PSYCHOMETRIC PROPERTIES OF THE EXPANDED CULTURAL INTELLIGENCE SCALE IN A SOUTH AFRICAN CONTEXT

By

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Declaration

I declare that the mini-dissertation, which I hereby submit for the degree Masters in Industrial Psychology at the University of Pretoria, is my own work and has not been submitted by me for a degree at another university.

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Francisco da Silva

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"If God is for us, who can be against us" – Romans 8:31

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Abstract

With organisations operating in a globalising world, intercultural contact within South African organisations is increasing more now than ever before. Developing cultural understanding amongst employees within multinational organisations may prove to be a completive advantage to be leveraged. Van Dyne et al. (2012) argue that Cultural Intelligence is a capability that can be measured and developed over time. The construct of Cultural Intelligence have evolved from a four factor model into an eleven factor construct which can be measured using the Expanded Cultural Intelligence Scale (E-CQS) in the scholarly literature.

The purpose of this study was to evaluate the psychometric properties of the E-CQS as a proxy for Cultural Intelligence in a South African context, within a large multi-national organisation with a considerable cultural diversity. A diverse sample of 601 employees from a South African multinational organisation was used in the study. Confirmatory Factor Analysis (CFA) was used to confirm whether the eleven factor model proposed by Van Dyne et al. (2012) fitted the sampled data. The CFA indicated that the data did not fit the data well resulting in poor model fit in an eleven factor model. Subsequently, the four factor model was evaluated, and this model also resulted in poor fit. Problem items with statistical significant residuals in the estimated covariance matrix was identified, and removed from the model resulting in a 20 item four factor model based on the original Cultural Intelligence model proposed by Ang et al. (2008).

The model with a reduced number of 20 items was evaluated using confirmatory factor analysis (CFA) within a Structural Equation Modelling (SEM) framework, which provided evidence for good model fit. The model was proven to be a reliable measure of Cultural Intelligence within the South African context, although the model lacked discriminant validity with high correlations between Metacognitive CQ and Behavioural CQ. Invariance testing of the four factor model provided evidence that the model is not invariant across race and gender groups and thus further research is required should South African organisations wish to capitalise on Cultural Intelligence within their organisations. An

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Exploratory Factor Analyses (EFAs) also confirmed the four factor model and provided insight into a possible three factor model that should be explored in future research.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
CFA	Confirmatory factor analysis
CFI	Comparative Fit Index
EFA	Exploratory factor analysis
CQ	Cultural Intelligence
CQS	The Cultural Intelligence Scale
E-CQS	The Expanded Cultural Intelligence Scale
RMSEA	Root Mean Square Error of Approximation
AIC	Akaike Information Criterion
RJP	Realistic Job Preview

CHAPTER 1: BACKGROUND TO THE STUDY

1.1 INTRODUCTION

With rapid advancements in transportation and information technologies, organisations are experiencing increasing intercultural contact more now than ever before, with the processes of globalisation and diversification ultimately homogenising world cultures and people (Ng, Van Dyne & Ang, 2012). Within this context, Thomas et al. (2015) argues the importance of understanding the effect of cultural differences on organisational behaviour in a world of work that has been influenced by the forces of globalisation. Due to an increasingly diverse workforce where by people engage in a global market place, each individual bringing different ways of thinking, patterns of negotiation and business practices (Ang & Inkpen, 2008; Berry, 2008; Chin & Gaynier, 2006), there is bound to be increased intercultural conflict. Thus, in order for world-class organisations to emerge in today's society, their managers need to look beyond the surface level of cultural interaction and differences, and focus on gaining a deeper understanding of culture if they are to mitigate the effects of conflict and improve business performance.

1.2 CULTURAL INTELLIGENCE: ORGANISATIONAL RESOURCE

Ang and Inkpen (2008) claim that "the possession of CQ [Cultural Intelligence] by a firm's managers is a valuable resource, especially when it resides within top management" (p. 343). Leaders with a high Cultural Intelligence are able to assess diverse work settings and adapt their style of leadership accordingly, resulting in effective leadership styles which have a positive impact on performance outcomes within a cross cultural work environment. These leaders also influence team-level outcomes and shape team performance by adjusting work climates and facilitate knowledge sharing (Elenkov & Manev, 2009; Groves & Feyerherm, 2011; Livermore, 2010).

Cultural Intelligence becomes specifically important in organisations where performance is dependent on successful intercultural interactions. The large multinational within the Fast Moving Consumer Goods (FMCG) industry used in this study operates across diverse environments from cosmopolitan cities to rural townships across the globe. With the FMCG recently changing its strategy, whereby the South African and African businesses are to report on financial data as one entity, there is increasing focus on global talent and expatriation. The possession of Cultural Intelligence by diversified employees within the FMCG may well be a competitive advantage to be leveraged strategically into the future.

Since the initial conceptualisation of Cultural Intelligence as a three dimensional model, Cultural Intelligence evolved into a four dimensional model (Metacognitive CQ, Cognitive CQ, Behavioural CQ and Motivational CQ) which was further developed using the 20-item Cultural Intelligence Scale (CQS) (Ang et al., 2007). In response to commentary in the *Handbook of Cultural Intelligence* which recognised the embryonic state of Cultural Intelligence, Van Dyne, Ang, Ng, Rockstuhl, Tan and Koh (2012) suggested that Cultural Intelligence can be conceptualised to have eleven sub-dimensions of Cultural Intelligence, as presented these in the Expanded Cultural Intelligence Scale (E-CQS), stating that “this expanded framework provides a better articulated conceptual space for each of four factors of Cultural Intelligence which should facilitate future research by providing more depth to the conceptualization of each factor of Cultural Intelligence” (p. 296). However, whether the eleven-dimensional model, loading to the four higher-order levels of Cultural Intelligence, would be able to replicate in a different context, has still not been explored.

1.3 THE RESEARCH PROBLEM

Academic scholars have acknowledged Cultural Intelligence as a measureable construct with measurable effects on both individual and organisational performance outcomes (Ng et al., 2012). The evolution of the Cultural Intelligence construct from a four dimensional model into a more comprehensive eleven sub-dimensional model,

provided an opportunity to examine the suitability of the E-CQS scale as a proxy for Cultural Intelligence in a developing economy and in a multi-cultural context. Therefore, before organisations can benefit from measuring Cultural Intelligence, the E-CQS needs to be validated in a multi-cultural South African context, within a context where there is substantial diversity among employees in terms of their cultural composition.

Although the 37 item E-CQS (Ng et al., 2012) was supported through empirical evidence, with validation studies using data from 286 individuals from more than 30 countries, additional validation of the E-CQS in the multicultural South African context could provide useful insights into the Cultural Intelligence construct and how it translates into a business culture which still echoes a legacy left behind by an apartheid regime. However, in order for South African business leaders to benefit from, and utilise the E-CQS, the instrument needs to be proved valid, reliable, unbiased and fair in the South African context as per the Employment Equity Act No. 55 of 1998 (Republic of South Africa, 1998).

1.4 PURPOSE OF THIS STUDY

The purpose of the study is to evaluate the psychometric properties of the E-CQS as a proxy for Cultural Intelligence in a South African context, within a large multi-national organisation with a considerable cultural diversity. For the purposes of this study, the organisation wishes to remain anonymous and shall be referred to as a multi-national FMCG.

1.5 RESEARCH OBJECTIVES

The secondary objectives of this study were therefore to:

- Examine the dimensionality of the E-CQS in the South African context;

- Evaluate various aspects of the measurement validity of the E-CQS, namely face validity, convergent validity, discriminant validity and nomological validity and;
- Estimate the reliability of the dimensions of the E-CQS within the South African context.
- Evaluate the invariance of the E-CQS across race and gender groups.

1.6 IMPORTANCE OF THE STUDY

The specific theoretical and practical contributions are described below.

1.6.1 Theoretical contribution

From a theoretical perspective, the study makes three contributions to the literature surrounding Cultural Intelligence: Firstly, unlike previous studies, this study was one of the first contextual studies of Cultural Intelligence using the Expanded Cultural Intelligence nomological network, adding insight to the possible refinement of Cultural Intelligence for the South African situation. Secondly, this study evaluated the psychometric properties of the E-CQS in the context of the South African multi-cultural diverse workplace. Thirdly, the validation of the E-CQS in the South African context will open multiple avenues for future research for using the Expanded Cultural Intelligence within a developing country.

1.6.2 Practical contribution

From a practical perspective, the validation of the E-CQS allows insights into the construct of Cultural Intelligence in the South African context. These insights allowed for the development of a more stable measurement of Cultural Intelligence for the South African context, the results of which would need additional research into the measurements application in organisational selection and development programs.

1.7 DELIMITATIONS

The study was delimited to the evaluation of the psychometric properties of the E-CQS across different cultural groups in a South African context, within a large multi-national FMCG. The organisation has a very rich history, originating in South Africa to later become the second largest within its industry globally. The FMCG has a strong culture and prides itself on organisational values and goal achievement. These values transcend organisational boundaries and are evident in the communities the FMCG serves. With this in mind, diversity is a key priority of the organisation and emulates throughout its culture. With such a strong heritage, value system, performance orientation and an evident diversity focus, there may be implications on how Cultural Intelligence is perceived by employees within the organisation.

1.8 ASSUMPTIONS

The proposed research project will be based on the following assumptions:

- The theoretical framework of Cultural Intelligence is an accurate reflection of the phenomenon being studied.
- The construct of Cultural Intelligence is clearly defined and the construct is measurable with the E-CQS.
- The methodology of the study is appropriate to address the proposed research objectives.
- The data collected will be sufficient for statistical analysis in order to produce valid and reliable results.
- The results of the study will be generalizable to the South African population.

1.9 DEFINITION OF KEY TERMS

The study made use of the following terms which are defined as follows:

Behavioural CQ: The aptitude required in order to determine where new behaviours are required as well as how to execute these behaviours effectively (Earley & Peterson, 2004). Behavioural CQ and its three sub dimensions are further defined in Section 2.1.2.

Culture: "Collective programming of the mind that distinguishes the members of one group from others" (Hofstede, 2005, p. 4). Culture, in this light, is a structure of collectively held values.

Cultural Intelligence (CQ): The capability to adjust successfully to new cultural contexts (Earley & Ang, 2003). "An individual's capability to function and manage effectively in culturally diverse settings" (Ang et al., 2007, p. 337). The construct of Cultural Intelligence comprises of Metacognitive CQ; Cognitive CQ, Behavioural CQ and Motivational CQ. The initial conceptualisation of the Cultural Intelligence is covered in Section 2.1.

Cognitive CQ: A person's capability to ascertain information about a new culture (Earley & Peterson, 2004). Cognitive CQ and its two sub dimensions are provided in Section 2.1.2.1.

Metacognitive CQ: The ability to "inductively create a proper mapping of the social situation to function correctly" (Earley & Peterson,

2004, p. 107). Metacognitive CQ and its three sub dimensions are explained in Section 2.1.2.2.

Motivational CQ: A person's ability to be efficacious with regards to new intercultural interactions (Earley & Peterson, 2004). Metacognitive CQ and its three sub dimensions are described in Section 2.1.2.3.

1.10 LAYOUT OF THE DISSERTATION

This dissertation begins with an overview of current literature surrounding the evolution of the Cultural Intelligence construct and its eleven sub dimensions. The potential benefits of Cultural Intelligence for South African organisations is also discussed. Following this, the methodologies applied in the study are discussed, followed by a results chapter that discusses results obtained in the study. Finally, the dissertation concludes with a discussion of research findings and makes recommendations for future research.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provides an overview of current literature prevalent to the study. Firstly, the conceptualisation, evolution and profiles of Cultural Intelligence is discussed. This is followed by a review of cultural intelligence as an organisational resource. Finally, a review of the performance outcomes of Cultural Intelligence provides an argument for the importance of evaluating the psychometric properties of the E-CQS within the South African context.

2.2 THE CONCEPTUALISATION OF CULTURAL INTELLIGENCE

Anchored in contemporary intelligence theory, Earley and Ang (2003) pioneered the construct of Cultural Intelligence (CQ). Cultural Intelligence is defined as "a person's capability to adapt effectively to new cultural contexts" (Earley, 2002, p. 283) and is consistent with the definition of general intelligence as the "ability to grasp and reason correctly with abstractions and solve problems" (Schmidt & Hunter, 2000, p. 3). In light of globalisation, Cultural Intelligence was conceptualised in order to address a gap in intelligence theory which related directly to the intercultural setting (Earley & Ang, 2003).

Cultural Intelligence is grounded in Sternburg and Detterman's (1986) integration of loci of intelligence; whereby metacognition, cognition and motivation exist in the brain, with behavioural actions being overtly displayed. Earley and Ang (2003) conceptualised Cultural Intelligence as consisting of the same four dimensions within a culturally diverse setting by applying a multi-loci-of-intelligence framework.

Later, Ang et al. (2007) clarified that the dimensions were qualitatively different aspects of effective functioning in culturally diverse settings; thus Metacognitive,

Cognitive, Motivational and Behavioural CQ are different capabilities that contribute to the overall Cultural Intelligence construct. The theory of Cultural Intelligence is clear on what Cultural Intelligence is and what it is not. Cultural Intelligence refers to capability and not personality or interest; Cultural Intelligence thus targets culturally relevant capabilities and is distinct from broad individual differences. Also, Cultural Intelligence is an intelligence which is distinct from other intelligences such as general, social and emotional intelligences (Ang, et al., 2007). According to Ng et al. (2012), Cultural Intelligence is not specific to any culture, but is a "culturally free construct that transcends cultural boundaries" (p. 34) and can be developed over time. Research has also provided strong evidence that Cultural Intelligence is distinct from other forms of intelligence although it does correlate with general cognitive ability, social intelligence and emotional intelligence (Moon, 2010; Rockstuhl, Seiler, Ang, Van Dyne & Annen, 2011; Thomas et al., 2015).

2.2.1 Measurement of Cultural Intelligence: A multidimensional construct

Since the initial conceptualisation of Cultural Intelligence as a three dimensional model of Behavioural CQ, Motivational CQ and Cognitive CQ (Earley & Ang, 2003), the construct further evolved into a four dimensional model (Metacognitive CQ, Motivational CQ, Cognitive CQ and Behavioural CQ) which was further developed using the 20-item Cultural Intelligence Scale (CQS) (Ang et al., 2007).

The CQS measurement has gone through numerous validation studies (Van Dyne et al., 2012) and is generalizable across: a) studies with time intervals ranging from four weeks to four months; b) students and executives; c) countries such as Singapore, the U.S., and Ireland, and; d) culturally diverse groups. Further, research illustrates the predictive validity and value of the observer-report and self-report versions of the scale (Van Dyne et al., 2012).

A recent South African study conducted by Mahembe and Engelbrecht (2014) evaluated the four factor, 20 item Cultural Intelligence Scale (CQS) initially proposed

by Ang et al. (2008). The CQS was administered to 229 young South African adults and revealed that the CQS was a valid and reliable measure of Cultural Intelligence as evidenced by high internal consistency coefficients within the scale.

The most recent scholarly development in terms of the Cultural Intelligence construct is that of the eleven sub-dimensions of Cultural Intelligence (Van Dyne et al., 2012). Van Dyne et al. (2012) liken this development to that of the Big Five Personality traits' sub-dimensions (Paunonen & Jackson, 2000) which allowed for the development of new personality models and refined the understanding of personality. In the same way, by drawing on Cultural Intelligence research, Van Dyne et al. (2012) have responded to gaps in Cultural Intelligence literature through the development of the eleven sub-dimensions for the four initial Cultural Intelligence dimensions. This resulted in the development of the Expanded Cultural Intelligence Scale (the E-CQS) which measures the eleven sub-dimensions of Cultural Intelligence (Van Dyne et al., 2012).

2.2.2 The four dimensions and sub dimensions of Cultural Intelligence

2.2.2.1 Cognitive CQ

Building on self-concept theory (Earley, 2003), the cognitive dimension refers to the aspects of intelligence relating to information processing. It can be distinguished as the total experience and knowledge that an individual has committed memory with regards to cultural adaption (Earley & Peterson, 2004). The flexibility of one's self-concept and the effortlessness of new information integration allows for the abandonment of pre-conceived ideas about a culture which permits for a deeper understanding of new cultures (Earley & Peterson, 2004).

Sub-Dimension One: Culture-General Knowledge

Defined as "knowledge of the universal elements that constitute a cultural environment" (Van Dyne et al., 2012, p. 301), culture-general knowledge is significant because it provides an organising framework for discerning ways in which cultures are similar or different and involves both the objective and subjective levels of culture knowledge (Van Dyne et al., 2012).

Sub-Dimension Two: Context-Specific Knowledge

Defined as "declarative knowledge about manifestations of cultural universals in a specific domain and procedural knowledge of how to be effective in that domain" (Van Dyne et al., 2012, p. 301), where 'domain' refers to a cultural context in: a) a geographical area (China is a more collectivistic country while America is more individualistic); b) a specific subculture (business managers as opposed to educators); or c) demographic subgroups based on race, age, gender and education (Van Dyne et al., 2012). Within this domain, specific knowledge about the expectations and norms about a specific culture is vital if individuals interacting within these domains are to be effective (Van Dyne et al., 2012).

According to Van Dyne et al. (2012) context-specific knowledge is occasionally referred to as the insider or emic understanding, while culture-general understanding refers to a broader cultural context and is often referred to as the etic or outsider understanding. Prior to this distinction, Ng and Earley (2006) discussed Cultural Intelligence as being a 'culture-free etic construct', as well as the conventional view of culture-bound intelligence that is etic. Individuals with a high Cognitive CQ possess both context-specific and culture-general knowledge. These individuals are able to understand a wide range of cultures, and the norms and the expectations associated with these cultures; allowing them to operate effectively and efficiently within a cultural domain (Van Dyne et al., 2012).

2.2.2.2 Metacognitive CQ

Early and Peterson (2004, p. 106) describe metacognition as "thinking about thinking, or knowledge and cognition about cognitive objects". Metacognition derives from two corresponding elements, namely: a) Metacognitive knowledge (how to deal with knowledge that has been gained in an array of multicultural circumstances) and b) Metacognitive experience (how to incorporate past experience as a point of reference for future multicultural interaction). Metacognitive CQ is thus an important aspect of Cultural Intelligence as it allows one to develop patterns within a new culture and allows for inductive reasoning (Earley & Peterson, 2004).

Sub-Dimension One: Planning

Defined as "strategizing before a culturally diverse encounter" (Van Dyne et al., 2012, p. 299), planning includes prior preparation by thinking carefully about short and long-term outcomes and establishing action plans with precise steps within the cultural context (Van Dyne et al., 2012). Planning can relate to the self, others and the resulting interdependence of interaction. Planning also allows the individual to take into account the perspectives of culturally diverse others, which in turn enhances their cultural understanding (Van Dyne et al., 2012).

Sub-Dimension Two: Awareness

Defined as "knowing about cultural thinking and knowledge of self and others in real time" (Van Dyne et al., 2012, p. 299), awareness describes "the degree to which people have real-time consciousness of how culture influences: (i) their own mental processes and behaviours; (ii) the mental processes and behaviours of others in intercultural interactions; and (iii) the intercultural situation." Over all, it involves: a) being aware of one's own cultural habits and how one uses his or her cultural knowledge within cultural interaction; b) suspending judgement until enough information is available; and c) knowledge of how culture impacts one's own and others behaviour in a situation (Van Dyne et al., 2012).

Sub-Dimension Three: Checking

Defined as "reviewing assumptions and adjusting mental maps when actual experiences differ from expectations" (Van Dyne et al., 2012, p. 299), checking entails thinking about and inquiring assumptions and regulating these based on novel information which involves contrast expectations (assumptions), and assessing these against actual occurrences (Van Dyne et al., 2012). The process of checking involves checking: a) individual cultural assumptions; b) assumptions made about culturally diverse others; and c) interpretations after the interaction (Van Dyne et al., 2012).

Individuals with high Metacognitive CQ (all three sub-dimensions activated) constantly question their own assumptions as well as those that they have about others. They are forward thinking, reflect on the occurrences during an intercultural interaction and regulate their own 'mental models' based on these encounters (Van Dyne et al., 2012).

Overall, the new sub-dimensions give emphasis to the dynamic nature of Cultural Intelligence. Planning should take place before entering into an intercultural interaction, checking should take place during and after the interaction, and awareness should take place throughout (Van Dyne et al., 2012).

2.2.2.3 Motivational CQ

Cognition and metacognition alone are not sufficient to allow for successful intercultural interaction. Self-efficacy is an important facet to the self and motivation as it allows one to make a judgement of his own capability to accomplish a certain performance level (Earley & Peterson, 2004). People tend to avoid tasks which are believed to fall outside their capabilities, and as such, efficacy judgements allow them to select tasks with a higher probability of success. It is this judgement that plays an important role in Cultural Intelligence as it determines an individual's need for personal contact in a new culture (Earley & Peterson, 2004). Thus efficacy is

central to motivation and Motivational CQ, as highly efficacious individuals do not require constant reward to persevere (Earley & Peterson, 2004).

Another important aspect of Motivational CQ is goal setting (Earley & Lituchy, 1991). Humans by nature are goal driven and purposeful; the challenge within the intercultural context is determining the goals of others from different backgrounds (Earley & Peterson, 2004). Goal setting is conditional for positive self-evaluation, and as such, self-evaluation allows for the identification of a gain or loss, resulting from intercultural interaction. According to Earley and Peterson (2004), if such a gain is in line with predetermined goals, then motivation arises.

As they guide an individual's choice of activity and the evaluation of such an activity, norms and values also play a critical role within Motivational CQ (Earley & Peterson, 2004). If an activity or cultural interaction is in line with the individual's norms and values, he or she will be more motivated to partake in the activity (Earley & Peterson, 2004).

Sub-Dimension One: Intrinsic Interest

Defined as "valuing culturally diverse experience in and of itself because it is inherently satisfying" (Van Dyne et al., 2012, p. 303), intrinsic interest includes the satisfaction of functioning with individuals from diverse cultural backgrounds, as well as the satisfaction gained from new intercultural experiences. The intrinsic natures of these interests are important as they are not dependent on a situation or on others, but are self-generated and thus motivating (Van Dyne et al., 2012).

Sub-Dimension Two: Extrinsic Interest

Defined as "valuing the tangible, personal benefits that can be derived from culturally diverse experiences" (Van Dyne et al., 2012, p. 304), this extrinsic interest is characterised by a feeling of improved employability due to intercultural experience and international work experience (Van Dyne et al., 2012). Other tangible benefits

include promotion and increased levels of responsibility. These extrinsic interests allow for organisational systems and rewards and are important in that they ensure incentives that motivate despondent employees within a multi-cultural work environment (Van Dyne et al., 2012).

Sub-Dimension Three: Self-efficacy to Adjust

Defined as "having specific task confidence in culturally diverse situations" (Van Dyne et al., 2012, p. 304), self-efficacy to adjust centres on dealing with the stress associated with cross cultural adjustment (Van Dyne et al., 2012). It encompasses a sense of confidence in dealing and working with others from diverse cultural backgrounds or within culturally diverse settings. As people engage in activities in which they feel efficacious, confidence and intrinsic motivation are interwoven (Van Dyne et al., 2012).

People who are able to display all three sub-dimensions are deemed to have a high Motivational CQ and are attracted to intercultural situations as they place a high value on the benefits resulting from such interactions (Van Dyne et al., 2012). They are also confident in their coping with inherent difficulties associated with intercultural interactions (Van Dyne et al., 2012). Overall, high Motivational CQ individuals value the tangible (extrinsic) and intangible (intrinsic and self-efficacy) benefits of motivation theory (Van Dyne et al., 2012).

2.2.2.4 Behavioural CQ

The behavioural dimension of Cultural Intelligence refers to an individual's behaviour and suggests that behavioural adaption is not only knowing what to 'do' and how to 'do' it (cognition and metacognition), and being able to persevere with 'doing' (motivation); but also having the correct behavioural responses and successfully 'doing' (Earley & Peterson, 2004). This behavioural component of Cultural Intelligence has various indirect ties with behaviour, but ultimately, Behavioural CQ requires the persistence to acquire new skills and the aptitude to determine where

behaviours are lacking in order to successfully acquire these new behaviours (Earley & Peterson, 2004). Behavioural CQ thus requires one to adapt his or her behaviour to new cultural settings.

