

Chapter 1: Literature Review

1.1: Introduction

The epistemological study of mankind inescapably requires an ontological assumption inherent in what it means to be a human being. From a psychological paradigmatic perspective, this ontological assumption is encapsulated within the construct of one's personality. Personality is regarded as the configuration of characteristic patterns of thoughts, feelings and behaviours that persist over time and situations that distinguishes one person from another (Kassin, 2003). Personality has been constructed from a variety of conceptual, theoretical and empirical perspectives with varying levels of abstraction and breadth. For example, the depth psychological approaches or psychoanalytic theorists contend that personality is comprised of unconscious forces within the person of which the individual is mostly unaware (Meyer, Moore & Viljoen, 2003). The humanists, by comparison view the ontological nature of human beings and personality construction as being comprised of natural tendencies to strive for the fullest development of one's inherited potential. The various perspectives all offer something unique to our understanding of people, from individual idiosyncrasies and differences to more general descriptions of what constitutes the human experience.

The current study is interested in how personality is operationalised and measured within the trait theory, through the NEO-PI-R, and more specifically the most recent version of this instrument, the NEO-PI-3 (McCrae, Costa & Martin, 2004). The NEO-PI-3 was constructed with the intention of making the original NEO-PI-R instrument more readable in terms of linguistic complexity (McCrae, Costa and Martin, 2004), and hence replaced 37 of the original 240 items within the NEO-PI-R, with less linguistically complex equivalent items. Having reviewed previous research conducted on the applicability of the NEO-PI-R within a South African context from studies such as Franklin (2009) and Laher (2010), and comparing their findings to the modifications

made to generate the NEO-PI-3, it becomes clear that the NEO-PI-3 did not adequately address all the concerns and criticisms raised within these two particular studies. As both the NEO-PI-R and the NEO-PI-3 were constructed within the United States of America, and hence contain many American linguistic and cultural phrases and references embodied within many of the items, the primary objective of the current study is to ascertain which of the items within the NEO-PI-3 are problematic for a South African context, with the intention of modifying and adapting the problematic items to become linguistically and culturally appropriate for a South African audience. As a general point of clarification, the NEO-PI-3 represents essentially the same instrument as the NEO-PI-R, with only the above mentioned 37 items being different. Therefore, throughout the following literature review, one must bear in mind that by virtue of the recentness of the NEO-PI-3's creation, there exists a paucity in literature and comparative analysis on this instrument where basically no research has been conducted on the NEO-PI-3 to the author's awareness. Therefore, an analysis of the NEO-PI-3 unavoidably involves an analysis of the NEO-PI-R. The literature review will therefore centre primarily on the NEO-PI-R, and previous research that has been conducted on that particular inventory, providing extrapolation to the NEO-PI-3, and potential problems inherent within this instrument within the South African context.

The general structure of the following literature review will proceed as follows. First a general 'Background' to the study will be further elaborated on, detailing some of the more pertinent issues contained in the study, this being followed a section on 'trait theory' and the 'Five Factor Model (FFM)' of personality. Following this section, research on the cross-cultural applicability of the FFM will be explored, followed by a discussion of the Five Factor Theory (FFT) of personality. Next, a section examining the NEO-PI-R will be investigated, leading to a section on the NEO-PI-R's applicability across different cultures. This section will be followed by a discussing detailed the distinction between the 'etic' and 'emic' approaches in psychometrics, leading to an examination of instrument invalidity within the South African context. Finally the NEO-PI-3 will be explored leading to the conclusion that a new, modified version of the NEO-PI-3 needs to be developed for a South African context.

1.2: *Background*

Local and international research has consistently demonstrated how taking a test in a language that is not one's home language, or a language in which one is not necessarily proficient affects responses to test items (Abrahams, 1996; Abrahams & Mauer, 1999; Allik & McCrae, 2002; Heaven & Pretorius, 1998; Heuchert, Parker, Stumpf & Myburgh, 2000; Horn, 2000; Piedmont, Bain, McCrae & Costa, 2002; Wallis & Birt, 2003).

Therefore, regardless of whether or not a particular South African has English as his or her first, second or third language, his or her expression and comprehension will be very different to how an American will construct the world around him or herself in terms of language. This dissimilarity in language construction will have an enormous impact on how one's personality is constructed, especially when answering a particular personality instrument, containing particular items, standardized on a particular population, such as the NEO-PI-3.

In summary, the sophisticated cerebral plane involved in language expression and understanding, including its vast abstract systems of connotation and denotation, as well as Western cultural nuances inherent in Westernised inventories may not be understood by many South Africans. South Africans may receive the instrument as inappropriate, confusing or unsuitable. Researchers have argued that instruments, such as the NEO-PI-3, must be utilized in a fair, unbiased and cross-culturally equivalent manner (Abrahams & Mauer, 1999; Laher, 2008; Prinsloo & Ebersöhn, 2002; Van Eeden & Prinsloo, 1997). This has led to a plenitude of international research focusing its energies towards investigating the appropriateness and applicability of certain Westernised personality instruments within certain non-Western cultural contexts (Allik & McCrae, 2002; Berry, Poortinga, & Pandey, 1997; Cheung, Cheung, Zhang, Leung, Leong, & Yeh, 2008; Church, & Katigbak, 2002; McCrae & Terracciano, 2005).

1.3: Trait theory and the Five Factor Model (FFM)

McCrae, John, Costa and Goldberg are regarded as the primary agents involved and responsible for launching the five-factor model into being the leading epistemology in personality research to date (Goldberg, 1990; McCrae & Allik, 2002). According to McCrae and Allik (2002) the FFM is a constellation of personality traits, which in turn are dimensions of relatively stable individual differences in tendencies to show consistent patterns in thoughts, feelings, and behaviours. McCrae further defined traits as “endogenous basic tendencies that, within a cultural context, give rise to habits, attitudes, skills, beliefs, and other characteristic adaptations” (McCrae, 2002, p.11), as defined within the Five Factor Theory (FFT) of personality (Allik & McCrae, 2002). The FFT will be discussed comprehensively below.

The FFM of personality consists of five key personality traits, called domains. These domains are: Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness. Each domain is made up of six key elements called facets, which acutely describe and demarcate the dimensions of individual personality, as well as the differences in patterns of thoughts, feelings, and behaviours. The five personality domains were developed with the intention of being global personality factors, and therefore may be indicative of a good degree of consistency in human thought, feeling and behaviour. Costa and McCrae (1992) describe the five domains and facets as follows:

Neuroticism is one of two classic dimensions of personality that is represented in most personality models. The Neuroticism domain consists of six facets, namely Anxiety, Anger and Hostility, Depression, Self-consciousness, Impulsiveness and Vulnerability. *Anxiety* embodies feelings of nervousness, apprehension, fear and feelings of being tense. *Anger and hostility* describes unfriendliness, aggression and general enmity. *Depression* refers to consistent moodiness, feelings of despair, hopelessness or dejection. *Self-consciousness* describes an emotional or wary personality facet with defined shyness. *Impulsiveness* is best defined by spontaneous and impetuous traits,

and even recklessness. *Vulnerability* describes a sense of low self-esteem, timidity or weakness. Together these facets account for the differences in the ability to construct and perceive reality as being threatening or difficult, and to feel negative emotions such as fear, shame, guilt, distrust and anger. High scores on the Neuroticism scale indicate that an individual has low impulse control, is poor at coping with stress and is prone to irrational ideas, while lower scores reflect emotional stability (Costa & McCrae, 1992).

Extraversion also called Positive Emotionality, is the second classic dimension of personality, and reflects the quantity and intensity of one's relationships with the social environment. There are six facets that constitute the behaviours and thought patterns that can be associated with the domain of Extraversion; Warmth, Gregariousness, Assertiveness, Activity, Excitement seeking and Positive emotions. *Warmth* describes the tendency to be charming, friendly and kind. *Gregariousness* refers to being sociable, convivial, with high levels of enthusiasm. *Assertiveness* is best described by interpersonal power and dominance. *Activity* embodies characteristics such as being lively, energetic, and to have a lot of gusto. *Excitement-seeking* refers to the drive to obtain exhilaration and pleasure-seeking activities. *Positive emotions* describe a sense of animation, charisma and being zealous. The facets account for the tendency to interact with that environment with energy, enthusiasm, spirit and confidence, an individual's propensity for sociability, assertiveness and talkativeness, and the ability to live out experiences as positively as possible (Costa & McCrae, 1992).

Openness to Experience groups together different types of behaviours that are aimed towards a search for and love of new experiences. These behaviours can be described by the six facets that make up the Openness domain, namely Fantasy, Aesthetics, Feelings, Action, Ideas and Values. *Fantasy* embodies an ability and propensity to be creative, have desire, and be inventive. *Aesthetics* refers to a need for refined, outer impressions and visual pleasure. *Feelings* refer to being able to connect with one's views and opinions and being insightful. *Actions* refer to behaviours and expression of thought and personality. *Ideas* are best described as intellect and insight. *Values* refer to one's principles, ethics and living standards. The facets are manifested in a wide

variety of interests, and account for an eagerness to seek out new, unusual experiences without anxiety, and often with great pleasure. Openness also indicates an active imagination, aesthetic sensitivity, attentiveness to inner feelings, a preference for variety, intellectual curiosity, and independence of judgment. Individuals scoring higher on this scale tend to be unconventional, willing to question authority, like to entertain new ideas and experience emotions keenly. Lower scoring individuals are likely to be conservative and conventional in their outlook, behaviours and social norms (Costa & McCrae, 1992).

Agreeableness is unique to the FFM. It accounts for the nature and quality of one's relationships with others, ranging from compassion to antagonism. The six facets of the Agreeableness domain include Trust, Straightforwardness, Altruism, Compliance, Modesty and Tender-mindedness. *Trust* refers to being reliable and loyal, and having the courage of one's convictions. *Straightforwardness* embodies being honest, candid and sincere. *Altruism* is described by being good natured, unselfish and humanitarian. *Compliance* refers to being cooperative, supportive, and accommodating. *Modesty* is defined as having humility, humbleness and not being arrogant. *Tender-mindedness* is warmth, empathy and not being jealous. Agreeableness is different to Extraversion in that it refers to the tone of relationships with others (kindness and empathy versus cynicism and hostility) whereas Extraversion refers to the individual him/herself. Agreeableness indicates that a person displays altruistic tendencies towards others. Therefore, high scores reflect the ability to be sympathetic with an eagerness to help others, while believing that others are trustworthy in return. Lower scores are suggestive of an egocentric individual, skeptical of others intentions and competitive rather than co-operative (Costa & McCrae, 1992).

Conscientiousness accounts for issues such as personal orientation, persistency of behaviours and the control of impulses. It is comprised of dynamic elements such as anticipation, success-orientation, task-orientation, as well as control and inhibition elements such as organisation, thoroughness, perseverance, and respect for procedures and standards. The six facets that function within this domain are

Competence, Order, Dutifulness, Achievement-striving, Self discipline and Deliberation. *Competence* refers to being capable and dependable. *Order* embodies thorough, meticulous and organised characteristics. *Dutifulness* is defined as being obedient, compliant and well behaved. *Achievement striving* is described by being conscientious and ambitious. *Self-discipline* embodies being responsible, persevering and devoted. *Deliberation* is defined by being reflexive, careful and not impulsive. The conscientious individual is seen as purposeful, strong-willed and determined. In abundance, this trait is evidenced by consistent achievements, dependability and orderliness; and in deficient can result in annoying attention to detail and compulsive neatness (Costa & McCrae, 1992).

Therefore, the FFM of personality proposes a broad summary of superordinate trait dimensions of personality. The FFM is therefore seen to be an empirically validated and comprehensive taxonomy of individual difference (McCrae & Costa 1997).

1.4: Cross-cultural applicability of the FFM

It becomes evident from the preceding discussion, that the trait theorists view an individual's personality as a unique manifestation, formed from the foundation of what is theorised to be a universal trait template. The critical components of this 'universal trait template' were derived from "analyses of the natural-language terms people use to describe themselves" (Laher, 2008, p.77). Over the years, this trait approach has come to be known as the traditional approach in personality research. This trait approach to personality description attempts to identify and measure the intrinsic qualities and personal characteristics or traits that are present or displayed within an individual, by using the natural language system as a tool for description.

However, an inherent paradox seems to exist within the trait approach. If language is used as the primary tool for analysis and description, and language is heavily influenced by culture, then it seems probable that each different cultural grouping will have a different theoretical foundation in terms of the descriptors used to describe a particular

individual. In other words, it seems not only sensible, but necessary to incorporate an extreme sensitivity to cultural variation and interpretation when dealing with the subject matter of linguistic comprehension and measurement. This will allow for a more valid application of the trait approach across cultures. This caveat will be most important within the domain of personality assessment and measurement, as the instruments used for assessment represent the tools that will be used to bridge the divide between theory and practice. This is not to say that the ontological assumptions associated with the trait approach are not valid or appropriate across cultures or contexts, only that the operationalisation of the FFM across cultures needs to be sensitively contextualized to the specific cultural nuances in the target culture of analysis.

However, many theorists have argued that the theoretical underpinning behind the FFM is not wholly applicable across cultures, even if one disregards the obvious threats to validity inherent in the operationalisation of the FFM (Laher, 2010). Some theorists have argued that while the FFM may have a great deal of universal applicability and validity; it is not entirely comprehensive or complete. According to Laher (2008), there are particular factors that exist outside of a Euro-American context, in which if a model or theory is to be regarded as truly universal, they should be considered and incorporated.

Within psychometric assessment and theory, a recent surge has begun in investigating the role of culture and language in both the operationalisation of a particular construct of measurement, as well as the underlying theoretical foundations inherent within the validity of the construct itself (Franklin, 2009). This skeptical stance adopted within psychometric testing and evaluation has brought the FFM into consideration, and queried the extent to which the FFM purports its universality. McCrae and Allik (2002) have adopted a critical and skeptical stance within their research and have questioned whether the foundations of personality processes are indeed universal, or whether significant disparities exist across cultures. They have yet to circumscribe or delineate an exact answer to these queries and concerns, and continue to suggest that in some respects personality structure does seem to transcend the boundaries of language and culture, yet in other respects it is most definitively molded by socio-cultural and historical

forces.

The trait dimensions, by virtue of their context of independence and non-contingent nature on cultural concerns are seen to be the most culturally unbiased approach to personality research and therefore argued to be theoretically the most applicable ideology across different contexts. What separates the trait theory of personality from all others is that it is not based on the theory of any one particular psychologist, but rather on language, the natural system that people use to communicate their understanding of one another. In summary, the consensus throughout the world to date indicates that the primary features of the FFM, or personality trait structure, appear to generalise well across cultures and contexts, although this is not to say that many theorists have found some interesting variations across the different cultures they have studied (Claasen, 1997; Piedmont, Bain, McCrae & Costa, 2002; McCrae & Terracciano, 2005; Cheung et.al., 2008). Many studies using the NEO-PI-R in cross-cultural situations between Western and Asian cultures have shown that variations in the five factors exist (Piedmont, Bain, McCrae & Costa, 2002). McCrae (2002) has purported that is the likely consequence of the differences between the individualistic based societies of the West and the collectivist based societies of non-Western communities, such as the East and by extension, some African societies. These variations found with regard to the FFM across different cultural contexts will be further discussed under the heading of '*Cross-cultural research on the NEO-PI-R*' below.

1.5: Five Factor Theory of Personality (FFT)

The Five-Factor Theory (FFT) of personality was created as a theoretical foundation to the Five-Factor Model of personality (McCrae & John, cited in McCrae & Allik, 2002). The FFM was largely created as a pragmatic delineation for personality structure and traits, while the Five-Factor Theory (FFT) was developed by McCrae and Costa in 1999 (McCrae & Allik, 2002) as an attempt to include the newer findings about personality and traits into a coherent and comprehensive theory. The FFT illustrates and acknowledges the dynamic intersection involved between internal and external forces

within the development of an individual's personality. Allik and McCrae (2002) define this intersection as involving elements of biology and culture, reciprocally interacting to mold an individual's values, norms, roles, relationships, habits and attitudes. The factors interact within an individual, producing an expression known as the individual's personality. The FFT defines the FFM's domains as individual personological traits or *basic tendencies*, such as Agreeableness, Conscientiousness or Extraversion. Many traditional trait theories stipulate that traits can be associated or related to behaviours, habits or personality patterns. However, at the heart of the FFT's ontological foundational assumptions, Allik and McCrae (2002) purport that traits are much deeper and ingrained tendencies, which are inaccessible to outside or external forces. The inquiry then arises as to how these traits interact and relate with external forces as defined earlier. The FFT explains this phenomenon in the expressionistic tendencies of traits. According to the FFT, even though a person's traits, or basic tendencies, are resolute and deeply grounded within the individual, they "interact with the environment in shaping those psychological structures that...guide behaviour: habits, values, interests, roles, relationships and attitudes" (Allik & McCrae, 2002, p. 304). Therefore, it is not the basic constitution of an individual's unique traits that are influenced or coloured by culture, context, society or life experiences; but rather it is the expression of those traits, embodied in what we call the individual personality, that finds form and flavour within that specific cultural context.

