in the study, was e-mailed to all the nurses that could take part in the study. The letter explained the key objectives and the nature of the study. An explanation that the respondents had full anonymity during the study was also put in the e-mail. All the nurses who were available at the time were asked to fill in the form that said they had given their informed consent in the study. Test booklets were provided, which included the biographical questionnaire, the SEIS 41-item scale and an answer sheet. The respondents were given limitless time to complete the paper-based questionnaires. On completion of the questionnaires, the respondents placed their answer sheets into marked boxes according to their demographic characteristics. The different hospitals that participated were given comprehensive feedback via email concerning the summary for EI in the health professions as well as information concerning employee-assistant programs.

Measuring instruments

A biographical questionnaire and the Schutte Emotional Intelligence Scale were used.

Biographical questionnaire

A biographical questionnaire was used to determine the biographical characteristics of the participants. The respondents were asked to respond on a nominal scale. In this questionnaire there was a question regarding the age of the participants. The respondents were also asked to give their gender and place of birth. For reasons of differentiation, the language and ethnic groups of the participants were asked. The job profile and education level of the participants were also identified.

Schutte Emotional Intelligence Scale (SEIS)

The Schutte Emotional Intelligence Scale (SEIS) was used in this study. The scale encompasses 41 items or questions (Schutte & Malouff, 1998). Respondents answer on a Likert-type scale. The total score was obtained by summarising the item responses. The SEIS is a very popularly used brief scale of measuring trait Emotional Intelligence. The SEIS is founded on Salovey and Mayer's (1990, 1997) trait models of EI.

The scale includes the thoughtful regulation, evaluation and awareness of emotions in the individual. The SEIS measures the knowledge, perception, expression, regulation and control of emotions in the respondent and others (Schutte & Malouff, 1998). Ways to utilise the scale in academic research entail investigating the characteristics of Emotional Intelligence, the consequence of Emotional Intelligence and the development of Emotional Intelligence (Schutte & Malouff, 1998). The developers of the 41-item version of the SEIS, Austin et al. (2004), found the overall internal reliability to be 0.85. These researchers established three factors and their internal reliabilities were 0.78; 0.68; and 0.76. Here are two examples of items loading on factor one: Item 29: "I motivate myself by imagining a good outcome to tasks I take on."; Item 38: "I use good moods to help myself keep trying in the face of obstacles." Here are two examples of items loading on factor two: Item 34: "Emotions don't play a big part in how I deal with problems."; Item 23: "I don't believe that my emotions give any help in coming up with new ideas". Here are two examples of items loading on factor three: Item 22: "I tend to misread peoples' facial expressions."; Item 36: "I don't know what others are feeling just by looking at them."

Statistical analysis

The statistical analysis of this study was carried out with the SPSS program and the AMOS program (SPSS Inc., 2011; AMOS 5.0). Descriptive statistics (e.g. means, standard deviations, range, skewness and kurtosis) was used to analyse the data. Stevens (1996) describes skewness as the measurement of the degree of unevenness or asymmetry demonstrated by the data. He further describes that kurtosis measures how the histogram has peaked.

Cronbach-alpha coefficients were used to determine the internal consistency, homogeneity and uni-dimensionality of the measuring instrument (Clark & Watson, 1995). Coefficient alpha contains important information regarding the proportion of variance of the items of a scale in terms of the total variance explained by the particular scale (Nunnally & Bernstein, 1994). A coefficient of 0.70 indicates that the items are regarded as reliable (Nunnally & Bernstein, 1994).

A Confirmatory Factor Analysis, using Structural Equation Modelling (SEM) in (AMOS 5.0), was used. According to Kline (1998) CFA allows the testing of the hypothesis to establish if a relationship between the observed variables and their underlying latent construct(s) exist. According to Byrne (2001), SEM is a powerful multivariate process, allowing the assessment of a series of concurrent hypotheses about the impact of latent and manifest variables on other variables, taking errors of measurement into account. Statistically appraising the fit of a model to the covariance matrix is accomplished using a "goodness-of-fit" test referenced against the χ^2 (Model Chi-square) distribution. A Confirmatory Factor Analysis was tested in Structural Equation modelling to determine the goodness of fit of a One-, Two-, Three- and Five-Factor model of the SEIS.

The Chi-Square value is the conventional assessment for determining general model fit and, "assesses the magnitude of discrepancy between the sample and fitted co-variances matrices" (Hu & Bentler, 1999: 2). Maximum probability estimation was used and the input for each analysis was the covariance matrix (Byrne, 2001). To test the different factor structures of the SEIS, several nested models were compared by means of the χ^2 difference test. In addition,

absolute and relative indices were computed to assess the goodness-of-fit of the different SEIS models.

As recommended by Marsh, Balla, and Hau (1996), the following relative goodness of fit indices were computed: (1) The Goodness-of-fit statistic (GFI) is applied as a substitute to the Chi-Square analysis and determines the percentage of variance that is accounted for by the anticipated population covariance (Tabachnick & Fidell, 2007); (2) The Adjusted Goodness-of-fit statistic (AGFI), which adjusts the GFI based upon degrees of freedom, with more saturated models reducing fit (Tabachnick and Fidell, 2007); (3) Parsimony Fit indices (PGFI) are based upon the GFI by adjusting for loss of degrees of freedom (Crowley and Fan, 1997); (4) Normed Fit Index (NFI) evaluates the model by assessing the $\chi2$ value of the model to the $\chi2$ of the null model (Bentler & Bonnet, 1980); (5) Incremental Fit Index (IFI provides a measure of the comparative improvement in fit of a substantive model in relation to a null model that is rooted within the substantive model (Tucker & Lewis, 1973); (6) Comparative Fit Index (CFI) statistics assumes that all latent variables are uncorrelated (null/independence model) and compares the sample covariance matrix with this null model (Bentler, 1990) and (7) The RMSEA informs us how well the model, with unknown but optimally selected parameter estimates would fit the population's covariance matrix (Byrne, 2001).

With regards to the above mentioned fit indices values of 0.90 or higher indicate a good fit for all the relative fit indices for the model to have a good fit. When considering the Root Mean Square Error of Approximation (RMSEA) ideally the lower value of the 90% confidence interval includes or is very near to zero (or no worse than 0.05) and the upper value is not very large, i.e., less than 0.08 (Byrne, 2001) for the model to have a good fit

Next, the results of the research article follow.

RESULTS

In the results a descriptive statistics table of the five factors of the best-fit model will be analysed, a table explaining the Confirmatory Factor Analysis of a One-, Two-, Three- and Five-Factor model of the SEIS will be analysed, a table explaining the Exploratory Factor Analysis of the SEIS: Five Factor Model will be analysed and finally a figure of the Confirmatory Factor Analysis of the Salovey and MayerFive Factor Model will be given.

Table 3 shows the means, standard deviations, skewness, kurtosis and Cronbach-alpha coefficients of the five factors found for the best-fit model of which the goodness-of-fit will be provided in the next section. Descriptive statistics illustrate the elementary features of data in a research study by taking into consideration the means, standard deviations, skewness, kurtosis and Cronbach-alpha coefficients (De Vos, Strydom, Fouché & Delport, 2005:137). Stevens (1996) describes skewness as the measurement of the degree of unevenness or asymmetry demonstrated by the data. He further describes kurtosis measures as how the histogram has peaked. De Vos et al. (2005) describe Cronbach-alpha coefficients as the degree to which a measure or factors have internal reliability.