Sub-Dimension One: Verbal Behaviour

Verbal behaviour is defined as "flexibility in vocalization (for example, accent and tone), the capability to flex verbal behaviour includes speaking faster or slower, louder or softer, and varying the amount of inflection" (Van Dyne et al., 2012, p. 305). This includes changing the warmth and style of verbal communication in varying intercultural situations as well as remaining flexible with the use of pausing and silence during conversation as these vary between cultures (Van Dyne et al., 2012).

Sub-Dimension Two: Non-verbal Behaviour

Non-verbal behaviour is defined as "flexibility in communication that is conveyed via gestures, facial expressions, and body language, rather than through words" (Van Dyne et al., 2012, p. 305). This flexibility is important in that different cultures make use of different gestures, facial expressions, seating distance, eye contact as well as greeting norms; each nonverbal gesture portraying a different meaning in different cultural settings (Van Dyne et al., 2012).

Sub-Dimension Three: Speech Acts

Speech acts are defined as "flexibility in manner of communicating specific types of messages such as that of requests, invitations, apologies, gratitude, disagreement, and saying 'no' are expressed appropriately based on local standards" (Van Dyne et al., 2012, p. 305). This is an important sub-dimension as there are differing conceptualisations of behavioural style when conveying different messages within different cultures (Van Dyne et al., 2012).

Individuals with high Behavioural CQ are able to overcome their innate human habits when dealing with others from different cultures. They display flexibility with regards

to speech acts, verbal and non-verbal behaviours by means of 'code-switching', and adjusting to the cultural context (Van Dyne et al., 2012). This ultimately enhances an individual's effectiveness of communication within multicultural settings (Van Dyne et al., 2012).

2.2.3 Cultural Intelligence profiles

Earley and Mosakowski (2004) provide evidence for the existence of five manager Cultural Intelligence profiles. These profiles relate to the three dimensions of Cultural Intelligence proposed by Earley and Ang (2003). Earley and Mosakowski (2004) propose that all managers fall into a profile category, with most being a combination of the profiles. For example, an Analyst-Confident Manager plans cultural interactions and has the confidence to put these plans into action (Earley & Mosakowski, 2004). Table 2-1 displays the five profiles as well as their corresponding attributes and Cultural Intelligence dimensions.

2.2.4 Predictive validity of Cultural Intelligence

Empirical evidence supported significant relationships between Cultural Intelligence and the three main forms of intercultural effectiveness, namely: a) cultural judgement and decision making (CJDM); b) socio cultural and psychological adjustment; and c) task performance (Ang, Van Dyne & Tan, 2011). Cognitive CQ and Metacognitive CQ predict CJDM, Behavioural CQ and Motivational CQ predict socio-cultural and psychological adjustment, while Behavioural CQ and Metacognitive CQ predict task performance (Ang et al., 2011). Support was also found for Cultural Intelligence as an antecedent of cultural adaption (Templer, Tay & Chandrasekar, 2006), the effectiveness of intercultural negotiation (Imai & Gelfand, 2010), global leadership (Rockstuhl et al., 2011), expatriate job performance and team processes within multi-cultural teams (Groves & Feyerherm, 2011; Rockstuhl & Ng, 2008).

Table 2-1: Cultural Intelligence Profiles

Profile	*Profile Description*
The Local	An individual that is low on all dimensions of Cultural Intelligence focuses on his/her environment and is not motivated to work outside that environment.
The Analyst	Displays high Metacognitive CQ and is able to work strategically. He/she displays the ability to learn from other cultures and plan strategies on how to interact with them.
The Confident	Displaying high Motivational CQ, this individual shows high levels of confidence and is able to display focused objectives when working with people from diverse cultures.
The Mimic	With high Behavioural CQ, the mimic creates a comfort zone for individuals from other cultures and is able to communicate ideas by applying the behavioural style and mannerisms of the others host culture.
The Cultural Chameleon	The rarest of the profiles, with only 5% of managers displaying high Cultural Intelligence on all dimensions, the cultural chameleon results in the most successful form of cross cultural interaction.

Adapted from Earley and Mosakowski (2004)

2.2.5 Critique of Cultural Intelligence

The concept of Cultural Intelligence has also been critiqued, with Berry and Ward (2006) arguing that intelligence varies amid countries. They based their argument against the concept of Cultural Intelligence on two points. Firstly, according to Berry and Ward (2006), a single construct like Cultural Intelligence is unlikely to be

applicable to all cultural settings due to the high complexity of intelligence measures. Secondly, they contend that acculturation is set in motion as a result of intercultural contact, arguing that the stress and conflict that result from intercultural contact lead to adaption.

Although there are few criticisms of Cultural Intelligence, Hampden-Turner and Trompenaars (2006) propose the following critiques: i) portraying one culture as more intelligent than another is discriminatory as each is entirely relative in their views; ii) one central definition of culture is modernist and against dominant belief; and iii) categorisation of culture is stereotypical and lacks subject. It should be noted however that these researchers view Cultural Intelligence as a cultural factor at a macro level. Hampden-Turner and Trompenaars (2006) propose that in order for Cultural Intelligence to be valid, research should define the construct of Cultural Intelligence in terms of synergy, complementary and latency hypotheses.

According to Thomas et al. (2008), with the operationalisation of the Cultural Intelligence scale, along which people are placed according to how much Cultural Intelligence they possess (Earley, 2003; Earley & Ang, 2003), the definitions fall short of distinguishing Cultural Intelligence as such. Rather, Cultural Intelligence is described as an average of a set of facets in a similar manner to that of intercultural competency, global mindset and even social intelligence within a new domain (Thomas et al., 2008). In their research, Thomas et al. (2008) define the Cultural Intelligence construct in terms of a system comprising of cognitive, Metacognitive and behavioural dimensions.

2.3 CULTURAL INTELLIGENCE AS AN ORGANISATIONAL RESOURCE

There are numerous accounts of Cultural Intelligence denoting an organisational resource, capability and competence that allows for a competitive advantage (Ang & Inkpen, 2008; Du Plessis, 2011; Groves & Feyerherm, 2011; Taylor, 2010). Research accepts the Resources Based View (RBV) of comprehending how firms gain and maintain a competitive advantage in terms of their capabilities (Moon, 2010). Ang and Inkpen (2008) labelled these resources as Managerial CQ, Competitive CQ and Structural CQ, with Moon (2010) exploring Organisational CQ and Groves and Feyerherm (2011) exploring Leader CQ.

2.3.1 Managerial CQ

Ang and Inkpen (2008) claim “the possession of CQ by a firm’s managers is a valuable resource, especially when it resides within top management” (p. 343). More scholars found a significant correlation between top management characteristics, firm performance and strategy (Carpenter, Sanders & Gregersen, 2001). Miller (1991) states that experiences allow for cognitive resources that shape the way in which managers view the world. For example, a manager’s ability to make accurate business judgements results from cognitive resources (Ang & Inkpen, 2008). Ang and Inkpen (2008) also propose that the diversity, motivation and drive of a top management team may contribute to the intercultural capabilities of an organisation.

2.3.2 Leader CQ

Research asserts that leaders with a high Cultural Intelligence (Leader CQ) are better able to assess diverse work settings and adapt their style of leadership accordingly (Groves & Feyerherm, 2011). As a result of their ability to adapt their leadership style, Livermore (2010) states that leaders with high Cultural Intelligence are able to contribute to leadership effectiveness and ultimately positively impact

performance outcomes. Elenkov and Manev (2009) found that leaders influence team-level outcomes and shape team performance by adjusting work climates (into climates of trust and openness), job characteristics and developing team structures that facilitate knowledge sharing (Groves & Feyerherm, 2011).

In a study conducted by Groves and Feyerherm (2011), Leader CQ, when measured using Ang et al.'s (2007) self-report Cultural Intelligence Scale (CQS), was found to: i) result in leaders having higher leader performance in culturally diverse teams in comparison to homogenous teams and, ii) facilitate greater team performance in culturally diverse teams compared to homogeneous teams.

This implies that leaders with a higher Cultural Intelligence perform better within culturally diverse team settings and facilitate greater performance than would be expected within homogenous teams. Creque and Gooden (2011) propose that organisations seeking to be effective will appoint leaders with global business competencies such as leadership skills, personal skills and interpersonal skills. Creque and Gooden (2011) conclude that Cultural Intelligence can add to global business competencies which, in turn, result in organisational effectiveness.

2.3.3 Competitive CQ

According to Ang and Inkpen (2008), if firms are viewed as intelligent, their intelligence does not stem solely from culturally intelligent managers. From a Cultural Intelligence perspective, the competitive resource advantage lies in the processes and routines existing within the firm (Ang & Inkpen, 2008). It is this possession of a competitive CQ advantage that can be viewed as a meta-capability (Teece, 2007) that goes beyond technical operations. Firms in possession of Competitive CQ are thus able to incorporate and unite knowledge assets within the firm, as well as between the firm and global business partners (Ang & Inkpen, 2008), thereby increasing performance.

2.3.4 Organisational CQ

Both individual Cultural Intelligence, defined as a set of capabilities or abilities, and organisational CQ (also termed *cultural capability),* defined as an organisational capability, explain variance in coping with diversity and functioning within global multicultural contexts at a macro level (Moon, 2010). Research on organisational capabilities and its positive effects on performance and competitive advantage are well documented (Akgun, Keskin, Byrne & Aren, 2007). Research based view research states that the more capabilities a firm have, the better its performance and competitive advantage (Moon, 2010).

Moon (2010) provides a conceptual framework for organisational CQ, although, to date, no empirical research on organisational CQ and performance has been conducted. Theoretically though, organisational CQ helps firms adjust within diverse cultural settings, allowing them to gain and sustain a competitive advantage (Moon, 2010).

2.4 ANTECEDENTS AND PERFORMANCE OUTCOMES RELATED TO CULTURAL INTELLIGENCE

Although not central to this study, the acknowledgement that Cultural Intelligence has a direct impact on multinational performance is believed important (Scholl, 2009), as this provides an argument for the development of Cultural Intelligence as an organisational resource, globally. Cultural Intelligence research has provided numerous insights into the relationship between Cultural Intelligence and factors impacting organisational performance. Table 2-2 on page 29 summarises studies known to the researcher which investigate the relationships between Cultural Intelligence and performance, again providing support for the importance of this study and the validation of the E-CQS within the South African context.

2.4.1 Task Performance

Campbell (1999) argues that skills, knowledge, abilities and motivation predict job performance. However, to Ang et al.'s (2007) surprise, not all four Cultural Intelligence dimensions correlated with task performance, although this finding is consistent with other empirical research (Roberts, 2005). Metacognitive CQ did predict task performance, implying that Metacognitive CQ is important for task performance within multicultural settings. Ang et al. (2007) also found that Behavioural CQ is an important predictor of task performance.

2.4.2 Job Performance

After controlling for variables such as gender, experience and language efficiency, Subramaniam, Che Rose, Kumar and Uli (2010) concluded that Cultural Intelligence relates significantly to job performance. This implies that Cultural Intelligence is an important factor with regards to organisational performance.

2.4.3 Assignment Specific Performance

After controlling for variables such as gender, experience and language efficiency, Subramaniam et al. (2010) concluded that Cultural Intelligence relates significantly to job performance. This implies that Cultural Intelligence is an important factor with regards to organisational performance

2.4.4 Financial Performance

De la Garcia-Carranza and Ergi (2010) established that Cultural Intelligence relates positively to employee commitment and corporate reputation, but there was no significant relationship between Cultural Intelligence and financial performance.

2.4.5 Adaptive Performance

Oodlers, Chernyshenko and Stark (2008) discovered that there is a significant positive relationship between Cultural Intelligence and adaptive performance. Therefore, adaptive performance implies that a well-adapted individual is able to perform, thus adding to the performance of the organisation as a whole.

2.4.6 Contextual Performance

Subramaniam et al. (2010) concluded that Behavioural CQ and Metacognitive CQ predicted contextual performance, which is consistent with existing conceptual and empirical research on organisational diversity. The fact that an employee is able to adapt his behaviour and apply Metacognitive thought processes, which result in effective cross-cultural interactions, explain the fact that Cultural Intelligence predicts an employee's performance in contextual environments.

2.4.7 Team Performance

A study conducted by Scholl (2009) concluded that Cultural Intelligence is an important tool in improving multinational and overall team performance. Also Metacognitive CQ, Cognitive CQ, Motivational CQ and Behavioural CQ correlated highly with team performance.

2.4.8 Organisational Performance

Scholl (2009) also concluded that Metacognitive CQ, Cognitive CQ and Motivational CQ are important in predicting organisational performance and business results.

Behavioural CQ however correlated strongly with organisational performance and weakly with business results.

2.4.9 Personality

Authors have investigated the relationships between Cultural Intelligence dimensions and the Big Five Personality Factors (Ang, Van Dyne & Koh, 2006). The Big Five model divides personality into the factors of agreeableness, consciousness, extraversion, emotional stability, and openness to experience (Ang et al., 2006). It was found that the four main dimensions of Cultural Intelligence correlated with personality as follows: Behavioural CQ relates to agreeableness and emotional stability; Metacognitive CQ with consciousness; Cognitive CQ, Motivational CQ and Behavioural CQ with extraversion; and openness with all four dimensions of Cultural Intelligence (Ang et al., 2006). It was also found by Oodlers et al. (2008) that openness to experience (namely its sub-facets: tolerance and curiosity), followed by conscientiousness are the most significant predictors of Cultural Intelligence.

2.4.10 Cultural Judgment and Decision Making

Ang et al. (2007) confirmed that Metacognitive CQ relates positively to Cultural Judgement and Decision Making (CJDM) effectiveness, which refers to the quality of an individual's decisions within the intercultural context (Ang, et al., 2007). According to Ang et al. (2007), CJDM has performance implications with regards to the decisions being culturally effective. As with Metacognitive CQ, Ang et al. (2007) also confirmed that Cognitive CQ relates positively with the effectiveness of CJDM. This has implications for accurate risk assessment in international business ventures (Van Dyne et al., 2012).

2.4.11 Cross Cultural Adjustment

According to Van Dyne et al. (2012), a key factor within this psychological research is cross-cultural adjustment which can be described as comprising of general adjustment (general condition of living within a new culture), interaction adjustment (socialisation with locals), work adjustment (work culture within the new cultural setting) and psychological adjustment (experience of general well-being within a new culture). Templer et al. (2006) demonstrate that Motivational CQ predicts work and general adjustment, with Subramaniam et al. (2010) concluding that expatriates with greater Metacognitive CQ and Motivational CQ experienced better general adjustment.

Ang et al. (2007) confirmed that individuals with higher Motivational CQ and Behavioural CQ experience better cross-cultural adjustment overall. This is in comparison to realistic living conditions previews and realistic job previews as predictors of cross-cultural adjustment (Templer et al., 2006). Subramaniam et al. (2010) also concluded that interaction adjustment is related to Metacognitive CQ, Motivational CQ and Cognitive CQ. Lee and Sukoco (2010) confirmed that all dimensions of Cultural Intelligence have a significant impact on expatriate adjustment with Templer et al. (2006) proving adjustment to be an important predictor of expatriate success.

2.4.12 Cultural Adaption

Ang et al. (2007) established that Motivational CQ and Behavioural CQ relate positively to cultural adaption (cultural adjustment and wellbeing). Within the South African context, Du Plessis (2011) found that female managers in general seem to have the capability to accept and better adjust to other cultures. Ward, Fischer, Lam and Hall (2009), however, found that Cultural Intelligence failed to demonstrate incremental validity with regards to predicting psychological, sociocultural and academic adaption.

2.4.13 Emotional Exhaustion

Tay, Westman, and Chia (2008) found a negative relationship between Cultural Intelligence and emotional exhaustion in that CQ acted as a buffer against family demands interfering with work. This resulted in increased on the job performance.

2.4.14 Realistic Job Preview

Realistic Job Previews (RJPs) allow expatriates to develop coping mechanisms in a new cultural setting and adjust within their new environment (Klaus & Chandrasekar, 2006). Templer et al. (2006) found a strong correlation between Motivational CQ and RJP, indicating better cross-cultural adjustment and subsequent performance.

2.4.15 Culture Shock

Expatriates who experience Culture Shock share doubtful feelings, personal and professional anxiety, dissatisfaction and uncertainty, resulting in different behavioural expectations (Chen, Lin & Sawangpattanakul, 2011). These have a negative effect on performance and according to Chen et al. (2011), all dimensions of Cultural Intelligence related negatively to culture shock implying that individuals with high Cultural Intelligence experience less culture shock and, as a result, perform better.

2.4.16 Intercultural Interaction

Within the scope of psychological outcomes of Cultural Intelligence, interpersonal trust has received attention with Rockstuhl and Ng, (2008) concluding that individuals within multi-cultural dyad teams were more likely to trust their partner when focal persons had higher Metacognitive CQ and Cognitive CQ and their partners had higher Behavioural CQ. Van Dyne et al. (2012) indicate that non-native

language speakers with higher Cultural Intelligence are more likely to engage in intercultural interactions and idea sharing as a result of increased affect-based trust. Imai and Gelfand (2010) found that multinational negotiators with higher Cultural Intelligence conformed to more integrative and cooperative management behaviours that aided in mutually beneficial negotiation outcomes. Thus, Cultural Intelligence is able to ensure positive behavioural outcomes that may positively impact organisational performance.

2.4.17 Openness to Experience

Openness to experience was found by Karma and Vedina (2009) to assist in developing intercultural group performance and is predicted by all four dimensions of Cultural Intelligence. This in light of the fact that Crowne (2008) affirms that experience relates to performance.

2.4.18 International Experience

According to Carpenter et al. (2001), international work experience should be considered as an ultimate resource for organisations as it allows for the development of a competitive advantage. International work and non-work experience provide individuals with opportunities to learn from and manage cross-cultural differences. Numerous studies have been conducted on Cultural Intelligence and international work experience (Crowne, 2008; Shannon & Begley, 2008) which conclude that different dimensions of Cultural Intelligence relate to experience in different contexts. However, they agree that the relationship between Cultural Intelligence and international work experience is stronger for individuals with a lower need for control (Van Dyne et al., 2012).

Table 2-2: The Antecedents and Performance Outcomes Related to Cultural Intelligence (CQ)

Study	Sample		Relationship between CQ and Performance Antecedents		
			Cultural Intelligence Dimension	Outcomes of CQ	Antecedents of CQ
(Ang et al., 2007)	Singapore University Undergraduates	n=576	Motivational CQ and Behavioural CQ	Cross Cultural Adjustment	
			Metacognitive CQ and Cognitive CQ	Cultural Judgement and Decision Making	
			Motivational CQ and Behavioural CQ	Cultural Adaption (cultural adjustment and wellbeing)	
			Metacognitive CQ and Behavioural CQ	Task Performance	
(Ang et al., 2006)	Singapore University Business Undergraduates	n=338	All dimensions of CQ		Big Five Personality Traits
(Chen et al., 2011)	Philippine laborious living in Taiwan	n=382	All dimensions of CQ	Culture Shock (negative relationship)	
(Crowne, 2008)	USA	n=140	All dimensions of CQ		Intercultural Experience
(Lee & Sukoco, 2010)	Expatriates in Taiwanese Firms	n=218	All dimensions of CQ	Expatriate Adjustment	
(Oodlers et al, 2008).	Task Performance Groups from 20 countries	n=313	All dimensions of CQ		Big Five Personality Traits: Openness to experience and conscientiousness
			All dimensions of CQ	Adaptive Performance	
(Rockstuhl & Ng, 2008)	40 Project Teams	n=259	Metacognitive CQ, Cognitive CQ and Behavioural CQ.	Interpersonal Trust	

Table 2-2 Continued: The Antecedents and Performance Outcomes Related to Cultural Intelligence (CQ)

Study	Sample		Relationship between CQ and Performance Antecedents		
			Cultural Intelligence Dimension	Outcomes of CQ	Antecedents of CQ
Rockstuhl et al. (2011)	Swiss Military Academy Leaders	n=126	All dimensions of CQ	Cross Border Leadership effectiveness	
			All dimensions of CQ	Cross Border Leadership effectiveness	
(Scholl, 2009)	Germany, Australia, USA	n=144	All dimensions of CQ	Organisational effectiveness	
			All dimensions of CQ	Multinational and overall team performance	
			All dimensions of CQ	Organisational Performance	
(Shannon & Begley, 2008)	Diverse Sample	n=245	All dimensions of CQ		Intercultural Experience
(Subramaniam et al., 2010)	Expatriates in Malaysia	n=332	Metacognitive CQ and Motivational CQ	Cross Cultural Adjustment (General adjustment)	
			Metacognitive CQ, Cognitive CQ and Motivational CQ	Intercultural Adjustment	
			All dimensions of CQ	Job Performance	
			Behavioural CQ	Assignment specific performance	
			Metacognitive CQ and Behavioural CQ	Contextual performance	
(Tay et al., 2008)	Short term business travellers	n=491	All dimensions of CQ	Emotional Exhaustion (negative relationship)	
			Motivational CQ		Realistic Job Preview
(Templer et al., 2006)	Global Professionals	n=185	Motivational CQ	Cross Cultural Adjustment (General work adjustment)	

With regards to non-work experience, Crowne (2008) concluded that experience gained from countries visited for education purposes predicted Cognitive CQ and Motivational CQ, while countries visited for leisure predicted Motivational CQ only. Other studies conclude that expatriate non-work experience predicts Cultural Intelligence in contrast to their work experience (Van Dyne et al., 2012).

Research also suggests that Cultural Intelligence can be developed through training programmes and work experience (MacNab & Worthley, 2012). It should be noted however that individual differences are likely to impact the way in which experience translates into Cultural Intelligence (Van Dyne et al., 2012). As a result, Cultural Intelligence acts a moderator with regards to the extent a leader may take his/her international experience and transform it into experiential learning that enhances leadership effectiveness. In another study conducted by Rockstuhl et al. (2011), international work experience was found to relate positively to general and cross border leadership effectiveness.

2.4.19 Organisational Learning

According to Scholl (2009), organisational learning plays an important role in organisational effectiveness and thus, performance. Organisational learning is facilitated by Cultural Intelligence and plays a significant role in resolving cross cultural conflicts (Scholl, 2009).

2.4.20 Cross Boarder Leadership Effectiveness

Rockstuhl et al. (2011) found Cultural Intelligence related positively to Cross Boarder Leadership Effectiveness. Surprisingly, leadership experience did not correlate with leadership effectiveness in Rockstuhl et al.'s (2011) study.

2.5 SUMMARY OF LITERATURE REVIEW

Numerous authors have set forth in exploring the relationship between Cultural Intelligence and performance (Ang et al., 2007; Ang & Inkpen, 2008; de la Garcia-Carranza & Ergi, 2010; Groves & Feyerherm, 2011; Moon, 2010; Oodlers et al., 2008; Scholl 2009; Subramaniam et al., 2010; Taylor, 2010). Researchers have found positive relationships between various Cultural Intelligence dimensions and antecedents of performance and performance outcomes, as well as negative relationships between Cultural Intelligence and performance inhibitors. This research has not necessarily been conducted on "organisational performance" however, but rather the antecedents and predictors of performance in general, due to a lack of literature in this regard. Authors have also used the term "organisational effectiveness" to denote the positive outcome Cultural Intelligence has on the organisation and ultimately the organisation's performance.

The benefits of Cultural Intelligence are paramount to effective organisational functioning, with Cultural Intelligence having a direct impact on the cognitive, psychological, behavioural and performance outcomes of employees. In terms of cognitive outcomes, Cultural Intelligence can assist in cross cultural decision making which results in positive intercultural interactions (Ang et al., 2007).

Literature suggests that various dimensions of Cultural Intelligence have an impact on the psychological state of individuals when entering multicultural settings, which has a positive impact on performance (Ang et al., 2007; Crowen, 2008; Rockstuhl & Ng, 2008; Chen et al., 2011; Templer et al., 2006). Also, authors conclude that Cultural Intelligence has a positive impact on the behaviours expressed by individuals in diverse settings which ultimately benefits organisational effectiveness.

Together, these outcomes ensure for effective intercultural interactions that result in increased performance. The research also has implications for organisational development with authors presenting methods for developing Cultural Intelligence

within organisations, thereby improving performance (Ang & Inkpen, 2008; Sholl, 2009).