Personality, according to the FFT, can therefore be understood as being grounded within a psychometric tradition of testing and measurement, while at the same time making allowance for a unique expression of personology as dictated through the individual's surrounding socio-cultural milieu. This ontological foundational assumption is of crucial importance to the current study in that it acknowledges the influential effects that external inputs (such as culture, society or language) have on an individual's accurate ability to understand and comprehend the presentation of certain Westernised concepts of basic tendencies or personality traits contained within the items of the NEO-PI-3. Therefore, this proposition necessitates the exploration of the NEO-PI-3's applicability within the South African context, in that the constructs, activities or ideas

contained within the NEO-PI-3 may be highly contextualised to the Western cultural experience. This would substantially hinder and affect the contextualised responses given by South African participants in terms of cultural comprehension and internalisation of each of the particular items presented in the NEO-PI-3. It is at this point that it seems necessary to explore how the NEO-PI-3 came to be, in terms of how it was founded and generated in order to understand why or how it could be culturally inappropriate for a South African audience. As alluded to earlier however, before one can discuss the NEO-PI-3, a discussion of the NEO-PI-R is first necessary.

1.6: NEO-PI-R

Within the scientific milieu of personality research and assessment, Paul T. Costa and Robert R. McCrae's (1992) NEO Personality Instrument Revised (NEO-PI-R)¹ is regarded as one of the leading personality instruments in the field of personality assessment. The epistemological foundation of the NEO-PI-R is embedded within the theoretical paradigm associated with the Five Factor Model (FFM) of personality. The NEO-PI-R is one of the most widely used and researched assessment inventories of the Five Factor Model of personality (McCrae & Allik, 2002). The NEO Personality Inventory was developed as a comprehensive operationalisation of the Five Factor Model during the 1980's and was reworked to its current, revised version, the NEO-PI-R, by Costa and McCrae, (1992). The NEO-PI-R was originally developed in the context of longitudinal studies of personality and aging, but has since become the most widely used and researched operationalisation of the Five-Factor Model of personality (Hřebíčková, *et.al.*, 2002; McCrae & Terracciano, 2005).

The NEO-PI-R embodies a conceptual model of personality which “distills decades of factor analytic research on the structure of personality” (Costa & McCrae, 1992, p. 1). Developed over 15 years on clinical and normal samples, the scales have been shown to be reliable and valid in assessing adult personality. The five dimensions assessed in

¹ see **Appendix A** for a sample of the NEO-PI-R questionnaire

the NEO-PI-R have shown to be quite stable among adults, and “predict a wide range of relevant life outcomes” (Piedmont, 1999, p. 987), including ability to cope and well-being. NEO-PI-R has been shown to evidence good convergent and discriminant validity across instruments, methods and observations (McCrae & Costa, 1992), to which it has become the most comprehensive and best validated personality measurement on the basis of Five-Factor Model (Costa & McCrae, 1992, McCrae & Allik, 2002). The NEO-PI-R therefore represents a highly researched and investigated personality inventory within the Western world of psychology. The primary issue therefore with this theoretical tradition and inventory is that the NEO-PI-R is embedded within a Westernised socio-cultural milieu. The NEO-PI-R was “developed and standardised within a Western cultural setting” using an American normative population (Wallis & Birt, 2003, p.182). How then does this theoretical foundation and operationalisation of personality fare within other cultures, contexts and languages?

1.7: Cross-Cultural Research on the NEO-PI-R

By virtue of the NEO-PI-R being standardized within a Westernised sample; within the United States, considerable concern has been raised over the NEO-PI-R’s applicability across cultures and social contexts (Allik & McCrae, 2002; Berry, Poortinga, & Pandey, 1997; Cheung, et. al., 2008; Church, & Katigbak, 2002; McCrae, & Terracciano, 2005), especially within an African context (Laher, 2008). Many cross-cultural studies on personality assessment have begged the question as to whether the five factors are indeed global or consistent across cultures. Poortinga, Van De Vijver and Van Hemert (2002) believe that administration of the NEO-PI-R within a non-Western society will most likely never result in a parallel factor structure cross-culturally. This proposition is purported as these theorists essentially believe that the idea of “personality” is a Western generated notion, and therefore notions or conceptualisations of “personhood” may be dissimilar cross-culturally. However, as an auxiliary note to this statement, these authors continue to elaborate and state that the evidence to date of structural equivalence within the FFM’s reliability cross-culturally has been adequate enough to support and encourage the investigation for personality universals as a meaningful and

worthwhile enterprise.

The different cultures that were commented on within McCrae and Allik (2002) study included; Chinese (McCrae, Costa, & Yik, 1996; Yik & Bond, 1993), Estonian and Finnish (Pulver, Allik, Pulkkinen, & Hämäläinen, 1995), Filipino and French (McCrae, Costa, del Pilar, Rolland, & Parker, 1998), Indian (Lodhi, Deo, & Belhekar, 2002), Portuguese (Lima, 2002), Russian (Martin, Oryol, Rukavishnikov, & Senin, 2000), South Korean (Piedmont & Chae, 1997), Turkish (Gülgöz, 2002), Vietnamese (Leininger, 2002), and Zimbabwean (Piedmont, Bain, McCrae, & Costa, 2002). In addition, Angleitner and Ostendorf (2000) have presented evidence for the robustness of the FFM in German speaking countries like Austria, former East and West Germany, and Switzerland.

In addition to the above mentioned research, Rolland (2000) asserted that on the basis of data gathered from sixteen cultures, that the Neuroticism, Openness to Experience, and Conscientiousness domains are cross-culturally valid. However, Rolland (2000) further stated that the Extraversion and Agreeableness domains are components of interpersonal circumstance and are more sensitive to the particular cultural context. McCrae, *et. al.* (1999) illustrated that age differentials in the five-factors of personality across the adult life span are comparable and correspond to samples taken from Germany, Italy, Portugal, Croatia and South Korea. In addition, McCrae (2001) scrutinised data from 26 cultures and demonstrated that the age and gender variations resembled and matched those found in the American equivalent samples. In elaboration of this research's findings, McCrae (2001) conducted an intercultural factor analysis, which yielded a close approximation to the five-factor model, where the factor scores were significantly related to other cultural level variables. McCrae (2002) then extended earlier data on age and gender differences to 36 cultures. The cultural level factor structures and correlates for both age and gender profiles were concluded to be generalisable and replicable. McCrae and Terracciano (2005) further provided feedback on data from 51 cultures and demonstrated results that supported the rough scalar equivalence of NEO-PI-R five factors and facets across cultures, again indicative of the

robust, dynamic and valid criteria inherent within the FFM of personality.

In addition, McCrae, Yik, Trapnell, Bond and Paulhus (1998b) cited research findings in support of the fact that the FFM is replicable not only in different languages but entirely different language families; including Sino-Tibetan, Hamito-Semitic, Uralic, and Malayo-Polynesian. Similarly, Church and Lonner (1998) cited a number of research studies that were indicative of the fact that the structure of translated versions of the NEO-PI-R had been replicated well in Dutch, German, Italian, Estonian, Finnish, Spanish, Hebrew, Portuguese, Russian, Korean, Japanese, and French. The NEO-PI-R as situated within the FFM is thus regarded as an empirically validated and comprehensive taxonomy of individual trait differences that has been validated cross-culturally (McCrae, 2001). McCrae (2001) has argued that no coherent and persuasive critique of the methods, findings or ontological nature of the FFM has appeared. Therefore, from a theoretical, ontological perspective, the FFM, as measured by the NEO-PI-R has been agreed by most theorists to be applicable across cultures, even transcending different languages.

In terms of African research on the NEO-PI-R, however, a number of contradicting research studies have been produced. Within McCrae and Terracciano's (2005) study, the authors specifically mentioned and made note that no comprehensive contemporary research has been conducted in South Africa. Within their study, the results pertaining to the five African countries assessed (Botswana, Nigeria, Burkina Faso, Ethiopia, Uganda) exhibited notably lower congruence in terms of internal consistency coefficients. It should be noted however, that none of the African participants took the test in their native home language. The NEO-PI-R was tested in English, and in the case of Burkina Faso, in French.

Although lacking in completeness, there has been some research conducted within the Southern African region utilising the NEO-PI-R in an attempt to replicate the FFM structure of personality. Research by Piedmont, Bain, McCrae and Costa (2002) comprehensively illustrated the issues associated with cross-cultural research in terms of applicability and appropriateness of the NEO-PI-R within Southern Africa. These

authors stressed the powerful, influencing role language and culture play in an individual's test performance. Piedmont *et al.* (2002) sought to explore the appropriateness of the NEO-PI-R within a Zimbabwean context by assessing 378 Zimbabweans, who were all bilingual and "competently skilled" in both English and Shona, with the NEO-PI-R. The researchers utilised both English and Shona versions of the NEO-PI-R in contrast, and explored and investigated the results for replication of five personality factors. Upon completion of the study, Piedmont *et al.* (2002) questioned the applicability and appropriateness of using Westernised, or non-standardised concepts and inventories on their Zimbabwean sample. The authors explored and ultimately challenged the resultant relevancy of using an inventory that was not standardized to be more culturally appropriate for a particular cultural context. The findings within this study included discussions on bias and equivalency, where in several instances there was no single Shona word to accurately convey the sometimes highly abstracted notions contained in the American English version of the NEO-PI-R. Of particular concern were the apparent lack of trait replication associated with the domains of Openness to Experience, Extraversion and Agreeableness (Piedmont *et al.*, 2002). This study became indicative of an inherent issue within cross-cultural research in that some concepts within the NEO-PI-R have no direct equivalent translations within the Shona language. Further, some of the cultural references in terms of activities and contemplations mentioned within the NEO-PI-R's items did not have any equivalent or relevant counterparts within the general Zimbabwean cultural milieu.

In an unpublished thesis by Horn (2000) the NEO-PI-R was translated into Xhosa and investigated for reliability and validity. The results of this study suggest that translation could be a viable option for contemplation and investigation, although it is not of direct interest in the current study. However, what is of particular importance as highlighted in Horn's (2000) study, was that the translation process became sometimes very problematic, as it was sometimes extremely difficult to find adequate equivalent concepts and words in the Xhosa language that replicated the original concept in the NEO-PI-R. This is a consequence of the Xhosa language being relatively limited in vocabulary when compared to English (Horn, 2000). This highlights the point that when

an individual who has English as a second or third language completes the NEO-PI-R, there may be instances where concepts become difficult to internally translate when completing the inventory. As such any attempt to modify the items within the NEO-PI-3, should be aimed at making the items literally more linguistically simple to comprehend.

Ten years ago, Taylor (2000) carried out a comparative research study on Black and White employees in their work environment, and used the NEO-PI-R to test their personality. The findings indicated that the Openness factor in particular was problematic to emerge for the Black employees, indicative that the NEO-PI-R was not as an effective instrument for personality assessment for Blacks as it did for Whites. Taylor (2000) went on to elaborate however, and stated that Black and White individuals whose home language was not English experienced difficulties in understanding the questionnaire. Taylor (2000) provided explanation to this phenomenon by positing that many items in the NEO-PI-R are difficult to understand where complex and abstract ideas become increasingly problematic to grasp, even in some case when English is the participants first language. Similar results have governed personality assessment in South Africa in the past (Abrahams & Mauer, 1999; Heuchert et.al., 2000; Heaven, Connors & Stones, 1994; Van der Vijver & Rothmann, 2004; Van Eeden & Prinsloo, 1997).

In a study conducted by Heaven and Pretorius (1998) they found support for the five factors with an Afrikaans-speaking, South African sample but found that the five factors did not replicate well for a Sotho-speaking, South African sample. According to Heaven and Pretorius (1998) the clearest factor to emerge within the Sotho speaking sample was an 'emotional stability factor'. Earlier research by Heaven et al. (1994, as cited in Heaven & Pretorius, 1998) also failed to comprehensively uncover the five factors in a sample of Black university students. Again, however, the reasons for this discrepancy were most likely of a methodological nature, in terms of the operationalisation of the FFM in the NEO-PI-R, (in terms of language used) and not necessarily innate differences in the ontological nature of these two samples.

Meiring, Van de Vijver, Rothmann and Barrick (2005) made reference to a case study by Taylor (2000) in which the five factors were not clearly demonstrated for a Black sample. The Openness to Experience dimension in particular could not be retrieved or adequately demonstrated. Heuchert, Parker, Stumpf and Myburgh (2000) used the NEO-PI-R in English on a multiracial group of South African students. These authors did find supporting evidence for the five factors, although the sample of students used were not representative of the general South African demographic. There existed a majority of White students than any other population group within their sample, indicative of a non-representative South African sample. Of particular note worthiness within this study, was that the domain of Openness to Experience was particularly weakly replicated for the Black students. These authors also provided a caveat within their study in that there also existed significant differences in the mean scores of several domains and facets between racial groupings. However, the authors speculated and attributed most of the differences to be largely of a social, lingual, economic and cultural notional difference.

Heaven, Connors and Stone (1994) conducted a study on the NEO-PI-R using 230 South Africans from a predominantly Black South African university and 186 students from an Australian university, investigating the applicability and replication of the five personality domains in the FFM within these two samples. The five factors replicated well for the Australian students, while the five factors did not emerge as well for the South African students, specifically the Openness domain. The reasons for this discrepancy as detailed by the researchers were home language, response-sets and basic personality structures. Three points of consideration need to be noted that emerged from this study. Firstly, the NEO-PI-R not only uses advanced English vocabulary and sentence structures, but the instrument was constructed in a foreign context. This is prone to generate at the very least, hesitation or mild confusion for first-language English-speakers, and definitely a barrier in interpretation and understanding for those using English as a second or third language. Secondly, it is possible that the contextualised styles with which South Africans respond to testing in general, and test items in particular, differs from their Western counterparts. Thirdly it is possible,

although currently not established, or proved in anyway, that the FFM does not adequately represent the personality structures in Southern African societies.

This study potentially raised two important concerns within the application of the NEO-PI-R in the South African context. Either the Westernised English contained in the instrument was too unfamiliar for South Africans to understand completely, thereby creating obstacles in comprehension and understanding, or that the actual domain of Openness is poorly demonstrated and represented within indigenous South African personalities, thereby indicative of the relative inappropriateness of the FFM in the South African context. According to Laher (2008) there are certain personality factors that exist outside of a Euro-American context, which if a model is to be truly universal and exhaustive, should be considered. McCrae and Allik (2002) have questioned whether the foundations of personality processes are indeed universal, or whether significant variations exist across cultures. However, there does not yet seem to be a circumscribed answer to those questions. The authors go on to suggest that in some respects personality structure does seem to transcend the boundaries of language and culture, yet in other respects it is definitively molded by socio-cultural and historical forces. The general consensus has been that the FFM can be sensitively influenced by an audience's national character or by a cultural environment (Cheung, et. al., 2008; Hrebíckova et. al., 2002; Piedmont, Bain, McCrae & Costa, 2002). An important consideration can be raised from this study however, in that if using an invalid instrument, as implied in the first instance of inappropriate language in the instrument, it would be impossible to truly gauge the five factors within the sample population, as the instrument is invalid to begin with. The possible language bias therefore represents a confounding factor within the NEO-PI-R, where the true demonstration of the five factors within the FFM cannot be expected to emerge when using an invalid instrument. The NEO-PI-R needs to therefore first be standardised and modified to a South African cultural context, before any consideration of the appropriateness of the FFM's theory can be remarked upon.