Table 3: *Descriptive statistics of the five factors of the best-fit model*

Item	Mean	SD	Skewness	Kurtosis	α
Emotion Management	17.71	5.38	0.01	-0.79	0.75
Emotion Integration	30.83	9.35	-0.56	-0.86	0.89
Emotion Perceiving	14.91	4.29	-0.34	-0.31	0.70
Emotion Awareness	12.14	4.87	-0.06	-0.94	0.74
Emotion Utilisation	43.28	8.75	-0.43	-0.30	0.81

Table 3 shows that Cronbach-alpha coefficients varying from 0.70 to 0.89 were obtained for all the SEIS factors on the Salovey and Mayer model of Emotional Intelligence. The factors Emotion Perceiving ($\alpha = 0.70$) and Emotion Awareness ($\alpha = 0.74$) showed the lowest alpha values, but are still acceptable, because the alphas are higher than the cut-off point of > 0.70 (Nunnally & Bernstein, 1994). The values for the five factors in the best-fit model were all acceptable. It is evident in the table that the scores from the various scales for each model are relatively normally distributed, with acceptable skewness (between -1 and 1) and kurtosis (between -1 and 1).

In Table 4, a Confirmatory Factor Analysis was tested by means of Structural Equation modelling to determine the goodness of fit of a One-, Two-, Three- and Five-Factor model of the SEIS. According to Byrne (2010), the objective of Confirmatory Factor Analysis is to test whether the data fit a hypothesised measurement model. This hypothesised model is based on

theory and/or previous methodical research. Supreme Fit indices establish how well the a priori model fits, or replicates the data. Supreme Fit indices include, but are not restricted to, the Chi-Squared test, GFI, AGFI, PGFI, NFI, IFI, TLI, CFI AND RMSEA.

Table 4: *Confirmatory Factor Analysis of a One-, Two-, Three- and Five-Factor model of the Schutte Emotional Intelligence Scale*

		CMIN/DF	GFI	AGFI	PGFI	NFI	IFI	TLI	CFI	RMSEA
Model	1: One-factor	8.17	0.48	0.40	0.42	0.45	0.48	0.43	0.48	0.17
Model	1: Revised	7.82	0.59	0.50	0.49	0.57	0.60	0.56	0.50	0.15
Model	2: Two-Factor	6.54	0.56	0.50	0.49	0.53	0.57	0.54	0.57	0.14
Model	2: Revised	6.39	0.57	0.52	0.51	0.54	0.58	0.55	0.58	0.14
Model 3:Three-Factor		6.52	0.62	0.56	0.53	0.54	0.58	0.54	0.58	0.14
Model	3: Revised	6.17	0.64	0.59	0.55	0.57	0.61	0.57	0.61	0.13
Model	4: Mayer-and Solevey-based Five-Factor	3.79	0.79	0.72	0.58	0.78	0.83	0.78	0.83	0.09

Model 4: Revised	3.40	0.82	0.74	0.57	0.82	0.90	0.80	0.90	0.09

Model 1

Model 1 (one-factor) model: The data did not fit the model, even after inspection of the modification indices; the revised model did not fit the data adequately. Inspection of the modification indices (MI) revealed that the fit could be improved if correlation was allowed between measurement errors and items with non-significant regression weights were eliminated from the model. This meant that the fit of the proposed model could be improved if the errors between items 31 and 21 and between items 27 and 21 were allowed to correlate. Items 22, 6, 8 and 3 were eliminated from the model because of the non-significant regression weights (item 22: $p = 0.04$; item 6: $p = 0.16$; item 8: $p = 0.04$ and item 4 $p = 0.35$. The revised model, however, also indicated a poor model fit (CMIN/DF = 7.82; GFI = 0.59; AGFI = 0.50; PGFI = 0.49; NFI = 0.57; IFI = O.48; TLI = 0.56; CFI = 0.50; RMSEA = 0.15). After the results had thus indicated that a one-factor model indicated poor model fit, it was decided to test a two-factor model.

Model 2

Model 2 (Two-factor model): This model was tested to confirm a possible two-factor model consisting of Management of Emotions/ Integration of Emotions as one factor and perceiving and Awareness as another factor. The results indicated a poor fit (CMIN/DF = 6.54; GFI = 0.56; AGFI = 0.50; PGFI = 0.49; NFI = 0.53; IFI = 0.57; TLI = 0.57; CFI = 0.57; RMSEA = 0.14). In comparison to the first, one-factor model the CMIN/DF was lower and closer to 1, which meant that it had a better fit than the first model. The GFI (0.56) indicated a poorer fit than the first model; AGFI (0.50) indicated a better fit than the first model; PGFI (0.49) indicated a better fit than the first model) NFI (0.53) indicated a better fit than the first model; IFI indicated a better fit; TLI (0.57) indicated an almost equal fit than the first model; while CFI (0.57) indicated a

worse fit than the first model. In the case of the RMSEA score, the first one-factor model's score was closer to 0.05.

Inspection of the modification indices (MI) revealed that the fit of the two-factor model could further be improved if regression was allowed between items and factors. This indicated that several factors had cross loadings between the two factors. Items 23, 34, 4, 13, 17, 39, 24, 8, 14 and 10 of Perceiving and Awareness also loaded on the Management/Integration factor. Items 2, 38, 1, 15, 27, 30 and 16 of the Perceiving/Awareness factor also loaded on the Management/Integration factor. The MI also indicated that if the errors between items 27 and 5 (M = 37.7), between items 19 and 18 (M = 50.0) and between items 19 and 18 (M = 39.1), it would result in better fit. The revised model showed a slightly better fit (CMIN/DF = 6.39; GFI = 0.57; AGFI = 0.52; PGFI = 0.51; NFI = 0.54; IFI = 0.58; TLI = 0.55; CFI = 0.58; RMSEA = 0.14), but the overall model fit was still problematic.

Model 3

Next, the model was fitted according to the proposed three-factor structure of Austin et al. (2004): Regulation, Utilisation and Appraisal of emotion. For model 3 (three-factor model), the indices revealed a poor fit between the model and the data (CMIN/DF = 6.52; GFI = 0.62; AGFI = 0.56; PGFI = 0.53; NFI = 0.54; IFI = 0.58; TLI = 0.54; CFI = 0.58; RMSEA = 0.14). However, inspection of the modification indices (MI) revealed that the fit between model 3 and the data could be further improved if correlation was allowed between the measurement errors of the Regulation, Utilisation and Appraisal of Emotion scales. This means that the fit of the model of Austin et al. (2004) could be improved if the errors between items 26 and 28 of the Regulation and Appraisal scales (MI = 40.6). Items 31 and 38 of the Appraisal and Regulation scales (MI=34.57). Items 29 and 31 (MI = 41) were allowed to correlate. The revised model showed an improvement (CMIN/DF = 6.17; GFI = 0.64; AGFI = 0.59; PGFI = 0.55; NFI = 0.57; IFI = 0.61; TLI = 0.57; CFI = 0.61; RMSEA = 0.13).