Ultimately, high Cultural Intelligence, when residing in South African management, has the potential to create a competitive advantage for organisations within the global marketplace. As an intelligence measure, managerial CQ will allow for effective intercultural interactions that can be further trained and developed with the potential to have a positive impact on South African organisational performance.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter provides details of the philosophy and methodological approach that was used for the empirical part of this study, followed by an explanation of the research design and the sampling procedure that was used to collect data. The E-CQS measurement instrument which was evaluated is also discussed. The chapter concludes with details of the procedures that were applied during the data collection process and analysis.

3.2 RESEARCH PHILOSOPHY

According to Krauss (2005), when a researcher decides on a philosophical world view, they should understand the epistemology of a paradigm and ultimately the nature of reality from which the study is carried out. Creswell (2008) states that the post-positivist world view is more appropriate to quantitative as opposed to qualitative research designs, and is sometimes referred to as the *scientific method*, *empirical science, post-positivistic research* or *post-positivism* (Creswell, 2008, p. 6). Krauss (2005) also states that *realism* or *post-positivism* differ from positivism in that positivism concerns a single concrete reality whilst realism or post-positivism concerns multiple perceptions of a single reality.

The post-positivist worldview is one in which “cause probably determines effect or outcome” Creswell (2008, p.7). Ultimately, post-positivistic researchers understand the need for gaining a deeper denotation of reality, as well as that this meaning may differ from group to group (Krauss, 2005). Thus, the post-positivistic researcher may be deterministic, in other words: determining the cause of an outcome (Creswell, 2008). Post-positivism is also reductionistic in that broad ideas are reduced into smaller testable ideas that take the form of hypotheses or research questions.

According to Krauss (2005), post-positivism is concerned with developing numerical measures of observable behaviour and testing these to gain a deeper understanding of the world and reality. As the researcher aims to evaluate the psychometric properties of an existing scale within the South African context, a post-positivistic philosophy was adopted by the researcher.

3.3 RESEARCH APPROACH

For this study the researcher adopted a quantitative, deductive research approach. This is due the fact that that the research is guided by theory and aims to determine the psychometric properties of the E-CQS in the South African context, as compared to existing literature (Saunders, Lewis & Thornhill, 2012). Thus, the data collected was used to evaluate the current psychometric properties and factor loadings of the E-CQS. According Saunders et al. (2012), the deductive reasoning approach is the most appropriate research approach for quantitative studies.

3.3.1 Advantages and disadvantages of the research approach

According to Welman, Kruger and Mitchell (2005) the purpose of quantitative research is to evaluate objective numerical data by means of statistical analysis. By using a quantitative approach, the researcher is able to perform various statistical analyses on the data and infer reliable and valid conclusions from the data. The analysis stage of quantitative studies is also generally quicker than qualitative studies. However, the disadvantages of this approach include the need for large samples and the researcher's inability to infer deeper meaning from the data as in qualitative research (Saunders et al., 2012).

3.4 STRATEGY OF INQUIRY

According to Saunders et al. (2012), within social research, survey research designs are one of the most popular designs used in validation studies. The authors also state that survey design is usually associated with a deductive research approach and descriptive or exploratory research. As the study involves the administration of a questionnaire (namely the E-CQS), survey design will allow the researcher to collect quantitative data which can be analysed using statistics (Welman et al., 2005). This statistical analysis is required in order to evaluate the psychometric properties of the instrument.

3.4.1 Advantages and disadvantages of the strategy of enquiry

According to Saunders et al. (2012), survey design is one of the most economic and time effective strategies of inquiry available to researchers as it allows for a large amount of information to be collected in a relatively short period of time. Using a survey design also allows the researcher to build models illustrating the relationships between variables (Saunders et al., 2012). Saunders et al. (2012) state that the greatest challenges with survery design lie in the fact that reseachers are expected to administer instruments to large sample groups, and that the quality of data collected depends on the quality of the instrument used.

3.5 DESCRIPTION OF THE RESEARCH DESIGN

The following are descriptors that best describe the broad research design for this proposed study: a non-experimental, cross sectional survey design.

- *Numeric data*: As the study involved primary data collection from a large sample using the E-CQS (an instrument with numerical rating scales), the researcher followed a quantitative research approach. A quantitative

approach allowed the researcher to perform various statistical analyses on the data and infer reliable and valid conclusions from the data as required in the evaluation of an instrument's psychometric properties (Welman et al., 2005).

- *Empirical data:* According to Saunders et al. (2012) empirical data refers to all new data, and secondary data, which is used to answer a new research question. Empirical data was thus collected by the researcher.
- *Primary Data:* For the proposed study, the researcher collected primary data from a large diverse sample of South African employees working across the country for large FMCG.
- *Fundamental research:* According to Saunders et al. (2012), fundamental studies are conducted in order to expand on current knowledge and involves understanding processes and outcomes. Since this study aimed to expand on Cultural Intelligence theory within the South African context, the study can be classified as a fundamental study.
- *Cross-sectional research*: According to Saunders et al. (2012), cross-sectional studies are focused on a particular point in time and data is collected to explain a phenomenon that is present at that time. As the study involved a single administration of the E-CQS to a large sample at a single point in time, the study meets the criteria of cross-sectional research.
- *Non-experimental research:* With no variables being manipulated during the study, as in experimental and quasi-experimental studies, the study can be described as being a non-experimental research study (Welman et al., 2005).
- *Confirmatory research:* According to Saunders et al., (2012) a study is confirmatory in nature when it aims to confirm a phenomenon. As the proposed study aims to confirm the dimensionality and psychometric properties of the E-CQS in the South African context, it meets the criteria of confirmatory research.

3.6 SAMPLING

This section discusses the study's sample population, context and units of analysis. Following this, the sampling methods and sample size are described.

3.6.1 Target population, context and unit of analysis

In order to ensure validity and reliability it is imperative that the researcher considered the purpose of the research, the target population and statistical measures to be used when selecting an appropriate sample (Creswell, 2009; Saunders et al., 2012). The researcher took this consideration into account when describing the sample for the study.

The validation of the E-CQS on a large sample of employees (professional, highly skilled and skilled) working in a multi-national organisation within a Fast Moving Consumer Goods (FMCG) industry, operating within all provinces across South Africa, allowed for a diverse South African sample population. This sample is for suitable the evaluation the psychometric properties of the E-CQS within a South African context. A possible limitation of focussing on a single company is that the specific organisational culture of the FMCG may impact employee's response patterns to items on the E-CQS due to a strong organisational culture. However, as having access to a large data base of employees in a very successful organisation highly competitive organisation should be viewed as a key strength in the study.

For the purpose of this dissertation, a skilled employee is defined as an individual in possession of a key skill or ability which is developed through tertiary education or on the job. A highly skilled employee is able to carry out tasks independently of others and is highly efficient in performing these tasks. Highly skilled employees usually supervise skilled employees in the workplace and adopt managerial roles within organisations (Mattes & Richmond, 2000). A professional is an individual in possession of specialised knowledge as a result of extensive educational training (usually at tertiary level), exercises autonomy in the workplace, and exercises professional judgement and ethical consideration when performing tasks (Mattes & Richmond, 2000).

3.6.2 Sampling methods

According to Saunders et al. (2012) researchers can decide between probability (the chance of each member in the population being selected for the study is known) and non-probability (the chance of each member in the population being selected for the study is not known) sampling methods. The researcher is employed within the Human Resources Department at the FMCG and received organisational permission to invite participants to the study from a list of over 5000 employee email addresses. Survey emails were sent to all 5000 employees with a response rate of 12.1%.

3.6.3 Sample size

A total of 606 participants agreed to participate in the study, and of those, 601 were included in the analysis which was regarded as sufficient to evaluate the psychometric properties of the Expanded Cultural Intelligence Scale (E-CQS).

Traditionally, the sample size required for a factor analysis study can be determined in two ways. Firstly, some researchers express that the absolute number of cases *(N)* is important with these researchers proposing sample sizes ranging from 100 to more than 500 responses, regardless of the number of items in an instrument (MacCullum, Widaman, Preacher & Hong, 2001). Secondly, other researchers express that the subject-to-variable ratio *(p)* is important when conducting factor analysis with these ratios ranging from (5:1) to (20:1) (Hogarty, Hines, Kromrey, Ferron & Mumford, 2005; MacCullum et al., 2001).

However, the use of these rules-of-thumb for determining a suitable sample size were critiqued to be dependent on the shared commonalities of the sample, which has an impact on the degree of over determination of factors (MacCullum et al., 2001). The obtained sample size was viewed to be sufficient for the purpose of this study.

3.7 DATA COLLECTION

The data collection instrument for the study was the Expanded Cultural Intelligence Scale (E-CQS). The instrument was used with the permission of the Cultural Intelligence Centre, LLC. The model for the E-QS had empirical evidence supporting the eleven sub-dimensions of Cultural Intelligence with the psychometric properties of the E-CQS having been validated using data from 286 individuals from more than 30 countries (Van Dyne et. al, 2012). The 37 item self-completed E-QCS was used to measure responses on items indicating and eleven first-order factors and four second-order factors. The items were rated on a seven point Likert scale ranging from strongly disagree to strongly agree. The questionnaire required 10-15 minutes to complete and data collection was administered using the Qualtrics online survey software licensed to the University of Pretoria.

The particular data analysis methods that were applied in this study to evaluate the validity and reliability of the measurement scale are described in the proceeding sections of this chapter.

3.8 DATA ANALYSIS APPROACH

This section discusses the processes and methods adopted by the researcher in order to analyse the data. Firstly, the methods applied in terms of how the data was recorded, stored and prepared for analysis are discussed. This is followed by descriptive and inferential statistical analysis sections.

3.8.1 Data recording and storage

During the data collection using online survey software, responses were stored online. After the survey was closed, that data was downloaded and coded, and imported to SPSS for the data analysis stage of the study. All biographical

information was coded in SPSS 23 assigning numerical values for nominal data for descriptive statistics. The quantitative responses were captured and coded on SPSS and were categorised as either interval, nominal or ordinal data (Saunders et al., 2012).

3.8.2 Preparing data for analysis

The data was prepared for analysis on SPSS 23. Responses from the Qualtrics survey software were downloaded in Excel format and stored onto a hard drive. Incomplete responses were removed from the dataset. A total of six non responses were removed from the data set. The remaining complete responses were each assigned a unique respondent number (ensuring anonymity). The process of data cleaning was tracked and recorded in the form of a coding book.

3.8.3 Accuracy and completeness of data

Since the quality of any study's results are largely dependent on the quality of data, the researcher took steps to ensure the accuracy and completeness of the recorded data. According to Saunders et al. (2012) researchers should ensure the integrity of the data by:

- *Scanning for illegitimate codes:* This was done by identifying any codes that lay outside of the predefined rage as per the code book. No illegitimate codes were identified.
- *Coding missing data:* Missing data was regarded as a non-response and was coded in SPSS by leaving the field blank. All responses remaining were regarded as complete and ready for analysis.
- *Illogical relationships:* The biographical section was reviewed to note illogical relationships between variables. No illogical relationships where identified.

All changes to the original data set were assigned a case number and linked back to the original data set so that errors and any changes could be traced back to the original data using Excel. Data screening resulted in a final sample size of 601 usable responses using *listwise* deletion), providing a ratio of 55 cases per variable.

3.8.4 Descriptive statistics

Descriptive statistics where used to describe the sample in terms of gender, race, age, marital status and home language with the introduction of additional contextual variables. These included the number of years working experience respondents have, both locally and abroad as well as their level of management and number of direct reports. Within this context respondents were also asked to describe the diversity of the teams they managed in terms of gender and cultural composition

3.8.5 Demographic characteristics of the sample

The demographic characteristics of the sample are disused in Table 3-1. It is evident from the data in Table 3.1 that the sample selected can be described as being diverse. Of the 601 valid responses, 59.7% were male. Only 31.6% of respondents where white, with 44.5% being African with 57.9% of respondents speaking an African language at home. More than 90% of the over 50% of the respondents reside in the Gauteng province, there was reasonable representation from the other eight provinces.

With regards to experience, 73.8% of respondents had more than six years working experience with 45% managing people, of which 47.4% manage more than 6 individuals. When asked about the diversity of the teams that the respondents managed, 33.4% of managers regarded the group to be very diverse in terms of culture with 60% regarding the team to be mostly comprised of males and 24.3% regarding the group to be well balanced in terms of gender representation.

Table 3-1: Demographic profile and contextual variables of respondents

Variables	Categories	Frequencies	Percentage
A1: Gender	Male	370	59.7
	Female	231	37.6
A2: Race	African	276	44.5
	White	195	31.6
	Coloured	68	11.4
	Indian	50	8.7
	Chinese	3	1.0
	Other	10	2.1
A3: Age	18 -25	56	9.0
	26 – 30	151	24.2
	31- 35	131	21.0
	36 – 40	88	14.1
	41 – 45	88	14.1
	46 – 50	36	5.8
	51 – 55	32	5.1
	55 – 60	29	4.7
	60+	8	1.3
A4: Home Language	English	262	42.1
	Afrikaans	96	15.4
	Sepedi	27	4.3
	Sesotho	36	5.8
	Setswana	54	8.7
	isiTsonga	17	2.7
	isiSwati	13	2.1
	Tshivenda	8	1.3
	isiZulu	56	9.0
	isiNdebele	2	0.3
	isiXhosa	40	6.4
	Other	4	0.6

Table 3-1 Continued: Demographic profile and contextual variables of respondents

Variables	Categories	Frequencies	Percentage
A5: Marital status	Single	239	38.4
	Married	298	47.8
	Divorced	31	5.0
	Widowed	9	1.4
	Co-Habitating	46	7.4
	Eastern Cape	30	4.8
	Free State	22	3.5
	Western Cape	77	12.4
	Limpopo	43	6.9
	North West	31	5.0
	KwaZulu-Natal	54	8.7
	Mpumalanga	18	2.9
	Gauteng	338	50.3
	Northern Cape	26	3.7
A7: Years working experience	0-2 Years	37	6.3
	2-5 Years	117	19.9
	6-10 Years	0	34.6
	11-15 Years	149	24.9
	16+ Years	87	14.3

Table 3-1 Continued: Demographic profile and contextual variables of respondents

Variables	Categories	Frequencies	Percentage
A8: Manager of people	Yes	228	41.5
	No	321	58.5
A9: Number of direct reports if managing people	1 – 5	141	52.6
	6-10	67	25
	11-20	42	15.7
	20+	18	6.71
A10: Diversity of group being managed in terms of culture	The group is predominantly from one cultural group	82	27.9
	There is some cultural diversity in the group	112	38.2
	The group is very diverse in terms of culture	99	33.4
A11: Diversity of group being managed in terms of gender	The group has mostly males	178	60.7
	The group has mostly females	44	15
	The group is quite balanced in terms of males and females	71	24.3

3.8.6 Data analysis method

A variety of statistical methods were applied in order to evaluate the psychometric properties of the E-CQS measurement scales within the South African context. The main statistical operations that were applied to the data include confirmatory factor analysis (CFA) and subsequently structural equation modelling (SEM), and calculating the internal consistency reliability of the items using Cronbach's alpha.

According to Hair et al. (2006), in order to use a summated scale in research (as per the E-CQS), researchers need to assess the dimensionality of the scale. According to Hair et al. (2006), confirmatory factor analysis can be used to assess the E-CQS's dimensionality by identifying the number of factors in a scale and the factor loadings of the variables onto each factor.

Before conducting a CFA, an assessment of normality was conducted on the 37 items of the E-QS to assess the assumption of univariate and multivariate normality, which according to West, Finch and Curran (1995) is important when conducting structural equation modelling due to the fact that non-normality can have an effect on the variance and covariance's on which structural equation modelling is built (Bryne, 2010).

Confirmatory factor analysis (CFA) was used to examine the validity of constructs measured by a measurement scale (Zikmund, 2013). According to Blunch (2013) confirmatory factor analysis has several advantages. Firstly, the procedure allows the researcher to apply prior knowledge in the testing the validity of a model. Secondly, the technique is well regarded as a popular and efficient assessment of both convergent and discriminate validity across measured constructs (Fornell & Larcker, 1981). Lastly, the CFA method also allows results to be obtained by separating variance into attribute, method and error composites and thus allows for estimating squared factor loadings and error variances (Bagozzi, Yi & Phillips, 1991).

Confirmatory factor analysis was applied to investigate whether the eleven second-order factor loadings of the 37 items could reasonably replicate in the sample, and was used to examine the degree to which multiple measures of the same construct illustrate agreement or convergence (Hair et al., 2006).

3.9 MEASUREMENT INVARIANCE TESTING

When comparing models across diverse groups, invariance testing becomes important as it allows the researcher to establish whether an instrument measures the same phenomenon across diverse groups (Horn & McArdle, 1992). In this study, invariance testing was applied to determine whether the E-CQS model can regarded as a valid assessment of Cultural Intelligence across diverse groups (namely across genders and races).

This study evaluated invariance at five levels as proposed by Steenkamp and Baumgartner (1998):

- Configural invariance is assessed whereby multiple confirmatory factor analysis of male and female and black, white and coloured responses is assessed is used to investigate whether multiple groups have the same pattern of free and fixed parameters (Cheung & Rensvold, 2002).
- Metric invariance is evaluated whereby metric invariance across groups is investigated by constraining equal regression weights for each item across the groups (Cheung & Rensvold, 2002). This is used to evaluate whether the scale was interpreted the same by multiple groups.
- Scalar invariance is examined by constraining regression weights and intercepts items with latent variables being equal. This evaluation is important establishing valid mean comparisons across groups (Steenkamp & Baumgartner, 1998).
- Factor covariance and variance invariance is evaluated by restraining regression weights, intercepts variance and covariance's as equal in order to whether correlations between variables can be assumed equal (Steenkamp & Baumgartner, 1998).
- Error variance invariance is assessed in order to evaluate if measurement error across multiple groups can be assumed equal (Steenkamp & Baumgartner, 1998).

These invariance assessments where conducted using an eleven factor and four factor model of Cultural Intelligence and was evaluated in terms of invariance between gender and race.

3.10 SECOND-ORDER FACTOR MODELS

Second-order factor analysis can be used to highlight the structure of a pattern of covariance between first-order latent factors, with fewer parameters (Strasheim, 2011). Second-order factor analysis has several advantages. Firstly, the analysis can be applied when factors in the first-order are not strongly correlated can be used to identify patterns of relationships at the first-order level. Secondly, second-order factor analysis can be used when underlying factors are considered to account for covariance between factors at the first-order level and lastly, it allows for second-order factors tend to take measurement errors of specific factors into account (Chen, Sousa and West, 2005). With regards to this study, Van Dyne et al. (2012) proposed an eleven factor second-order model with four first-order factors which are outlined in Table 3-2 below.

Table 3-2: Factor Structure of the E-CQS

Second-Order Factor	***First-Order Factor***	***Items***
Motivational CQ	Intrinsic motivation	B1, B12, B23
	Extrinsic motivation	B2, B13, B24
	Self-sufficiency to adjust	B3, B14, B23
Cognitive CQ	Culture general knowledge	B4, B15, B26, B34, B36
	Context specific knowledge	B5, B16, B27, B35, B37
Metacognitive CQ	Planning	B6, B17, B28
	Awareness	B7, B18, B29
	Checking	B8, B19, B30
Behavioural CQ	Verbal behaviour	B9, B20, B31
	Non-verbal behaviour	B10, B21, B32
	Speech acts	B11, B22, B33

Source: Author's own summary from Van Dyne et al. (2012)

3.11 FIT MEASURES IN STRUCTURAL EQUATION MODELLING

Structural equation modelling (SEM) can be described as a process whereby observed data is evaluated in terms of its fit relative to a structural model through the evaluation of covariance within the model (Schermelleh-Engel & Moosbrugger, 2003). Overtime, a number of measures have emerged in literature, each with situational shortcomings. It is thus important to take several criteria into consideration when evaluating model fit.

The fit measures used in this study were the Chi-square statistic, Incremental Fit Index (IFI), the Tucker Lewis Fit index (TLI), the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA), the Standardised Root Mean Residual (SRMR), as well as the Akaike Information Criterion (AIC). Each of these fit measures is explained in more detail in the paragraphs below.

The Chi-squared statistic is a measure of discrepancy between the sample covariance matrix and the model implied covariance matrix. This should ideally be insignificant for the model to fit the data well (Raykov & Marcoulides, 2006). Where sample sizes are large as in this study, a number of other measures should be used to interpret the suitability of a proposed model. For this study the values of the ratio of Chi-square to degrees of freedom was additionally used to evaluate model fit. This ratio would need to be less than 3 (Hu & Bentler, 1999) in order for the model to conclude that it fit the data reasonably.

The Incremental Fit Index (IFI) is used to evaluate how well a model fits relative to a baseline model while the Tucker-Lewis Fit Index (TLI) compares normed chi-square values against a null and specified model and accounts for model complexity. Lastly the Comparative Fit Index (CFI) provides relative improvement in fit compared to a statistical baseline model (Hu & Bentler, 1999; Hair, et al., 2006).

In this study, the additional criteria that were used to evaluate model fit was based on three fit indices, namely IFI, TLI and CFI, all of which range between 0 and 1. The closer to 1 the more acceptable the model fit. Hu and Bentler (1999) argue that these values should be above 0.9 for acceptable fit and greater than 0.95 for excellent fit. It should also be known that the TLI values can be greater than 1, indicative of an over-specified model (Strasheim, 2014).

An additional measure that was examined during the study was that of the Root Mean Square Error Approximation (RMSEA). This fit measure is based on the non-central Chi-square distribution whereby models are assumed to be only approximately correct. RMSEA values of less than 0.05 are usually indicative of good fit. Values between 0.05 and 0.08 are regarded as indicative of reasonable fit while values greater than 0.08 and 0.10 are indicative of mediocre and poor fit respectively (Diamantopolous & Siguaw, 2000).

According to Browne (2015), the Standardised Root Mean Residual (SRMR) can be considered a measure of average discrepancy between correlations of observed data and the correlation matrix of the implied model. A model with SRMR values less than 0.08 can be regarded as good fit between model and data (Hu & Bentler, 1999).

The Akaike Information Criterion (AIC) can be used with models that are not nested by adjusting the Chai-square for the number of estimated parameters and can be used when comparing models. The model with the smallest AIC value is regarded as the preferred model (Schermelleh-Engel & Moosbrugger, 2003).

3.12 RELIABILITY OF RESEARCH INSTRUMENTS

The reliability of a research instrument to measure a particular phenomenon is imperative to ensure stable research results (Wilson, 2010; Zikmund, 2003). Although reliability has a direct impact on the validity of research instruments, it is not the only criterion influencing validity (Saunders et al., 2012).

3.12.1 Internal consistency reliability

The most commonly applied mathematical methods used when assessing internal reliability is the Cronbach's coefficient alpha that estimates internal consistency reliability with the most suitable and widely applied measure being the Cronbach's alpha (Bryman & Bell, 2007; Eisinga, Grotenhuis & Pelzer, 2013). The Cronbach's alpha ranges between 0 and 1, with 1 indicating a perfect internal reliability while 0 indicates no internal reliably. According to Peterson (1994), a Cronbach Alpha of 0.7 can be regarded as a suitable level of internal consistency reliability. Although researchers generally agree to a Cronbach alpha coefficient of at least 0.7, in exploratory research 0.6 is acceptable (Hair et al., 2006).

In order to determine the internal consistency of the E-CQS, item-to-total-correlation analysis was conducted which evaluated correlations between individual items and summed scores for each construct. These correlations should ideally be greater than 0.5. Secondly, inter-item-correlation analysis evaluated correlations between items which should be greater 0.3 to be regarded as reliable (Hair et al., 2006). Lastly, Cronbach's alpha coefficient was used to determine the consistency of the entire E-EQS scale.

3.13 EXPLORATORY FACTOR ANALYSIS

Exploratory factor analysis (EFA) was conducted in order to explore the factor structure of both the eleven and four factor models of Cultural Intelligence.

Confirmatory factor analysis was conducted as a “more direct input response analysis of the data” (Merkle, Layne, Bloomberg & Zhang, 1998, p. 208), while exploratory factor analysis provided an indication of relationships between variables without the hypothesis proposed by Van Dyne et al. (2012). This was conducted to explore for confirmation of findings after changes were made to the model.