The Basic Traits Inventory (BTI) was developed in South Africa using the FFM and measures personality in terms of the same five broad domains as contained in the NEO-PI-3, as defined by the FFM (Taylor & de Bruin, 2005). The BTI is a self report instrument consisting of 193 items and requires approximately 30-45 minutes to complete. It is suitable for individuals from the age of sixteen years with a minimum educational level of grade ten. BTI items are answered on a 5-point scale ranging from strongly agree (1) to strongly disagree (5). It has six scales, namely, Openness to Experience (O), Conscientiousness (C), Extraversion (E), Agreeableness (A), Neuroticism (N) and Social Desirability (SD). The first four scales are subdivided into five facets and the fifth, N, has only four facets (Taylor & de Bruin, 2005). The social desirability items are used as a measure to check for subjects “faking good” and does not form part of the FFM. The BTI scale, however, is still in its infancy and as such is still being developed, and not much work has been done at the facet level. This brief discussion is undertaken to mention the BTI in terms of completeness with regards to inventories currently being developed in the South African context, as such the BTI is not mentioned again within this study.

Abrahams and Mauer (1999) studied the effect of home language and the individual's ability to understand the items in the 16PF within South Africa. These researchers find strong evidence of language bias in historically disadvantaged groups of South Africans, which biased the responses obtained. The researcher noted that particular individuals were unfamiliar with certain words and concepts within the test items. This resulted in the test results producing different measured constructs in the racial group for whom the test was intended, and was not suitable for a multicultural society as South Africa, as it was not adequately standardised to the local norms and cultural context within South Africa. Thus far, researchers all agree that issues of appropriateness and applicability of imported instruments, which are not standardised for a multicultural South African audience, are not suitable for use in a multicultural society such as South Africa (Abrahams, 1996; Abrahams & Mauer, 1999; Claasen, 1997; Meiring, 2007; Meiring, Van der Vijver, Rothmann & Barrick; 2005; Taylor, 2000). It has been argued that perhaps the primary concern of personality assessment in South Africa is the

development of new, culturally appropriate instruments and also the standardisation and modification of existing instruments for a local audience (Van der Vijver & Rothmann, 2004).

Laher (2010) investigated the applicability of the FFM in a South African context. Laher (2010) concluded that while the five factors are generally replicable in a South African context, subtle differences do exist and as argued by Cheung & Leung (1998) it may be that Africans cut the social perceptual world differently. In terms of the NEO-PI-R, Laher (2010) found that arguments can be made for the validity and reliability of the instrument at the domain level, however, the instrument did exhibit evidence of bias at the facet level. It seems that the FFM does seem to hold some validity within a South African context. However, the question arises, are the difference within in the FFM at the facet level within a South African context as found by Laher (2010) a function of the NEO-PI-R being invalid in terms of language used at the item level, or is the FFM an invalid epistemological framework to base personality on in South Africa. Within Laher's (2010) study, 9 items within the NEO-PI-R were identified as being problematic by over 2% of her sample of 425 students, suggestive of the fact that the problem could lie at the level of language used within the items in the NEO-PI-R. As yet there is insufficient evidence within a South African context to suggest that the FFM is invalid.

Franklin (2009) found a perceived presence of American socio-cultural references within the use of language, grammar and socio-cultural context in the NEO-PI-R. Franklin's (2009) results show evidence of language bias in the NEO-PI-R, and subsequently identified 54 items within the inventory through both her quantitative and qualitative analyses that are especially problematic for a South African user group. Franklin's study suggests that the NEO-PI-R would need to be revised to suit the South African context by changing the problematic items. Franklin's (2009) study however, still doesn't answer the question as to whether or not the FFM is an appropriate theoretical foundation for personality within South Africa. In a study by Piedmont *et.al.* (2002), the researchers of this study found that the Extraversion domain (particularly the Excitement-seeking facet) and Openness to Experience domain (particularly the Values facet), were problematic.

However, only once a valid instrument is developed and administered within a South African context can one make any statements regarding the FFM's applicability within a South African context. Because the NEO-PI-R is not an applicable instrument within a South African context, it does not mean that the FFM is not an appropriate theoretical basis for personality in South Africa. What is needed is a more culturally sensitive version of the NEO-PI-R to be given to a South African audience, which could provide more valid commentary on the FFM's applicability within a South African context.

Within the field of psychometrics in general, and personality assessment in particular, researchers need to be extremely attentive and sensitive to issues of cross-cultural validity, especially when administering an instrument not locally generated within that tests sample's culture. Therefore, when investigating personality within the South African context, researchers need to be highly critical, and maintain a healthy level of skepticism when administering instruments such as the NEO-PI-R within the field of personality assessment. As detailed in the previous sections, it is quite clear that culture, context and language will all play an influential role in the validity of the NEO-PI-R in the South African context. The national character or South African Personality as discussed earlier will be nuanced and molded by these cultural forces in ways that could render an entire foreign generated instrument invalid within the South African context.

When we discuss, describe, express or comprehend personality, either our own personality or that of others, we use the tool of language to interrogate and describe this concept. Language is the only method that can be used to express or conceptualise this concept. One could go as far as saying that the entire enterprise contained within the notion of 'personality' is completely language-laden. When one discussed the variety of traits and characteristics used to define a particular personality, or compare personalities across individuals, one uses language to reason, understand, compare, describe, comprehend, differentiate and distinguish. Therefore, the very concept of personality would not exist if language did not come first. Personality exists as a comparison; it is a form of communication between two individuals. One can only make a reference to his or her personality in relation to another type of personality. The very

notion of personality exists as a means of describing who we are, using language as the method of this communication. Therefore, it makes sense that if one uses a particular language, dialect or method of communication, this type of communication will contextualise how you describe or communicate your personality to others.

The previous discussions thus far have all arrived at the potentiality and probability of the NEO-PI-R containing specifically Western or American referential items. By virtue of subtle nuance and cultural specificity, the NEO-PI-R can therefore never be completely valid within the South African context. There is a very important need to reconsider the items constructed within the NEO-PI-R to be more cultural relevant and valid within the South African culture. According to Piedmont et al. (2002) the vast majority of languages spoken within central and Southern Africa, with the exception of Afrikaans and colonial imports such as English, French, German and Portuguese, are derivatives of the Bantu branch of the Niger-Congo language family, and are completely unrelated to any European or Asian languages. These languages have been formed and flavoured within a cultural milieu that is manifestly African. Communication and understanding in these contexts can be described as having hundreds of year's worth of cultural experiences, beliefs and practices. In many cases these languages do not share the same lingual, conceptual and structural characteristics as English or other European languages.

The reasons for the inherent problems within the NEO-PI-R, is that the creators of the NEO-PI-R have not had the opportunity to sociocentrically orientate themselves within a South African socio-cultural milieu; that is living and working with the local people (Piedmont et.al., 2002). Therefore the linguistic productions within the test cannot be expected to adequately 'speak to' a culturally specific audience, such as in South Africa. In addition, the instrument cannot be expected to contain the many subtle nuances in thought, values and behaviour that subsumes a national identity, or a cultural connectedness, such as the utilisation of many specific 'South Africanisms'. Horn, (2000) stipulated that Southern Africans are in general more inclined towards global, intuitive, collective and expressive cognitive functions, than to the more detail-

orientated, analytic and abstracted reasoning approaches that characterise Western thought processes. Therefore, when assessing the South African personality by using the NEO-PI-R in English, a modification must be made not only to the contextual language, or the cultural references, but the language must be simplified to become slightly more literal in the interpretation, as often these abstractions are not translatable or culturally convertible into any indigenous language in South Africa.

The above mentioned research studies highlight the complexity associated within cross-cultural research, specifically in South Africa; where not only are the participants from another cultural context to where the inventory was standardised, but that oftentimes English is not the participants home language. Issues of validity, reliability and bias become very real concerns when administering the NEO-PI-R in South Africa. These Westernised inventories need to be culturally and linguistically modified in order to make Westernised instruments valid within the South African context. One needs to always be fully aware and cognisant of the prominent influence language and culture has on personality measurement and assessment within South Africa.

The caveat in the aforementioned paragraphs becomes the overarching rationale behind the current studies impetus. When you don't adapt or modify particular Westernised inventories, such as the NEO-PI-R or the NEO-PI-3, and administer the inventory to an audience within South Africa; the test items lose their relevancy and applicability to the receiving audience. The items within the NEO-PI-R and NEO-PI-3 have been formed and flavoured by the American cultural experience and as such are not entirely applicable to a South African audience without modification. Furthermore, in some cases the use of English becomes a confounding factor, especially when English is not the home language of the receiving audience, such as in the majority of South Africans. A society's cultural and linguistic systems influences the way individuals within that society generate meaning and understanding. Concepts, experiences, activities and events are all highly contextualised and understood differently within each and every society, and as such many culturally specific items within the NEO-PI-R or NEO-PI-3 will be completely foreign and unidentifiable to a South African test participant.

Within the NEO-PI-3 there are many contextual inferences about people, concepts or objects in the general experienced environment that are highly problematic within a South African context. Franklin (2009) examined specific items that were deemed to be inappropriate within the South African context, which have formed the primary basis for the current study, and will be explored in more depth in the methods chapter of this study. Without delving into her extensive results, it is worth mentioning here a few examples of items identified within the NEO-PI-R that proved to be problematic within the South African context, either linguistically or culturally, for clarity sake.

Linguistically, words such as “lackadaisical”, “shrewdness” and “fastidious” are words that were identified in the NEO-PI-R’s items in Franklin’s (2009) research by participants as being difficult to comprehend. These words were seen as being linguistically complex for the South African context, indicative of the fact that when participants have English as their second or third language, the items must be more simply and understandably stated. Examples of culturally inappropriate words used in the NEO-PI-R as documented by Franklin (2009), included “vacation”, “Las Vegas” and “solitaire”. These words are embodied within the American culture and as such are inappropriate within the South African context. In South Africa, people would refer to “holiday” and not “vacation”; “Las Vegas” is an American city, probably not known to most South Africans, and “solitaire” is a culturally specific card game within America. Rolland (2002) suggested that one needs to question the appropriateness of the NEO-PI-R, as it may exclusively reflect the idiosyncrasies of American culture and language.

As mentioned earlier, the Employment Equity Act (EEA) within South Africa has manifested psychology, as a discipline, to be the warden to issues of appropriateness and applicability of psychometric instruments within South Africa (Van der Vijver & Rothmann, 2004). The Act, established in 1998, stated that “psychological testing and other similar assessments are prohibited unless the test or assessment being used – (a) has been scientifically shown to be valid and reliable, (b) can be applied fairly to all employees; and (c) is not biased against any employee or group” (Government Gazette,

1998). There is therefore an imperative need to re-evaluate psychometric instruments to meet the requirements stipulated in the EEA. This has become especially urgent given changed context within South Africa's demographic composition, in terms of the integration of previously segregated population groups (Meiring, Van der Vijver, Rothmann & Barrick, 2005). Even though there has been substantial transformative progress within South Africa since the institution of democracy in 1994, there is still much work to be done in terms of eradicating instrument assessment bias and instilling conceptual equivalence within psychometrics within South Africa (Taylor, 2000). The NEO-PI-R in particular has received very little critical scrutiny in South Africa, in comparison to its personality assessment counterparts (Abrahams, 1996; Meiring 2007; Meiring, Van der Vijver, Rothman, & Barrick, 2005; Van Eeden, & Prinsloo, 1997).

1.8: *The Emic versus the Etic Approach*

With regards to situating the current and previous research studies on personality in terms of anthropological theory, the studies mentioned can be approximately divided into two primary categories, namely emic or etic (Berry, as cited in Rolland, 2002). The 'emic approach' is aimed at uncovering and discovering cultural specifics in terms of idiosyncratic concepts, beliefs, values, practices and norms specific to that particular culture. The emic approach stipulates that research should be conducted by gathering rich, deep and meaningful data on lingual specificities in that particular culture. The primary objective within the etic approach by contrast, is aimed at identifying whether particular concepts, constructs and ideologies from a particular culture can be found in different contexts and cultures, thereby endeavouring to discover universals across cultures. Researchers who conduct studies within non-Western cultural settings, suggest and recommend that an integrated approach between both emic and etic be utilised so as to identify and illuminate both cross-cultural universals as well as cultural specifics within a particular culture (Heuchert *et.al.*, 2000; Laher, 2008; McCrae, 2002; Piedmont *et.al.*, 2002; Prinsloo & Ebersöhn, 2002; Rolland, 2002).

The imposed etic or pseudo-etic approach to personality research and assessment

assumes the universality of constructs (traits within personality) and allows for cross-cultural comparison. This approach should not be confused with the integrated approach, which is more focused on the cultural specifics of the emic variables. The impetus behind the use of inventories such as the NEO-PI-R in cross-cultural research and personality assessment is due to the extensive research that has happened using pseudo-etic approaches. For example, McCrae and Terracciano (2005) used the NEO-PI-R in combining data from 36 cultures, incorporating 11 different language families across 5 continents, and employed an imposed etic approach towards studying the replication of the five personality domains across cultural groupings.

There is however, also support for the alternative, integrated approach. Recent research on personality assessment that is now available appears to study the cultural specifics of the emic variables. For example, Cheung, F., Cheung, Zhang, Leung, Leong & Yeh (2008) utilised the Chinese Personality Assessment Inventory (CPAI) in a combined emic-etic approach to generate six culturally relevant and appropriate Openness to Experience scales. In essence, Cheung et al. (2008) developed the CPAI to assess Chinese personality from an indigenous perspective. This assessment inventory is thus not only culturally relevant, but also is of comparative value because they are derived using Western assessment ontology's, becoming a truly integrative approach to personality research. It has been demonstrated that three out of four CPAI scales correspond very well with four NEO-PI-R personality domains (Neuroticism, Extraversion, Agreeableness and Conscientiousness), but are clearly more culturally appropriate and relevant.

The continued use of imported inventories based on Westernised constructs of personality is thought to limit users in non-Western societies, as the items may not be culturally relevant in diverse cultures (Church & Katigbak, 2002). There is therefore an urgent need to adapt these instruments to be more culturally valid and appropriate in the culture of assessment. In respect to these assertions, there is a small, but emergent body of literature applicable to Southern African regions that suggest that the NEO-PI-R is not wholly applicable in non-Western contexts (Allik & McCrae, 2002; McCrae &

Terracciano, 2005). Therefore there is a need for supportive research that would investigate the NEO-PI-R (or rather the NEO-PI-3's) applicability in non-Western cultural contexts, and elucidate the potential inappropriateness of the items within this instrument, in non-Western communities such as South Africa.

1.9: NEO-PI-3

In 2004, McCrae, Costa and Martin revised the NEO-PI-R to be more readable and understandable at the item level, by generating the NEO-PI-3. These researchers realised that many of the 240 items within the inventory were difficult to understand, and hence replaced 37 items with more understandable versions². These researchers had originally identified 48 items as being potentially problematic, however, settled on only changing 37. The new inventory, the NEO-PI-3 has made good improvement in making the original NEO-PI-R more understandable and readable; however, it is still an American inventory with American language. Of the 37 items identified as problematic within the NEO-PI-3, Franklin (2009) only overlapped on 17 of the 37 in her research within a South African context. This still leaves 37 items that Franklin (2009) identified as problematic within a South African context that the authors of the NEO-PI-3 did not change, resulting in 15% of the NEO-PI-3's items potentially still being problematic in a South African context. There is therefore still much work to be conducted on the NEO-PI-3 so that the instrument is valid within a South African context.

1.10: The Development of a New Inventory – A Modified Version of the NEO-PI-3

The preceding sections within this literature review have all provided evidence and support for the suggestion that the most appropriate course of action to be taking regarding the development of a culturally appropriate and valid personality instrument in

² see **Appendix B** for the 37 new NEO-PI-3 items and the 37 old NEO-PI-R items

South Africa, is to modify the problematic items NEO-PI-3. As clarified in the beginning of this review, the NEO-PI-R and NEO-PI-3 are identical instruments barring 37 items. Given the relative recent development of the NEO-PI-3, there is a paucity of research available on it, and as such the majority of the review was on the NEO-PI-R. In essence however, one must view the two instruments as being very similar, and all the arguments against the NEO-PI-R, culturally speaking within the South African context, are mostly valid for the NEO-PI-3.