Model 4: Mayer- and Salovey-based model

The results indicated an overall improvement of the previous models (CMIN/DF = 3.79; GFI = 0.79; AGFI = 0.72; PGFI = 0.58; NFI = 0.78; IFI = 0.83; TLI = 0.78; CFI = 0.83; RMSEA = 0.09). Inspection of the modification indices (MI) revealed that the fit for model 4 and the data

could be improved further if correlation was allowed between the measurement errors of the five factors. This means that the fit of the proposed model could be improved if the errors between item 11 and 34 (Integration and Awareness MI = 17.0); items 35 and 19 (M1 = 20.5) (Utilisation), items 3 and 33 (Management and Integration) were allowed to correlate. The revised model showed an improvement with acceptable values for the following indices: CMIN/DF = 3.0; IFI = 0.90; CFI = 0.90. Although some of the other indices did not meet the cut-off point of 0.90 it was an improvement over the independent model (GFI = 0.82) compared to 0.24 of the independent model; RMSEA = 0.90, compared to 0.00 of the independence model) Next, an exploratory factor analysis (principal component analysis) was executed on the data to assist in assigning the items to the original model of Emotional Intelligence of Salovey and Mayer (1990). The factor analysis explained 58.52% of the variance (Table 5). The factors were labelled in accordance with the Emotional Intelligence factors of Salovey and Mayer (1990). Reliability analyses also indicated that the five-factor model of Emotional Intelligence could possibly provide a good model fit when testing it in Confirmatory Factor Analysis: Emotion Utilisation (α=0.81); Emotion Management (α= 0.75); Emotion Awareness (α=0.74); Emotion Perceiving (0.70) and Emotion Integration (0.89). The information obtained was used in constructing the model via Confirmatory Factor Analysis.

Item	Factor 1 = Emotion Utilisation	Factor 2 = Emotion Awareness	Factor 3 = Emotion Perceiving	Factor 4 = Emotion Integration	Factor 5 = Emotion Management
	$\alpha = 0.81$	$\alpha = 0.74$	$\alpha = 0.70$	$\alpha = 0.90$	$\alpha = 0.80$

Table 5: *Exploratory factor Analysis of the SEIS: Five factor model*

1. I know when to speak about my personal problems to others.	0.79	-0.02	0.17	-0.07	0.04
2. When I am faced with obstacles, I remember times when I faced similar obstacles and overcame them.	0.75	-0.23	-0.19	0.05	-0.19
3. I generally expect to fail when I try something new.	0.62	0.06	0.02	0.36	0.16
4. My mood has little effect on how I deal with	0.61	0.12	-0.15	0.25	-0.09

problems.

5. Other people find it easy to confide in me.	0.59	0.29	-0.02	0.09	-0.12
6. I find it hard to understand the non-verbal messages of other people.	0.55	-0.29	-0.22	0.20	-0.05
7. Some of the major events of my life have led me to re-evaluate what is important and not important.	-0.49	0.16	-0.09	0.14	0.34

8. I sometimes can't tell whether someone I am conversing with is serious or joking.	0.47	-0.29	0.18	0.27	-0.11
9. When my mood changes I see new possibilities.	0.44	0.37	-0.16	0.38	-0.12
10. Emotions don't have much effect on my quality of life.	0.41	-0.32	0.08	0.04	-0.15
11. I am aware of my emotions as I experience	0.39	0.39	0.09	0.14	-0.29

them.

12. I generally don't expect good things to happen.	0.04	-0.72	-0.01	0.08	-0.02
13. When trying to solve a problem in my life, I find it helpful to be as unemotional as possible.	-0.08	0.68	-0.22	-0.01	0.03
14. I prefer to keep my emotions private.	0.19	0.64	-0.10	0.18	0.18
15. When I experience a positive emotion, I	0.06	-0.59	-0.17	0.14	-0.22

know how to
make it last.

16. I arrange events others enjoy.	-0.24	0.58	-0.09	0.01	-0.00
17. I quite often misread what is going on in social situations.	-0.08	-0.52	0.27	-0.03	0.29
18. I seek out activities that make me happy.	-0.01	0.44	-0.34	0.08	-0.15
19. I am aware of the non-verbal message that I send others.	0.03	-0.26	-0.06	0.21	0.23
20. I have little interest	0.18	-0.03	-0.67	-0.27	0.17

in   the
impression I
make   on
others.

21. When I am in a positive mood, solving problems is easy for me.	-0.02	-0.13	0.62	0.02	-0.14
22. I tend to misread peoples' facial expressions.	-0.13	-0.11	0.62	0.03	0.05
23. I don't believe that my emotions give any help in coming up with new ideas.	0.10	0.00	0.62	-0.19	-0.08

24. I often don't know why my emotions change.	-0.11	-0.21	0.45	0.30	-0.07
25. I don't find that being in a positive mood helps me come up with new ideas.	-0.18	0.09	-0.43	-0.19	0.02
26. I find it hard to control my emotions.	-0.34	-0.26	-0.34	-0.14	0.07
27. I easily recognise my emotions as I experience them.	-0.11	-0.17	-0.35	-0.19	0.24

28. People have told me that I am difficult to talk to.	0.11	-0.12	0.31	0.27	0.12
29. I motivate myself by imagining a good outcome to tasks I take on.	0.10	0.05	0.25	0.81	0.08
30. I compliment others when they have done something well.	-002	0.31	0.05	0.77	0.05
31. I am aware of the non-verbal messages other people	0.02	-0.21	0.07	0.68	-0.03

send.

32. When another person tells me about an important event in his or her life, I almost feel as though I have experienced the event myself.	0.12	-0.13	-0.17	0.64	-0.24
33. When I feel a change in emotions, I tend to come up with new ideas.	0.11	-0.18	-0.02	0.62	-0.36
34. Emotions don't play a big part in how I deal with	0.30	-0.07	0.08	0.58	0.01

problems.

35. When I am faced with a challenge, I give up because I believe I will fail.	0.46	-0.15	-0.04	0.48	-0.22
36. I know what other people are feeling just by looking at them.	0.47	0.01	0.10	0.47	-0.04
37. I help other people feel better when they are down.	-0.01	-0.11	-0.07	0.05	-0.69
38. I use good moods to help	0.13	0.10	0.29	0.05	-0.59

myself keep trying in the face of obstacles.

39. I find it hard to tell how someone is feeling from their tone of voice.	0.00	-0.05	0.28	-0.15	-0.54
40. It is difficult for me to understand why people feel the way they do.	0.34	-0.02	-0.39	0.36	-0.45
41. I find it hard to form close friendships.	0.29	0.06	-0.05	0.33	-0.34