SPSS23 was used to conduct a factor analysis with principal axis factoring as extraction method and varimax rotation methods. In this particular context the researchers endeavored to establish whether a four factor model of Cultural Intelligence measured the four factor’s proposed post Confirmatory Factor Analysis.

Initially, the inter-correlation between the variables of each model was explored as proposed by (Field, 2009). This gave an indication of whether the items in the models which correlated as per the theory of Cultural Intelligence. This allowed for the determining of how many factor loadings there were within the model.

The use of eigenvalues allowed the researcher to explore explained and unexplained covariation between items in the model (De Vellis, 2003). This revealed how many factors were to be retained in the analysis (Field, 2009), which is usually those with eigenvalues greater than one (Merkle et al., 1998).

The principal axis factor extraction technique was employed as a data reduction method (Costello & Osborne, 2005), whereby the method of extraction ensured that the variances explained from the correlation matrix are maximised by each factor and that the amount of variance explained by each factor is equal to the respective eigenvalue, ensuring that that the factors do not correlate with one another (Merkle et al., 1998).

3.14 VALIDITY OF RESEARCH INSTRUMENTS

3.14.1 Content validity

Content validity can be regarded as a measure of how well an instrument collects data essential to addressing a specific construct or theme. This validity is subjective and refers to the respondents' perceptions regarding what an instrument is supposed to measure (i.e. does the instrument look like it measures Cultural Intelligence?). Content validity, similar to face validity, is not measured objectively. It refers to whether or not the items of the instrument items reflect the construct being measured and is usually determined by subject matter experts (Hair et al., 2006; Strydom, Fouché & Delport, 2004).

According to Cooper and Schindler (2006), instruments with adequate content validity should cover a wide scope of questions aimed at evaluating a particular construct or research problem. Based on this, the content validity for this study can only be assumed valid if the items in the E-CQS sufficiently cover the eleven constructs being measured.

Cooper and Schindler (2006) also argue that, content validity of an instrument can be determined in two main ways. Firstly, the judgment of the researcher on the instrument and secondly, the researcher's investigation of current literature. As this is a pre-existing scale, the researcher did not design the research instrument, however as discussed in Chapter 3, the instrument was designed by the seminal authors on Cultural Intelligence.

3.14.2 Construct validity

Construct validity can be described as a measure of the extent to which a group of constructs are related to the same underlying theory (Sekaran, 1992). According to Hair et al. (2006) in multivariate analysis research the three most recognised validities are convergent validity, discriminant validity and nomological validity. However, in order to evaluate a scale, researchers need to ensure that the scale items reflect the construct being defined and measured by the scale. Thus construct validity is of utmost importance if the E-CQS is to be regarded as being a valid measure of Cultural Intelligence (Hair et al. 2006).

3.14.3 Discriminant and convergent validity

According to Hair et al. (2006), convergent validity is a measure of the degree to which two measures of the same construct are related, whereas discriminant validity refers to the degree to which two conceptuality similar constructs are distinct. Which can be evaluated through the estimation of composite reliability (CR) (Fornell & Larcker, 1981; Farrel, 2010). The approach developed by Fornell and Larcker (1981) is a useful evaluation of a measurement models validity and reliability. The composite reliability (CR) of a construct is a function of the standardized regression weights and estimated error variances where;

$$CR = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + \sum \varepsilon_i}$$

In this equation, λ_i is the standardized factor loading and ε_i is the error variance of the indicator. Fornell and Larcker (1981) argue that that there is support for convergent validity when the composite reliability (a function of the sums of the standardised loadings and measurement error variances) is greater than 0.5.

The use of SEM allows for the measurement of convergent and discriminant validity through calculating the Average Variance Extracted (AVE) (Strasheim, Pitt & Caruana, 2007). According to Fornell and Larcker (1981, p. 46), convergent validity is established once shared variance accounts for 0.50 of the total variance, and discriminant validity is established once "AVE for each construct is more than the squared correlation between that construct and any other in the model" (Strasheim, Pitt & Caruana, 2007, p. 109).

Fornell and Larcker (1981) also highlighted that the Average Variance Extracted (AVE) provides insights into the amount of variance explained by the construct relative to the amount unexplained measurement error variance. Fornell and Larker (1981) also state that AVE which is always more conservative that CR is a function of the ratio of sums of squared loadings of standardised regression coefficients and measurement error variances. AVE is calculated as follows:

$$AVE = \frac{\sum \lambda_i^2}{\sum \lambda_i^2 + \sum \varepsilon_i}$$

AVE is therefore useful when evaluating the discriminant validity of a construct by comparing AVE with the highest correlation of the construct with other constructs. AVE greater than the maximum correlation with remaining constructs supports discriminant validity (Fornell and Larcker, 1981).

According to Strasheim (2011), the issue of measurement equivalence in confirmatory analysis in the South African context is an important issue, especially when measures with clearly defined sub-dimensions are used. With instruments in South Africa being applied cross culturally, researchers should evaluate the instruments' invariance in order to ensure valid findings which can be used by international scholars (Strasheim, 2011). According to Hair et al. (2006), the E-CQS can be regarded as a multivariate scale as several variables (Behavioural CQ, Motivational CQ, Cognitive CQ and Metacognitive CQ) are joined to form a composite scale/construct (Cultural Intelligence).

In this study, discriminant validity of the four first-order factors of E-CQS, namely Behavioural, Motivational, Metacognitive and, Cognitive Cultural Intelligence were evaluated applying the approach suggested by Fornell and Larker (1981).

3.15 ETHICAL CONSIDERATIONS

It is imperative that research is conducted in an ethical and morally responsible manner. There were thus a number of ethical considerations that were taken into account when conducting this research study. According to Welman, Kruger and Mitchell (2005), research ethics concerns issues such as human rights and honesty. Ethics are important in all stages of research and ought to be considered in every choice that is made during the research process. A number of ethical considerations were taken into consideration during the study and are discussed below.

3.15.1 Researcher competence

The researcher is trained and regarded as competent in terms of the research process. The researcher required adequate knowledge of survey design theory and the statistical techniques discussed in the data analysis section of this study. Where the researcher was unable to perform certain complex statistical analysis, the researcher sought guidance from a statistician. Also, the researcher took steps to ensure data integrity by adopting an objective stance as per the post-positivist philosophy.

3.15.2 Copyright

The researcher ensured that no copyright infringements on the part of the researcher, university, or respondent took place. The researcher contacted the test developers and received consent prior to the use of the E-CQS for research purposes. The following clause accompanied all forms of the questionnaire:

> "© Cultural Intelligence Center, 2011. Used by permission of the Cultural Intelligence Center, LLC. Note. Use of this scale is granted to academic researchers for research purposes only. For information on using the scale or items for purposes other than academic research (e.g. consulting, program evaluation, non-academic organizations), send an email to cquery@culturalq.com
>
> For more information, see Van Dyne, L., Ang, S., Ng, K.Y., Rockstuhl, T., Tan, M. L. & Koh, C. (2012). Subdimensions of the four factor model of Cultural Intelligence: Expanding the conceptualization and measurement of Cultural Intelligence. *Social and Personality Psychology Compass*, 6/4, 295-313.
>
> See also http://culturalq.com"

3.15.3 Informed consent

Prior to administering the survey, senior management at the FMCG company gave formal permission in the form of a 'request to conduct academic research' letter, before the data collection commenced. Enrolment into the study was voluntary with a total of 5 000 email invitations to employees to participate in the study being sent to employees with the FMCG.

The participants were informed of the purpose of the study and were ensured that confidentiality would be maintained. They were also informed that they could withdraw from the study at any time in the form of a cover letter containing all relevant information (refer to Addendum A).

3.15.4 Data analysis and storage

The researcher adhered to ethical principles when analysing the data and reported all statistical analysis techniques in the form of an analysis journal. According to global guidelines, the storing of research data should be for a minimum period of ten (10) years. The final electronic dataset will be stored along with the thesis/dissertation on CD ROM in the UP digital repository, UP Space. It is the responsibility of the researcher, supervisor and, ultimately, the Head of the department to ensure the storage of the data.

As the researcher will be adding to academic research, an ethical obligation exists to report results fully and accurately and shortcomings and limitations will be clearly stated.

3.15.5 Measurement bias

This section will focus on the measurement bias that can occur during data collection. According to Saunders et al. (2012) there are two sources of measurement bias. Firstly, measurement bias can occur when the researcher deliberately distorts data by intentionally (or unintentionally) capturing incorrect responses, and secondly if there are variations in the way the data is collected. As this study involves primary data which will be collected from respondents, the researcher ensured that there were no variations in data collection techniques in that all surveys were sent out at the same time with the same communication via the same collection method. Also, during data collection, the researcher ensured the integrity of the data by capturing responses on SPSS diligently. Cross checks of recorded responses were conducted throughout the data collection phase.

3.15.6 Reliability and validity

As the E-CQS has not been validated on the South African population, the psychometric properties of the instrument were not known prior to conducting the study. Research, however, demonstrated high reliability and validity coefficient's within other contexts (Van Dyne et al., 2012). Van Dyne et al. (2012) also reported that CFA in a study of 286 respondents from more than 30 countries (a diverse sample), resulted in the E-CQS displaying acceptable convergent validity with the 11-factor model: "demonstrating and excellent fit to the covariance matrix, with significant factor loadings" (p. 307).

Thus, as the objective of this study was to evaluate the psychometric properties of the E-CQS in the South African population, statistical analysis was conducted in order to determine the measures quality for future research. All efforts were taken so as to ensure the data collection and analysis was conducted in such a way to minimise the potential bias that may arise from applying different data collection methods, and the web-based survey eliminated data capturing errors.

3.16 CHAPTER SUMMARY

This chapter described the research methodology that was applied in this study. The chapter described the research design and sampling strategies applied to select the sample from the population. The chapter also clarified the research instruments used during data collection and discussed the methods for data analysis undertaken to assess the psychometric properties of the E-CQS.

CHAPTER 4: THE PSYCHOMETRIC PROPERTIES OF THE E-CQS

4.1 INTRODUCTION

This chapter presents empirical findings of this study and includes reporting of the reliability analysis carried out to examine the internal consistency of the E-CQS. Reliability analysis took place prior to and after confirmatory factor analysis in order to evaluate the impact of model adjustments on the internal consistency of the models. Thereafter, confirmatory factor analysis (CFA) was conducted to evaluate the psychometric properties of both an eleven factor and a four factor model of Cultural Intelligence. The measurement equivalence of the refined four-factor model of E-CQS are also reported across race and gender groups.

4.2 RELIABILITY ANALYSIS

Before conducting a confirmatory factor analysis on the latent variables and items comprising the E-CQS, the internal consistency reliabilities where calculated for each of the eleven dimensions. An evaluation of the internal consistency reliability or Cronbach's alpha of the items loading on each of the first-order latent variables is informative about items that may be problematic. In addition, the Cronbach's alpha for the four factor first-order model, hereafter referred to as CFA4a were also calculated (refer to Figure 4.2).

The Cronbach's alpha values were evaluated for each model with the eleven factor model yielding values ranging between 0.609 to 0.887 and the four factor model yielding values ranging from 0.838 to 0.921 as illustrated in Table 4-1.

According to Peterson (1994), Cronbach's alpha should ideally be greater than 0.7 to provide support for internal consistency reliability. It is therefore clear that the eleven factor model lacked internal consistency across 6 of the 11 factors while the four

factor model remained internally consistent across all four factors. The fact that the internal consistency of the four-factor model yielded higher values, should be wrongly interpreted as being better, due to the fact that more items in an instrument are known to yield higher levels of internal consistency (Field, 2009).

Table 4-1: Internal consistency analysis of the eleven and four factor models prior to confirmatory factor analysis

Eleven Factor Model CFA11a (n = 601)		
Dimension	**Items**	**Cronbach's alpha**
F1: Intrinsic motivation	B1, B12, B23	0.681
F2: Extrinsic motivation	B2, B13, B24	0.609
F3: Self-sufficiency to adjust	B3, B14, B25	0.671
F4: Culture general knowledge	B4, B15, B26, B34, B36	0.812
F5: Context specific knowledge	B5, B16, B27, B35, B37	0.887
F6: Planning	B17, B28, B6	0.751
F7: Awareness	B18, B29, B7	0.668
F8: Checking	B8, B19, B30	0.699
F9: Verbal behaviour	B20, B31, B9	0.746
F10: Non-verbal behaviour	B21, B32, B10	0.694
F11: Speech acts	B22, B33, B11	0.706
Four Factor Model CFA4a (n=601)		
Motivational CQ	B1, B2, B3, B12, B13, B14, B23, B24, B25	0.838
Cognitive CQ	B4, B5, B15, B16, B26, B27, B34, B35, B36, B37	0.921
Metacognitive CQ	B6, B7, B8, B17, B18, B19, B28, B29, B30	0.864
Behavioural CQ	B9, B10, B11, B20, B21, b22, B31, B32, B33	0.893

4.3 TESTING FOR THE ASSUMPTION OF NORMALITY OF THE MEASUREMENT ITEMS OF THE E-CQS

A key assumption in structural equation modelling (SEM) is that of multivariate normality of the items measuring the scale. A pre-requisite of multivariate normality, is that the individual items follow a normal distribution. Therefore, each item should approximately follow the normal distribution. However, if the items can be assumed to have univariate normality, it does not necessarily imply that multivariate normality also applies. Two aspects of the distribution have an effect on the distribution of scores, skewness and kurtosis. Of these two, an excessively high kurtosis have the most severe impact on the significance of the estimates, and the measures of fit (Byrne, 2010). Therefore, testing for normality is important prior to using maximum likelihood estimation in confirmatory factor analysis.

In this study, the items in the initial eleven factor model (CFA11b) had negative kurtosis values ranging from –0.440 to –0.039, and positive values ranging from 0.021 to 3.018 as shown in Table 4-2. According to West, *et al*., (1995), non-zero kurtosis values that are equal to or greater than 7 indicate a departure from normality. Therefore, the kurtosis values suggest that the distribution of the item scores were not highly kurtotic, and therefore, without a significant deviation from the multivariate normality assumption, maximum likelihood estimation is appropriate for estimating model parameters.

Table 4-2: Tests of normality of the items indicating the E-CQS

Variable	min	max	Skew	c.r.	Kurtosis	c.r.
B25	1	6	-1.211	-12.124	2.475	12.387
B14	1	6	-1.081	-10.820	2.609	13.058
B3	1	6	-1.124	-11.247	1.601	8.01
B23	1	6	-0.827	-8.275	0.327	1.636
B12	1	6	-0.633	-6.335	0.021	0.105
B1	1	6	-1.215	-12.165	3.018	15.103
B24	1	6	-1.336	-13.375	2.499	12.504
B28	1	6	-0.479	-4.792	-0.586	-2.933
B2	1	6	-1.102	-11.025	0.911	4.561
B17	1	6	-0.573	-5.739	-0.378	-1.892
B30	1	6	-1.113	-11.136	1.682	8.417
B19	1	6	-0.592	-5.926	-0.273	-1.365
B8	1	6	-1.264	-12.647	2.367	11.846
B29	1	6	-0.861	-8.622	1.168	5.845
B37	1	6	-0.542	-5.424	-0.440	-2.200
B18	1	6	-1.085	-10.858	1.544	7.724
B35	1	6	-0.682	-6.828	0.099	0.494
B27	1	6	-0.512	-5.128	-0.384	-1.924
B16	1	6	-0.683	-6.838	0.565	2.826
B5	1	6	-0.943	-9.434	0.728	3.641
B34	1	6	-0.746	-7.464	0.088	0.439
B4	1	6	-0.713	-7.136	0.416	2.082
B15	1	6	-0.771	-7.719	0.405	2.029
B26	1	6	-0.608	-6.087	-0.055	-0.275
B31	1	6	-0.650	-6.507	-0.224	-1.123
B20	1	6	-0.770	-7.703	-0.045	-0.227
B33	1	6	-0.802	-8.027	-0.039	-0.195
B22	1	6	-0.690	-6.910	-0.194	-0.969
B21	1	6	-0.344	-3.445	-0.822	-4.115
B32	1	6	-1.007	-10.074	0.574	2.870
Multivariate					308.056	86.176

4.4 CONFIRMATORY FACTOR ANALYSIS OF THE INSTRUMENT

A first-order confirmatory factor analysis with the measurement model shown in Figure 4-1 was used as originally proposed by Van Dyne et al. (2012). For ease of reference, this model is referred to as CFA11 in the study. Since a good fitting first-order model is a requirement before a second-order model would make sense, (Marsh and Hocevar, 1985), the first-order model with eleven latent variables was investigated as the first step in the analysis.

Figure 4-1 presents a first-order confirmatory factor analysis model of Cultural Intelligence. This model has 11 latent variables, namely: Intrinsic motivation, Extrinsic motivation, Self-sufficiency to adjust, Culture general knowledge, Context specific knowledge, Planning, Awareness, Checking, Verbal behaviour, Non-verbal behaviour and Speech acts.

When the model in Figure 4-1 was fitted to the sample covariance matrix (n=601), it resulted in a very poor fit, with a Chi-square-value of 2182.300 and degrees of freedom = 574, and IFI, TLI and CFI between 0.847 and 0.869. The biggest problem was that the sample covariance matrix between the first-order constructs was not positive definite, and estimates were therefore not accurate, and it seemed that the model was over-specified. Even when problematic items were removed, the problem persisted. Therefore, the results did not support the validity of an eleven factor model.

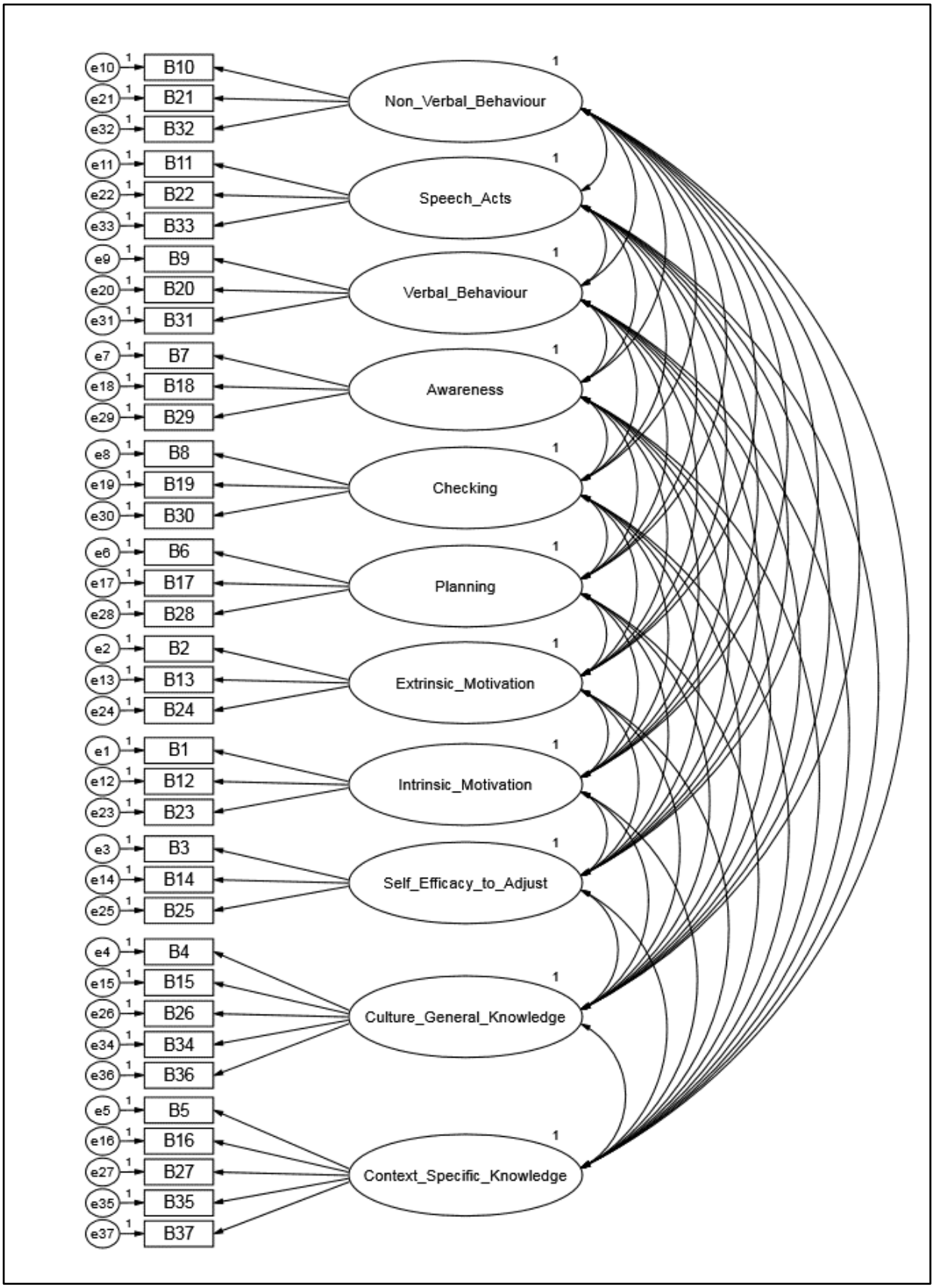

Figure 4-1: An eleven factor model of Cultural Intelligence (CFA11)

4.4.1 A first-order confirmatory factor analysis model with four latent variables

Figure 4-2 presents a first-order confirmatory factor analysis model with four latent variables, as originally conceptualised by Ang et al. (2008) with the four latent variables being Motivational CQ, Cognitive CQ, Metacognitive CQ and Behavioural CQ.

On Figure 4-2, the double-headed arrows in between the latent variables or factors in the ellipses represent covariances between these variables. The factor loadings or regression coefficients are shown on the arrows pointing from the latent variables to the observed indicator item variables (B1-B37), and the measurement error terms are shown in the small circles with arrows pointing to the observed variable in the model. The variances of the error terms represent the extent to which extraneous factors influence the variance explained by latent constructs in the model (Hair et al., 2006). Generally speaking, the higher the error term, the less variance is explained by the model.

Confirmatory factor analysis (CFA) is used to confirm whether or not a theoretical pattern of relationships between constructs is evident based on sampled data. Structural Equation Modelling (SEM) was deemed appropriate to the study as this method tests the fit of an existing structure to sampled data (Worthington & Whittaker, 2006).

In order to test the suitability of a model, a number of fit measures need to be evaluated. Firstly, the Chi-square (χ^2) statistic quantifies the discrepancy between the observed covariance matrix and the model implied covariance matrix. For the purposes of this study, the values of Chi-squared to degrees of freedom (df) ratio was used to assess the models stability to explain covariance between items. According to Hu and Bentler (1999) ratios of less than 3 are regarded as acceptable fit, although this is not the only fit criterion to be used.

According to Hu and Bentler (1999), a variety of additional measures should be evaluated when assessing for model fit, as it is rare that the Chi-squared statistic can be relied upon with large samples as in the study. The main fit measures evaluated in this study included the Incremental Fit Index (IFI), the Tucker-Lewis Fit Index (TLI), the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA).

The IFI can be denoted as a goodness of fit index which is used to consider the proportion of variance and covariance that are explained by the proposed model. (Raykov & Marcoulides 2000). The TLI allows for comparison of values of the normed Chi-square that exist between a null and specified model. Lastly, the CFI is regarded as an improved version of the normed fit index, and demonstrates the relative improvement in fit of the researcher's model while being compared to a statistical baseline model (Raykov & Marcoulides, 2006). For all the above fit measures, values close to 0.95 are regarded as good fit (Hu and Bentler (1999).

Another fit measure that was evaluated was the RMSEA. This measure is based on the non-centralised chi-square distribution and assumes that models are only approximately correct. According to Hair, *et al.* (2010), this measure illustrates how well a model fits an entire population. If the RMSEA is below 0.05, it is regarded as excellent fit, with values below 0.08 as sufficient fit (Hu & Bentler, 1999). The Akaike Information Criterion (AIC) is another useful criterion of fit to compare models – a model with a smaller AIC indicate better fit (Raykov & Marcoulides, 2006).