The central focus of the present study is centred on the notion that Westernised English lexicons may not be an ideal or even adequate match for South Africans lexicons. Therefore, it is suggested that the test scores within the NEO-PI-3 will continue to exhibit this bias until appropriate revisions or modifications are suggested and/or initiated (Heuchert, Parker, Stumpf & Myburg, 2000; Vogt, 2009). The proverbial obstacle in the current study is centred on the South African and the American socio-cultural and lingual milieus. Within South Africa, many of these Westernised instruments are utilised in the same unstandardised form as the original, which is becoming apparently increasingly problematic (Abrahams, 1996; Abrahams & Mauer, 1999; Heaven & Pretorius, 1998; Heuchert, Parker, Stumpf & Myburg, 2000; McCrae & Costa, 1997; McCrae & Terracciano, 2005; Piedmont, Bain, McCrae & Costa, 2002; Prinsloo & Ebersöhn, 2002; Van Eeden & Prinsloo, 1997; Wallis & Birt, 2003). Under these circumstances it is difficult to imagine how a multicultural South African audience could ever complete the NEO-PI-3 in a reliable, valid manner, when considering the cultural and linguistic barriers (Poortinga & Van de Vijver, 1987).

Therefore, in order to investigate the ontological basis for the FFM in a South African context, one needs a more culturally sensitive instrument that is seen to be culturally reliable and valid, so that one can thereafter assess the FFM within a South African context. This study proposes to utilise the research findings primarily from Franklin (2009) and Laher (2010), and further the investigation into personality research in South Africa by developing a modified edition of the NEO-PI-3 for the South African context. Once developed, the psychometric properties of this modified version of the NEO-PI-3

were assessed in relation to its congruency with the FFM of personality on a South African sample. Issues of validity and reliability were investigated with regards to this modified inventory to assess the FFM within the South African context. It is hoped that not only will a more culturally sensitive version of the NEO-PI-3 within the South African context will emerge from this study, but also add further insight into the debate regarding the FFM's applicability within a South African context. This process of item modification will involve the NEO-PI-3 to be adapted.

1.11: *Test Adaptation*

Test adaptation is a process by which an existing assessment instrument is transferred from a source language and/or culture to a target language and/or culture (Auchter & Stanfielf, 1997; Geisinger, 2003; Hambleton, 1996; Hambleton and Bollwark, 1991; Hambleton & Patsula, 2000; van der Vijver & Leung, 1997; van der Vijver and Tanzer, 1998). In many ways this procedure mimics that of new test development. The decision to engage in this process is driven by the general need to produce an equivalent or comparable instrument for use in a target language and/or with a target culture population (Al-Ansari and Bella, 1997; Chang, 1999; Tanzer and Sim, 1999).

According to the criteria set out by the International Test Commission Guidelines for Translating and Adapting Tests (International Test Commission (2010)), the effects of cultural differences which are not relevant or important to the main purposes of the study should be minimized to the extent possible. The amount of overlap in the constructs in the populations of interest should be assessed.

Test developers should provide evidence that item content and stimulus materials are familiar to all intended populations, as well as implement systematic judgmental evidence, both linguistic and psychological, to improve the accuracy of the adaptation process and compile evidence on the equivalence of all language versions. This will insure the validity and reliability of the test adaptation. This process should involve the application of appropriate statistical techniques to establish the equivalence of the different versions of the instrument, and identify problematic components or aspects of

the instrument which may be inadequate to one or more of the intended populations. Finally, test developers should insure that the adaptation process takes full account of linguistic and cultural differences among the populations for whom adapted versions of the instrument are intended.

In order to adapt the NEO-PI-3, the researcher of the current study will have to pay close attention to the test specification inherent in the NEO-PI-3. Test specifications are a guide by which a test is assembled. They offer a detailed description of the targeted content domain and cognitive levels to be assessed (Cunningham, 1986). Just as a building is constructed to the detailed specifications of a blueprint, a test is assembled in accordance to a table of specifications. It is by this standardised approach to test assembly that parallel forms of a particular test can be produced. In the context of test adaptation, additional work may be required to produce an adapted version of the original test's table of specifications. The extent of the work will vary, depending on the purpose of the test, the goal of the test, the goal of the adaptation, and the target audience (Beller, Gafini, & Hanani, 1999). More specifically, item adaptation involves focusing on the cultural aspects of the item in the test that is under adaptation (Ercikan, 1998; Hambleton, 1993). The purpose of item adaptation is to translate the spirit of the item rather than the item itself. The items to be changed in the NEO-PI-3 will need to be modified by keeping a close reference to the definition of the domain and facets as set out by the NEO-PI-R professional manual by Costa and McCrae (1992), without losing the essence of the item.

A critical step to any instrument adaptation procedure, involves the actual piloting of the adapted instrument (Hambleton & Patsula, 2000). Piloting is a process by which an authentic test session is simulated. The resulting data is analysed from several aspects (van de Vijver & Tanzer, 1998). Items are evaluated for relative difficulty, reliability and validity. Instructions are evaluated for clarity, flow, and adequacy. Test forms are evaluated for balance and face validity (Hambleton, 2002). Speededness, a measure of how speeded (rushed) an assessment is, is assessed and group-level analysis are performed. The goal of a pilot session is to solicit formative feedback from typical

examinees that can be used to improve the overall quality of the assessment instrument and the test session (Hambleton & Patsula, 2000). Ideally, both quantitative as well as qualitative feedback are collected from representative, typical examinees. The success of a pilot session will greatly depend on the quantity and representativeness of the pilot examinees (Woodcock & Muñoz-Sandoval, 1999). Though this is true for regular test development, it is especially true for test adaptation.

In order to investigate the reliability and validity of the NEO-PI-3, internal consistency reliability coefficients (Cramer, 2003) were calculated for the modified NEO-PI-3 using Cronbach Alpha coefficients. This measure of reliability assesses the degree to which the different parts of the instrument measure the same construct, by calculating inter-item correlations (Murphy & Davidshofer, 2005). In terms of the modified NEO-PI-3's construct validity, the modified instrument was subjected to an exploratory factor analysis using a principal components analysis with varimax rotation. Principal components analysis was used since it is a simple but effective method of determining factors that explains all the variance including the error variance in any particular correlation matrix. Varimax rotation was utilized, aiming to maximise the sum of variances of squared loadings in the columns of the factor matrix. Principal components analysis with varimax rotation is also the method utilised by the developers of the NEO-PI-R (Costa & McCrae, 1992). This process of factor analysis allowed the researcher to assess the number of factors evident in the modified version of the NEO-PI-3, and comment on whether or not the five factors emerged within the instrument.

1.12: Conclusion

According to the most recent literature sources (Meiring, 2007; Laher, 2008; Franklin 2009), this current study may be amongst the first to systematically address the issue of inappropriate items in the NEO-PI-R within the South African context, and certainly the first to systematically address the applicability of the items contained within the NEO-PI-3 within a South African context. This study therefore modified the NEO-PI-3 in terms of

problematic items contained within the instrument, and investigated the reliability and validity of the instrument within the South African context. This study addressed the issues raised in Franklin (2009) and Laher's (2010) research by modifying the NEO-PI-3 in according to their findings. It is hoped that this modified version of the NEO-PI-3 for a South African context will provide more valid answers surrounding the applicability of the FFM of personality within the South African context. Further, the modified version of the NEO-PI-3 could provide the basis for the development of a valid and reliable South African Edition of the NEO-PI-3, which will have a substantial impact on the method and assessment of personality within South Africa.

Since the turn of the millennium, an enormous amount of research on the five-factor model of personality has been conducted on no fewer than 69 different cultures worldwide. Highlighted within these research studies are issues surrounding the influences and impact that language, culture, national character, sociology, politics and history has on personality assessment (Church & Katigbak, 2002; Heuchert et.al., 2000; Hřebíčková et al., 2002; McCrae, 2002; McCrae & Terracciano, 2005; Piedmont et al., 2002; Rolland, 2002). In all cases the FFM has evidenced some good replication, and therefore adequate trait representation in most Western societies, as well as some non-Western societies. However, there are several on-going debates as to whether the measurement of the FFM is culturally appropriate in a non-Western context, and whether it is the optimal, culturally relevant approach for non-Western societies.

The impetus behind the current study was to add further insight into the assessment and measurement of personality within the South African context, by modifying the NEO-PI-3 to be more culturally and linguistically appropriate for a South African audience. It is further hoped that the results of this study can shed further light on the FFM's applicability within the South African cultural milieu, within the context of instrument and item cultural applicability.

Chapter 2: Methods

2.1: Introduction

The current study was comprised of many different stages and phases. As a point of clarification, the general structure of the methods chapter are outlined in this introductory section, detailing how the study progressed from one phase to the next and from one stage to the next. In general, the study is composed of two primary phases, **Phase A** and **Phase B**. **Phase A** involved the creation of the adapted version of the NEO-PI-3 for a South African audience, informed primarily through Laher (2010) and Franklin's (2009) research. **Phase B** involved the piloting of this adapted version of the NEO-PI-3 on a South African sample of university students, and thereafter analyzing the results, primarily looking at the reliability and validity of the modified instrument.

2.1.1: Phase A

Phase A was composed of 4 stages, **Stage 1**, **Stage 2**, **Stage 3**, and **Stage 4**. **Stage 1** involved reviewing previous research done on the NEO-PI-R's applicability within a South African context. As part of this stage, the author of this research conducted a lecturer survey using the NEO-PI-R on a small sample of 5 university lecturers at The University of the Witwatersrand. These lecturers were asked them to comment on whether or not they felt the items in the NEO-PI-R were problematic, either linguistically or culturally, in a South African context. This survey will be referred to as the 'Lecturer Survey (Number 1)', as there were two 'Lecturer Surveys' conducted in this current study, which will be explained shortly. The researcher then utilized the findings from this Lecturer Survey (No.1), in conjunction with previous research findings concluded by Franklin (2009) and Laher (2010), as well as the research done by McCrae, Costa and Martin's (2004) on the development of the NEO-PI-3, where they identified problematic items in the NEO-PI-R. These four pieces of afore mentioned research informed the creation and generation of a list of potentially problematic items within the NEO-PI-R in

general. The generation of this list of potentially problematic items will be described in more detail under the 'Procedure' section below.

Stage 2 involved using the findings from **Stage 1** and specifically piloting these potentially problematic items on another small sample of lecturers (n=12) at the University of the Witwatersrand, and again asking them to identify the *most* problematic items, either linguistically or culturally for a South African audience. This second lecturer survey will be referred to as 'Lecturer Survey (No.2)'. Included in this list of potentially problematic items from the NEO-PI-R were the 37 new items generated by the NEO-PI-3 to test their applicability within the South African context. Using the data gathered from this Lecturer Survey (No.2), a final list of 'problematic items' was decided upon, from both the NEO-PI-R and the 37 new items from the NEO-PI-3. The decision to incorporate the item as being deemed inappropriate was decided upon with regards to the magnitude of participants who found the item problematic, and comparing each of the above mentioned studies' evidence to arrive at a final list of problematic items. This included insight on whether or not any of the new NEO-PI-3 items were seen as problematic within a South African context.

Stage 3 involved an extensive analysis of each of the problematic items as identified in **Stage 2** and deciding upon suitable alternatives as evidenced through the perceived problem with the item, either linguistically or culturally within a South African context. This process also included an analysis of whether or not the new NEO-PI-3 items were seen as appropriate in a South African context or not. In some cases the original NEO-PI-R item was seen as unproblematic in the South African context, where the researchers of the NEO-PI-3 deemed it necessary to change the item. In such cases it was decided that the original NEO-PI-R item should be kept for the South African context. A final list of alternatives to the 'problematic items' was eventually decided upon. This process of item modification is detailed below in the 'Results' section.

Stage 4 involved sending this final list of 'problematic items' and their decided alternatives to Professor McCrae in the United States for checking and approval. Once

all of his feedback was incorporated, a modified version of the NEO-PI-3 was produced for use in the South African context.

2.1.2: *Phase B*

Phase B involved the actual piloting of this new adapted version of the NEO-PI-3, including all the modified items, upon a sample of 175 South African students at the University of the Witwatersrand. Once all the questionnaires were completed, and returned, an internal consistency analysis, a factor analysis as well as a thematic content analysis was conducted on the data to comment on the criteria of reliability and validity within the adapted version of the NEO-PI-3 for a South African audience.

2.2: *Aim of the Study*

The primary aim of this research is to investigate the applicability of a modified version of the NEO Personality Inventory 3 (NEO-PI-3) (McCrae, Costa & Martin, 2004) in the South African context. Through informed changes to the NEO-PI-3's items, as suggested through previous research on the NEO-PI-R by Franklin, (2009), Laher, (2010), and the two Lecturer Survey's mentioned above, this research intends to comment on the criteria of reliability and validity of this modified instrument using a volunteer sample of undergraduate students at the University of the Witwatersrand in South Africa. This research intends to contribute to the increasing interest and understanding of personality assessment in South Africa, by identifying whether specific items from the NEO-PI-3 are problematic and/or inappropriate for audiences in the South African context. By addressing whether participants experience difficulties in understanding particular words, sentences and the abstract concepts contained within the NEO-PI-3, both linguistically and culturally, this research hopes to ultimately produce a modified, more valid and reliable NEO-PI-3 instrument for the South African context.

2.3: *Rationale*

Psychometrics within psychology in general and personality in particular are of crucial importance in the development of psychology in South Africa and continues to affect more South Africans than any other branch of psychology (Sehlapelo and Terre Blanche, 1996). Given South African psychology's intimate historical connection with psychometrics, diverse cultural context and the continued prevalence of testing in modern day South Africa, Sehlapelo and Terre Blanche (1996) argue that psychometric testing should obviously be an important site of transformation. They argue that psychological tests, such as personality inventories, are used on a large scale to determine who gains access to economic and educational opportunities, and if psychology as a discipline is truly interested in empowerment, the reform of testing practices, and the elimination of test bias should be one of its priorities.

Within South Africa it has been suggested that researchers should be focusing their efforts on the exploration of issues of reliability, validity and bias in psychological instruments, but to date research on actual instruments particularly in personality assessment is lacking (Bedell, van Eeden & van Staden, 1999; Foxcroft, 2004; van de Vijver & Rothmann, 2004). In addition, the Employment Equity Act (EEA) in South Africa pronounced psychology as the caretaker to issues of appropriateness and applicability of psychological instruments for the country's peoples (Van der Vijver & Rothmann, 2004). Therefore, it is psychology's duty as a professional discipline to ensure the reliability and validity of instruments used within the South African context.

The issue surrounding the multicultural applicability and appropriateness of psychometric instruments has been a contentious issue in the field of personality testing since the 1960's (Abrahams, 1996; Abrahams & Mauer, 1999; Heuchert, Parker, Stumpf & Mybrugh, 2000; Prinsloo & Ebersöhn, 2002). Within South Africa, several researchers have continued this trend and have focused on the applicability of certain instruments, exploring issues of general relevance, validity, bias and fairness (Abrahams, 1996;

Abrahams & Mauer, 1999; Heaven & Pretorius, 1998; Heuchert, Parker, Stumpf & Myburgh, 2000; Wallis & Birt, 2003). Particularly over the past 10 years, South African researchers have explored these topics within personality research using the NEO-PI-R (Franklin, 2009; Laher, 2010) as well as other personality inventories, such as the 16 Personality Factor questionnaire (Abrahams, 1996, 1999, 2002; Prinsloo & Ebersöhn, 2002; Prinsloo & Van Eeden, 2005), and the 15FQ personality test (Meiring, 2007).

In all cases the authors generally found support and motivation to either standardise certain aspects of the inventories using South African normative populations, or raise important and reflexive queries regarding the appropriateness of certain inventories in the South African context. However, despite ongoing inquiry there remains relatively little material that pays exclusive attention to the NEO-PI-R (Franklin, 2009; Laher, 2010), and the difficulties experienced by first, second or third language English-speaking South Africans, and none on its recent adaptation; the NEO-PI-3 (McCrae, Costa & Martin, 2004).

The NEO-PI-R embodies a conceptual model of personality which “distills decades of factor analytic research on the structure of personality” (Costa & McCrae, 1992, p. 1) into five superordinate dimensions. Known as the Five Factor Model (FFM) of Personality, the NEO-PI-R represents the most prominent and researched operationalisation of this model. The NEO-PI-R was standardized on over 1000 individuals taken primarily from the Augmented Baltimore Longitudinal Study of Aging (ABLSA), the ABLSA Peer Sample, individuals in a large US national organization and several clinical samples. As such, the NEO-PI-R was “developed and standardised within a Western cultural setting using an American normative population” (Wallis & Birt, 2003, p.182). Many theorists have thus voiced their support for investigating the appropriateness and applicability of certain Westernised personality instruments, such as the NEO-PI-R, in order to be more culturally applicable to non-Western contexts (Allik & McCrae, 2002; Berry, Poortinga, & van der Vijver, 1987; Cheung, et. al., 2008; Church, & Katigbak, 2002; McCrae, & Terracciano, 2005). There is a small, but growing body of knowledge that focuses exclusively on bias and fairness in personality

assessment in the South African context, as is seen as a vitally important process in personality research (Abrahams, 2002; Franklin, 2009; Laher, 2008; Meiring, Van der Vijver, Rothman, & Barrick, 2005; Poortinga & Van de Vijver, 1987; Van Eeden, & Prinsloo, 1997).