Below Figure 1 explains the correlations in the Confirmatory Factor Analysis between EI and the five factors, each individual factor with their items loading on them and error scores.
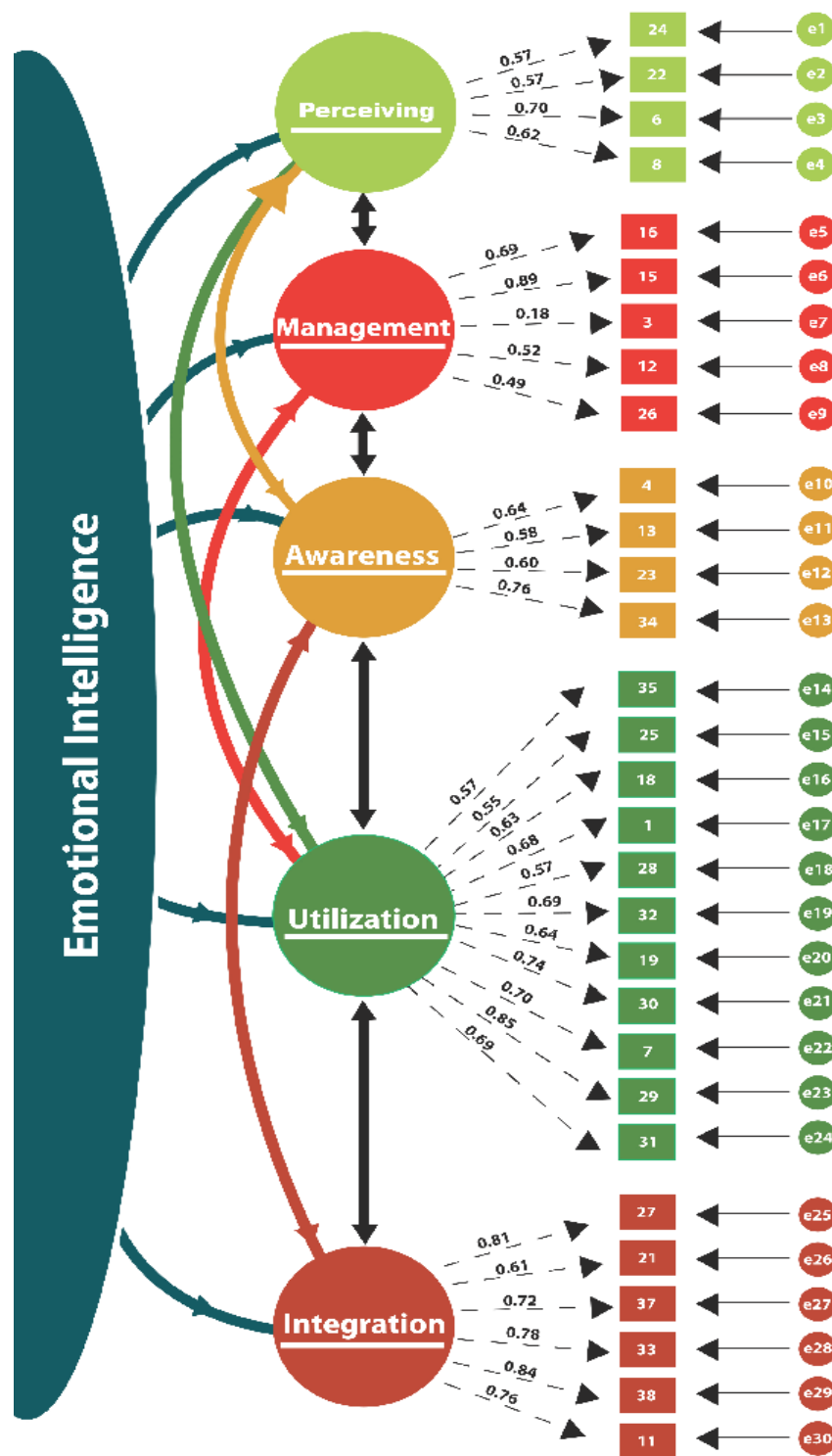
Figure 1: Confirmatory Factor Analysis of the Salovey and Mayer Five Factor Model

Next, the results of the research article will be discussed.

DISCUSSION

The first objective of this study was to conceptualise Emotional Intelligence and the factor structure of the Schutte Emotional Intelligence Scale through a literature review. The research on Emotional Intelligence (EI) has advanced considerably over the past 20 years because of the construct's scientific and practical relevance. However, a valid, reliable, standardised, consistent factor in a homogeneous working sample that can be utilised for research purposes and a practical-purposes measurement instrument in South Africa are still elusive. The Schutte Emotional Intelligence Scale has been found as a reliable brief scale of measuring trait Emotional Intelligence (Schutte & Malouff 1998). However, there are different results regarding the factor structure of the SEIS. To summarise, Schutte et al. (1998) reported an uni-factorial structure for the SEIS; Austin et al. (2004) reported a three-factor structure; while Petrides and Furnham (2000); Ciarrochi, Chan and Bajar (2001); Ciarrochi, Chan, Caputi, and Roberts (2001); Saklofske et al. (2003) reported a four-factor structure; and Jonker and Vosloo (2008) reported a six-factor structure. Against this background, the following general research objective was formulated: The purpose of this research study was to determine the factor structure of the 41-item version of the Schutte Emotional Intelligence Scale (SEIS) by using a nursing population in the North-West and Gauteng Provinces of South Africa.

The second objective of this study was to determine the factor structure, as determined by Confirmatory Factor Analysis, of the 41-item version of the Schutte Emotional Intelligence Scale, as measured in a South African nursing environment.

The results of the Confirmatory Factor Analysis of the One-and Two-factor models will be presented, followed by the Three-factor Model of Austin et al. (2004). Lastly, the model that fit the data the best will be discussed.

Model 1 and Model 2

Firstly, the data did not fit the uni-factor model of EI, even after inspection of the modification indices. The revised model also did not fit the data adequately Secondly, a Two-factor model was tested: This model was tested to confirm a possible two-factor model consisting of Management of Emotions/ Integration of Emotions, proposed as one factor, and Perceiving and Awareness of Emotions proposed as another factor. The results indicated a poor fit In comparison to the first, one-factor model, the CMIN/DF was lower and closer to 1, which meant that the two-factor model had a better fit than the first model (Byrne, 2010). However, the overall model fit was still problematic. A possible hypothesis for the poor fit of the one- and two-factor models may be because EI is more complex, multidimensional and process orientated than just a general factor structure.

When taking into account the research of the conceptualisation of EI by Salovey and Mayer (1997), it can be said that EI is more complex than one or two factors. Salovey and Mayer (1997) found that EI reveals not a solitary trait or ability, but rather a combination of four diverse emotional reasoning aptitudes: the ability to recognise emotions, to evaluate and develop emotions to assist thought, to comprehend emotions and emotional knowledge, and to regulate emotions thoughtfully in order to encourage emotional and intellectual development. Goleman (1998) added that EI consists of an extensive array of competencies that must be taken into account when defining and measuring the concept. Researchers have found that, due to the complex and diverse nature of EI described in theory, it must have an influence on the multidimensionality of EI measures (Dulewicz & Higgs, 2000; Jordan, Ashkanasy, Hartel, & Hooper, 2002). Empirically, EI has been found to have multiple distinct factors in the development of EI measures (Austin et al., 2004; Ciarrochi, Chan & Bajar 2001; Petrides & Furnham, 2000), which supports the multiplicity in the theoretical definition of EI (Salovey & Mayer, 1990; Goleman, 1998; Bar-On, 2000).

Salovey and Mayer (1997) emphasise the importance of a process-oriented model that takes into account the stages of development in EI in order to measure and explain the multidimensionality of the construct adequately. Petrides and Furnham (2000) state that EI is developed over time and that there is an emotional processes to Emotional Intelligence, which adds to the complexity

of the term EI. Petrides and Furnham (2000) state that EI is thus more complex than just one or two factors and it must be supported by a theoretical framework when creating an EI measure.

Another interpretation of the results found could be explained by comparing the current research to the original research on the SEIS by Schutte and Malouff (1998). Differences in the replication of the uni-factorial model of Emotional Intelligence can clearly be pointed out: The authors, Schutte and Malouf (1998), originally created the SEIS from data obtained from 346 university students and individuals from diverse community settings in the South-eastern area of the United States of America. The results found in this current research were grounded on working nurses in the North-West and Gauteng Provinces of South Africa. A demographic difference of the participants like age, where the average age in Schutte and Malouf's (1998) study was 29, and in this study between 18 and 31 (45.3%), could have an influence on the factor structure found. Other demographic factors pertaining to the participants like language might also have an influence on the differences in factor structures found between the two studies. In the study of Schutte and Malouff (1998) the spoken language of all participants was English while in this study the participants' spoken language differentiated between Afrikaans (44.8%), English (22.4%), Sepedi (6.9%), Sesotho (9.7%) to Setswana (16.2%).