The four-factor model shown in Figure 4-2 did not fit the data well, with the fit measures of this model shown in Table 4-3. From the fit measures in this table it is clear that based on evaluating a variety of fit measures, the full four factor model (CFA4a) with all 37 items as indicators did not fit the data well. The procedure that was followed thereafter was to consider several criteria for identifying problematic items, and to remove these items from the model. The method used was that of running the model, and examining the standardised residual covariance matrix.

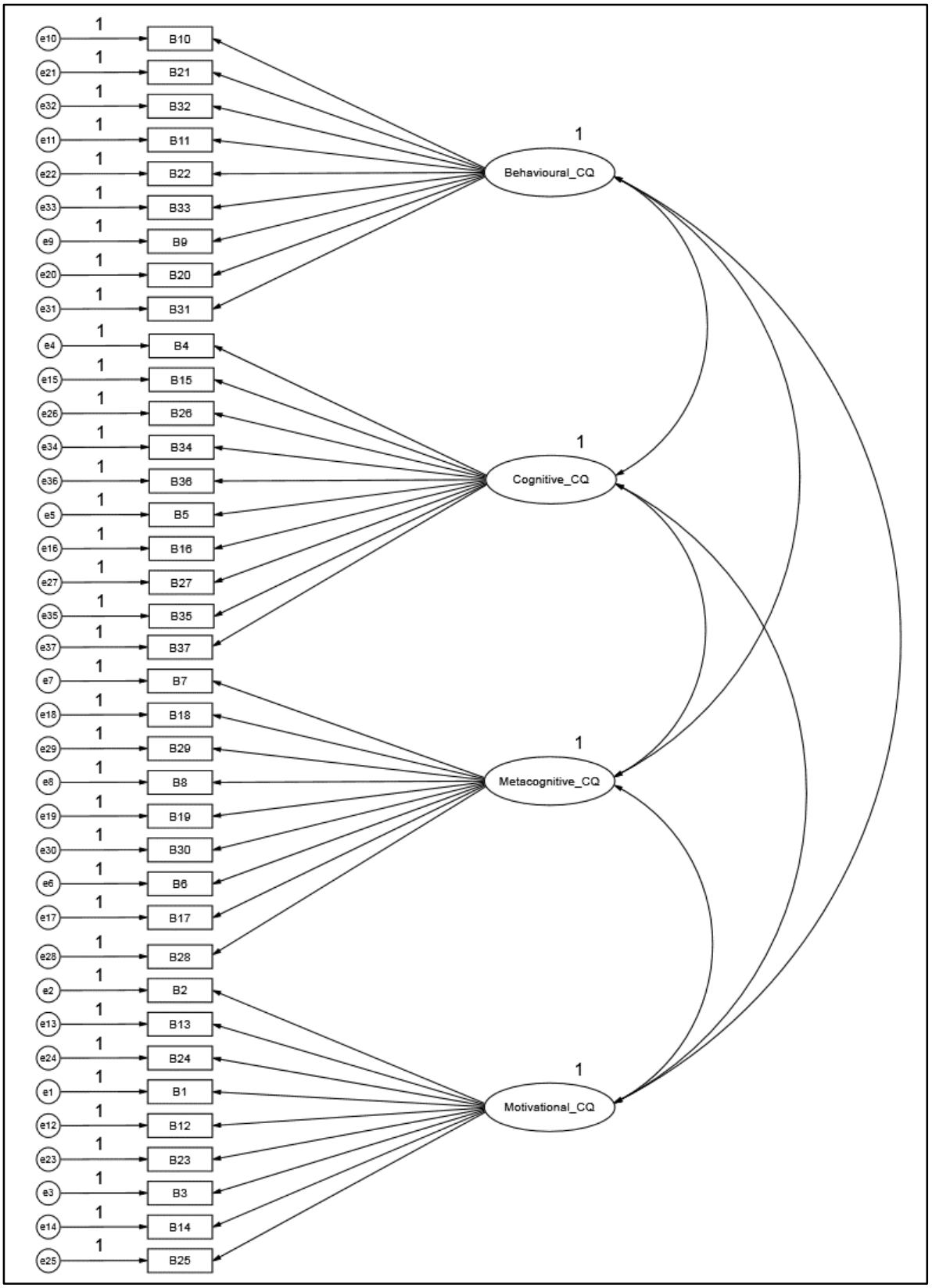

Figure 4-2: The initial four factor model (CFA4a) of Cultural Intelligence

If the residuals in this matrix was large for a specific item in terms of its covariance with several other items in the matrix, and if the estimated squared multiple correlation of that item was low, it would make sense to consider that item for exclusion in the model. In addition, the estimated error variance and the item content was considered before an item was removed. If an item had complex wording it was considered an additional rationale for removing the item. This procedure was repeated, with items being removed one-by-one. The items that were removed step-by-step are listed in Table 4-14, at the end of this section, and the resulting model that was fitted is shown in Figure 4-3.

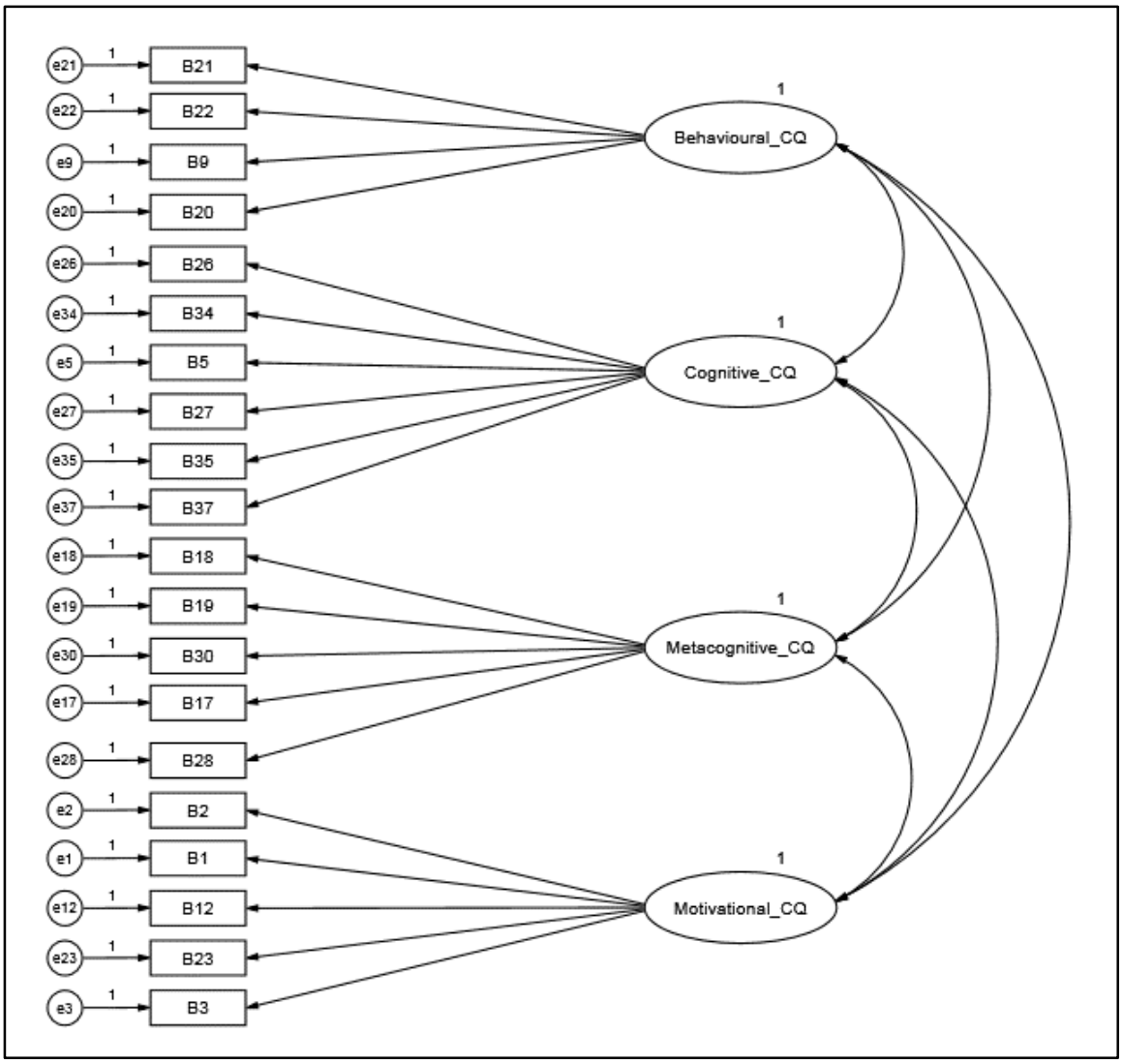

Figure 4-3: The final four factor model of Cultural Intelligence (CFA4a)

A summary of the fit measures of the original eleven factor model (CFA11), the original four factor model (CFAa) and the final four factor model (CFA4b) are given in Table 4-3. It is clear from the fit measures that model CFA4b offered a substantially improved fit compared to model CFA4a, based on all the fit measures. Firstly, the Chi-square statistic (CMIN) was reduced from 2445.2 to 537.5, about a quarter of the original value. Secondly, the IFI, TLI and CFI improved from values of about 0.85 to values over 0.93. The RMSEA also improved from 0.070 to 0.063. Lastly, the AIC decreased from 2605.2 to 629.5, all indicating that the CFA4b model, with the problematic items removed, can be deemed to provide adequate fit to the data.

Table 4-3: Summary of fit measure of eleven factor and four factor models

	CFA11	**CFA4a**	**CFA4b**
Model	**Eleven Factor First-order Model**	**Four Factor First-order Model**	**Four Factor First-order Model (problem items removed)**
NPAR	166	80	46
CMIN	2182.3	2445.2	537.5
DF	574	623	164
P	0	0	0.000
CMIN/DF	3.802	3.925	3.277
AIC	2514.3	2605.2	629.5
IFI	0.869	0.852	0.941
TLI	0.847	0.841	0.931
CFI	0.869	0.851	0.940
RMSEA	0.068	0.070	0.062
LO 90	0.065	0.067	0.056
HI 90	0.071	0.073	0.067
PCLOSE	0.000	0.000	0.001
Conclusion about model fit	This model cannot be interpreted, because the estimated covariance matrix was not positive definite. The model was probably over-specified or too complex.	This model did not fit adequately.	After removal of problematic items, this model provided good fit to the data.

When the ratio of the Chi-square value to degrees of freedom is considered (CMIN/DF), the value reduced substantially from model CFA4a to CFAb, but remained to be slightly higher than 3, which is higher than the threshold suggested by Hu and Bentler (1999). The alternative fit indices (IFI, TLI and CFI) were much lower than 0.9, and after omission of the problematic items, these fit indices were relatively close to 0.95, which is generally deemed to indicate very good fit between the data and the model (Hu & Bentler, 1999). The RMSEA values for all the CFA models were between 0.06 and 0.07, indicating reasonable fit for all models (Hu and Bentler, 1999; Diamantopoulos & Siguaw, 2000).

The overall conclusion of the results based on the fit measures is that the eleven factor model is not supported by the data, the original four factor model (CFA4a) does not provide good fit, but a four factor model with problematic items removed (CFA4b) seems to be a plausible model for the sample covariance matrix.

4.4.2 The estimated model parameters of the final first-order confirmatory factor analysis model with four latent variables (CFA4b)

The maximum likelihood (ML) estimation method for estimating model parameters in a structural equation modelling framework produces "…estimates for the parameters which maximise the likelihood that the empirical covariance matrix is drawn from a population for which the model-implied covariance matrix is valid" (Schermelleh-Engel et al., 2003:25). Since the tests for normality showed that there was not extreme kurtosis for the individual items, and due to the large sample size, it is appropriate to use maximum likelihood estimation.

For the all CFA models fitted and reported so far, the means and variances of the latent variables were constrained equal to 0 and 1 respectively for the purposes of model identification (Bollen, 1989). This method of identification constraints is specifically useful when the focus of the analysis is on the factor loadings and error

variances, for example when the psychometric properties of an instrument is evaluated. This method of identification constraints makes it easier to evaluate the estimated covariances between the latent variables, since these covariances are expressed as correlations between the latent variables.

The maximum likelihood estimated model parameters of model CFA4b are given in Tables 4-4 to 4-6. From Table 4-4 it is clear that the estimated regression weights for model CFA4b are all highly significant and the standardised regression weights range between 0.605 and 0.852. Since all these are above 0.6 as recommended by Hair et al. (2006), it provides support for this model as being plausible to measure Cultural Intelligence within a South African context.

Table 4-4: Maximum likelihood estimated regression weights for model CFA4b

			Estimate	S.E.	Critial Ratio	P	Standardised regression weights
B21	<---	Behavioural_CQ	1.106	0.047	23.361	***	0.818
B22	<---	Behavioural_CQ	1.013	0.043	23.615	***	0.824
B9	<---	Behavioural_CQ	0.783	0.048	16.316	***	0.629
B20	<---	Behavioural_CQ	0.977	0.045	21.789	***	0.780
B26	<---	Cognitive_CQ	0.879	0.038	23.062	***	0.799
B34	<---	Cognitive_CQ	0.791	0.041	19.452	***	0.709
B5	<---	Cognitive_CQ	0.723	0.042	17.345	***	0.650
B27	<---	Cognitive_CQ	0.965	0.038	25.440	***	0.852
B35	<---	Cognitive_CQ	0.923	0.039	23.870	***	0.818
B37	<---	Cognitive_CQ	1.034	0.041	24.989	***	0.842
B18	<---	Metacognitive_CQ	0.762	0.036	21.347	***	0.768
B19	<---	Metacognitive_CQ	0.909	0.043	20.930	***	0.757
B30	<---	Metacognitive_CQ	0.597	0.038	15.561	***	0.605
B17	<---	Metacognitive_CQ	0.910	0.045	20.400	***	0.743
B28	<---	Metacognitive_CQ	0.878	0.048	18.446	***	0.690
B2	<---	Motivational_CQ	0.749	0.045	16.638	***	0.661
B1	<---	Motivational_CQ	0.554	0.031	17.909	***	0.701
B12	<---	Motivational_CQ	0.717	0.043	16.555	***	0.659
B23	<---	Motivational_CQ	0.718	0.047	15.403	***	0.622
B3	<---	Motivational_CQ	0.653	0.041	16.086	***	0.644

Table 4-5 reports the model implied estimates of the correlations between the latent variables, which provide information regarding the interrelationships of the four constructs in the final model. When the estimated correlations between the latent variables are considered in Table 4-5, the highest correlation value is 0.819, between Behavioural CQ and Metacognitive CQ.

This may be problematic in the sense that the discriminant validity between these two constructs seems not to be clearly established. If this number is squared, it suggests that more than 67.1% of variance is shared between these two constructs, suggesting that the items measuring these dimensions may be interpreted to carry the same meaning. Similarly, Cognitive CQ and Metacognitive have an estimated correlation value of 0.738 which is regarded as high. This suggests that 54.5% variance is shared by these two constructs.

The dimensions with the lowest correlation are Behavioural CQ and Motivational CQ with a correlation value of 0.532, sharing 28.3% of variance. It is ideal that the percentage of variance shared between constructs should be in the region of 50%, or lower.

Table 4-5: Estimated correlations between latent variables for model CFA4b

			Estimate r	% r^2
Behavioural_CQ	<-->	Cognitive_CQ	0.631	39.8
Behavioural_CQ	<-->	Metacognitive_CQ	0.819	67.1
Behavioural_CQ	<-->	Motivational_CQ	0.532	28.3
Cognitive_CQ	<-->	Metacognitive_CQ	0.738	54.5
Cognitive_CQ	<-->	Motivational_CQ	0.596	35.5
Metacognitive_CQ	<-->	Motivational_CQ	0.656	43.0

The estimated squared multiple correlations are presented in Table 4-6. According to Hooper, Coughlan and Mullen (2008), values greater than 0.20 suggest that items share sufficient variance with other variables in the model, and can thus be retained.

For model CFA4b, all of the squared multiple correlations are higher than 0.20, indicating that items in model CFA4b share substantial variance, and therefore that the model is suitable to explain the phenomenon of Cultural Intelligence being measured. The smallest squared multiple correlations are for items B30, B23 and B9, ranging between 0.366 and 0.396. An examination of the estimated error variances show variation, the largest error variances are for items B9, B28, B23, B2 and B5, with values ranging between 0.936 and 0.714. A small error variance suggest that the item has a small measurement error associated with it, which is more ideal for an item to reflect the underlying factor that it measures.

Table 4-6: Estimated error variances and squared multiple correlations for model CFA4b

Error term	Estimated variance	Item	Squared multiple correlation
e1	0.318	B1	0.491
e2	0.721	B2	0.438
e3	0.601	B3	0.415
e5	0.714	B5	0.423
e9	0.936	B9	0.396
e12	0.670	B12	0.434
e17	0.669	B17	0.553
e18	0.404	B18	0.590
e19	0.614	B19	0.573
e20	0.614	B20	0.609
e21	0.603	B21	0.670
e22	0.484	B22	0.680
e23	0.817	B23	0.387
e26	0.437	B26	0.639
e27	0.352	B27	0.726
e28	0.847	B28	0.477
e30	0.619	B30	0.366
e34	0.618	B34	0.503
e35	0.421	B35	0.669
e37	0.438	B37	0.710

4.4.3 An analysis of the item reliability of model CFA4b

Using the approach proposed by Fornell and Larcker (1981), an analysis of the item reliabilities based on the standardised regression weights and the estimated error variances were conducted, with the results shown in Table 4-7. Based on these item reliabilities, there still seem to be a number of problematic items, with several of the item reliabilities lower than 0.50, the value recommended by Fornell and Larcker (1981).

Table 4-7: Estimated item reliabilities for the items in model CFA4b

Item		Factor	Estimate λ	$(\lambda)^2$	Error term	Estimate ε	Item reliability $\lambda^2/(\lambda^2+\varepsilon)$
B21	<---	Behavioural_CQ	0.818	0.669	e21	0.603	0.526
B22	<---	Behavioural_CQ	0.824	0.679	e22	0.484	0.584
B9	<---	Behavioural_CQ	0.629	0.396	e9	0.936	0.297
B20	<---	Behavioural_CQ	0.780	0.608	e20	0.614	0.498
B26	<---	Cognitive_CQ	0.799	0.638	e26	0.437	0.594
B34	<---	Cognitive_CQ	0.709	0.503	e34	0.618	0.449
B5	<---	Cognitive_CQ	0.650	0.423	e5	0.714	0.372
B27	<---	Cognitive_CQ	0.852	0.726	e27	0.352	0.673
B35	<---	Cognitive_CQ	0.818	0.669	e35	0.421	0.614
B37	<---	Cognitive_CQ	0.842	0.709	e37	0.438	0.618
B18	<---	Metacognitive_CQ	0.768	0.590	e18	0.404	0.593
B19	<---	Metacognitive_CQ	0.757	0.573	e19	0.614	0.483
B30	<---	Metacognitive_CQ	0.605	0.366	e30	0.619	0.372
B17	<---	Metacognitive_CQ	0.743	0.552	e17	0.669	0.452
B28	<---	Metacognitive_CQ	0.690	0.476	e28	0.847	0.360
B2	<---	Motivational_CQ	0.661	0.437	e2	0.721	0.377
B1	<---	Motivational_CQ	0.701	0.491	e1	0.318	0.607
B12	<---	Motivational_CQ	0.659	0.434	e12	0.670	0.393
B23	<---	Motivational_CQ	0.622	0.387	e23	0.817	0.321
B3	<---	Motivational_CQ	0.644	0.415	e3	0.601	0.408

From Table 4-7 it is clear that items with reliabilities lower than 0.5 still remained with the four factor model, even after problematic items were removed. These items were: item B9 in the Behavioural CQ dimension; items B5 and B34 in the Cognitive CQ dimensions; items B17, B28 and B30 in the Metacognitive CQ dimensions; and lastly all the items in the Motivational CQ factor, with the exception of B1. Therefore, despite having a good fitting model overall, several items still seemed to be problematic and should possibly require revision before even the final four factor model with fewer items, model CFA4b could be used with confidence in South African studies.

4.4.4 An analysis of the convergent and discriminant validity of model CFA4b

In order to evaluate the convergent and discriminant validity of the final model CFA4b, the approach proposed by Fornell and Larcker (1981) has been adopted whereby if a constructs composite reliability (CR) for each of the four factors is greater than 0.7, there is support for the convergent validity of the construct. A calculation of the Average Variance Extracted (AVE) for each factor provides evidence of the amount of variance that is captured by a construct in relation to measurement error variance. According to Fornell and Larcker (1981), if AVE is compared to the highest correlation of a construct with the other factors, it allows an assessment of the discriminant validity of the instrument. Discriminant validity is supported when AVE is more than the maximum correlations squared (R2) of the remaining constructs. Therefore, if the ratio of AVE/R2 is calculated, this ratio should be more than 1 for discriminant validity to be supported. (Fornell & Larcker, 1981).

Table 4-8 summarises the AVE and maximum correlation squared (R2) for each construct measured in the final four factor model CFA4b. The results in this table illustrate that convergent validity is supported for all four constructs with the CR values being larger than 0.5. The table also illustrates that discriminant validity is not clearly supported by the model with the ratio of two dimensions less than 1. This points to a possible problem with the discriminant validity of the two dimensions Behavioural CQ and Metacognitive CQ.

Table 4-8: Assessment of the convergent and discriminant validity of the first-order confirmatory factor analysis model

	Composite reliability (CR)	Average variance extracted (AVE)	Max (R^2)	(AVE) / Max(R^2)
Behavioural_CQ	0.779	0.471	0.671	0.702
Cognitive_CQ	0.880	0.552	0.545	1.014
Metacognitive_CQ	0.801	0.448	0.671	0.668
Motivational_CQ	0.776	0.776	0.430	1.803

4.4.5 Internal consistency reliability analysis after confirmatory factor analyses

Initial reliability analysis of the eleven factor model CFA11 revealed Cronbach alpha's for each construct ranging from 0.609 to 0.887, as reported in Table 4-1. The eleven factor model resulted in several problems and was thus abandoned. During the CFA analyses of the initial four factor model, problem items with high standardised residuals of the covariance matrix were identified, and after examination of the item wording, based on its content and complexity, problematics items were removed from the model, until a model with fewer items was found that fitted the data reasonable well. This final model was named CFA4b.

The reliability analysis of the initial four factor model CFA4a with 37 items, revealed Cronbach alpha's for each construct ranging from 0.838 to 0.921. After the stepwise removal of the problematic items, reliability analysis of the final four factor model CFA4b revealed Cronbach alpha's for each construct ranging from 0.780 to 0.902 as shown in Table 4-9. All factors displayed high internal consistency reliabilities with all the Cronbach's alpha coefficients greater than 0.7 (Peterson, 1994).

The results of the reliability analyses in Table 4-9 had a small decline for the dimension of Motivational CQ, the value for Model CFA4a is 0.838, whilst for model

CFA4b, the value 0.780. However, one should bear in mind that reliabilities of a scale are inflated when several items are included in the calculation of the reliability estimate (Hair et al. 2006).

Table 4-9: Cronbach's coefficient alpha for the dimensions of the E-CQS for the four factor models CFA4a and CFA4b

Dimension	Items included in reliability analysis	Cronbach Alpha
Original four factor model CFA4a		
Motivational CQ	B1, B2, B3, B12, B13, B14, B23, B24, B25	0.838
Cognitive CQ	B4, B5, B15, B16, B26, B27, B34, B35, B36, B37	0.921
Metacognitive CQ	B6, B7, B8, B17, B18, B19, B28, B29, B30	0.864
Behavioural CQ	B9, B10, B11, B20, B21, b22, B31, B32, B33	0.893
Final four factor model CFA4b		
Motivational CQ	B1, B2, B3, B12, B23	0.780
Cognitive CQ	B5, B26, B27, B34, B35, B37	0.902
Metacognitive CQ	B17 ,B18, B19, B28, B30,	0.833
Behavioural CQ	B9, B20, B21, B22	0.844

4.4.6 Invariance testing of the final four factor model of Cultural Intelligence (CFA4b)

Since South Africa can be regarded as a very diverse country in terms of gender and race representation in the workplace, especially due to Employment Equity legislation Act No. 55 of 1998 (Republic of South Africa, 1998), it is required that a complete psychometric assessment of a measurement instrument includes testing the measurement invariance of the instrument.