In particular, Franklin's (2009) and Laher's (2010) research suggest that the NEO-PI-R is not wholly linguistically and culturally applicable within a South African context, and suggest that it needs to be revised to be appropriate for a South African audience. The NEO-PI-3 (McCrae, Costa and Martin, 2004) was developed in 2004 in the United States in an attempt to make the NEO-PI-R more readable at the item level, by simplifying certain items in terms of language used. Although an improvement on the NEO-PI-R in terms of the complexity of language used, the NEO-PI-3 was still generated within an American context, with many American cultural and linguistic idiosyncrasies. Thus, the NEO-PI-3 did not specifically address the issues raised as problematic within Franklin (2009) and Laher's (2010) research. Therefore, this study seeks to modify the NEO-PI-3 to be more culturally sensitive and applicable within a South African context, and then administer this modified version of the NEO-PI-3 to a sample of South African students to test the criteria of reliability and validity of this modified instrument. By this rationale, the current research will render statistical evidence regarding the appropriateness of this modified NEO-PI-3 instrument within a multicultural South African perspective on personality assessment.

2.4: *Primary Research Questions*

2.4.1: *Phase A*

Based on findings of studies by McCrae, Costa and Martin (2004), Franklin, (2009), Laher, (2010) and the two Lecturer Surveys, it was evident that revisions were required on the 240 NEO-PI-3 items (included within are 203 NEO-PI-R items). Hence, the questions for **Phase A** include:

- Which Items were problematic from the NEO-PI-R?
- Which items were problematic of the 37 revised items in the NEO-PI-3?
- What was/were the nature of the problems in the problematic items?
- How best could the problematic items be adapted or modified?

2.4.2: *Phase B*

- Is the adapted version of the NEO-PI-3 reliable for use in a South African context?
- Is the adapted version of the NEO-PI-3 valid for use in a South African context?

2.5: *Primary Research Hypotheses*

2.5.1: *Phase A*

No hypotheses were applicable for **Phase A**.

2.5.2: *Phase B*

- An adapted version of the NEO-PI-3 will be reliable for use in a South African context in terms of internal consistency.
- An adapted version of the NEO-PI-3 will be valid for use in a South African context in terms of construct and face validity.

2.6: Sample

2.6.1: Phase A

In terms of **Stage 1** of **Phase A**, there were a number of studies that were involved in reference to producing the list of potentially problematic items in the NEO-PI-R / NEO-PI-3. As a preliminary evaluation of the NEO-PI-R, the author of the current study asked five psychology lecturers at the University of the Witwatersrand to identify any items in the NEO-PI-R as being potentially problematic, either linguistically or culturally, within the South African context. These lecturers were asked on a convenient sampling basis and voluntarily completed the questionnaire given to them³. There was no demographic information taken from this sample and as such, none is reported. These lecturers were asked to take the questionnaire home with them and return the completed questionnaire approximately 1 week later. The lecturers were not asked to actually complete the questionnaire in terms of assessing their personality, but rather just to note whether or not they thought any items were problematic. This Lecturer Survey (No.1) was conducted primarily to add extra support to the potentially problematic items as found in the 3 existing studies detailed below.

In conjunction with the above mentioned Lecturer Survey (No.1), research findings from three other studies: McCrae, Costa and Martin (2004); Franklin (2009) and Laher (2010) provided the initial list of potentially problematic items within the NEO-PI-R. As the data obtained from these three studies are of crucial importance within the current research study, it is necessary to mention the sample used in all three studies.

In McCrae, Costa and Martin's (2004) study, 500 participants ranging in age from 14 to 20 were used. Age and sex were stratified, resulting in an overrepresentation of the late adolescent groups. Participants resided in 26 states in the United States, although most were from Pennsylvania. Characteristics of the sample are given in **Table 2.1** below. In

³ see **Appendix D**

terms of race, the sample was predominantly white. High academic achievers were overrepresented in this sample in which the majority expected to obtain a post baccalaureate degree. Most (474) (94.8%) listed English as their best language, although 82 respondents also spoke other languages with their families.

Table 2.1
Sample distribution from McCrae, Costa and Martin's (2004) research

Variables under study		Frequency	Percentage (%)	Cumulative Percentage (%)
Gender	Male	242	48.4	48.4
	Female	258	51.6	100
Age	14	46	9.2	9.2
	15	48	9.6	18.8
	16	46	9.2	28.0
	17	64	12.8	40.8
	18	100	20.0	60.8
	19	98	19.6	80.4
	20	98	19.6	100
Population Group	Hispanic	9	1.8	1.8
	White	423	84.6	86.4
	Black	14	2.8	89.2
	Asian/Pacific Islander	38	7.6	96.8
	Other	16	3.2	100

Franklin's (2009) quantitative sample comprised 28 postgraduate volunteer students, from a class of 51 students at the University of the Witwatersrand, all of which were asked to participate in the research. These 28 students completed the NEO-PI-R, from which Franklin analysed their responses quantitatively. Franklin's (2009) quantitative sample is detailed below in **Table 2.2**.

Table 2.2
Sample distribution from Franklin's (2009) quantitative research

Variables under study		Frequency	Percentage (%)	Cumulative Percentage (%)
Gender	Male	3	10.7	10.7
	Female	25	89.3	100
Population Group	Black	6	21.4	21.4
	Coloured	3	10.7	32.1
	Indian	4	14.3	46.4
	White	14	50	96.4
	East Asian	1	3.6	100
Home Language	Afrikaans	1	3.6	3.6
	English	20	71.4	75
	SeSotho	1	3.6	78.6
	Seswana	1	3.6	82.2
	isiXhosa	2	7.1	89.3
	IsiZulu	2	7.1	96.4
	Mandarin	1	3.6	100

Franklin (2009) also conducted a qualitative analysis involving focus groups from the same sample of 51 postgraduate students. Ten students from this group of 51 participated in two focus group meetings. Therefore the qualitative sample of ten volunteers was representative of approximately 20% of the overall participating body of students. The first focus group consisted of a group of five female volunteers. The group represented Black, Coloured and White population groupings, and a home language variety of Afrikaans, English, isiZulu and seSotho. The second focus group two consisted of a group of three men and two women. The second group represented Black, Indian and White population groupings and a home language variety of English and isiXhosa. Overall the groups represented six first language English speakers and four second language English speakers (see **Table 2.3** below).

Table 2.3
Sample distribution from Franklin's (2009) qualitative research

Variables under study		Frequency	Percentage (%)	Cumulative Percentage (%)
Gender	Male	3	30.0	30.0
	Female	7	70.0	100
Population Group	Black	3	30.0	30.0
	Coloured	1	10.0	40.0
	Indian	1	10.0	50.0
	White	5	50.0	100
	Afrikaans	1	10.0	10.0
Home Language	English	6	60.0	70.0
	SeSotho	1	10.0	80.0
	isiXhosa	1	10.0	90.0
	IsiZulu	1	10.0	100
	English	6	60.0	60.0
Home Language Collapsed	Non English	4	40.0	40.0

Laher's (2010) research comprised a sample of 425 volunteer psychology students at the University of the Witwatersrand who completed the NEO-PI-R, and commented on the appropriateness of the items within the instrument. **Table 2.4** detailed the demographic information surrounding Laher's (2010) sample.

Table 2.4
Sample distribution from Laher's (2010) research

Variables under study		Frequency	Percentage (%)	Cumulative Percentage (%)
Gender	Male	122	28.71	28.71
	Female	303	71.29	100
Population Group	Black	121	28.47	28.47
	Coloured	27	6.35	34.82
	Indian	76	17.88	52.71
	White	189	44.47	97.18
	Asian	9	2.12	99.29
	Other	3	0.71	100
Religious Affiliation	Christianity	239	56.24	56.24
	Hinduism	34	7.80	64.24
	Islam	43	10.12	74.35
	Judaism	39	9.18	83.53
	Traditional African	50	11.76	95.29
	No Religious Affiliation	20	4.68	100
Home Language	English	293	68.47	68.47
	Afrikaans	10	2.35	70.82
	Ndebele	4	0.94	71.76
	Pedi	15	3.53	75.29
	Swati	5	1.18	76.47
	Sotho	10	2.35	78.82
	Tsonga	12	2.82	81.65
	Tswana	18	4.24	85.88
	Venda	4	0.94	86.82
	Xhosa	14	3.29	90.12
	Zulu	20	4.71	94.82
	Other	22	5.18	100
English Reading Ability	Not so good	0	0	0
	Fairly good	1	0.75	0.75
	Satisfactory	11	8.21	8.96
	Very good	54	40.30	49.25
	Excellent	68	50.75	100
English Comprehension Ability	Not so good	0	0	0
	Fairly good	1	0.75	0.75
	Satisfactory	12	8.96	9.70
	Very good	66	49.25	58.96
	Excellent	55	41.04	100

In terms of Laher's (2010) sample, it is evident from Table 2.4, that 28.71% of the sample was male (n=122) and 71.29% female (n=303). In terms of population groupings, 28.47% classified themselves as Black (n=120), 6.35% as Coloured (n=27), 17.88% as Indian (n=76), 44.47% as White (n=189), 2.12% (n=9) as Asian, e.g. Chinese, Taiwanese and 0.71% (n=3) choosing the 'Other' option but not specifying their grouping. For religious affiliation, 56.24% (n=239) were Christian while 39.76% were affiliated to other religions (34 were Hindu, 43 were Muslim, 39 were Jewish, 50 were affiliated with a Traditional African Religion) and 4.68% had no religious affiliation (16 chose the no religious affiliation option, 1 selected the Atheist option and 3 selected the Agnostic option). Language groupings were distributed as follows: 68.47% of the sample reported English as their home language (n=302), 2.35% spoke Afrikaans as their home language (n=10) while 14.18% (n=102) of the sample spoke an African language and 5% (n=22) selected the 'Other' option specifying Chinese, Taiwanese, etc as their home language.

The results from the above mentioned studies were then corroborated with the Lecturer Survey (No. 1), and a final list of 130 items were identified as being potentially problematic within the NEO-PI-R (see further elaboration on this process in the "Results" section below). In terms of Stage 2 of the study, these 130 items as well as the 37 revised items in the NEO-PI-3 were then distributed to 12 volunteer psychology lecturers at the University of the Witwatersrand, constituting the Lecturer Survey (No.2). The lecturers were again asked to comment on the cultural and linguistic applicability of those particular items within a South African context⁴. As with the Lecturer Survey (No.1), no demographic information was asked from these lecturers and as such, none is reported.

2.6.2: Phase B

The results from **Phase A** informed the creation of an adapted version of the NEO-PI-3.

⁴ see **Appendix D**

This modified version of the NEO-PI-3 was administered to 175 volunteer students at the University of the Witwatersrand. The sample was gathered by using a non-probability convenience sampling technique (Huck, 2004). This technique was the only plausible method available for collecting the relevant information, as due to the large sample needed and the length of questionnaire, the only feasible way of collecting the data was on a volunteer basis.

The sample consisted of undergraduate Psychology II and Accounting I students, attending tutorials and lectures respectively at the University of the Witwatersrand. The use of students in psychological research is a contentious issue as students are generally not representative of the population (Rosenthal & Rosnow, 1991). However the use of students is consistent with previous research in this area particularly when research on personality instruments is at the preliminary or exploratory stage as is the case in this study (see Costa & McCrae, 1992; Cheung et al., 2003; 2008; McCrae et al., 2005).

According to Abrahams (1996, 2002), from a general perspective, contemporary trends in psychometric research show that students are often used, and that they represent a relatively homogenous group, especially for research addressing bias, fairness and appropriateness of psychometric instruments. In these cases, where the constructs under study are sensitive to the composition of the sample, the relative homogeneity of a student group ensures a degree of reliability. Furthermore, when using 175 students at a university, it can be assumed that the effects of language proficiency and test wiseness should be minimal. With respect to the accounting students used (127), they needed to have past English first language at a Matric level to be allowed into the course they are registered for (B. Comm), and as such would be expected to have a fairly good basic understanding of English. The second year psychology students had already passed their first year at university, and as such were assumed to have a basic level of understanding and comprehension in English. As the sample constitutes students at a university, it was assumed that the sample would be generally familiar with test-taking procedures and would have a certain level of test-wiseness so as to allow a

certain level of standardisation in the test taking procedure.

The sample's age ranged from 17 – 34 years old, with a mean age of 19.54 (S.D. = 1.89) as evidenced in **Table 2.5** below. Age was positively skewed as is expected from a student sample, and as such was not normally distributed.

Table 2.5
Descriptive Statistics for Age

AGE					
Number	Mean	Standard Deviation	Minimum	Maximum	Skewness Coefficient
174	19.54	1.89	17	34	3.52

Table 2.6
Descriptive Statistics for Gender, Population Group, Religious Affiliation and Language

Variables under study		Frequency	Percentage (%)	Cumulative Percentage (%)
Gender	Male	59	33.71	33.71
	Female	116	66.29	100.00
Population Group	Black	92	52.57	52.57
	White	43	24.57	77.14
	Indian	24	13.71	90.86
	Coloured	8	4.57	95.43
	Other	8	4.57	100.00
Religious Affiliation	Christianity	125	71.43	71.43
	Islam	8	4.57	76.00
	Judaism	7	4.00	80.00
	Hinduism	17	9.71	89.71
	Traditional African Religion	4	2.29	92.00
	No Religious Affiliation	11	6.29	98.29
	Other	3	1.71	100.00
Home Language	Afrikaans	3	1.71	1.71
	English	86	49.14	50.86
	isiNdebele	2	1.14	52.00
	Sepedi	13	7.43	59.43
	SiSwati	5	2.86	62.29
	Sesotho	9	5.14	67.43
	Xisonga	1	0.57	68.00
	Setswana	14	8.00	76.00
	Tshivenda	3	1.71	77.71
	isiXhosa	9	5.14	82.86
	isiZulu	24	13.71	96.57
	Other	6	3.43	100.00
English Reading Ability	'Not so good'	0	0	0
	2	1	0.98	0.98
	3	12	11.76	12.75
	4	42	41.18	53.92
	'Excellent'	47	46.08	100.00
English Comprehension Ability	'Not so good'	0	0	0
	2	3	3.13	3.13
	3	12	12.50	15.63
	4	45	46.88	62.50
	'Excellent'	36	37.50	100.00
Ever taken a Psychological Test?	No	97	56.73	56.73
	Yes	74	43.27	100.00
Test Familiarity	'somewhat familiar'	11	12.64	12.64
	2	22	25.29	37.93
	3	33	37.93	75.86
	4	17	19.54	95.40
	'very familiar'	4	4.60	100.00
Degree Studied	Psychology	48	27.43	27.43
	Accounting	127	72.75	100.00
Year of study	1	115	65.71	65.71
	2	54	30.86	96.57
	3	6	3.43	100.00

From **Table 2.6** it is evident that the sample comprised 59 males and 116 females. Approximately half the participants were black (52.57%), while the next highest category was white (24.57%) comprising approximately one quarter of the sample. 13.71% of the sample were Indian, while only 4.57% were Coloured. In terms of religious affiliation, 125 were Christian, 17 were Hindu, 8 were Muslim, 7 were Jewish, 4 were affiliated with a Traditional African Religion, 11 had no religious affiliation, and 3 were affiliated with other religions (i.e. Paganism, Buddhism etc).

Approximately half (49.14%) were first language English speakers, while the others varied with isiZulu (13.71%), Setswana (8%) and Sepedi (7.43%) being the next highest language categories. Even though there were only 89 participants who stated that English was not their home language, 102 answered the question on English reading ability, in terms of English not being their first language. This situation was the same for the English comprehension question, where 96 participants answered this question. 84.38% of the participants who answered the question on English comprehension ability rated their ability as either excellent, or just below excellent, with only 3.13% of the participants stating that their English comprehension was only just better than “not so good”. 87.24% of the participants who answered the question on English reading ability rated their English reading abilities as either excellent or just below excellent, with only approximately 1% of the sample rating their English reading abilities as just better than “not so good”. In terms of test-taking familiarity, there was an approximate normal distribution ranging from “somewhat familiar” to “very familiar”, with the majority 37.93% exactly in-between. 43.27% of the sample had taken a psychological test before

2.7: *Instruments*

2.7.1: *Phase A*

This study utilized a number of questionnaires, all related to the NEO-PI-R. In **Stage 1** of **Phase A**, the Lecturer Survey (No.1) comprised the NEO-PI-R in its original form.