Model 3

Since a one-and two-factor model did not fit the data adequately, the model was fitted according to the proposed three-factor structure of Austin et al. (2004), who proposed Emotional Intelligence as a construct consisting of Regulation of emotion, Utilisation of emotion and Appraisal of emotion as their three factors. However, model 3 revealed a poor fit between the model and the data. The revised model showed an improvement but still did not fit the data adequately. The poor fit was not necessarily due the psychometric properties of the model, but may be due to demographic and biographical differences between the South African participants in this study and the British participants used by Austin et al. (2004).

The most distinct demographic differences between the two studies are language and culture. The data gathered in the study of Austin et al. (2004) were obtained from participants who were

all from an individualistic western culture who all spoke English. This study, however, was conducted across collectivistic African languages groups, from Afrikaans (44.8%), English (22.4%), Sepedi (6.9%), Sesotho (9.7%) to Setswana (16.2%). The participants in this study might have had more difficulty to understand difficult English terms like "vigorous, immersed and resilient" that form part of the items of the SEIS.

According to Elfenbein and Ambady (2002), culture and language are very important aspects, which should be taken into consideration when discussing EI. Culture and language play a significant function in the comprehension and expression of emotions, because they are such intertwined terms (Sibia, Srivastava, & Misra 2003). Certain cultural norms have a major influence on emotional responses within a social network (Matsumoto, 2002). Due to the fact that the EI construct is strongly embedded in Western research (Bar-On & Parker, 2000; Salovey & Mayer, 1990; Schutte & Malouff, 1998), it has commonly been accepted that EI is universal, without taking into account that Emotional Intelligence differs between cultures (Sibia et al., 2003).

Research by Matsumuto, Yoo and Nakagawa (2008) found considerable variations in the understanding and expression of emotions between culture groups. According to their study, individuals from individualistic cultures are able to express their emotions much better, compared to individuals from collectivistic cultures. Their study also showed that in individualistic cultures individuals are more able to express negative emotions compared to those in collectivistic cultures. Parker, Saklofske, Shaughnessy, Huang, Wood, et al. (2005) state that when measures of EI are developed or adapted, the difference of Emotional Intelligence between certain culture and language groups must be taken into account. The measures must be adapted in such a way that there is no bias towards any cultural group.

Model 4: Mayer- and Salovey-based model

Finally, an exploratory factor analysis (principal component analysis) was performed on the data to assist in assigning the items to the original model of Emotional Intelligence of Salovey and Mayer (1990). The factor analysis explained 58.52% of the total variance. The factors were

named: Emotion Utilisation, Emotion Management, Emotion Awareness, Emotion Perception and Emotion Integration. The information obtained was used in constructing the model via Confirmatory Factor Analysis. The reliability analysis also indicated the internal consistency of the Salovey and Mayer model to be satisfactory. When the results of the exploratory factor analysis were tested via Confirmatory Factor Analysis the results indicated an overall improvement on the previous models, indicating emotional intelligence as a differentiated construct.

A possible hypothesis for the best-fit model may be due to the fact that EI is an advanced, complex and process-orientated construct could be a reason that this five-factor structure fits the data better than the one-, two- and three-factor structures measured (Dulewicz & Higgs, 2000; Jordan, Ashkanasy, Hartel, & Hooper, 2002). According to Bar-On and Parker (2000), EI is a complex and comprehensive construct explained as a collection of aptitudes, proficiency and individual character to assist in identifying, comprehending and managing emotions in the self and other individuals. An EI measure must be able to measure the entire EI construct (Bar-On & Parker 2000). Due to this fact many other studies have proposed that EI consists of four (Ciarrochi, Chan, & Bajgar, 2001; Ciarrochi, Deane, & Anderson, 2002; Petrides & Furnham, 2000; Saklofske et al., 2003) or more structures (Jonker &Vosloo, 2008; Van der Merwe, 2005), as found in this current study. Petrides and Furnham (2000) state that, due to the complexity of EI, measures of EI must be strongly embedded in a theoretical framework.

When Schutte and Malouff (1998) developed their measurement scale of EI they based it on the original models of Salovey and Mayer (1990, 1997) and stated that they were the best theoretically cohesive and comprehensive models of EI. Schutte and Malouff (1998) further emphasise the fact that when a scale of EI is developed, it should be done on a sound theoretical framework in order to encompass the entire dimensionality of EI. Petrides and Furnham (2000) state that scientific theory on the foundation and components of EI must be thoroughly conducted before a valid measure of EI can be developed and even the benefits of EI be discussed. Considering theory when developing an EI measure could be a reason why this model fits better than the others that were tested.

It must be taken into account that this model still does not have a superior fit. The reason that the model did not have a superior fit could be because the SEIS was not adapted to a South African cultural and language context. Petrides and Furnham (2000) explain that the validation of any EI measure has to be conducted principally in the context in which the measure was developed. This could be a reason why this model did not have a perfect fit. Matsumoto, (2002) adds to this by stating that a measure of EI should be adapted to the language and cultural context of the respondents, because EI is a result of, and restricted to, the culture in which it was developed in the individual. Sharma, Biswal, Deller, and Mandal (2009) caution that EI may only be meaningful within the culture in which that particular construct was developed. They further state that a measure's items must be generated and adapted in such a way that it will take cultural differences into account.

The conclusion can be drawn that, when compared to Model 1, Models 2 and 3 revised the five-factor model based on the model and theory of Salovey and Mayer(1990) fitted the data the best and confirmed the factors of Mayer and Solovey (1990).

It is important to compare the five-factor structure found in this study to other research that has been done on the SEIS in South Africa namely to the research of Jonker and Vosloo (2008) who found a six-factor model. The factors that were extracted were labelled Positive Affect, Emotions-Others, Happy Emotions, Emotions-Own, Non-Verbal Emotions, and Emotional Control. The difference in populations, once again, had an influence on the factor structures found between the two studies.

The population used in this study by Jonker and Vosloo (2008) was a group of Economic Sciences students at a tertiary institution in the North-West Province of South Africa. The difference in factor structures found could be that nurses (the population in this study) work in much more emotionally draining circumstances (Murphy & Janeke, 2009). Another determining factor could be that the average age of the participants in the study of Jonker and Vosloo (2008) was 18 years (53.70%) and in this current study the largest number of participants were between the ages of 18 to 31 (45.3%). In the current study the languages Sepedi, Sesotho and Setswana

comprise a representation of 49%, while in the study by Jonker and Vosloo (2008) the African languages comprise only 32.70%.

The population of this study consisted mainly of female participants (93.6%), compared to the study of Vosloo (2005) that had an equal number of females (52.20%) and males (47.80%) as participants. Cakan and Altun (2005) state that certain research conducted in Western cultures (Schutte & Malouff ,1998; Saklofske et al., 2003) have found different results for EI between gender types. Roothman, Kirsten, and Wissing (2003) have found that females obtained higher results on somatic indicators, the articulation of affect and understanding of spiritual characteristics. They also explained that this could be a reason for the ability that females have to empathise with others, compared to males who did not score high on empathy. The differences found between the EI levels of males and females could explain the difference in factor structures found between the two studies.

The third objective of this study was to determine the reliability of the Schutte Emotional Intelligence Scale as measured by the 41-item version within a South African working population.