Due to large differences between cultural groups, one would expect that the psychometric properties of scales may be different across gender and race groups, especially on a scale that measures Cultural Intelligence.

Therefore, in order to ensure a comprehensive psychometric evaluation of the four factor model, an evaluation of the measurement equivalence of the E-CQS scale was regarded as important in this study. Two sets of invariance testing models were tested on the final CFA4b model, namely invariance testing across race groups and gender groups. For the purposes of analysis, race groups were grouped as i) Black (n=276); ii) White (n=195) and iii) Indian (n=50) and Coloured (n=68) (total n=118), because the group sizes in the last two groups were too small to include them in the analyses separately. The rationale for grouping the last groups together is that within the workplace, both groups are also regarded as previously disadvantaged minorities from an Employment Equity perspective (Republic of South Africa, 1998).

Measurement invariance testing was conducted by using the SPSS AMOS23 multiple-group (MG) procedure for invariance testing by testing the five increasingly restrictive models proposed. Following the method suggested by Steenkamp and Baumgartner (1998) discussed in Section 3.9, the resulting fit measures of model CFA4b are displayed for invariance over race groups in Tables 4-10 and 4-11; and for the invariance testing over males and females is provided in Tables 4-12 to 4-13.

The procedure for race groups and gender groups was similar. In the analysis of measurement equivalence over groups, the identification constraints that were used was that of setting one of the regression coefficients equal to one, and setting the corresponding measurement intercept equal to zero. This method allows a very simple approach to test for measurement equivalence (Strasheim, 2011).

In the evaluation of equivalence, the unconstrained model M0 was fitted for multiple groups simultaneously, which allowed the measurement model to be equivalent across groups, but all the estimated parameters were estimated freely for each group. The M0 model tested whether groups had the same factorial structure in model CFA4b. If Model M0 fits the data well, it can be assumed that the forms of the models are similar across groups.

In the next model, M1, the measurement weights are constrained across groups. If this model fits well, and does not fit significantly worse than model M0, metric invariance can be assumed to hold. Model M1 (measurement weights model) evaluated if the values of factor loading were equal across groups and evaluated whether the descriptors and measurement scale were interpreted the same by the groups (Steenkamp & Baumgartner, 1998).

Model M2 (measurement intercepts) assessed whether groups had a similar understanding of the items in the E-CQS in the sense that they had the same offset or origin. It is only when models M0, M1 and M2 fit reasonably well, and model M2 compare to M1 does not fit significantly worse, that it is feasible to compare means across groups based on the means of the latent variables.

In model M3, the latent means are constrained equal across groups. If this model does not fit well, it implies that the means are significantly different across groups.

In model M4 (structural covariances), the covariances are constrained equal across groups. If this model does not fit well, it does not have serious implications for measurement invariance. The interest is then mainly on the substantive part of the model, and it means that the variances on the latent variables and/or the covariances between the latent variables are not similar across groups.

The last model, M4 (measurement residuals) was also evaluated. In this model the error variances of the residual terms are constrained equal. This last set of constraints is generally viewed not to be necessary and is overly strict (Strasheim, 2011).

If the data fits model M4 well, it can be said that the models are fully equivalent across groups, that the instrument is equally reliable across groups (Steenkamp and Baumgartner, 1998).

Model fit was evaluated by evaluating a number of fit indices, namely the Incremental Fit Index (IFI); the Tucker-Lewis Fit Index (TLI) and the Comparative Fit Index (CFI). Values higher than 0.90 indicate good fit as per Hu and Bentler's (1999) recommended threshold. Chi-squared to degrees of freedom ratios were also evaluated to assess model fit with a cut-off ratio of Chi-squared to degrees of freedom of less than 3 (Hu & Bentler, 1999) was adopted. Finally, the Root Mean Square Error (RMSE) was also evaluated with values less than 0.05 indicative of a good fit; values between 0.05 and 0.08 indicating a reasonable fit and values above 0.08 indicative of average fit and values greater than 0.10 indicating a poor fit (Hu and Bentler, 1999).

Based on baseline comparisons, all five models (M0 to M4) had Chi-square values less than 3 in Table 4-10. The IFI, TLI and CFI values were less than 0.9 for all the models, except for model M0. For all the models the RMSEA values were less than 0.05, which suggests good fit over race groups.

When the nested model comparisons across race groups are considered in Table 4-11, the results suggest that measurement invariance do not hold over race groups. The Chi-square difference test is always significant, which implies that when the more restricted model is compared to its reference model, the resulting fit is significantly worse.

When the invariance of model CFA4b is evaluated over males and females, as given in Table 4-12, the model provides adequate fit across all models for model M0 to M5. The ratios of CMIN/DF is less than 3 for all six models; the IFI, TLI and CFI are all more than 0.9; and the RMSEA are all less than 0.05.

Table 4-10: Measurement invariance of model CFA4b over different race groups

Model	NPAR	CMIN	DF	P	CMIN/DF
M0: Unconstrained	198	1029.2	492	0.000	2.092
M1: Measurement weights	166	1091.8	524	0.000	2.084
M2: Measurement intercepts	134	1196.2	556	0.000	2.151
M3: Structural means	126	1345.3	564	0.000	2.385
M4: Structural covariances	106	1405.6	584	0.000	2.407
M5: Measurement residuals	66	1488.6	624	0.000	2.386
Baseline Comparisons	**IFI**	**TLI**	**CFI**	**PCFI**	**AIC**
M0: Unconstrained	0.903	0.887	0.902	0.779	1425.2
M1: Measurement weights	0.897	0.887	0.896	0.824	1423.8
M2: Measurement intercepts	0.884	0.880	0.883	0.862	1464.2
M3: Structural means	0.858	0.856	0.858	0.849	1597.3
M4: Structural covariances	0.850	0.854	0.850	0.871	1617.6
M5: Measurement residuals	0.841	0.856	0.842	0.922	1620.6
	RMSEA	**LO 90**	**HI 90**	**PCLOSE**	
M0: Unconstrained	0.043	0.039	0.047	0.999	
M1: Measurement weights	0.043	0.039	0.047	0.999	
M2: Measurement intercepts	0.044	0.041	0.048	0.997	
M3: Structural means	0.049	0.045	0.052	0.748	
M4: Structural covariances	0.049	0.046	0.052	0.688	
M5: Measurement residuals	0.049	0.045	0.052	0.759	

Table 4-11: Nested model comparisons for testing measurement invariance over race groups for model CFA4b

Model	ΔDF	ΔCMIN	P
Assuming model M0: Unconstrained to be correct:			
M1-M0: Measurement weights	32	62.513	0.001
M2-M0: Measurement intercepts	64	166.910	0.000
M3-M0: Structural means	72	316.089	0.000
M4-M0: Structural covariances	92	376.395	0.000
M5-M0: Measurement residuals	132	459.312	0.000
Assuming model M1: Measurement weights to be correct:			
M2-M1: Measurement intercepts	32	104.397	0.000
M3-M1: Structural means	40	253.576	0.000
M4-M1: Structural covariances	60	313.882	0.000
M5-M1: Measurement residuals	100	396.799	0.000
Assuming model M2: Measurement intercepts to be correct:			
M3-M2: Structural means	8	149.179	0.000
M4-M2: Structural covariances	28	209.485	0.000
M5-M2: Measurement residuals	68	292.402	0.000
Assuming model M3: Structural means to be correct:			
M4-M3: Structural covariances	20	60.306	0.000
M5-M3: Measurement residuals	60	143.223	0.000
Assuming model M4: Structural covariances to be correct:			
M5-M4: Measurement residuals	40	82.917	0.000

Table 4-12: Measurement invariance of model CFA4b over males and females for model CFA4b

Model	NPAR	CMIN	DF	P	CMIN/DF
M0: Unconstrained	132	795.588	328	0.000	2.426
M1: Measurement weights	116	810.394	344	0.000	2.356
M2: Measurement intercepts	100	854.697	360	0.000	2.374
M3: Structural means	96	874.738	364	0.000	2.403
M4: Structural covariances	86	893.704	374	0.000	2.390
M5: Measurement residuals	66	924.56	394	0.000	2.347
	IFI	**TLI**	**CFI**	**PCFI**	**AIC**
M0: Unconstrained	0.926	0.914	0.926	0.799	1059.588
M1: Measurement weights	0.926	0.918	0.926	0.838	1042.394
M2: Measurement intercepts	0.922	0.917	0.922	0.873	1054.697
M3: Structural means	0.919	0.915	0.919	0.880	1066.738
M4: Structural covariances	0.918	0.916	0.918	0.903	1065.704
M5: Measurement residuals	0.916	0.919	0.916	0.950	1056.560
	RMSEA	**LO 90**	**HI 90**	**PCLOSE**	
M0: Unconstrained	0.049	0.044	0.053	0.672	
M1: Measurement weights	0.048	0.043	0.052	0.823	
M2: Measurement intercepts	0.048	0.044	0.052	0.795	
M3: Structural means	0.048	0.044	0.053	0.735	
M4: Structural covariances	0.048	0.044	0.052	0.768	
M5: Measurement residuals	0.047	0.043	0.051	0.856	

When the nested model comparisons in Table 4-13 are evaluated, it is clear that the difference in fit measures when model M1-M0 is considered is not significant (p=0.539). This finding suggests that metric invariance can be assumed to hold over males and females. However, the model M2-M0, as well as M1-M0 are both significant, which means that it cannot be assumed that the intercepts are equal for males and females.

Table 4-13: Nested model comparisons for testing measurement invariance over gender groups for model CFA4b

Model	ΔDF	ΔCMIN	P
Assuming model M0: Unconstrained to be correct:			
M1: Measurement weights	16	14.806	0.539
M2: Measurement intercepts	32	59.108	0.002
M3: Structural means	36	79.150	0.000
M4: Structural covariances	46	98.116	0.000
M5: Measurement residuals	66	128.972	0.000
Assuming model M1: Measurement weights to be correct:			
M2: Measurement intercepts	16	44.303	0.000
M3: Structural means	20	64.344	0.000
M4: Structural covariances	30	83.310	0.000
M5: Measurement residuals	50	114.166	0.000
Assuming model M2: Measurement intercepts to be correct:			
M3: Structural means	4	20.041	0.000
M4: Structural covariances	14	39.007	0.000
M5: Measurement residuals	34	69.863	0.000
Assuming model M3: Structural means to be correct:			
M4: Structural covariances	10	18.966	0.041
M5: Measurement residuals	30	49.822	0.013
Assuming model M4: Structural covariances to be correct:			
M5: Measurement residuals	20	30.856	0.057

Therefore, major limitations of the CFA4b model is that measurement equivalence over race and gender groups cannot be assumed – rendering this model very limited for valid comparisons across race and gender groups Steenkamp and Baumgartner, 1998).

4.4.7 A list of the problematic items in the four-factor model of Cultural Intelligence

After all the analyses in the preceding section, it would be informative for future scholars using the E-CQS to have a list with the items that seemed to be problematic. The list with annotations is provided in Table 4-14. When reviewing problem items highlighted in Table 4-14, one could argue that some items are too complex in terms of item wording, with them measuring different concepts to what was intended. For example, item B10 relating to the behavioural change in standing distance between cultures may be impacted by a post-apartheid mind-set legacy where distance between race groups was engrained in the South African culture. Complex items such as B4, B15, and B13 where abstract concepts such as 'value frameworks', 'legal, economic and political systems' and 'domestic roles', are not well defined may have resulted in varying interpretations.

The words used in some items may also have resulted in varying interpretations. For example, item B11 makes use of the word 'disagree' which may have a negative connotation in African cultures, were respect for older members implies that it would be socially unacceptable for younger members of a community to disagree with an older member. Similarly, items B31 and B16 make use of words 'warmth' and 'at ease' respectively, these words may not be prevalent in the everyday South Africans vocabulary and thus may result in missed interpretations when responding to the items.

The use of language at the item level is thus important and would need to be reviewed at a granular level if the scale is to be used in South Africa. This is especially important in a country with diverse cultures and socio-economic backgrounds where access to education is limited, and complex item interpretations may not be uniform.

Table 4-14: Problematic items identified in the preceding analyses

Dimension or factor	Item	Item wording
Behavioural_CQ	B10	I modify how close or far apart I stand when interacting with people from different cultures.
	B11	I modify the way I disagree with others to fit the cultural setting.
	B31	I modify the amount of warmth I express to fit the cultural context.
	B32	I vary the way I greet others (shake hands, bow, nod) when in different cultural contexts.
	B33	I vary the way I show gratitude (express appreciation, accept compliments) based on the cultural context.
Cognitive_CQ	B4	I can describe the different cultural value frameworks that explain behaviours around the world.
	B15	I can describe similarities and differences in legal, economic, and political systems across cultures.
	B16	I can describe how to put people from different cultures at ease.
	B36	I can speak and understand many languages.
Metacognitive_CQ	B6	I develop action plans before interacting with people from a different culture.
	B7	I am aware of how my culture influences my interactions with people from different cultures.
	B8	I adjust my understanding of a culture while I interact with people from that culture.
	B29	I am conscious of how other people's culture influences their thoughts, feelings, and actions.
Motivational_CQ	B13	Given a choice, I value the tangible benefits (pay, promotion, perks) of an intercultural rather than a domestic role
	B14	I am sure I can deal with the stresses of interacting with people from cultures that are new to me.
	B24	I value the reputation I would gain from developing global networks and connections.
	B25	I am confident I can socialize with locals in a culture that is unfamiliar to me.

4.5 EXPLORATORY FACTOR ANALYSIS OF THE INSTRUMENT

Since the proposed eleven factor model of Van Dyne et al. (2012) did not fit the data at all, and since the four factor model CFA4a also did not fit well, is seems appropriate to investigate the factor structure using exploratory factor analysis. Another reason for this is that the CFA4b model which contained only 20 items, still contained a number of problematic items and also lacked discriminant validity.

The first analysis presented in this section comprised a principle component analysis of the original 37 items, and restricting the number of factors to be extracted to four, regardless of the number of eigenvalues larger than one. The results are interpreted using varimax rotation. With varimax rotation, the principle components are forced to be independent. These results are discussed in Section 4.5.1. Principal component analysis is a useful pre-screening method to identify problematic items with low communality estimates, and with cross loadings or low loadings or regression weights (Hair et al., 2006).

In Section 4.5.2, exploratory factor analysis using principle axis factoring was conducted next, with the original 37 items, using promax oblique rotation. With oblique rotation, the extracted factors are allowed to be correlated and the occurrence of cross-loadings is reduced.

Section 4.5.3 has the results of an exploratory factor analysis with the 20 items and with four factors extracted. For both these sections, the number of factors to be extracted were set to be equal to four. However, when the eigenvalues were inspected, it seemed that only three eigenvalues were above 1, suggesting that a three-factor model would also be appropriate to represent the underlying factor structure of the covariance matrix. Lastly, in Section 4.5.4, the results of an EFA with three factors is presented with the 20 items that were selected based on the CFA results.

The findings from the EFA analyses provide interesting insights, especially in respect of the discrimination between two of the factors.

4.5.1 Principal component analysis of the original 37 items of the E-CQS with four components extracted

Principle component analysis is useful for an initial assessment of a measurement scale. The results of this analysis is provided in Table 4-15 to 4-17.

The communality estimates in Table 4-15 shows that there are a few items that may be problematic. According to Hair et al. (2006), the communalities should ideally exceed 0.5. From inspecting the communalities, it is clear that several of the items have communalities less than 0.5.

When the eigenvalues are examined in Table 4-16, it is clear that more than four factors, and even six factors may offer plausible factor patterns. This interpretation is based on the mineigen criterion, which states that the ideal number of factors to extract is close to number of eigenvalues that are larger than 1, but one should examine the factor patterns of several solutions before a final representation is selected. In this analysis, a four factor solution was adopted in order to examine the results when four factors are extracted, in order to compare these results meaningfully with that in Section 4.4.2, where model CFA4a was fitted to the data. In the principle component analysis, approximately 55% of the variability is explained among the 37 items.

Table 4-17 presents the results of the varimax rotated component pattern. When these results are examined, it seems that the dimensions representing Cognitive CQ grouped together meaningfully, and those representing Motivational CQ also grouped together. However, the items representing Behavioural CQ and Metacognitive CQ were mixed up in the rotated solution. It is also clear that several items had cross-loadings, which is not ideal.

Table 4-15: Communality estimates of the 37 items in the E-CQS with four components extracted

Communality estimates	Initial	Extraction
MotivCQ IM B1 I truly enjoy interacting with people from different cultures.	1.000	0.553
MotivCQ EM B2 I value the status I would gain from living or working in a different culture.	1.000	0.439
MotivCQ SE B3 I am confident that I can persist in coping with living conditions in different cultures.	1.000	0.472
CogCQ CGK B4 I can describe the different cultural value frameworks that explain behaviours around the world.	1.000	0.555
CogCQ CSK B5 I can describe the ways that leadership styles differ across cultural settings.	1.000	0.551
MetaCQ Plan B6 I develop action plans before interacting with people from a different culture.	1.000	0.541
MetaCQ Aware B7 I am aware of how my culture influences my interactions with people from different cultures.	1.000	0.371
MetaCQ Check B8 I adjust my understanding of a culture while I interact with people from that culture.	1.000	0.505
BehaCQ Verbal B9 I change my use of pause and silence to suit different cultural situations.	1.000	0.509
BehaCQ NonVer B10 I modify how close or far apart I stand when interacting with people from different cultures.	1.000	0.553
BehaCQ Speech B11 I modify the way I disagree with others to fit the cultural setting.	1.000	0.503
MotivCQ IM B12 I thrive on the differences in cultures that are new to me.	1.000	0.500
MotivCQ EM B13 Given a choice, I value the tangible benefits (pay, promotion, perks) of an intercultural rather than a domestic role.	1.000	0.325
MotivCQ SE B14 I am sure I can deal with the stresses of interacting with people from cultures that are new to me.	1.000	0.454
CogCQ CGK B15 I can describe similarities and differences in legal, economic, and political systems across cultures.	1.000	0.579
CogCQ CSK B16 I can describe how to put people from different cultures at ease.	1.000	0.598
MetaCQ Plan B17 I think about possible cultural differences before meeting people from other cultures.	1.000	0.585
MetaCQ Aware B18 I pay attention to how cultural aspects of the situation influence what is happening in that situation.	1.000	0.546
MetaCQ Check B19 I double check the accuracy of my cultural knowledge during intercultural interactions.	1.000	0.493
BehaCQ Verbal B20 I vary my verbal behaviours (accept, tone, rate of speaking) to fit specific cultural contexts.	1.000	0.571
BehaCQ NonVer B21 I change my non-verbal behaviours (hand gestures, head movements) to fit the cultural situation.	1.000	0.620
BehaCQ Speech B22 I change how I make requests of others depending on their cultural background.	1.000	0.662
MotivCQ IM B23 Given a choice, I prefer work groups composed of people with different (rather than similar) cultural backgrounds	1.000	0.498
MotivCQ EM B24 I value the reputation I would gain from developing global networks and connections.	1.000	0.511
MotivCQ SE B25 I am confident I can socialize with locals in a culture that is unfamiliar to me.	1.000	0.547
CogCQ CGK B26 I can describe differences in kinship systems and role expectations for men and women across cultures	1.000	0.639
CogCQ CSK B27 I can describe effective negotiation strategies across different cultures.	1.000	0.737

Communality estimates	Initial	Extraction
MetaCQ Plan B28 I ask myself what I hope to accomplish before I meet with people from different cultures.	1.000	0.539
MetaCQ Aware B29 I am conscious of how other people's culture influences their thoughts, feelings, and actions.	1.000	0.436
MetaCQ Check B30 I update my cultural knowledge after a cultural misunderstanding.	1.000	0.446
BehaCQ Verbal B31 I modify the amount of warmth I express to fit the cultural context.	1.000	0.593
BehaCQ NonVer B32 I vary the way I greet others (shake hands, bow, nod) when in different cultural contexts.	1.000	0.628
BehaCQ Speech B33 I vary the way I show gratitude (express appreciation, accept compliments) based on the cultural context.	1.000	0.638
CogCQ CGK B34 I can describe different views of beauty and aesthetics across cultural settings.	1.000	0.590
CogCQ CSK B35 I can describe different ways to motivate and reward people across cultures.	1.000	0.712
CogCQ CGK B36 I can speak and understand many languages.	1.000	0.455
CogCQ CSK B37 I can describe effective ways for dealing with conflict in different cultures.	1.000	0.755

Extraction Method: Principal Component Analysis.

Table 4-16: Percentage of variance explained for a principle component analysis of the 37 items of the E-CQS

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14.349	38.782	38.782	14.349	38.782	38.782	6.184	16.715	16.715
2	2.492	6.735	45.517	2.492	6.735	45.517	5.412	14.627	31.342
3	1.999	5.404	50.920	1.999	5.404	50.920	4.676	12.639	43.980
4	1.367	3.696	54.616	1.367	3.696	54.616	3.935	10.636	54.616
5	1.228	3.318	57.934						
6	0.952	2.572	60.506						

Table 4-17: Varimax rotated component matrix with four components extracted from the 37 items of the E-CQS

Rotated component matrix	Component			
	1	2	3	4
CogCQ CSK B37 I can describe effective ways for dealing with conflict in different cultures.	0.795			
CogCQ CSK B27 I can describe effective negotiation strategies across different cultures.	0.782			
CogCQ CSK B35 I can describe different ways to motivate and reward people across cultures.	0.711			0.371
CogCQ CGK B26 I can describe differences in kinship systems and role expectations for men and women across cultures	0.700			
CogCQ CSK B5 I can describe the ways that leadership styles differ across cultural settings.	0.668			
CogCQ CGK B4 I can describe the different cultural value frameworks that explain behaviours around the world.	0.644		0.303	
CogCQ CGK B15 I can describe similarities and differences in legal, economic, and political systems across cultures.	0.640		0.336	
CogCQ CGK B36 I can speak and understand many languages.	0.621			
CogCQ CSK B16 I can describe how to put people from different cultures at ease.	0.610		0.358	
CogCQ CGK B34 I can describe different views of beauty and aesthetics across cultural settings.	0.600			0.448
BehaCQ NonVer B10 I modify how close or far apart I stand when interacting with people from different cultures.		0.693		
MetaCQ Plan B17 I think about possible cultural differences before meeting people from other cultures.		0.655		
BehaCQ Speech B11 I modify the way I disagree with others to fit the cultural setting.		0.646		
MetaCQ Plan B6 I develop action plans before interacting with people from a different culture.	0.354	0.641		
BehaCQ Verbal B9 I change my use of pause and silence to suit different cultural situations.		0.608		
MetaCQ Check B8 I adjust my understanding of a culture while I interact with people from that culture.		0.597	0.340	
BehaCQ NonVer B21 I change my non-verbal behaviours (hand gestures, head movements) to fit the cultural situation.		0.559		0.498
MetaCQ Plan B28 I ask myself what I hope to accomplish before I meet with people from different cultures.	0.408	0.548		
MetaCQ Aware B7 I am aware of how my culture influences my interactions with people from different cultures.		0.515	0.309	
MetaCQ Aware B18 I pay attention to how cultural aspects of the situation influence what is happening in that situation.		0.484	0.350	0.326
MetaCQ Check B19 I double check the accuracy of my cultural knowledge during intercultural interactions.	0.338	0.468		
MotivCQ EM B13 Given a choice, I value the tangible benefits (pay, promotion, perks) of an intercultural rather than a domestic role		0.399	0.357	

Table 4-17: continued

Rotated component matrix	Component			
	1	2	3	4
MotivCQ IM B1 I truly enjoy interacting with people from different cultures.			0.722	
MotivCQ SE B25 I am confident I can socialize with locals in a culture that is unfamiliar to me.			0.654	
MotivCQ IM B23 Given a choice, I prefer work groups composed of people with different (rather than similar) cultural backgrounds			0.623	
MotivCQ SE B14 I am sure I can deal with the stresses of interacting with people from cultures that are new to me.			0.615	
MotivCQ EM B24 I value the reputation I would gain from developing global networks and connections.			0.601	0.335
MotivCQ SE B3 I am confident that I can persist in coping with living conditions in different cultures.	0.328		0.588	
MotivCQ EM B2 I value the status I would gain from living or working in a different culture.			0.586	
MotivCQ IM B12 I thrive on the differences in cultures that are new to me		0.409	0.535	
MetaCQ Check B30 I update my cultural knowledge after a cultural misunderstanding.			0.427	0.415
BehaCQ NonVer B32 I vary the way I greet others (shake hands, bow, nod) when in different cultural contexts.				0.718
BehaCQ Speech B33 I vary the way I show gratitude (express appreciation, accept compliments) based on the cultural context.	0.310			0.703
BehaCQ Speech B22 I change how I make requests of others depending on their cultural background.		0.480		0.619
BehaCQ Verbal B31 I modify the amount of warmth I express to fit the cultural context.	0.370	0.387		0.533
BehaCQ Verbal B20 I vary my verbal behaviours (accept, tone, rate of speaking) to fit specific cultural contexts.		0.468		0.527
MetaCQ Aware B29 I am conscious of how other people's culture influences their thoughts, feelings, and actions.	0.317		0.357	0.387

4.5.2 Exploratory factor analysis using principal axis factoring of the original 37 items of the E-CQS

After the principal component analysis, exploratory factor analysis was conducted. In table 4-18, the initial communalities are now no longer equal to 1, as in principal component analysis, due to the fact that exploratory factor analysis assumes that measurement error is in the model.