The participants were not asked to rate their personality traits, but rather comment exclusively on whether they felt the item was linguistically or culturally inappropriate for a South African context⁵. The NEO-PI-R is discussed below.

The second Lecturer Survey (No.2) as part of **Stage 2** of **Phase A**, comprised 130 problematic items as identified by McCrae, Costa and Martin's (2004), Franklin's (2009) and Laher's (2010) studies as well the 37 new items from the NEO-PI-3⁶. The lecturers were asked to comment on the cultural and linguistic applicability of those particular items within a South African context, by ticking whether they thought the item was problematic or not.

2.7.2: Phase B

Phase B of this study involved administering the adapted version of the NEO-PI-3 to the sample of 175 students at the University of the Witwatersrand. This adapted version of the NEO-PI-3 comprised a demographic section, questions from the NEO-PI-R, NEO-PI-3, modified items generated within this study, as well as open-ended questions⁷. In total, of the 240 items within the general section of the questionnaire; 30 were from the NEO-PI-3, 161 were from the NEO-PI-R and 49 were new items generated within this study. Attached to each item asked within this questionnaire, was a space left on the right-hand column for the participant to tick had he or she felt the item was inappropriate either linguistically or culturally from a South African perspective and context. There were 3 open-ended questions at the end of the questionnaire (see below for a discussion on each of the above mentioned sections).

2.7.2.1: Demographic Information

Age, gender, religious affiliation, population group and home language were the major

⁵ see **Appendix D**

⁶ see **Appendix B**

⁷ see **Appendix G**

categories of demographic information asked for in this section. Other questions also asked within this section included questions on the participants Test-Familiarity, Test Wiseness, English Comprehension and Reading, Faculty of Registration, Year of Study, and if they had ever taken a Psychological Test before⁸. All of these variables were used for descriptive purposes only.

2.7.2.2: *Neo-Personality Inventory-Revised (NEO-PI-R)*

The NEO-PI-R⁹ embodies a conceptual model of personality which “distills decades of factor analytic research on the structure of personality” (Costa & McCrae, 1992, p. 1) into five superordinate dimensions. The NEO-PI-R represents the most prominent and researched operationalisation of the Five Factor Model (FFM) of Personality, and as such measures the five domains of: Neuroticism (N), Extraversion (E), Openness to Experience (O), Conscientiousness (C) and Agreeableness (A). The NEO-PI-R was standardized on over 1000 individuals taken primarily from the Augmented Baltimore Longitudinal Study of Aging (ABLSA), the ABLSA Peer Sample, individuals in a large US national organization and several clinical samples.

The NEO-PI-R is a self report instrument consisting of 240 items and requires approximately 40 minutes to complete. It is available in two forms, the S and R form. Form S is an instrument for self-rating, and form R is used for rating someone else. The items are the same except that the subject is changed in form R to the third person. Form S is appropriate for men and women of all ages, and given the nature of the current study, only Form S is of relevance. In terms of readability, the NEO-PI-R has an overall Flesch-Kincaid grade level of 5.7, however, it was noted that some items were much more complicated and required a higher reading level (Schinka & Borum, 1994 as cited in McCrae, Costa & Martin, 2004). Therefore, in terms of overall readability, with all scales and items included, the NEO-PI-R is seen to be only applicable if the subject completing the inventory has had at least 10 years of formal education with an average

⁸ see **Appendix G**

⁹ see **Appendix A**

grade or better.

The NEO-PI-R measures each of the five factors postulated in the FFM through 48 items each, which are further sub-divided into six sets of eight items. These clusters or facets of items were designed to provide more detailed information about some of the more important concepts within each of the five domains. NEO-PI-R items are answered on a 5-point Likert-type scale ranging from 'strongly agree' (4) to 'strongly disagree' (0), where the scales are balanced to control for the effects of acquiescence (Costa & McCrae, 1992).

2.7.2.2.1. Reliability of the NEO-PI-R

Form S has acceptable internal consistency with alphas ranging from 0.56 to 0.81 for the individual facet scales, which are acceptable for scales with only eight items, and 0.86 to 0.95 for the forty-eight item domain scales. Costa and McCrae (1992) suggest that the NEO-PI-R is one of the few instruments that has demonstrated measurement of enduring dispositions, yielding alphas from 0.68 to 0.83 and from 0.63 to 0.79 for six and three year retests respectively. However, it must be stated that in some cross-cultural studies using the NEO-PI-R, the alpha coefficients for domain and facet scales are consistently lower than the norms for their American counterparts (Horn, 2000; Piedmont et al., 2002; Taylor, 2000). In a study using the NEO-PI-R for Shona speakers in Zimbabwe, a one-week retest scenario yielded alphas of 0.48 to 0.92 (Piedmont et al., 2002) in which respondents gave similar responses on both occasions.

2.7.2.2.2. Validity of the NEO-PI-R

Considerable evidence shows that as measures of broad personality traits from a Western perspective, the NEO-PI-R scales show good validity in many ways and in many different samples. NEO-PI-R has been shown to evidence good convergent and discriminant validity across instruments, methods and observations (McCrae & Costa, 1992), to which it has become the most comprehensive and best validated personality

measurement on the basis of Five-Factor Model (FFM) (Costa & McCrae, 1992, McCrae & Allik, 2002). In terms of convergent validity, both domain and facet scores from the NEO-PI-R have shown to relate in a predictable way to personality trait scores from a variety of personality measures including the Personality Research Form (PRF) and the California Personality Inventory (CPI), peer reports, and adjective checklists (Costa & McCrae, 1992).

2.7.2.3: *NEO-Personality Inventory-3 (NEO-PI-3)*

The NEO-PI-3 was developed with the intention of making the NEO-PI-R more readable and less complex in terms of how the questions were asked. As such, the NEO-PI-3 represents the NEO-PI-R with 37 of the original 240 items being modified to be a “more readable version of the NEO-PI-R” (McCrae, Costa & Martin, 2004, p. 261)¹⁰. The NEO-PI-3 has exhibited an overall reading grade of 5.3 and has, according to McCrae, Costa and Martin, (2004), eliminated most of the items from the NEO-PI-R that adolescents aged 14 to 20 find difficult. Therefore, in terms of psychometric properties, the NEO-PI-3 and the NEO-PI-R are very similar, with the “NEO-PI-3 show[ing] modest improvements over the generally good performance of the NEO-PI-R” (McCrae, Costa & Martin, 2004, p. 268). Internal consistencies for the five domains in the NEO-PI-3 ranged from 0.85 to 0.89 for Form S and from 0.84 to 0.93 for Form R (McCrae, Costa & Martin, 2004).

Preliminary evidence of validity on the NEO-PI-3 was shown by correlating the NEO-PI-3 scales with the Subjective Well-Being (SWB) scale. The SWB is a single scale, comprising The Affect Balance Scale (Bradburn, 1969), a Satisfaction Index that asks about various aspects of life (Costa & McCrae, 1984), the one-item Delighted–Terrible Scale (Andrews & Withey, 1976), and the 5-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). The SWB was significantly related to the N, E, A, and C scales, but not to O. Consistent with research on gender differences (McCrae, 2001), women scored higher than men on all five domains, although the effects were small in

¹⁰ see **Appendix B**

magnitude. Consistent with earlier studies of adolescents (McCrae et al., 2002), there were small cross-sectional increases in O and C but no age associations for the other factors. All these correlates suggest that NEO-PI-3 scales have convergent and discriminant validity when used in an adolescent population, within the United States.

2.7.2.4: *Open-Ended Response Questions*

As part of the questionnaire administering the adapted NEO-PI-3, three open-ended questions were asked at the end of the instrument. The open-ended questions asked the participants to state and discuss any culturally or linguistically problematic items they identified within the questionnaire in reference to the South African context¹¹.

The researcher included the open-ended questions in order to comment on the problematic items from a qualitative perspective, and gain deeper descriptive feedback regarding the nature of the problem in each identified item. In conjunction with the space provided to tick inappropriate items throughout the adapted NEO-PI-3 questionnaire, this portion of the qualitative phase provided a means with which to mindfully engage in a reading of the data in terms of assessing why the participants found any particular item inappropriate either linguistically or culturally. Two of the three open-ended questions asked about cultural appropriateness and linguistic appropriateness respectively, while the final question asked the participants to comment on the questionnaire's face validity by asking what they thought the questionnaire was measuring.

2.8: *Research Design*

The study was conducted in such a way as to be classified as having a non-experimental cross-sectional research design. No variables were manipulated, and

¹¹ see end of **Appendix G**

there was no control group; as such the design takes the form of being non-experimental (Rosnow & Rosenthal, 1991). Non-experimental methods are well suited for explorative research such as in this study, where the requirements for causality are not applicable; namely there is no manipulation of the independent variable, no controlled measures and the volunteers are not randomised (Larsen & Buss, 2005).

The study was primarily quantitative in nature, but did employ some qualitative techniques and received some qualitative data. As such, the current research strategy adopted within this study is termed a 'mixed methods approach' as both quantitative and qualitative methods were used (Rosnow & Rosenthal, 1991). The advantage of using this dual focus is that it fulfills both the quantitative and trend analysis, as well as the qualitative and exploratory analysis, needed in evaluating the appropriateness of the adapted NEO-PI-3 for a South African context. This approach allowed the researcher to recognise that the data obtained was rooted in the subject's cultural and lingual perceptions, and not only in a physical or psychometric reality. Thus, the analytic technique that was used was an uncomplicated dual focus, which reflected upon the participants' responses (Babbie & Mouton, 2004). The inherent advantage of this approach was that it allowed for maximum elaboration, interpretation and statistical support on the appropriateness of the language utilized in this modified, adapted NEO-PI-3 instrument.

Bailey (1997) defines qualitative study as a descriptive method that emphasises lived experience of a particular phenomenon. The qualitative portion of this study, although fairly minimal, explored aspects of lived experience in open-ended questions at the end of the questionnaire. After completing the questionnaire, it was important to allow the volunteers the opportunity to reflect upon their experience whilst completing the modified NEO-PI-3. By using an open-ended response format, the researcher was able to gather concise, descriptive data regarding the subjective experience of the volunteers and their personal interactions with the NEO-PI-3. The aim herein was to identify specific words, items and concepts that were problematic, therefore highlighting subjective difficulties related to language, culture and understanding when completing

the NEO-PI-3 within the South African context.

2.9: Procedure

2.9.1: Phase A

2.9.1.1. Stage 1

Stage 1 of this study began by conducting the first Lecturer Survey (No.1) on the NEO-PI-R; which involved administering the NEO-PI-R to 5 lectures at the University of the Witwatersrand in South Africa. Lecturers in the Psychology Department at the university were approached to participate in the research, making it clear that participation was completely voluntary. 5 lecturers ultimately volunteered to participate in the research. These 5 lecturers were allowed to take the questionnaire home with them, and asked to return it approximately one week later to the researcher's supervisor at the University of the Witwatersrand. The lecturers were not asked to complete the NEO-PI-R in terms of offering information on their personality, but asked rather to tick any items they felt could be potentially problematic (either linguistically or culturally) in a South African context¹². This questionnaire was estimated to take 40 minutes to complete. In conjunction with this process, the researcher generated a list of potentially problematic items in the NEO-PI-R, by collating previous research findings on the NEO-PI-R's applicability in the South African context from McCrae, Costa and Martin (2004), Franklin, (2009) and Laher's, (2010) research studies. The 3 research studies in conjunction with the Lecturer Survey (No.1) formed the basis of a preliminary analysis of the potentially problematic items in the NEO-PI-R.

2.9.1.2. Stage 2

Using the findings from **Stage 1**, a list of 167 items was identified as being potentially

¹² see **Appendix D**

problematic for the South African context. The 167 items were made up of the 130 potentially problematic items from the NEO-PI-R as identified in **Stage 1**, as well as including the 37 new items from the NEO-PI-3. This list was constructed into a questionnaire¹³ and surveyed on 12 volunteer Psychology lecturers at the University of the Witwatersrand; comprising the second Lecturer Survey (No.2) on the applicability of the NEO-PI-R and NEO-PI-3's items within the South African context. As with the first Lecturer Survey, the lecturers weren't actually asked to complete the questionnaire in terms of offering their opinions on their personality, but rather asked to comment exclusively on whether they felt the items in the questionnaire were potentially problematic for a South African context in terms of culture and language. The lecturers were asked to complete the questionnaire in their own pace and return the instrument when they were done, approximately one week from receiving the questionnaire to the researcher's supervisor's pigeon hole at the University of the Witwatersrand. The questionnaire was estimated to take 30 minutes to complete.

Once the questionnaires were received from the lecturers, a table of all research findings thus far on the NEO-PI-R and NEO-PI-3 as mentioned in **Stage 1** and **Stage 2** was collated. This table is detailed in the 'results' section below and comprised a list of all available evidence on the potentially problematic items in the NEO-PI-R and the NEO-PI-3. Through a cross tabulation of the evidential data gathered up to this point, a decision was decided upon whether or not the item should be changed, modified or completely revised. More generally, an item was decided to need to change if most of the prior research findings from the two Lecturer Surveys, McCrae, Costa and Martin, (2004), Franklin, (2009), and Laher's (2010) research had found some aspect of the item to be problematic.

2.9.1.3. Stage 3

This part of **Phase A** involved an extensive analysis of each of the problematic items as identified in **Stage 2** and deciding upon a suitable alternative as evidenced through the

¹³ see **Appendix D**

perceived problem with the item, either linguistically or culturally within a South African context. This process also included an analysis of whether or not the new NEO-PI-3 items were appropriate in a South African context or not. A final list of alternatives to the 'problematic items' was eventually decided upon. The items were changed by keeping a close reference to the definition of the domain and facets as set out by the NEO-PI-R professional manual by Costa and McCrae (1992), without losing the essence of the item. This manual formed the test's specifications as detailed in the theory on test adaptation in the literature review in Chapter 1. Test specifications are a guide by which a test is assembled (Cunningham, 1986). The items were adapted by focusing on the cultural and linguistic aspects of the item. The purpose of item adaptation is to translate the spirit of the item rather than the item itself (Ercikan, 1998; Hambleton, 1993), which is how the researcher modified the items, bearing this notion in mind. A final list of inappropriate items for the South African context was decided upon, which included a proposed alternative to the problematic item.

2.9.1.4. Stage 4

This final list of identified problematic items with the proposed alternative was sent to McCrae for approval as well as the publishers of the inventory for their approval for use in **Phase B** of the study. Approval to administer this modified version of the NEO-PI-3 within the South African context was granted by PAR¹⁴. Through extensive correspondence between McCrae and the researcher over the proposed items to be changed, suitable alternatives were eventually arrived upon. The vast majority of the alternative items were uncontested by McCrae where a few were asked to be further modified according to his suggestions (these items will be detailed in the results section below).

¹⁴ see **Appendix F**

2.9.2: *Phase B*

Once all the changes to the problematic items had been finalised, a new, modified version of the NEO-PI-3 was compiled for use in the South African context. **Phase B** of this study involved the actual piloting of this modified version of the NEO-PI-3 on a sample of university students at the University of the Witwatersrand.

In terms of the Psychology II students participating in the research, they were given the questionnaire during lecture times as well as during their Research Design and Analysis tutorials and asked to complete the questionnaire at home during their own time. They were instructed that if they wanted to participate, they should fill in the questionnaire and hand it back in an appropriately marked box in the first year Psychology office at the university. This box was left in the office to receive the questionnaires for approximately 3 weeks after the questionnaires were handed out. The researcher then collected the completed questionnaires from this box in order to analyse the data. In terms of the Accounting I students participating in the research, permission was granted by the relevant first year Accounting lecturer to utilise one lecture time slot (45 minutes) to hand out the questionnaires in the lecture and wait while they filled the questionnaire in. Again, the completion of the questionnaire was completely voluntary and if anyone didn't want to complete a questionnaire there were accounting examples presented on the overhead for them to practice while the others filled in the questionnaire. This ensured that the students didn't feel obligated to complete the questionnaire, while still giving them something to do while the others completed the questionnaire. Once all the questionnaires were received, the responses were entered and scored on a computer and then entered into SAS for analysis. The analysis in **Phase B** involved looking at the instrument in terms of the criteria of reliability and validity.