The reliability analyses indicated that the five-factor model of EI as suggested by this study showed an overall high internal and external reliability. The factors found namely: Emotion Utilisation ($\alpha=0.81$); Emotion Management ($\alpha= 0.75$); Emotion Awareness ($\alpha=0.74$); Emotion Perceiving (0.70) and Emotion Integration (0.89) all displayed relatively high Cronbach Alpha Coefficients. Possible reasons for these high alphas could be due to a few general reasons.

The population had a very high level of homogeneity with regards to culture, age and gender. This meant that respondents could have answered the questions in a similar manner (Barchard & Hakstian, 2004; Matsumuto, Yoo & Nakagawa, 2008).

The factors Emotion Perceiving ($\alpha = 0.70$) and Emotion Awereness ($\alpha = 0.74$) showed the lowest alphas. A possible reason for this is that the population, whose second language is mostly English, could not understand the difference between the terms"perceiving" and "awareness".

LIMITATIONS

A cross-sectional survey design was applied as a research design in this study. However, this design has been scrutinised in a number of studies. A longitudinal design may give results that are more desirable. Self-report questionnaires were used to gather the data in this study; thus, the results were founded on the feelings and opinion of the participants. Participants could thus be biased with regard to opinions of themselves, compared to what other uninvolved individuals might have of them (Hofstee, 1994). A five-point Likert Scale is confusing for the participants. Another problem that self-report measures of Emotional Intelligence may pose is that *optimism* and *general positive mood* may overlap (Ciarrochi, Deane, & Anderson, 2002).

The sample in this study was very homogeneous because the participants were all nurses. The majority of the nurses were between the ages of 18 to 31 (45.3%). Bar-On (2000) states that EI seems to develop with age, which means that older nurses might have given emotionally more mature responses, which would have been better for this study. The emotionally draining work environment of nurses was not always taken into consideration in this study and this might have had an impact on the responses of the participants. Most of the participants were second-language English speakers and they struggled to understand some of the jargon in the questionnaires.

In comparison to the study of Mayer and Geher (1996) that used a large sample size to determine total Emotional Intelligence, the sample of 290 nurses in this study was relatively small. The small amount of research on the SEIS in the nursing environment in the South African context and research on the emotional well-being of nurses also limited the results of this study.

Next, recommendations will be made for future research and for future use of the 41-item version of the Schutte Emotional Intelligence Scale within a South African population.

RECOMMENDATIONS

The fourth objective of this study was to make recommendations for future research and for future use of the 41-item version of the Schutte Emotional Intelligence Scale within a South African population. The findings of this current research study may possibly be set as a benchmark for using the SEIS as a five-factor structure, reliable measure within a nursing environment in the South African context. The nursing environment can use the results from this study to determine the individual and overall Emotional Intelligence of their employees. As discussed earlier in this article nurses with high levels of EI are able to manage their relationships with diverse others, maintain a better attitude towards patient care and form and maintain relationships with patients and co-workers (Dimitriades, 2007; Gignac & Ekermans, 2010). Once Emotional Intelligence of a certain employee is determined, his/her emotional well-being can be managed accordingly. Interventions can also be put in place in the nursing environment to improve the performance of their employees.

The five-factor structure of the SEIS, with factors: Emotion Utilisation; Emotion Management; Emotion Awareness; Emotion Perceiving and Emotion Integration can be seen as an internally reliable measurement of EI. This research has made related research possible. When comparing this current research to international research on the SEIS, certain language adjustments need to be made. It is recommended that the SEIS be adapted to more acceptable South African language formats, while taking into account certain cultural aspects. Items that take cultural differences into context should be developed.

It is suggested that other research be conducted outside the nursing environment in a public sector context on the SEIS. It is important to develop other norm groups for the SEIS in other occupations in South Africa. It is also suggested that a population with a more equal representation of both gender groups be used. It can be recommended that a larger sample size by using other research methods like a longitudinal design, using exploratory research, equivalence and bias analysis be used. It can also be suggested that the SEIS can be made a computerised test that would expedite data gathering.

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CHAPTER 3

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

This chapter comprises conclusions regarding the literature review and the empirical study according to the specific objectives. The limitations of the research are discussed, followed by recommendations for the research problem in organisations, and lastly, suggestions are made for future research.

3.1 CONCLUSION

The purpose of this study was to examine the factor structure of the 41-item version of the Schutte Emotional Intelligence Scale (SEIS) within a South African nursing context by means of confirmatory factor analysis. The objectives were reached by means of a literature review and an empirical study.

The first objective of this study was to conceptualise Emotional Intelligence (EI) and the factor structure of the Schutte Emotional Intelligence Scale (SEIS) through a literature review.

Salovey and Mayer (1990) conceptualised EI as a mental ability pertaining the relationship between emotion and cognition. Other researchers' conceptualisation of EI state that EI is the ability to be conscious of one's emotions, to evaluate and develop one's emotions so as to assist thinking, to comprehend emotions and emotional information, and to manage emotions so as to sustain emotional and intellectual development in oneself (Salovey & Mayer 1997; Goleman, 1995; Bar-On, 2000). Murphy and Janeke (2009) state it is important that reliable and valid measures of EI must be used in the workplace. EI is a fundamental part in the quality of service rendered by nurses (Murphy & Janeke, 2009). According to Oginska-Bulik (2005) the ability to manage your own emotions, while having the ability to identify others' emotions, is very important in the nursing environment. A substantial amount of research has been done on the most appropriate, valid and reliable approach for the measurement of EI (Petrides & Furnham, 2000; Van Rooy & Viswesvaran, 2005).

The measurement of EI is grouped under two distinct thought patterns concerning the classification of EI. The one approach states that EI is a cognitive aptitude while the other approach considers that EI is part of an individual's temperament (Mayer, Salovey, & Caruso, 2000). A lot of research has been found to support the discriminant and incremental validity of trait EI tests (Petrides & Furnham, 2000). A self-report method of measuring trait EI that has been used in a lot of research is the Schutte Emotional Intelligence Scale (SEIS) (Schutte & Malouff, 1998).

The fact that the SEIS consists of 33 or 41 items has helped it to become the leading short scale for measuring and conducting research on trait EI. The SEIS has been found to express some face, construct, predictive, discriminant and criterion validity (Petrides & Furnham, 2000; 2003), but there are some problems with the scale's items and factor structures (Austin, Saklofske, Huang & McKenney, 2004). The more popular 33-item version of the SEIS has been condemned for having a shortage of reverse-keyed items (Petrides & Furnham, 2000) which could have a negative influence on the responses and the overall score of EI (Austin, et al. 2004).

Due to the problem with the 33-item version of the SEIS developed by Schutte, et al. (1998) a new version, in which reversed wordings were created for nine of the original 30 forward-keyed items, was developed by Austin et al. (2004). Eight new items were also incorporated into this new version. Thus the 41-item version of the SEIS, which had 20 forward-keyed and 21 reverse-keyed items, was developed and approved (Austin et al., 2004).

Other researchers found different factor structures of the SEIS in comparison to the uni-factor structure by found by Schutte et al. (1998) in their development of the scale. A three factor structure was proposed by Austin et al. (2004), a four factor structure was found by both Petrides and Furnham (2000); and Ciarrochi, Chan, and Bajar (2001). Ciarrochi et al., (2001), Saklofske et al. (2003) and Jonker and Vosloo (2008) reported a six factor structure of the SEIS. No research has been done on the 41-item version of the SEIS within a South African nursing context.

In conclusion EI can be seen as the ability that an individual has to recognise emotions in the self and in others. The measurement of EI is very important and measures that have satisfactory psychometric properties must be used. A measure that has been found to have valid and reliable psychometric properties is the Schutte Emotional Intelligence Scale. There have been some studies on the scale that have found problems with the scale's item and factor structures.