There were again after extraction a large number of communality estimates that were less than 0.5, suggesting that these items may be problematic. It is interesting to note that the items with low extraction communalities, coincide with those that were excluded in the CFA analyses.

The percentage of variance explained in Table 4-19 shows that after rotation, the variance with each of the rotated axes are well spread out, with the first axis associated with 11.3% shared variance, the second axis associated with 11.2% shared variance, the third axis with 9.4% shared variance and the fourth axis with 8.2% shared variance.

The promax rotated factor pattern in Table 4-20 has a number of factors loadings that are clearly loading on a single factor only. However, there are still a number of items with cross loadings. In addition, the items associated with Behavioural CQ and Metacognitive CQ loaded on the same factor.

Table 4-18: Communality estimates of the 37 items in the E-CQS with four factors extracted

Communality estimates	Initial	Extraction
MotivCQ IM B1 I truly enjoy interacting with people from different cultures.	0.473	0.472
MotivCQ EM B2 I value the status I would gain from living or working in a different culture.	0.466	0.360
MotivCQ SE B3 I am confident that I can persist in coping with living conditions in different cultures.	0.462	0.401
CogCQ CGK B4 I can describe the different cultural value frameworks that explain behaviours around the world.	0.586	0.500
CogCQ CSK B5 I can describe the ways that leadership styles differ across cultural settings.	0.545	0.482
MetaCQ Plan B6 I develop action plans before interacting with people from a different culture.	0.435	0.399
MetaCQ Aware B7 I am aware of how my culture influences my interactions with people from different cultures.	0.394	0.295
MetaCQ Check B8 I adjust my understanding of a culture while I interact with people from that culture.	0.480	0.452
BehaCQ Verbal B9 I change my use of pause and silence to suit different cultural situations.	0.478	0.463
BehaCQ NonVer B10 I modify how close or far apart I stand when interacting with people from different cultures.	0.481	0.477
BehaCQ Speech B11 I modify the way I disagree with others to fit the cultural setting.	0.444	0.425
MotivCQ IM B12 I thrive on the differences in cultures that are new to me	0.463	0.427
MotivCQ EM B13 Given a choice, I value the tangible benefits (pay, promotion, perks) of an intercultural rather than a domestic role	0.321	0.272
MotivCQ SE B14 I am sure I can deal with the stresses of interacting with people from cultures that are new to me.	0.417	0.384
CogCQ CGK B15 I can describe similarities and differences in legal, economic, and political systems across cultures.	0.560	0.541
CogCQ CSK B16 I can describe how to put people from different cultures at ease.	0.592	0.577
MetaCQ Plan B17 I think about possible cultural differences before meeting people from other cultures.	0.583	0.552
MetaCQ Aware B18 I pay attention to how cultural aspects of the situation influence what is happening in that situation.	0.594	0.528
MetaCQ Check B19 I double check the accuracy of my cultural knowledge during intercultural interactions.	0.556	0.474
BehaCQ Verbal B20 I vary my verbal behaviours (accept, tone, rate of speaking) to fit specific cultural contexts.	0.574	0.525
BehaCQ NonVer B21 I change my non-verbal behaviours (hand gestures, head movements) to fit the cultural situation.	0.627	0.589
BehaCQ Speech B22 I change how I make requests of others depending on their cultural background.	0.642	0.620
MotivCQ IM B23 Given a choice, I prefer work groups composed of people with different (rather than similar) cultural backgrounds	0.433	0.421
MotivCQ EM B24 I value the reputation I would gain from developing global networks and connections.	0.486	0.426
MotivCQ SE B25 I am confident I can socialize with locals in a culture that is unfamiliar to me.	0.476	0.440
CogCQ CGK B26 I can describe differences in kinship systems and role expectations for men and women across cultures	0.637	0.609
CogCQ CSK B27 I can describe effective negotiation strategies across different cultures.	0.716	0.721
MetaCQ Plan B28 I ask myself what I hope to accomplish before I meet with people from different cultures.	0.562	0.504
MetaCQ Aware B29 I am conscious of how other people's culture influences their thoughts, feelings, and actions.	0.509	0.391

Communality estimates	Initial	Extraction
MetaCQ Check B30 I update my cultural knowledge after a cultural misunderstanding.	0.493	0.380
BehaCQ Verbal B31 I modify the amount of warmth I express to fit the cultural context.	0.559	0.554
BehaCQ NonVer B32 I vary the way I greet others (shake hands, bow, nod) when in different cultural contexts.	0.642	0.603
BehaCQ Speech B33 I vary the way I show gratitude (express appreciation, accept compliments) based on the cultural context.	0.668	0.640
CogCQ CGK B34 I can describe different views of beauty and aesthetics across cultural settings.	0.558	0.531
CogCQ CSK B35 I can describe different ways to motivate and reward people across cultures.	0.679	0.689
CogCQ CGK B36 I can speak and understand many languages.	0.483	0.384
CogCQ CSK B37 I can describe effective ways for dealing with conflict in different cultures.	0.725	0.742

Table 4-19: Percentage of variance explained for a factor analysis extracting four factors from the 37 items of the E-CQS

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	14.349	38.782	38.782	13.867	37.477	37.477	11.328
2	2.492	6.735	45.517	1.993	5.385	42.862	11.175
3	1.999	5.404	50.920	1.512	4.085	46.948	9.390
4	1.367	3.696	54.616	0.880	2.377	49.325	8.156

Table 4-20: Promax rotated pattern matrix with four factors extracted for 32 items

Pattern Matrix	Factor			
	1	2	3	4
CogCQ CSK B37 I can describe effective ways for dealing with conflict in different cultures.	0.911			
CogCQ CSK B27 I can describe effective negotiation strategies across different cultures.	0.894			
CogCQ CSK B35 I can describe different ways to motivate and reward people across cultures.	0.748			
CogCQ CGK B26 I can describe differences in kinship systems and role expectations for men and women across cultures	0.737			
CogCQ CSK B5 I can describe the ways that leadership styles differ across cultural settings.	0.673			
CogCQ CGK B15 I can describe similarities and differences in legal, economic, and political systems across cultures.	0.628			
CogCQ CGK B4 I can describe the different cultural value frameworks that explain behaviours around the world.	0.616			
CogCQ CGK B36 I can speak and understand many languages.	0.603			
CogCQ CGK B34 I can describe different views of beauty and aesthetics across cultural settings.	0.586			0.332
CogCQ CSK B16 I can describe how to put people from different cultures at ease.	0.581			
BehaCQ NonVer B10 I modify how close or far apart I stand when interacting with people from different cultures.		0.799		
MetaCQ Plan B17 I think about possible cultural differences before meeting people from other cultures.		0.725		
BehaCQ Speech B11 I modify the way I disagree with others to fit the cultural setting.		0.721		
BehaCQ Verbal B9 I change my use of pause and silence to suit different cultural situations.		0.656		
MetaCQ Plan B6 I develop action plans before interacting with people from a different culture.		0.655		
MetaCQ Check B8 I adjust my understanding of a culture while I interact with people from that culture.		0.643		
BehaCQ NonVer B21 I change my non-verbal behaviours (hand gestures, head movements) to fit the cultural situation.		0.565		0.323
MetaCQ Plan B28 I ask myself what I hope to accomplish before I meet with people from different cultures.	0.302	0.560		
MetaCQ Aware B7 I am aware of how my culture influences my interactions with people from different cultures.		0.518		
MetaCQ Aware B18 I pay attention to how cultural aspects of the situation influence what is happening in that situation.		0.471		
BehaCQ Verbal B20 I vary my verbal behaviours (accept, tone, rate of speaking) to fit specific cultural contexts.		0.449		0.333
MetaCQ Check B19 I double check the accuracy of my cultural knowledge during intercultural interactions.		0.434		
MotivCQ EM B13 Given a choice, I value the tangible benefits (pay, promotion) of an intercultural rather than a domestic role		0.322		

Table 4-20: continued

Pattern Matrix	Factor			
	1	2	3	4
MotivCQ IM B1 I truly enjoy interacting with people from different cultures.			0.787	
MotivCQ SE B25 I am confident I can socialize with locals in a culture that is unfamiliar to me.			0.673	
MotivCQ IM B23 Given a choice, I prefer work groups composed of people with different (rather than similar) cultural backgrounds			0.641	
MotivCQ EM B24 I value the reputation I would gain from developing global networks and connections.			0.599	
MotivCQ SE B14 I am sure I can deal with the stresses of interacting with people from cultures that are new to me.			0.593	
MotivCQ EM B2 I value the status I would gain from living or working in a different culture.			0.571	
MotivCQ SE B3 I am confident that I can persist in coping with living conditions in different cultures.			0.567	
MotivCQ IM B12 I thrive on the differences in cultures that are new to me		0.325	0.469	
MetaCQ Check B30 I update my cultural knowledge after a cultural misunderstanding.			0.351	
MetaCQ Aware B29 I am conscious of how other people's culture influences their thoughts, feelings, and actions.				
BehaCQ Speech B33 I vary the way I show gratitude (express appreciation, accept compliments) based on the cultural context.				0.762
BehaCQ NonVer B32 I vary the way I greet others (shake hands, bow, nod) when in different cultural contexts.				0.750
BehaCQ Speech B22 I change how I make requests of others depending on their cultural background.		0.457		0.478
BehaCQ Verbal B31 I modify the amount of warmth I express to fit the cultural context.				0.362

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

Table 4-21: Factor correlation matrix for four factors and 37 items

Factor	1	2	3	4
1	1.000	0.646	0.639	0.570
2	0.646	1.000	0.600	0.645
3	0.639	0.600	1.000	0.442
4	0.570	0.645	0.442	1.000

4.5.3 Exploratory factor of the 20 items of the E-CQS based on the results of the CFA analyses

The results of an EFA analysis with four factors extracted are shown in Tables 4-22 to 4-25. These results indicate that only a few items had low communality estimates after extraction. The percentage of variance explained for a model with four factors extracted with the selected 20 items shared variance quite proportionally after extraction, with the numbers ranging between 4.8% and 6.8%.

The promax rotated factor pattern shown in Table 4-24 has a clear factor pattern, without any cross-loadings, and with the factor loadings large. The items grouped clearly within each of their factors. However, if the eigenvalues in Table 4-23 are examined, it shows that only three eigenvalues are larger than 1, with a sharp decline in eigenvalues from the third value (1.548) to the fourth eigenvalue (0.860). There were also within each of the last three factors at least one item with a loading less than 0.5.

The factor correlation matrix for the four factor solution with only 20 items in Table 4-25 shows a correlation above 0.7 between factors 2 and 3, which represents the Behavioural CQ and Metacognitive CQ dimensions. This finding is consistent with the results obtained in the CFA4b model.

Table 4-22: Communality estimates of 20 items in the E-CQS with four factors extracted

Communality estimates	Initial	Extraction
MotivCQ IM B1 I truly enjoy interacting with people from different cultures.	0.444	0.626
MotivCQ EM B2 I value the status I would gain from living or working in a different culture.	0.383	0.436
MotivCQ SE B3 I am confident that I can persist in coping with living conditions in different cultures.	0.385	0.420
CogCQ CSK B5 I can describe the ways that leadership styles differ across cultural settings.	0.428	0.440
BehaCQ Verbal B9 I change my use of pause and silence to suit different cultural situations.	0.374	0.392
MotivCQ IM B12 I thrive on the differences in cultures that are new to me.	0.403	0.417
MetaCQ Plan B17 I think about possible cultural differences before meeting people from other cultures.	0.542	0.613
MetaCQ Aware B18 I pay attention to how cultural aspects of the situation influence what is happening in that situation.	0.561	0.569
MetaCQ Check B19 I double check the accuracy of my cultural knowledge during intercultural interactions.	0.525	0.569
BehaCQ Verbal B20 I vary my verbal behaviours (accept, tone, rate of speaking) to fit specific cultural contexts.	0.555	0.588
BehaCQ NonVer B21 I change my non-verbal behaviours (hand gestures, head movements) to fit the cultural situation.	0.597	0.644
BehaCQ Speech B22 I change how I make requests of others depending on their cultural background.	0.624	0.763
MotivCQ IM B23 Given a choice, I prefer work groups composed of people with different (rather than similar) cultural backgrounds.	0.374	0.397
CogCQ CGK B26 I can describe differences in kinship systems and role expectations for men and women across cultures.	0.621	0.628
CogCQ CSK B27 I can describe effective negotiation strategies across different cultures.	0.694	0.739
MetaCQ Plan B28 I ask myself what I hope to accomplish before I meet with people from different cultures.	0.513	0.514
MetaCQ Check B30 I update my cultural knowledge after a cultural misunderstanding.	0.359	0.360
CogCQ CGK B34 I can describe different views of beauty and aesthetics across cultural settings.	0.521	0.518
CogCQ CSK B35 I can describe different ways to motivate and reward people across cultures.	0.654	0.685
CogCQ CSK B37 I can describe effective ways for dealing with conflict in different cultures.	0.661	0.715

Table 4-23: Percentage of variance explained for a factor analysis extracting four factors from 20 items of the E-CQS

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	8.640	43.202	43.202	8.215	41.073	41.073	6.752
2	1.679	8.397	51.599	1.219	6.093	47.165	5.782
3	1.548	7.741	59.340	1.157	5.785	52.950	4.795
4	0.860	4.302	63.642	0.442	2.210	55.159	6.700
5	0.742	3.710	67.353				
6	0.690	3.452	70.805				
7	0.654	3.270	74.075				

Table 4-24: Promax rotated pattern matrix with four factors extracted for 20 items

Pattern Matrix	Factor			
	1	2	3	4
CogCQ CSK B27 I can describe effective negotiation strategies across different cultures.	0.879			
CogCQ CSK B37 I can describe effective ways for dealing with conflict in different cultures.	0.861			
CogCQ CSK B35 I can describe different ways to motivate and reward people across cultures.	0.780			
CogCQ CGK B26 I can describe differences in kinship systems and role expectations for men and women across cultures.	0.739			
CogCQ CGK B34 I can describe different views of beauty and aesthetics across cultural settings.	0.690			
CogCQ CSK B5 I can describe the ways that leadership styles differ across cultural settings.	0.613			
BehaCQ Speech B22 I change how I make requests of others depending on their cultural background.		0.920		
BehaCQ NonVer B21 I change my non-verbal behaviours (hand gestures, head movements) to fit the cultural situation.		0.709		
BehaCQ Verbal B20 I vary my verbal behaviours (accept, tone, rate of speaking) to fit specific cultural contexts.		0.669		
BehaCQ Verbal B9 I change my use of pause and silence to suit different cultural situations.		0.391		
MotivCQ IM B1 I truly enjoy interacting with people from different cultures.			0.875	
MotivCQ EM B2 I value the status I would gain from living or working in a different culture.			0.651	
MotivCQ SE B3 I am confident that I can persist in coping with living conditions in different cultures.			0.559	
MotivCQ IM B23 Given a choice, I prefer work groups composed of people with different (rather than similar) cultural backgrounds.			0.541	
MotivCQ IM B12 I thrive on the differences in cultures that are new to me.			0.445	
MetaCQ Plan B17 I think about possible cultural differences before meeting people from other cultures.				0.828
MetaCQ Check B19 I double check the accuracy of my cultural knowledge during intercultural interactions.				0.657
MetaCQ Aware B18 I pay attention to how cultural aspects of the situation influence what is happening in that situation.				0.610
MetaCQ Plan B28 I ask myself what I hope to accomplish before I meet with people from different cultures.				0.576
MetaCQ Check B30 I update my cultural knowledge after a cultural misunderstanding.				0.367

Table 4-25: Factor correlation matrix for four factors and 20 items

Factor	1	2	3	4
1	1.000	0.585	0.533	0.692
2	0.585	1.000	0.446	0.726
3	0.533	0.446	1.000	0.576
4	0.692	0.726	0.576	1.000

4.5.4 Exploratory factor analysis of the 20 items of the E-CQS with only three factors extracted

The communality estimates in Table 4-26 still show a number of items with low estimates after extraction. These items are consistent with those pointed out as having low item reliabilities in Section 4.4.3, indicating that these items may still be problematic.

The percentage of variance in Table 4-27 explained with three factors extracted was somewhat stronger for the first two factors, but equally shared between them, approximate 6.8% to 7.0%, and with the third factor having about 5.0% variance associated with it.

The promax rotated factor solution in Table 4-28 shows a clear factor pattern for Cognitive CQ and Motivational CQ, and with all the items in the Behavioural CQ and Metacognitive CQ in the same dimension. The factor loadings are strong, with only three loadings less than 0.5 in this solution.

The correlations between the factors in Table 4-29 are all less than 0.7, suggesting that with a three factor solution, discriminant validity is not a serious issue to be concerned about, suggesting that there may be reason to investigate the conceptual overlap between the dimensions of Metacognitive and Behavioural Cultural Intelligence.

Table 4-26: Communality estimates of 20 items in the E-CQS with three factors extracted

Communality estimates	Initial	Extraction
MotivCQ IM B1 I truly enjoy interacting with people from different cultures.	0.444	0.608
MotivCQ EM B2 I value the status I would gain from living or working in a different culture.	0.383	0.439
MotivCQ SE B3 I am confident that I can persist in coping with living conditions in different cultures.	0.385	0.424
CogCQ CSK B5 I can describe the ways that leadership styles differ across cultural settings.	0.428	0.439
BehaCQ Verbal B9 I change my use of pause and silence to suit different cultural situations.	0.374	0.399
MotivCQ IM B12 I thrive on the differences in cultures that are new to me	0.403	0.408
MetaCQ Plan B17 I think about possible cultural differences before meeting people from other cultures.	0.542	0.502
MetaCQ Aware B18 I pay attention to how cultural aspects of the situation influence what is happening in that situation.	0.561	0.531
MetaCQ Check B19 I double check the accuracy of my cultural knowledge during intercultural interactions.	0.525	0.512
BehaCQ Verbal B20 I vary my verbal behaviours (accept, tone, rate of speaking) to fit specific cultural contexts.	0.555	0.562
BehaCQ NonVer B21 I change my non-verbal behaviours (hand gestures, head movements) to fit the cultural situation.	0.597	0.610
BehaCQ Speech B22 I change how I make requests of others depending on their cultural background.	0.624	0.626
MotivCQ IM B23 Given a choice, I prefer work groups composed of people with different (rather than similar) cultural backgrounds.	0.374	0.372
CogCQ CGK B26 I can describe differences in kinship systems and role expectations for men and women across cultures	0.621	0.628
CogCQ CSK B27 I can describe effective negotiation strategies across different cultures.	0.694	0.741
MetaCQ Plan B28 I ask myself what I hope to accomplish before I meet with people from different cultures.	0.513	0.469
MetaCQ Check B30 I update my cultural knowledge after a cultural misunderstanding.	0.359	0.352
CogCQ CGK B34 I can describe different views of beauty and aesthetics across cultural settings.	0.521	0.500
CogCQ CSK B35 I can describe different ways to motivate and reward people across cultures.	0.654	0.680
CogCQ CSK B37 I can describe effective ways for dealing with conflict in different cultures.	0.661	0.715

Table 4-27: Percentage of variance explained for a factor analysis extracting three factors from 20 items of the E-CQS

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	8.640	43.202	43.202	8.187	40.933	40.933	6.987
2	1.679	8.397	51.599	1.185	5.926	46.860	6.781
3	1.548	7.741	59.340	1.143	5.716	52.576	4.993
4	0.860	4.302	63.642				

Table 4-28: Promax rotated pattern matrix with three factors extracted for 20 items

Pattern Matrix	Factor		
	1	2	3
BehaCQ Speech B22 I change how I make requests of others depending on their cultural background.	0.875		
BehaCQ NonVer B21 I change my non-verbal behaviours (hand gestures, head movements) to fit the cultural situation.	0.832		
BehaCQ Verbal B20 I vary my verbal behaviours (accept, tone, rate of speaking) to fit specific cultural contexts.	0.791		
MetaCQ Plan B17 I think about possible cultural differences before meeting people from other cultures.	0.664		
BehaCQ Verbal B9 I change my use of pause and silence to suit different cultural situations.	0.625		
MetaCQ Aware B18 I pay attention to how cultural aspects of the situation influence what is happening in that situation.	0.587		
MetaCQ Check B19 I double check the accuracy of my cultural knowledge during intercultural interactions.	0.546		
MetaCQ Plan B28 I ask myself what I hope to accomplish before I meet with people from different cultures.	0.497		
MetaCQ Check B30 I update my cultural knowledge after a cultural misunderstanding.	0.386		
CogCQ CSK B27 I can describe effective negotiation strategies across different cultures.		0.897	
CogCQ CSK B37 I can describe effective ways for dealing with conflict in different cultures.		0.867	
CogCQ CSK B35 I can describe different ways to motivate and reward people across cultures.		0.772	
CogCQ CGK B26 I can describe differences in kinship systems and role expectations for men and women across cultures		0.757	
CogCQ CGK B34 I can describe different views of beauty and aesthetics across cultural settings.		0.656	
CogCQ CSK B5 I can describe the ways that leadership styles differ across cultural settings.		0.612	
MotivCQ IM B1 I truly enjoy interacting with people from different cultures.			0.870
MotivCQ EM B2 I value the status I would gain from living or working in a different culture.			0.671
MotivCQ SE B3 I am confident that I can persist in coping with living conditions in different cultures.			0.591
MotivCQ IM B23 Given a choice, I prefer work groups composed of people with different (rather than similar) cultural backgrounds			0.508
MotivCQ IM B12 I thrive on the differences in cultures that are new to me			0.493

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

Table 4-29: Factor correlation matrix for three factors and 20 items

Factor	1	2	3
1	1.000	0.680	0.559
2	0.680	1.000	0.559
3	0.559	0.559	1.000

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

4.6 CHAPTER SUMMARY

In this chapter the results of confirmatory factor analyses were used to investigate the psychometric properties of the E-CQS. A test was conducted to evaluate whether the assumption of normality was met, with no significant kurtosis in the items. It was therefore possible to use maximum likehood estimation as a method to estimate the parameters of the models.

The empirical results from the study indicated that the eleven factor model did not fit the data, and that there were problems with the covariance matrix that was not positive definite. Thereafter, the original four factor model CFA4a was fitted to the data. When the standardised residuals of the covariance matrix was inspected, several problem items were shown to be candidates for being removed from the model. The item wording was evaluated, and removed if other criteria were also shown to be problematic, for example if the error variance of that item was high and if the squared multiple correlation of that item was low. The process was repeated, and the final model CFA4b provided adequate fit.

Using the approach suggested by Fornell and Larcker (1981), an analysis of the item reliabilities were conducted on the final model CFA4b. This analysis revealed that several problematic items still remained, despite the fact that the model had adequate fit. An analysis of the composite reliability (CR) suggested that convergent validity was strongly supported by the final model. However, discriminant validity was not clearly supported, specifically for the constructs Behavioural CQ and Metacognitive CQ. The strong estimated correlation between these two constructs provided further support that there seems to be a large overlap between these constructs within the observed sample covariance matrix.