2.10: *Ethical Considerations*

Ethics clearance was obtained from the Human Research Ethics Committee at the

University of the Witwatersrand (Protocol Number: *MPSYC/09/002 IH*). In terms of the two Lecturer Surveys conducted, permission was granted by the researcher's supervisor to approach the lecturers at the University of the Witwatersrand. The lecturers were approached in an ad hoc manner within the Psychology Department at the University of the Witwatersrand and asked to complete the questionnaire. A cover letter was attached to the questionnaire¹⁵, detailing the purpose of the research and what the lecturers were expected to do. Participation in the survey was completely voluntary and anonymity was achieved by asked no identifying information in the questionnaire.

For **Phase B** of the study, the researcher approached the course coordinators of both Accounting I and Psychology II at the University of the Witwatersrand to ask for permission to conduct research on their respective students. After permission was granted, the respective course coordinator was required to give signed permission to the researcher to approach the students to ask for their voluntary participation¹⁶.

Permission was granted by the relevant course coordinators/heads of school to pilot the modified NEO-PI-3 on the first year Accounting as well as second year Psychology students at the University of the Witwatersrand. Informed consent to participate in the study was obtained via the use of a cover letter¹⁷ which appeared at the front of the questionnaire. The cover letter attached to the front of the questionnaire briefly explained to the participant's issues surrounding voluntary participation, informed consent and ensuring them of their right to remain anonymous and confidential. The cover letter briefly outlined the nature of the study, and stated that by completing the questionnaire, the participant had agreed that their response may be used for research purposes. In addition, the cover letter provided contact details of the researchers, should participants require additional information. Once having approached the students, the researcher explained the aims and the purpose of the study and issues pertaining to consent, anonymity, confidentiality and participation to the potential

15 see **Appendix D**

16 see **Appendix E**

17 see **Appendix G**

participants.

The Psychology students were addressed in their Research Design and Analysis tutorials and asked to take the questionnaire home with them. Once they had completed the questionnaire, they were instructed to return the questionnaire to the first year Psychology offices at the University of the Witwatersrand. Participation in terms of even taking a questionnaire was completely voluntary, and if a potential participant took a questionnaire, it was also completely voluntary in terms of bringing it back completed.

The Accounting students were approached during a lecture period and given time by their lecturer to complete the questionnaire during that same lecture period. The completion of the questionnaires was completely voluntary and if potential participant didn't want to complete a questionnaire there were accounting examples presented on the overhead for them to practice while the others filled in the questionnaire. This ensured that the students didn't feel obligated to complete the questionnaire, while still giving the non-participants something to do while the others completed the questionnaire. All participants were fully briefed about the research before giving their informed consent to participate as a volunteer. Potential participants who chose to abstain from the research were not disadvantaged or discriminated against in any way. Similarly, those who did participate were not rewarded or advantaged in any way; this being the same for the Psychology participants, or non-participants.

A completed and returned questionnaire was regarded as permission and consent from the volunteer to the researcher to utilise that data. Anonymity was guaranteed, and no individually identifying information was requested from any volunteer, at any point during the data collection. Thus, no individual scoring or feedback was provided about an individual's performance on the modified NEO-PI-3. Students were informed that no individual feedback will be provided as the research is only investigating group trends and norms within the sample as a whole, and that information regarding the study will only be available in November 2010 on the department's website:

(<http://www.wits.ac.za/Humanities/Umthombo/psychology/index.html>)

The volunteers were instructed to keep the cover sheet that was attached to the questionnaire. The researcher addressed all queries regarding the research, and encouraged volunteers to contact him if any queries or uncertainties arose.

2.11: Data Analysis

2.11.1: Phase A

Phase A involved a fairly complicated iterative process of firstly identifying potentially problematic items, as based on previous research and the two Lecturer Surveys, and then changing and modifying the items to be more applicable to a South African context. This process also involved getting approval for the changes made from Professor McCrae and PAR.

Stage 1 of Phase A involved a review of previous research done on the NEO-PI-R's applicability within the South African context. This review included looking at the findings concluded by McCrae, Costa and Martin (2004), Franklin (2009), and Laher's (2010) research. In addition to these findings, the first Lecturer Survey conducted, provided further evidence for the items that seemed to emerge as being most problematic for a South African context. This process generated a list of potentially problematic items within both the NEO-PI-R and the NEO-PI-3 for the South African context.

Stage 2 involved using the findings from **Stage 1** and specifically surveying these items on a small sample of 12 university lecturers at the University of the Witwatersrand asking them to further identify the *most* problematic items. This process comprised the Lecturer Survey (No.2). Using this information gathered from the lecturers, a final list of 'problematic items' was decided upon, including comments on whether or not any of the new NEO-PI-3 items were seen as problematic.

Stage 3 involved an extensive analysis of each of the problematic items as identified in **Stage 2** and deciding upon suitable alternatives as evidenced through the perceived problem with the item, either linguistically or culturally within a South African context. This process also included an analysis of whether or not the new NEO-PI-3 items were deemed as appropriate in a South African context or not, and deciding upon further alternatives in the case of problematic NEO-PI-3 items. The items were changed by keeping a close reference to the definition of the domain and facets as set out by the NEO-PI-R professional Manual by Costa and McCrae (1992), without losing the essence of the item. This manual formed the test's specification and guided the process of item adaptation. The items were adapted by focusing on the cultural and linguistic aspects of the item. The *spirit* of the item was retained and adapted to become more culturally and linguistically relevant and appropriate for the South African context in terms of the language used in the item. A final list of inappropriate items for the South African context was decided upon, which included proposed alternatives to the problematic items.

Finally, **Stage 4** involved sending this final list of 'problematic items' and their decided alternatives to Professor McCrae in the United States, as well as PAR, and asking for approval and comments on the changes to be made to each problematic item.

2.11.2: Phase B

Once the modifications and changes to the problematic items had been made, a modified version of the NEO-PI-3 was generated to be piloted in the South African context. **Phase B** involved the actual piloting of this new adapted version of the NEO-PI-3, including all the modified items, upon a sample of South African students at the University of the Witwatersrand. Tests were then conducted on the completed questionnaires to measure the questionnaires validity and reliability. In addition, feedback was given on whether or not the participants in the sample felt the items in the modified NEO-PI-3 were problematic, either linguistically or culturally in the South African context. This feedback was done via both closed ended 'ticking' of the item, or

through the open-ended questions at the end of the questionnaire¹⁸. This process allowed the researcher to further explore any problematic items that still existed in the questionnaire as based on the participant's feedback. The following 4 sections detail the specific analyses that took place in **Phase B**, and why they were necessary to conduct.

2.11.2.1. Descriptive Statistics

Means, ranges, standard deviations and skewness coefficients (Huck, 2004) were obtained for all the interval data variables, which included all the personality domain and facet scales as well as the variable age. Frequencies were calculated for all the nominal variables (gender, religious affiliation, home language, population group, English comprehension and reading, test-wiseness and whether or not the participant had ever taken a psychological test before). The nominal variables were used for only descriptive purposes allowing the researcher to gain a richer understanding of the participant's demographic composition and English ability.

2.11.2.2. Internal Consistency Reliabilities

Internal consistency reliability coefficients (Cramer, 2003) were calculated for the modified NEO-PI-3 using Cronbach Alpha coefficients. This measure of reliability assesses the degree to which the different parts of the instrument measure the same construct, by calculating inter-item correlations (Murphy & Davidshofer, 2005). This analysis assessed the reliability of the modified version of the NEO-PI-3.

2.11.2.3. Factor Analysis

In terms of the primary focus behind this study, the main impetus regarding the evaluation of this modified NEO-PI-3 involved an evaluation of this instrument's construct validity. The modified NEO-PI-3 was subjected to an exploratory factor

¹⁸ see **Appendix G**

analysis using a principal components analysis with varimax rotation. Principal components analysis was used since it is a simple but effective method of determining factors that explains all the variance including the error variance in any particular correlation matrix. Varimax rotation was utilized, aiming to maximise the sum of variances of squared loadings in the columns of the factor matrix. Principal components analysis with varimax rotation is also the method utilised by the developers of the NEO-PI-R (Costa & McCrae, 1992). This process of factor analysis allowed the researcher to assess the number of factors evident in the modified version of the NEO-PI-3, and comment on whether or not the five factors emerged within the instrument.

2.11.2.4. *Thematic Content Analysis*

The issue of item relevance and appropriateness for the South African context was looked at by analysing the responses given by the participants to the open and closed ended questions contained in the questionnaire. The participants had the opportunity to assess each item's cultural and linguistic appropriateness for the South African context by either ticking the item, deeming it inappropriate, or commenting on the item in the open-ended questions at the end of the questionnaire. In addition, the final open-ended question within the questionnaire asked the participants to comment on what they thought the questionnaire was measuring, allowing the researcher to assess the face validity of the questionnaire. Responses to these items were analysed using basic content analysis (Braun & Clarke, 2006).

In the Chapter to follow, the results and discussion of the study's data will be explored and reported on. For each section, the results pertaining to each part of the study will first be presented, followed by a discussion of the results.

Chapter 3: Results and Discussion

The following results and discussion section will be outlined according to the two Phases that occurred within the study; **Phase A** and **Phase B**. As a general point of clarification, **Table 3.1** below, outlines and abbreviates each domain and facet within the NEO-PI-3. This table is to be used as a point of reference in terms of comprehending the results and corresponding discussion that follows throughout this chapter.

Table 3.1
Five Factor Model Domain and Facet Scales

Neuroticism (N)			
Anxiety	(N1)	Angry-Hostility	(N2)
Depression	(N3)	Self-consciousness	(N4)
Impulsiveness	(N5)	Vulnerability	(N6)
Extraversion (E)			
Warmth	(E1)	Gregariousness	(E2)
Assertiveness	(E3)	Activity	(E4)
Excitement-seeking	(E5)	Positive Emotions	(E6)
Openness to Experience (O)			
Fantasy	(O1)	Aesthetics	(O2)
Feelings	(O3)	Actions	(O4)
Ideas	(O5)	Values	(O6)
Agreeableness (A)			
Trust	(A1)	Straightforwardness	(A2)
Altruism	(A3)	Compliance	(A4)
Modesty	(A5)	Tender-Mindedness	(A6)
Conscientiousness (c)			
Competence	(C1)	Order	(C2)
Dutifulness	(C3)	Achievement Striving	(C4)
Self-Discipline	(C5)	Deliberation	(C6)

3.1: Phase A

Stage 1 of **Phase A** involved the initial generation of the list of potentially problematic items within the NEO-PI-R. This process of generating the list of potentially problematic

items in the NEO-PI-R involved collating the findings from previous studies by McCrae, Costa and Martin (2004), Franklin, (2009) and Laher, (2010), and tabulating the data in order to assess which items seem to be most problematic. In addition, the findings from Lecturer Survey (No.1) were included in this list so as to add further data of potentially problematic items in the NEO-PI-R.

The Lecturer Survey (No.1) involved approaching 5 lecturers at the University of the Witwatersrand and asking them to comment on each of the NEO-PI-R's items in terms of their applicability to the South African context, both culturally and linguistically. Even though the lecturers participating in this survey commented on the cultural and linguistic applicability of each item, the resultant score as presented in **Table 3.2** represents a combined score, summarising both the problematic linguistic and cultural items into a single overall score. The result is that the score for this Lecturer Survey (No.1) does not distinguish between whether or not the lecturer found the item linguistically problematic or culturally problematic, only that the lecturer found the item problematic in some way.

Within this survey, 102 items within the NEO-PI-R were identified by at least one of the 5 lecturers as being problematic. However, this survey involved a very small sample that was asked specifically to identify problematic items within the NEO-PI-R either linguistically or culturally. The result was that there was most likely an over representation of problematic items within the NEO-PI-R as professed by the lecturers within this sample. The lecturers within this sample are all highly educated people, representing a very particular demographic of people within the South African context. As such, the researcher assumed that the lecturers within the sample would possibly be over critical of the items within the NEO-PI-R, as they were specifically looking for problematic items from an academic perspective. As such, the researcher decided to look primarily at the items that were identified by at least 2 of the lecturers as being problematic, and more closely at the items where 3 or more of the 5 lecturers identified the item as being problematic. The results of this Lecturer Survey indicated that 48 items were identified as being problematic by at least 2 of the 5 lecturers in the sample, and 26 items were identified as being potentially problematic by at least 3 of the 5

lecturers participating in the survey (see **Table 3.2** below). Of the 48 items identified as being problematic by at least 2 of the 5 lecturers within the survey, 10 were from the Neuroticism domain, 13 from the Extraversion domain, 10 from the Openness to Experience domain, 9 from the Agreeableness domain, and 6 were from the Conscientiousness domain. The result is that approximately the same number of problematic items appeared to come from the N, O and A domains, while the C domain only had 6 potentially problematic items, and the E Domain had 13. Therefore, at a preliminary glance, the Lecturer Survey (No.1) seems to suggest that the most problematic domain in terms of the South African context, appears to be Extraversion, with Conscientiousness being the least problematic from this very basic initial survey. In terms of the facet with the most problematic items, Positive Emotions (E6) contained 4 problematic items, followed by Activity (E4), Excitement-Seeking (E5), and Altruism (A3), all containing 3 problematic items. This again seems to suggest that the Extraversion domain comes across as being most problematic domain for the South African context.

Franklin (2009) found a perceived presence of American socio-cultural references within the use of language, grammar and socio-cultural context in the NEO-PI-R. Franklin's (2009) results show evidence of inappropriate language used in the NEO-PI-R, and subsequently identified a number of items within the inventory through both her quantitative and qualitative analyses that are especially problematic for a South African user group. Within the quantitative analysis of Franklin's (2009) study, Franklin (2009) identified 32 items that were problematic within the South African context. Of these 32 problematic items, 11 were significant at the 5% level, while 21 items were significant at the 10% level of significance (see **Table 3.2** below). Within Franklin's (2009) qualitative analysis, Franklin (2009) identified 26 problematic items as concluded through her thematic content analysis. These 26 items only overlapped on 4 of the items identified in her quantitative analysis, and therefore represent a further 22 problematic items unrecognised in her quantitative analysis. Therefore, Franklin (2009) identified a total of 54 potentially problematic items within the NEO-PI-R for the South African context, through both her quantitative and qualitative analyses.

In terms of the domains from which these 54 problematic items came from, 10 came from N, 14 from E, 9 from O, 12 from A and 9 from C. In agreement with the Lecturer Survey (No.1), the most problematic domain within the South African context appeared to be Extraversion. This problematic domain is followed by Agreeableness, Neuroticism, Openness to Experience and finally Conscientiousness. The least problematic domain, being Conscientiousness, is also in agreement with the Lecturer Survey (No.1). The most problematic facets are represented by Activity (E4), Positive Emotions (E6), Tender-Mindedness (A6) and Competence (C1), all having 4 problematic items in their respective facets. Other facets that were seen as problematic within Franklin's (2009) study are Anxiety (N1), Excitement-Seeking (E5), Aesthetics (O2), and Straightforwardness (A2), each containing 3 problematic items. Again, Extraversion seems to emerge as the most problematic domain when looking at the problematic facets.

As identified through a preliminary analysis of Laher's (2010) results, 9 items within the NEO-PI-R were identified as being problematic by at least 2% of her sample of 425 students (see **Table 3.2** below for which items were problematic). Even though 45 items were identified by at least one of the participants in her study as being problematic for a South African context, the 9 items that had at least 9 participants identifying the item as being problematic are of most importance to the current study. The 2% 'cut-off' in terms of looking at potentially problematic items was decided upon as in congruence with McCrae, Costa and Martin's (2004) study, where they too made the 'cut-off' in terms of addressing problematic items when more than 2 % of their sample indicated that a particular item was problematic. As such, the same '2%' rule was applied throughout the current study. In terms of the domains from which these 9 problematic items identified within this study came from, 1 came from N (Anxiety), 1 from E (Excitement-Seeking), 4 from A (2 from Straightforwardness, 2 from Tender-Mindedness), 3 from C (Order, Dutifulness and Achievement Striving) and 0 from O. As such, the domain which seems to have the most problematic items comes from A, followed by C.