The second objective of the study was to determine the factor structure, as determined by confirmatory factor analysis, of the 41-item version of the Schutte Emotional Intelligence Scale, as measured in a South African nursing environment.

The results of the confirmatory factor analysis of the One and Two factor models were firstly presented, followed by the Three factor Model of Austin, et al. (2004). Lastly the model that fitted the data the best was discussed.

Model 1 and Model 2

In the first instance the data did not fit the uni-factor model of EI, even after examination of the modification indices. The revised model also did not fit the data satisfactorily. Secondly a Two factor model was tested: This model was tested to confirm a potential two factor model consisting of Management of Emotions/ Integration of Emotions as proposed as one factor and perceiving and Awareness of emotions proposed as another factor. The results, however, indicated a poor fit. In relationship to the first, one factor, model the two factor model had a better fit than the first model (Byrne, 2010), but the overall model fit was still problematic. A likely hypothesis for the poor fit of the one and two factor models may be due to the fact that EI is more complex, multidimensional and process orientated than just a general factor structure.

When looking at the research of the conceptualisation of EI by Salovey and Mayer (1997), it is likely to be said that EI is more complex than one or two factors. Salovey and Mayer (1997) established that EI reveals not a single trait or ability, but rather an amalgamation of four diverse emotional reasoning abilities: the ability to identify emotions, to assess and develop emotions so as to assist thinking, to understand emotions and emotional information, and to thoughtfully manage emotions so as to support emotional and intellectual growth. Goleman (1995) added that

EI consists of a wide array of abilities that must be taken into account when conceptualising and measuring the concept. Researchers have found that due to the complex and diverse nature of EI described in theory it must have an influence on the multidimensionality of EI measures (Dulewicz & Higgs, 2000; Jordan, Ashkanasy, Hartel & Hooper, 2002). Empirically EI has been found to have numerous different factors in the development of EI measures (Austin et al., 2004; Ciarrochi, Chan & Bajar 2001; Petrides & Furnham, 2000) which supports the multiplicity in the theoretical definition of EI (Mayer & Salovey, 1990; Goleman, 1998; Bar-On, 2000).

Mayer and Salovey's (1997) accentuate the significance of a process-oriented model that takes into account the levels of development in EI in order to measure and explain the multidimensionality of the construct sufficiently. Mayer, Salovey, and Caruso (2000) state that EI is developed over time and that there is an emotional processes to EI which adds to the complexity of the term. Petrides and Furnham (2000) state that EI is thus more complex than just one or two factors and it must be supported by a theoretical framework when developing an EI measure.

An additional clarification of the results found could be explained by comparing the current research to the original research on the SEIS by Schutte et al. (1998). Differences in the reproduction of the uni-factorial model of EI can clearly be pointed out: The authors, Schutte et al. (1998), originally developed the SEIS from data obtained from 346 university students and individuals from diverse community settings in the South-Eastern area of the United States of America. The results found in this present research were grounded on working nurses in the North West and Gauteng provinces of South Africa. A demographic dissimilarity of the participants like age where the average age in Schutte et al.'s (1998) study was 29 and in this study between the ages of 18 and 31 (45.3%) could have an influence on the factor structure established. Another demographic factor pertaining to the participants like language might also have an influence on the differences in factor structures found between the two studies. In the study of Schutte et al. (1998) the spoken language of all participants was English while in this study the participants' spoken language differentiated from Afrikaans (44.8%), English (22.4%), Sepedi (6.9%), Sesotho (9.7%) to Setswana (16.2%).

Model 3

Since a one and two factor model did not fit the data sufficiently the model was fitted according to the proposed three factor structure of Austin, et al. (2004) who proposed EI as construct comprising of Regulation of emotion, Use of emotion and Assessment of emotion as their three factors. However Model 3 revealed a poor fit between the model and the data. The revised model showed an improvement, but still did not fit the data sufficiently. The poor fit was not necessarily due the psychometric properties of the model, but may be due to demographic and biographical differences between the South African participants in this current study compared to the study of Austin et al. (2004) where British participants were used.

The most distinctive demographic differences between the two studies are language and culture. The data obtained in the study of Austin et al. (2004) was retrieved from participants who were all from an individualistic western culture who all spoke English. This study, however, was performed across collectivistic African languages groups from Afrikaans (44.8%), English (22.4%), Sepedi (6.9%), Sesotho (9.7%) to Setswana (16.2%). The participants in this study might have had more trouble to understand difficult English terms like: "vigorous, immersed and resilient" that form part of the items of the SEIS.

According to Elfenbein and Ambady (2002) culture and language are very significant aspects that should be taken into consideration when discussing EI. Culture and language play a important function in the understanding and expression of emotions, because they are such intertwined terms (Sibia, Srivastava, Misra 2003). Certain cultural norms have a large influence on emotional reactions within a social system (Matsumoto, 2002). Due to the fact that the EI construct is strongly rooted in Western research (Salovey & Mayer, 1990; Schutte et al.; Bar-On & Parker, 2000) it has been generally accepted that EI is universal without taking into account that EI differs between cultures (Sibia, Srivastava & Misra 2003).

A study by Matsumuto, Yoo and Nakagawa (2008) established substantial variations in the understanding and expression of emotions between culture groups. According to their study people from individualistic cultures are able to express their emotions much better compared to people from collectivistic cultures. Their research also showed that in individualistic cultures

individuals are more able to articulate negative emotions compared to those in collectivistic cultures. Parker, Saklofske, Shaughnessy, Huang, Wood and Eastabrook, (2005) state when measures of EI are developed or modified the difference of EI between certain culture and language groups must be taken into account. The measures must be adapted in such a way that there is no prejudice towards any cultural group.

Model 4: Salovey and Mayer based model

Finally an exploratory factor analysis (principal component analysis) was executed on the data to assist in assigning the items to the original model of Emotional Intelligence of Salovey and Mayer (1990). The factor analysis explained 58.52% of the variance. The factors were named: Emotion Utilisation; Emotion Management; Emotion Awareness; Emotion Perceiving and Emotion Integration. The information obtained was used in constructing the model via confirmatory factor analysis. The Reliability analysis also indicated that the internal consistency of the Salovey and Mayer model to be satisfactory. When the results of the exploratory factor analysis were tested via confirmatory factor analysis the results indicated an overall improvement of the previous models indicating EI as a differentiated construct.

A possible hypotheses for the best fit model may be due to the fact that EI is an sophisticated, complex and process orientated construct could be a reason that this five factor structure fit the data better than the one, two and three factor structures measured (Dulewicz & Higgs, 2000; Jordan, Ashkanasy, Hartel, & Hooper, 2002). According to Bar-On and Parker (2000) EI is a complex and comprehensive construct explained as a compilation of aptitudes, proficiency and individual character to assist in identifying, comprehending and managing emotions in the self and other individuals. An EI measure must be able to measure the entire EI construct (Bar-On & Parker 2000). Due to this fact many other studies have proposed that EI consists of four (Ciarrochi, Chan, & Bajgar, 2001; Ciarrochi, Deane, & Anderson, 2002; Petrides & Furnham, 2000; Saklofske, Austin, & Minski, 2003) or more structures (Jonker &Vosloo, 2008; Van der Merwe, 2005) as found in this current study. Petrides and Furnham (2000) state that due to the complexity of EI that measures of EI must be strongly rooted in a theoretical framework.