The four factor model of Cultural Intelligence (CFA4b) displayed similar internal consistency when compared to the original factor model (CFA4a), except for the dimension of Motivational IQ, which declined substantially after the removal of

problematic items. However the Cronbach's alpha value for Motivational IQ (0.780) was still above the 0.70 threshold. The other four factors had very good internal consistency reliability above 0.80 for the remaining three dimensions.

The assessment of measurement invariance over race groups showed that the final model was not invariant across race groups at all. Only configural invariance could assumed to hold over race groups. Over gender groups, only metric invariance can be assumed to hold. These results imply that is would be invalid to compare race groups or gender groups in using model CFA4b.

After the confirmatory factor analyses, exploratory factor analyses were conducted in order to investigate whether further analyses would show the same items to be problematic, and whether the same issues with the scale would emerge. The results of the exploratory factor analyses in the Section 4.5 corroborated the findings that were obtained in the confirmatory factor analyses reported in Section 4.4.

All these results suggest that the E-CQS instrument has several problems associated with it within a South African context. Even the better fitting model CFA4b still had item problems and lacked clear discrimination. A further detailed discussion of the research findings are given in Chapter 5.

CHAPTER 5: DISCUSSION OF RESEARCH FINDINGS AND LIMITATIONS

5.1 INTRODUCTION

In this chapter the results presented in chapter 4 are discussed, especially within the limitation of conducting the study within a single organisation, especially in view of the diversity of the workforce within South Africa, and how this affects how the phenomenon of Cultural Intelligence seems to function within South Africa. Firstly, demographic and contextual results are discussed followed by a discussion of the psychometric properties of the eleven factor and four factor models of cultural intelligence that were tested in this study.

The study conducted by Van Dyne et al. (2012) resulted from the administration of their proposed Expanded Cultural Intelligence Scale (E-CQS) to 286 respondents from multiple countries. In their study, confirmatory factor analysis demonstrated sufficient discriminant validity within the second-order model that they proposed. Composite reliabilities were reported as being acceptable with support for convergent and discriminant validity was found. Average variance extracted (AVE) also supported this finding. The purpose of this study was to evaluate the psychometric properties of the E-CQS within the South African context.

5.1.1 Demographic and contextual variables

Of the 601 valid responses from a large South African FMCG company, 59.7% were male. Only 31.6% of respondents where white, with 44.5% being African with 57.9% of respondents speaking an African language at home. Although more than 90% of the over 50% of the respondents resided in the Gauteng province, there was reasonable representation from the other eight provinces.

With regards to experience, 73.8% of respondents had more than six years working experience with 45% managing people, of which 47.4% manage more than 6

individuals. When asked about the diversity of the teams that the respondents managed, 33.4% of managers regarded the group to be very diverse in terms of culture with 60% regarding the team to be mostly comprised of males and 24.3% regarding the group to be well balanced in terms of gender representation.

5.1.2 Cultural intelligence a multi-dimensional construct

Initially, Earley (2003) conceptualised cultural intelligence as a three dimensional model with Ang et al. (2007) arguing that this construct is more fully represented as a four dimensional model, with the dimensions of Metacognitive CQ, Motivational CQ, Cognitive CQ and Behavioural CQ. The Cultural Intelligence Scale (CQS) was operationalised using 20 items (Ang et al., 2007). More recently, Van Dyne et al. (2012) expanded on the conceptualisation of CQ, proposing that the CQ construct consists of eleven sub-dimensions of Cultural Intelligence, and was named the Expanded Cultural Intelligence Scale (E-CQS). This expanded E-CQS scale was the focus of this study, and the current investigation focussed on whether the eleven sub-dimensions of Cultural Intelligence (Van Dyne et al., 2012) could be replicated in an observed sample in a South African context.

5.1.3 The psychometric properties of the E-CQS in the South African context

Internal consistency reliabilities where calculated for each of the eleven dimensions of the E-CQS with the eleven factor model (CFA11) somewhat lacking in internal consistency due to a few dimensions having Cronbach's alpha values lower than 0.7 as recommended by Peterson (1994). A four factor model (CFA4a), which was consistent with the four higher-order factors of Van Dyne et al. (2012) was tested instead, and was also evaluated with Cronbach's alpha ranging from 0.838 to 0.921 providing sufficient support for internal consistency reliability. The fact that the internal consistency of the four-factor model yielded higher values, should not be wrongly interpreted as being better, due to the fact that more items in an instrument are known to yield higher levels of internal consistency (Field, 2009). Kurtosis values

for both models suggested that the distribution of the item scores were not highly kurtotic, and therefore, without a significant deviation from the multivariate normality assumption, maximum likelihood estimation was appropriate for estimating model parameters.

First-order confirmatory factor analysis (CFA) was conducted on the eleven factor model proposed by Van Dyne et al. (2012). This was a first step towards assessing the suitability of a second-order model. A good fitting first-order model is a requirement before a second-order model would make sense (Marsh and Hocevar, 1985). Following an investigation into the first-order model with eleven latent variables (CFA11), the confirmatory factor analysis (CFA) resulted in poor model fit with a Chi-square value of 2182.3 and degrees of freedom = 574, and IFI, TLI and CFI between 0.847 and 0.869. All the fit measures evaluated did not fall within acceptable ranges. However, the biggest problem with the eleven factor model was that the sample covariance matrix between the first-order constructs was not positive definite, and thus estimates were not accurate. It therefore seemed as though the eleven factor model was over-specified, and therefore it also did not make sense to proceed with a more restricted second-order model.

First-order confirmatory factor analysis (CFA) was then conducted on a factor analysis model with four first-order latent variables (CFA4a), as originally conceptualised by Ang et al. (2008) with the four latent variables being Motivational CQ, Cognitive CQ, Metacognitive CQ and Behavioural CQ. With all 37 items included, the model did not fit the data well. Following this, a total of 17 problematic items were identified and removed from the model using a step-wise approach, mainly by examination of the standardised residual covariance matrix. These items were B4, B4, B6, B7, B8, B10, B11, B13, B14, B15, B16, B24, B25, B29, B31, B32, B33 and B36. Following the removal of these items a 20 item, four factor model of Cultural Intelligence (CFA4b) resulted.

This four factor model (CFA4b) offered a substantially improved fit compared to model CFA4a, based on all the fit measures. Firstly, the Chi-square statistic was

reduced to about a quarter of the original value. Secondly, the IFI, TLI and CFI improved from values of about 0.85 to values over 0.93. The RMSEA also improved from 0.070 to 0.063. Lastly, the AIC decreased from 2605 to 629, all indicating that the CFA4b model can be deemed to provide adequate fit to the data. Estimated correlations between the latent variables in CFA4b indicted that there was a high correlation between Behavioural CQ and Metacognitive CQ, indicative that discriminant validity between these two constructs may not be well established.

An analysis of the item reliabilities of CFA4b indicated that there were still a number of problematic items, with several of the item reliabilities lower than 0.50, the value recommended by Fornell and Larcker (1981). Composite reliabilities for CFA4b were all above 0.7 for all four factors as per recommendations made by Fornell and Larcker (1981), providing sufficient support for the convergent validity of the scale. When evaluating the ratio of the average variance extracted (AVE) to the maximum of the squared correlation with the other constructs, ratios of less than 1 were evident with two dimensions, namely Behavioural CQ and Metacognitive CQ. This provided further evidence for poor discriminant validity between these two constructs.

In order to ensure a comprehensive psychometric evaluation of the final four factor model (CFA4b), an evaluation of the measurement equivalence of the E-CQS scale was regarded as important in this study. Two sets of invariance testing models were tested on the final CFA4b the model, namely invariance testing across race groups and across gender groups. Measurement invariance testing was conducted by applying increasingly restrictive models proposed by Steenkamp and Baumgartner (1998) through SPSS AMOS 23 multiple-group (MG) procedure for invariance testing.

With regards to evaluating equivalence, the fit statistics for M0 (unconstrained model) was fitted for multiple groups simultaneously. The model tested whether groups had the same factorial structure within the four factor model. Model M1, (the measurement weights model) evaluated if the values of factor loading were equal

across groups and evaluated whether the descriptors and measurement scale were interpreted the same by the groups (Steenkamp & Baumgartner, 1998). In model M2, (the measurement intercepts model) assessed whether groups had a similar understanding of the items in the E-CQS in terms of its off-set or origin. For model M3, the means of the latent variables were constrained equal. In model M4 the structural variances and covariances were constrained equal, whilst in model M5, the measurement residuals were also constrained equal. If the data fits these models, the CFA4 models can be said to be measuring the same construct across the groups and that the instrument is equally reliable across groups (Steenkamp and Baumgartner, 1998).

Model fit was evaluated by evaluating a number of fit indices, namely the Incremental Fit Index (IFI), the Tucker-Lewis Fit Index (TLI) and the Comparative Fit Index (CFI). Values higher than 0.90 indicate good fit as per Hu and Bentler's (1999) recommended threshold. The ratios of the Chi-square value to the degrees of freedom were also evaluated to assess model fit with a cut-off ratio of Chi-square to degrees of freedom (CMIN/DF) of less than 3 (Hu & Bentler, 1999). Finally, the Root Mean Square Error (RMSEA) was also evaluated with values less than 0.05 indicative of a good fit; values between 0.05 and 0.08 indicate a reasonable fit and values above 0.08 indicative of average fit and values greater than 0.10 indicating a poor fit (Hu and Bentler, 1999). Based on baseline comparisons, the results suggested that the 20 item four factor model CFA4b was not invariant across race and gender groups.

The results of the exploratory factor analyses were consistent with the findings obtained in the confirmatory factor analyses. The results showed that the 37 item E-CQS had several problem items with cross-loadings, and the intstrument lacked discriminant validity. The twenty item solution produced a clear factor pattern with the four original dimensions of Cognitive CQ, Motivational CQ, Behavioural CQ and Metacognitive CQ, but with problems of discriminant validity between the Behavioural and Metacognitive dimensions. When a three factor solution was extracted, the items of Behavioural CQ and Metacognitive CQ loaded onto the same factor.

All these findings point to the fact that the E-CQS instrument in its original form has limited applicability in a South African context, and requires serious revision before it can be used with confidence.

5.2 LIMITATIONS OF THE STUDY

The focus of the study was on the psychometric properties of the E-CQS within the South African context. This assessment was based on a fairly large sample, however, the sample of respondents was from a single organisation in the highly competitive FMCG industry. It is possible that this limited scope of the data, and the prevailing organisational culture could have an influence on the results. Extending the scope of the study beyond a single organisation could be beneficial in order to generalise of the findings to other organisations within South Africa. As the sample selected in this study are employed within the same organisation, the extent to which the organisational culture influenced response patterns is unknown.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

In this final chapter, the conclusions regarding the psychometric properties of the E-CQS in this study are contrasted with findings in the literature. This chapter concludes with recommendations for future research.

6.2 CONCLUSION

The psychometric properties of the E-CQS as discussed in Chapters 4 and 5 provide evidence that the E-CQS has limited scope as an instrument to measure Cultural Intelligence within the South African context in its current form. The complex multidimensional eleven factor model (CFA11) did not replicate at all in the sample that was observed. This is most likely due to the model being over specified, or the model being overly complex with too few items discriminating between the eleven factors. A four factor model (CFA4b) with 17 problem items removed presented a more suitable and reliable measure of cultural intelligence, with results indicating good model fit to the data sampled in the study. Although the model in CFA4b was found to be a more reliable measure of Cultural Intelligence, the model still lacked in terms of the discriminant validity across the Behavioural CQ and Metacognitive CQ dimensions.

When reviewing the development of the E-CQS and the Cultural Intelligence construct, it is interesting to note that Cultural Intelligence was initially conceptualised as a three dimensional model which evolved into a four dimensional model, and was later conceptualised and proposed as an eleven sub-dimensional model, with four second-order factors as per recommendations by Van Dyne et al. (2012). The argument for the evolution of Cultural Intelligence into an eleven factor model was based on the fact that the expanded framework allowed for a better conceptualisation of each of four factors of cultural intelligence (Van Dyne et al., 2012).

Based on the results of this study, it could be argued that the conceptualisation of Cultural Intelligence as an eleven factor model may be premature within the South African context due to over specification and the overly complicated nature of the construct. Instead, a more suitable four factor model was evaluated in terms of its psychometric properties with the results proving promising results for further research. It could thus be reasoned that Cultural Intelligence is truly just a four factor first order model of Motivational CQ, Metacognitive CQ, Cognitive CQ and Behavioural CQ.

Overall, the four factor model proved to be a more valid, reliable and cross culturally equivalent measure of cultural intelligence within the South African context within the sample that was observed. However, additional research is required in order to ensure that measurement or cultural intelligence is free from cultural or gender bias, and is fully represented conceptually within the South African world of work.

6.3 RECOMMENDATIONS FOR FUTURE RESEARCH

Based on the findings of this study, several recommendations emerge for future research. It is recommended that additional qualitative research be conducted on the concept of cultural intelligence, in order to develop more appropriate items for the E-CQS. A content validity assessment among academic and industry experts of the old and proposed new items may be a next step, in order to assess how the items are perceived within the South African context.

This is in light of the fact that 17 problematic items were removed from the final four factor model. Further research is also required to further investigate the validity of the four factor model for ethnic, gender and language groups separately. It is not clear from the study whether participants clearly distinguished between Behavioural CQ and Metacognitive CQ, therefore the factor structure of the four factor model

should also be scrutinised further in order to further explore the high correlations between these constructs.

Future studies could also include the evaluation of the four factor model of Cultural Intelligence as antecedents on performance outcomes and investigate possible mediating variables. Such a study would need to be more global in nature, and needs to incorporate several multinational organisations.

From the literature review is was undoubtedly clear that Cultural Intelligence is an important concept, especially as an antecedent of individual and organisational performance. Cultural intelligence will increasingly be an important focus for scholars, given the globalisation of firms, and the diffusion of markets. With increased meltdowns on economies, firms will increasingly be under pressure towards improved performance, regardless of the individual. Therefore, employees with an improved understanding of diversity and equipped to deal with this added complexity in the workplace are likely to be more productive and perform better in the workplace. By being more sophisticated in terms of Cultural Intelligence, more productive employees will be better equipped to steer their organisations towards the path of survival and success in a turbulent and ever-changing business environment.

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Addendum A

LETTER OF INTRODUCTION

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Economic and
Management Sciences
01 February 2015

Informed Consent for participation in academic research

Department of Human Resource Management

Psychometric Properties of the Expanded Cultural Intelligence Scale (E-CQS) in the South African Context

Research conducted by:
Mr. F.D.S. da Silva (29319537)
Cell: 083 417 3082
Dear Respondent

You are invited to participate in an academic research study conducted by Francisco Davide Santos da Silva, a Masters student from the Department of Human Resource Management at the University of Pretoria. The purpose of the study is to evaluate the psychometric properties of the E-CQS across different cultural groups in a South African context.

Please note the following:

- This study involves an anonymous survey. Your name will not appear on the questionnaire and the answers you give will be treated as strictly confidential. You cannot be identified in person based on the answers you give. Kindly note that consent cannot be withdrawn once the questionnaire is submitted as there is no way to trace the particular questionnaire that has been filled in.
- Your participation in this study is very important to us. You may, however, choose not to participate and you may also stop participating at any time without any negative consequences.
- Please answer the questions in the attached questionnaire as completely and honestly as possible. This should not take more than 10 minutes of your time.
- The results of the study will be used for academic purposes only and may be published in an academic journal. We will provide you with a summary of our findings on request.
- Please contact my study leaders, Prof. Yvonne du Plessis and Arien Strasheim, 012 420 3145; email yvonne.duplessis@up.ac.za or arien.strasheim@up.ac.za if you have any questions or comments regarding the study.

Please sign the form to indicate that:

- You have read and understand the information provided above.
- You give your consent to participate in the study on a voluntary basis.

_____ _____

Respondent's Initial Date

Addendum B

RESEARCH INSTRUMENT

Section A:	Demographic Information

1. How many years working experience do you have?										
01	0 - 2	02	2 - 5	03	6 – 10	04	11 - 15	05	16 +	

2. Are you in a position in your organisation where you need to manage or supervise other people?				
01	Yes	02	No	

3. If you answered yes to question 2, how many people are you currently directly managing or supervising?								
01	1 – 5	02	6 – 10	03	11 – 20	04	20+	

4. If you answered yes to question 2, how diverse is the group that you are directly managing or supervising in terms of cultural composition?					
01	The group is predominantly from one cultural group	02	There is some cultural diversity in the group	03	The group is very diverse in terms of culture

5. If you answered yes to question 2, how diverse is the group that you are directly managing or supervising in terms of gender composition?					
01	The group has mostly males	02	The group has mostly females	03	The group is quite balanced in terms of males and females

6. How would you rate your level of interaction/engagement with people at work from a culture that differs from your own?					
01	Almost no Interaction	02	Some interaction	03	Very frequent interaction

7. How do you feel in general about your own interactions with people from other cultural groups than your own?					
01	A person from another cultural group needs to adapt his/her behaviour to what is acceptable in your culture.	02	Both yourself and a person from another cultural group needs to adapt individual behaviours to what is acceptable in both cultures.	03	You are the one who predominantly adapts your own behaviour to what is acceptable in that of another culture.

8. How many languages can you speak?					
01	Only 1	02	Two	03	Three
04	Four	06	Five	07	Six or more

9. Please name the languages referred to in question 8.					
01	Afrikaans	02	English	03	French
04	German	05	isiNdebele	06	isiSwati
07	isiXhosa	08	isiZulu	09	Khoisan
10	Mandarin	11	Sepedi	12	Sesotho
13	Setswana	14	Spanish	15	Swahili
16	Tshivenda	17	Xitsonga	18	Other

10. Have you ever worked outside the borders of your country of residence?				
01	Yes	02	No	

17. If you answered yes to question 10, please state the country and the duration that you worked in that country (in months)															
13.1		01	0-1	02	1-2	03	2-3	04	3-6	05	6-12	06	12-24	07	24 +
13.2		01	0-1	02	1-2	03	2-3	04	3-6	05	6-12	06	12-24	07	24 +
13.3		01	0-1	02	1-2	03	2-3	04	3-6	05	6-12	06	12-24	07	24 +
13.4		01	0-1	02	1-2	03	2-3	04	3-6	05	6-12	06	12-24	07	24 +
13.5		01	0-1	02	1-2	03	2-3	04	3-6	05	6-12	06	12-24	07	24 +
13.6		01	0-1	02	1-2	03	2-3	04	3-6	05	6-12	06	12-24	07	24+

18. Age																	
01	18-25	02	26-30	03	31-35	04	36-40	05	41-45	06	46-50	07	51-55	08	55-60	09	60 +

19. Race												
01	African	02	White	03	Coloured	04	Indian	05	Chinese	06	Other	

20. Gender				
01	Male	02	Female	

21. Citizenship						
01	South African	02	Other	03	If Other Please Specify:	

22. Home Language					
01	English	02	Afrikaans	03	Sepedi
04	Sesotho	05	Setswana	06	isiTsonga
07	isiSwati	08	Tshivenda	09	isiZulu
10	isiNdebele	11	isiXhosa	12	Other
23. Marital Status					
01	Single	02	Married	03	Divorced
04	Widowed	05	Co-Habiting		
24. In which province do you work?					
01	Eastern Cape	02	Free State	03	Western Cape
04	Limpopo	05	North West	06	KwaZulu-Natal
07	Mpumalanga	08	Gauteng	09	Northern Cape

Section B:	Expanded Cultural Intelligence Scale

Note. Use of this scale is granted to academic researchers for research purposes only. For information on using the scale or items for purposes other than academic research (e.g. consulting, program evaluation, non-academic organizations), send an email to cquery@culturalq.com

For more information, see Van Dyne, L., Ang, S., Ng, K.Y., Rockstuhl, T., Tan, M. L. & Koh, C. (2012). Subdimensions of the four factor model of cultural intelligence: Expanding the conceptualization and measurement of cultural intelligence. *Social and Personality Psychology Compass*, 6/4, 295-313. See also http://culturalq.com

Section B: Expanded Cultural Intelligence Scale
Read each statement and select the response that best describes your capabilities relative to those of your peers. Select the answer that BEST describes you AS YOU REALLY ARE

		Strongly disagree	Disagree	Disagree somewhat	Neither agree nor disagree	Agree somewhat	Agree	Strongly agree
1	I truly enjoy interacting with people from different cultures.	1	2	3	4	5	6	7
2	I value the status I would gain from living or working in a different culture.	1	2	3	4	5	6	7
3	I am confident that I can persist in coping with living conditions in different cultures.	1	2	3	4	5	6	7
4	I can describe the different cultural value frameworks that explain behaviours around the world.	1	2	3	4	5	6	7
5	I can describe the ways that leadership styles differ across cultural settings.	1	2	3	4	5	6	7
6	I develop action plans before interacting with people from a different culture.	1	2	3	4	5	6	7
7	I am aware of how my culture influences my interactions with people from different cultures.	1	2	3	4	5	6	7
8	I adjust my understanding of a culture while I interact with people from that culture.	1	2	3	4	5	6	7
9	I change my use of pause and silence to suit different cultural situations.	1	2	3	4	5	6	7
10	I modify how close or far apart I stand when interacting with people from different cultures.	1	2	3	4	5	6	7
11	I modify the way I disagree with others to fit the cultural setting.	1	2	3	4	5	6	7
12	I thrive on the differences in cultures that are new to me	1	2	3	4	5	6	7
13	Given a choice, I value the tangible benefits (pay, promotion, perks) of an intercultural rather than a domestic role	1	2	3	4	5	6	7
14	I am sure I can deal with the stresses of interacting with people from cultures that are new to me.	1	2	3	4	5	6	7
15	I can describe similarities and differences in legal, economic, and	1	2	3	4	5	6	7

		Strongly disagree	Disagree	Disagree somewhat	Neither agree nor disagree	Agree somewhat	Agree	Strongly agree
	political systems across cultures.							
16	I can describe how to put people from different cultures at ease.	1	2	3	4	5	6	7
17	I think about possible cultural differences before meeting people from other cultures.	1	2	3	4	5	6	7
18	I pay attention to how cultural aspects of the situation influence what is happening in that situation.	1	2	3	4	5	6	7
19	I double check the accuracy of my cultural knowledge during intercultural interactions.	1	2	3	4	5	6	7
20	I vary my verbal behaviours (accept, tone, rate of speaking) to fit specific cultural contexts.	1	2	3	4	5	6	7
21	I change my non-verbal behaviours (hand gestures, head movements) to fit the cultural situation.	1	2	3	4	5	6	7
22	I change how I make requests of others depending on their cultural background.	1	2	3	4	5	6	7
23	Given a choice, I prefer work groups composed of people with different (rather than similar) cultural backgrounds	1	2	3	4	5	6	7
24	I value the reputation I would gain from developing global networks and connections.	1	2	3	4	5	6	7
25	I am confident I can socialize with locals in a culture that is unfamiliar to me.	1	2	3	4	5	6	7
26	I can describe differences in kinship systems and role expectations for men and women across cultures	1	2	3	4	5	6	7
27	I can describe effective negotiation strategies across different cultures.	1	2	3	4	5	6	7
28	I ask myself what I hope to accomplish before I meet with people from different cultures.	1	2	3	4	5	6	7
29	I am conscious of how other people's culture influences their thoughts, feelings, and actions.	1	2	3	4	5	6	7
30	I update my cultural knowledge after a cultural misunderstanding.	1	2	3	4	5	6	7

		Strongly disagree	Disagree	Disagree somewhat	Neither agree nor disagree	Agree somewhat	Agree	Strongly agree
31	I modify the amount of warmth I express to fit the cultural context.	1	2	3	4	5	6	7
32	I vary the way I greet others (shake hands, bow, nod) when in different cultural contexts.	1	2	3	4	5	6	7
33	I vary the way I show gratitude (express appreciation, accept compliments) based on the cultural context.	1	2	3	4	5	6	7
34	I can describe different views of beauty and aesthetics across cultural settings.	1	2	3	4	5	6	7
35	I can describe different ways to motivate and reward people across cultures.	1	2	3	4	5	6	7
36	I can speak and understand many languages.	1	2	3	4	5	6	7
37	I can describe effective ways for dealing with conflict in different cultures.	1	2	3	4	5	6	7

THANK YOU FOR PARTICIPATING IN THIS SURVEY. YOUR PARTICIPATION IS GREATLY APPRECIATED