When Schutte et al. (1998) developed their measurement scale of EI they based it on the original models of Salovey and Mayer (1990, 1997) and stated that they were the best theoretically cohesive and comprehensive models of EI. Schutte et al. (1998) further put emphasis on the fact that when a scale of EI is developed it should be done on a sound theoretical framework in order to encompasses the entire dimensionality of EI. Petrides and Furnham (2000) state that scientific theory on the foundation and components of EI must be thoroughly conducted before a valid measure of EI can be developed and even the benefits of EI be discussed. Taking theory into account when developing an EI measure could be a reason why this model fit better than the others that were tested.

It must be taken into account that this model still did not have a superior fit. The reason that the model did not have a superior fit could be due to the fact that the SEIS was not adapted to a South African cultural and language context. Petrides and Furnham (2000) explain that the validation of any EI measure has to be conducted mainly in the context in which the measure was developed this could be a reason that this model did not have a perfect fit. Matsumuto, Yoo and Nakagawa, (2008) adds to this by stating that a measure of EI should be modified to the language and cultural context of the respondents because EI is a result of, and restricted to, the culture in which it was developed in the individual. Sharma, Biswal, Deller and Mandal (2009) caution that EI may only be meaningful within the culture in which that particular construct was developed. They further state that a measure's items must be generated and adapted in such a way that it will make room for cultural differences.

The conclusion can be drawn that when compared with Models 1, 2 and 3, the revised 5-factor model based on the model and theory of Salovey and Mayer(1990) fitted the data best and confirmed the factors of Mayer and Solovey (1990).

It is important to compare the five factor structure found in this study to other research that has been done on the SEIS in South Africa namely to the research of Jonker and Vosloo (2008) who found a six factor model. The factors that were extracted were labelled Positive Affect,

Emotions-Others, Happy Emotions, Emotions-Own, Non- Verbal Emotions, and Emotional Control. The difference in populations, once again, had an influence on the factor structures found between the two studies.

The population used in this study of Jonker and Vosloo (2008) was a group of Economical Sciences students at a tertiary institution in the North West Province of South Africa. The difference in factor structures found could be that nurses (the population in this study) work in much more emotional draining circumstances (Murphy & Janeke, 2009). Another determining factor could be that the average age of the participants in the study of Jonker and Vosloo (2008) was 18 years old (53.70%) and in this current study the largest number of participants were between the ages of 18 to 31 (45.3%). In the current study the languages Sepedi, Sesotho and Setswana make up a representation of 49% while in the study of Jonker and Vosloo (2008) the African languages make up only 32.70%.

The population of this study consisted of mainly female participants (93.6%) compared to the study of Jonker and Vosloo (2008) that had an equal amount of females (52.20%) and males (47.80%) as participants. Cakan and Altun (2005) state that certain research conducted in Western cultures (Schutte et al. 1998; Saklofske, Austin & Minski 2003) found different results for EI between gender types. Roothman, Kirsten, and Wissing (2003) found that females obtained higher results on somatic indicators, the articulation of affect and understanding of spiritual characteristics. They also explained that this could be a reason for the ability that females have to empathise with others in comparison to males who did not score highly on empathy. The differences found between the EI levels of males and females could explain the difference in factor structures found between the two studies.

The third objective of this study was to determine the reliability of the Schutte Emotional Intelligence Scale as measured by the 41-item version within a South African working population.

The reliability analyses specified that the five-factor model of EI as suggested by this study showed an overall high internal and external reliability. The factors found namely: Emotion

Utilisation (α=0.81); Emotion Management (α= 0.75); Emotion Awareness (α=0.74); Emotion Perceiving (0.70) and Emotion Integration (0.89) all displayed relatively high Cronbach Alpha Coefficients. Possible reasons for these high alphas could be due to a few general reasons.

The population had a very high level of homogeneity with regards to culture, age and gender. This meant that respondents could have answered the questions in a similar manner (Barchard & Hakstian, 2004; Matsumuto, Yoo & Nakagawa, 2008).

The factors Emotion Perceiving (α = 0.70) and Emotion Awereness (α = 0.74) showed the lowest alphas. A possible reason for this is that the population, whose second language is mostly English, could not understand the difference between the terms "perceiving" and "awareness".

3.2 LIMITATIONS

Despite the positive results, the study was not without limitations. A cross-sectional survey design was applied as a research design in this study. However this design has been scrutinised in a number of studies. A longitudinal design may give more desirable results. Self-report questionnaires were used to gather the data in this study, thus the results were founded on the feelings and opinion of the participants. Participants could thus be bias with regards to opinions of themselves in comparison to what another uninvolved individual might give of them (Hofstee, 1994). A five point Likert Scale is confusing for the participants. Another problem that self-report measures of Emotional Intelligence may pose s that *optimism* and *general positive mood* may overlap (Ciarrochi, Deane, & Anderson, 2002).

The sample in this study was very homogeneous because the participants were all nurses. The majority of the nurses were between the ages of 18 to 31 (45.3%). Bar-On (2000) states that EI seems to develop with age which means that older nurses might have given more emotional mature responses which would have been better for this study. The emotional draining work environment of nurses was not always taken into consideration in this study and this might have had an impact on the responses of the participants. Most of the participants were second language English speakers and they struggled to understand some of the jargon in the questionnaires.

In comparison to the study of Mayer and Geher (1996) that used a large sample size to determine total Emotional Intelligence the sample of 290 nurses in this study was relatively small. The small amount of research on the SEIS in the nursing environment in the South African context and research on the emotional well-being of nurses also limited the results of this study.

3.3 RECOMMENDATIONS

The fourth objective of this study was to make recommendations for future research and for future use of the 41-item version of the Schutte Emotional Intelligence Scale within a South African population. The recommendations will now be discussed. Suggestions are made for future research and for practice in the following sub-sections.

Recommendations for future research

Instead of a cross-sectional survey design a longitudinal design could be implemented to find better results over a longer period of time. The five-factor structure of the SEIS, with factors: Emotion Utilisation; Emotion Management; Emotion Awareness; Emotion Perceiving and Emotion Integration can be seen as an internally reliable measurement of EI. This research has made related research possible. When comparing this current research to international research on the SEIS certain language adjustments need to be made. It is recommended that the SEIS be adapted to more acceptable South African language formats while taking into account certain cultural aspects. Items that take cultural differences into context should be developed.

It is suggested that other research be done outside the nursing environment in a public sector context on the SEIS. It is important to develop other norm groups for the SEIS in other occupations in South Africa. It is also suggested that a population with a more equal representation of both gender groups be used. It can be recommended that a larger sample size by using other research methods like a longitudinal design, using exploratory research, equivalence and bias analysis be used. It can also be suggested that the SEIS can be made a computerised test that would expedite data gathering.

Recommendations for the nursing environment

The findings of this current research study may possibly be set as a benchmark for using the SEIS as a five-factor structure within a nursing environment in the South African context. The nursing environment can use the results from this study to determine the individual and overall Emotional Intelligence of their employees. As discussed earlier in this article nurses with high levels of EI are able to manage their relationships with diverse others, maintain a better attitude towards patient care and form and maintain relationships with patients and co-workers (Dimitriades, 2007; Gignac & Ekermans, 2010). Once Emotional Intelligence is determined of a certain employee his/her emotional well-being can be managed accordingly.

Interventions can also be put in place in the nursing environment to better the performance of their employees. An example of such an intervention could be training workshops where nurses could be trained to apply their EI in the workplace.

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