Excitement-Seeking (E5) was also seen as highly problematic in the Lecturer Survey (No.1), while Franklin (2009) also found Tender-Mindedness (A6), Anxiety (N1), Excitement Seeking (E5) and Straightforwardness (A2) to be problematic in her study. Excitement-Seeking (E5) was found to be problematic in Franklin (2009), Laher (2010) and the Lecturer Survey (No.1). Similar results were reported in a study by Piedmont et al. (2002) in which Extraversion (particularly Excitement-Seeking) was most problematic. However, Piedmont (2002) also found the Openness to Experience Domain to be highly problematic, particularly the Values facet (O6), which didn't emerge to be as problematic in the above mentioned South African studies.

Generally, Extraversion as well as Agreeableness seemed to emerge from Franklin (2009), Laher (2010) and the Lecturer Survey (No.1) studies as being the most problematic, with Conscientiousness arguably being the least problematic. One must understand this statement as being a broad, general statement, based on a basic survey of the above mentioned studies and survey. However, in Rolland's (2002) review of research on the NEO-PI-R and the generalisability of the FFM across 16 various Western and East European cultures, the results showed that the cross-cultural generalisability of N, O and C is relatively good, while E and A are much more sensitive to cultural and lingual influences. The results discussed thus far are in agreement with Rolland's (2002) study.

In 2004, McCrae, Costa and Martin revised the NEO-PI-R to become linguistically a more readable and understandable version of the instrument. These researchers realised that many of the 240 items within the inventory were difficult to understand, and hence replaced 37 items with more linguistically simpler versions. These researchers had originally identified 48 items as being potentially problematic, but only changed 37. The new inventory, the NEO-PI-3 has made good improvement in making the original NEO-PI-R more understandable and readable; however, it is still an American inventory containing American linguistic idiosyncrasies and cultural references. The 37 item changes represent 6 changes to the N domain, 6 to the E domain, 6 to the O domain, 8 to the A domain, and 11 to the C domain. As such, the authors of the NEO-PI-3 felt that

the C domain was the most problematic, followed by the A domain. Interestingly, the South African studies mentioned above found the C domain to be the least problematic, indicative of possible cultural differences between the South African samples used in the above mentioned studies, and the American sample used in McCrae, Costa and Martin (2004) study. The authors of the NEO-PI-3 found the Tender-Mindedness (A6) and the Competence (C1) facets as being most problematic, with 4 item changes in each facet. These two problematic facets were followed by Self-Consciousness (N4), Values (O6), Order (C2), and Dutifulness (C3) all needing 3 item changes according to McCrae, Costa and Martin (2004). In terms of congruence with this study and the South African studies mentioned above, Franklin (2009) also found Tender-Mindedness (A6) and Competence (C1) as being the most problematic, also indicating that 4 changes should be needed to each facet respectively. Laher (2010) also found the facet Tender-Mindedness (A6), Order (C2) and Dutifulness (C3) to be problematic in her study.

Of the 37 items identified as problematic within the NEO-PI-3, Franklin (2009) only overlapped on 17 of the 37 in her research within a South African context. This still leaves 20 items that Franklin (2009) identified as problematic within a South African context that the authors of the NEO-PI-3 didn't change. If one combines both pieces of research from the NEO-PI-3 and Franklin (2009), there are 75 items out of the original 240 items from the NEO-PI-R that have been identified as being problematic, within South Africa and America, which makes 31% of the NEO-PI-R being potentially problematic. In terms of a strict South African audience, as based on Franklin's (2009) research, an additional 37 items from the NEO-PI-3 are still problematic, resulting in 15% of the NEO-PI-3's items potentially still being problematic in a South African context.

Of the 9 most problematic items as identified by Laher (2010), the NEO-PI-3 only changed 6 of them, leaving 3 unchanged. In total, of the 45 items identified by at least one participant in Laher's (2010) study, the NEO-PI-3 changed only 19 of these items, leaving 26 unchanged. In addition, finding from the Lecturer Survey (No.1) indicated that there were 105 items identified by at least one of the lecturers as problematic,

indicative of the suggestion that there exists a large number of items within the NEO-PI-R that are potentially problematic in the South African context, that still haven't been addressed within the NEO-PI-3.

In summary, there were 130 items that were identified as being problematic in terms of language or culture by McCrae, Costa and Martin's (2004), Franklin's (2009), Laher's (2010) study and the Lecturer Survey (No.1) combined (see **Table 3.2** below). These 130 items are displayed below in **Table 3.2** with the results from each study detailed next to each item.

Table 3.2
Cross Tabulation of the Potentially Problematic Items identified in the first Lecturer Survey, Previous Research on NEO-PI-R's applicability in the South African Context, as well as the NEO-PI-3 results.

Number	Item	Facet	Domain	Lecturer Survey (No.1) Number of lecturers that found the item from the NEO-PI-R problematic (n=5)	Laher (2010) % problematic. (n=425)	Franklin (2009) Research Quantitative (n=28) (showing p-value)	Franklin (2009) Research Qualitative (n=10) Y=problematic	NEO-PI-3 Y=NEO-PI-3 changes
1	1	Anxiety	N1	1	.	.	.	.
2	61	Anxiety	N1	2	0.4	0.05	.	.
3	91	Anxiety	N1	3	0.4	.	.	.
4	121	Anxiety	N1	1	2.6	0.05	Y	Y
5	211	Anxiety	N1	.	.	0.00*	.	.
6	66	Angry Hostility	N2	3	.	.	.	.
7	96	Angry Hostility	N2	1	0.7	.	.	.
8	156	Angry Hostility	N2	1	.	.	.	.
9	186	Angry Hostility	N2	3	.	.	.	.
10	11	Depression	N3	4	.	.	.	.
11	71	Depression	N3	1	0.4	.	.	.
12	101	Depression	N3	1	1	.	.	.
13	131	Depression	N3	.	.	0.07	.	.
14	161	Depression	N3	.	.	0.08	.	.
15	191	Depression	N3	2	.	.	.	.
16	221	Depression	N3	1	.	.	.	.
17	16	Self-Consciousness	N4	3	1.7	0.09	Y	Y
18	106	Self-Consciousness	N4	1	.	0.07	.	.
19	136	Self-Consciousness	N4	.	.	.	.	Y
20	226	Self-Consciousness	N4	.	.	.	.	Y
21	21	Impulsiveness	N5	1	.	0.04*	.	Y
22	81	Impulsiveness	N5	.	0.4	.	.	Y
23	171	Impulsiveness	N5	2	0.7	0.02*	.	.
24	26	Vulnerability	N6	1	.	.	.	.
25	86	Vulnerability	N6	3	.	0.07	.	.

26	116	Vulnerability	N6	3	.	.	.	.
27	236	Vulnerability	N6	1	.	.	.	.
28	62	Warmth	E1	1	.	.	.	.
29	92	Warmth	E1	2	0.2	.	.	.
30	212	Warmth	E1	.	.	0.05	.	.
31	7	Gregariousness	E2	1	.	.	.	.
32	157	Gregariousness	E2	4	0.2	.	Y	.
33	217	Gregariousness	E2	.	.	0.04*	.	.
34	12	Assertiveness	E3	2	0.7	.	.	.
35	42	Assertiveness	E3	.	.	.	.	Y
36	17	Activity	E4	2	.	.	.	Y
37	47	Activity	E4	2	1	.	Y	Y
38	77	Activity	E4	.	.	0.06	.	.
39	137	Activity	E4	2	.	.	.	.
40	167	Activity	E4	.	.	0.05	.	.
41	197	Activity	E4	1	0.2	0.01*	.	.
42	22	Excitement-Seeking	E5	1	.	.	.	.
43	52	Excitement-Seeking	E5	5	2.4	.	Y	.
44	82	Excitement-Seeking	E5	4	.	.	.	.
45	112	Excitement-Seeking	E5	1	.	0.07	Y	.
46	172	Excitement-Seeking	E5	2	0.2	.	Y	.
47	202	Excitement-Seeking	E5	1	0.2	.	.	Y
48	27	Positive Emotions	E6	3	0.2	.	Y	.
49	57	Positive Emotions	E6	1	1	.	.	Y
50	87	Positive Emotions	E6	1	0.7	.	.	.
51	117	Positive Emotions	E6	3	0.2	.	Y	.
52	147	Positive Emotions	E6	.	1	.	Y	Y
53	177	Positive Emotions	E6	2	.	.	.	.
54	207	Positive Emotions	E6	2	.	.	.	.
55	237	Positive Emotions	E6	.	.	0.03*	.	.
56	33	Fantasy	O1	3	.	.	.	.
57	63	Fantasy	O1	1	.	.	.	.
58	153	Fantasy	O1	1	.	.	.	.
59	183	Fantasy	O1	2	.	.	.	.
60	8	Aesthetics	O2	4	.	0.02*	.	Y
61	68	Aesthetics	O2	.	.	0.05	.	.
62	98	Aesthetics	O2	2	.	.	.	.
63	128	Aesthetics	O2	1	.	0.05	.	.
64	188	Aesthetics	O2	1	.	.	.	.
65	218	Aesthetics	O2	1	.	.	.	.
66	166	Feelings	O3	.	.	0.08	.	.
67	193	Feelings	O3	1	.	.	.	.
68	223	Feelings	O3	2	.	0.05	.	.
69	18	Actions	O4	1	.	.	.	.
70	78	Actions	O4	.	.	.	.	Y
71	108	Actions	O4	1	.	0.04*	.	.
72	168	Actions	O4	.	.	.	.	Y
73	198	Actions	O4	3	.	.	Y	.
74	53	Ideas	O5	1	.	.	.	.
75	143	Ideas	O5	5	.	.	Y	.
76	173	Ideas	O5	2	.	.	.	.
77	203	Ideas	O5	1	.	.	.	.
78	28	Values	O6	2	.	.	.	.
79	58	Values	O6	1	.	.	.	.
80	118	Values	O6	.	.	.	.	Y
81	148	Values	O6	.	.	.	.	Y
82	178	Values	O6	1	.	.	.	.
83	238	Values	O6	3	.	.	Y	Y
84	4	Trust	A1	3	0.7	0.05	.	Y
85	94	Trust	A1	1	.	.	.	.
86	9	Straightforwardness	A2	3	5.2	0.02*	Y	.
87	99	Straightforwardness	A2	1	.	.	.	.
88	129	Straightforwardness	A2	1	.	.	.	.
89	189	Straightforwardness	A2	1	0.4	0.05	.	.
90	219	Straightforwardness	A2	2	2.4	.	Y	Y
91	14	Altruism	A3	4	0.7	.	.	.

92	44	Altruism	A3	2	0.7	0.04*	.	.
93	74	Altruism	A3	2	0.4	.	.	.
94	194	Altruism	A3	1	.	.	.	.
95	49	Compliance	A4	2	0.4	.	Y	.
96	199	Compliance	A4	1	0.7	.	.	.
97	229	Compliance	A4	1	.	.	.	Y
98	24	Modesty	A5	1	.	.	.	.
99	84	Modesty	A5	.	0.7	.	Y	.
100	114	Modesty	A5	1	.	.	.	Y
101	174	Modesty	A5	.	.	.	Y	.
102	29	Tender-Mindedness	A6	1	0.4	.	.	Y
103	59	Tender-Mindedness	A6	1	0.2	.	Y	Y
104	119	Tender-Mindedness	A6	5	30	.	Y	Y
105	149	Tender-Mindedness	A6	1	1	.	Y	Y
106	239	Tender-Mindedness	A6	3	2.4	.	Y	.
107	5	Competence	C1	4	1.4	.	Y	Y
108	35	Competence	C1	2	.	.	.	Y
109	95	Competence	C1	.	.	0.06	.	.
110	125	Competence	C1	1	.	0.05	.	Y
111	155	Competence	C1	1	.	0.07	.	.
112	185	Competence	C1	.	.	.	.	Y
113	215	Competence	C1	1	.	.	.	.
114	10	Order	C2	.	.	.	.	Y
115	70	Order	C2	.	1.4	.	.	Y
116	160	Order	C2	3	16.7	.	Y	Y
117	190	Order	C2	1	0.7	.	.	.
118	15	Dutifulness	C3	2	0.4	.	.	.
119	45	Dutifulness	C3	1	.	.	.	.
120	105	Dutifulness	C3	4	2.6	.	Y	Y
121	165	Dutifulness	C3	1	.	.	.	Y
122	225	Dutifulness	C3	.	.	.	.	Y
123	20	Achievement Striving	C4	5	15.8	.	Y	Y
124	80	Achievement-Striving	C4	1	0.4	.	.	.
125	230	Achievement-Striving	C4	1	.	.	.	.
126	25	Self-Discipline	C5	1	.	.	.	.
127	115	Self-Discipline	C5	.	.	0.07	.	.
128	235	Self-Discipline	C5	1	.	.	.	.
129	30	Deliberation	C6	.	.	0.04*	.	.
130	150	Deliberation	C6	1	.	.	.	.

For Franklin (2009) Quantitative—significant at $p < 0.01$ * significant at $p < 0.05$

The emphasis behind **Stage 1** of the current study was not to necessarily identify the most problematic Domain or Facet within the NEO-PI-R, but to rather focus on the individual items within the NEO-PI-R from a South African perspective. As is evident from the above discussion and **Table 3.2**, there were many similarities and discrepancies between the studies mentioned in terms of which items they found most problematic. As is evident from **Table 3.2**, some items are clearly problematic, such as Item 119, or Item 20, from both a South African perspective and an American one. Some other items however, such as Item 9 or Item 52 are also clearly problematic, but only from a South African perspective. The challenge now was to decide which items had enough supporting evidence to warrant the item needing to be changed as informed by the data in **Table 3.2**. However, before this process could take place, the

researcher of the current study, needed to ascertain the reception of the new 37 NEO-PI-3 items within a South African context. As such, **Stage 2** was established, which involved the second Lecturer Survey (No.2).

Stage 2 of Phase A involved the surveying of the above tabulated 130 problematic NEO-PI-R items as identified in **Stage 1**, as well as the 37 new items from the NEO-PI-3 on another lecturer sample of 12 lecturers at the University of the Witwatersrand. This process was called the Lecturer Survey (No.2), and was in effect a very similar procedure as the first Lecturer Survey (No.1). This survey was necessary, as one could not assume that the new 37 items as generated in the NEO-PI-3 would be appropriate for the South African context, even with their linguistic revisions. The lecturers again commented on the criteria of cultural and linguistic appropriateness of the item within the South African context. This second Lecturer Survey not only surveyed the problematic items from the NEO-PI-R once again, but also added commentary on the appropriateness of the 37 new NEO-PI-3 items within the South African context, something which the previous studies had not. Once the responses were received from the lecturers, all the available data on the various item's applicability within the South African context was again tabulated and analysed (see **Table 3.3** below). The results from the Lecturer Survey (No.2) were split into whether or not the lecturer participant found the item linguistically inappropriate or culturally inappropriate. If one summarises the results in terms of whether or not at least 3 lecturers from this sample (25%) found an item problematic, either linguistically or culturally, then 59 items out of the 130 potentially problematic items from the NEO-PI-R were identified by this sample as being problematic. In particular, 11 of these problematic items came from the N domain, 14 from the E domain, 12 from the O domain, 13 from the A domain, and 9 from the C domain. Again, the Conscientiousness domain seems to emerge as being the least problematic within a South African context. In terms of the most problematic facets, Positive Emotion (E6) emerged as the most problematic, with 6 problematic items. This facet was followed by Aesthetics (O2) with 4 problematic items identified, and then Angry Hostility (N2), Depression (N3), Excitement-Seeking (E5), Fantasy (O1), Straightforwardness (A2), Altruism (A3), Tender-Mindedness (A6), and Achievement

Striving (C4), all with 3 problematic items.

Of the 37 new items from the NEO-PI-3 asked within the Lecturer Survey (No.2), 6 items were found to be problematic by at least 25% of the 12 lecturers. In terms of these 6 items, 1 problematic item came from each of the domains E and A, and 2 problematic items came from both O and C. The two problematic items from O both came from Actions (O4), as well as both problematic items from C coming from Order (C2).

As is evident from the above discussion, the delineations on determining whether or not an item, facet or domain is deemed to be problematic are largely arbitrarily decided. The point of the above discussion is mainly to gain some insights into which of the domains and facets within the NEO-PI-3 are problematic, so as to guide the revision process involved in the adaptation of the items. So as to not bias any of the above studies, a cross tabulation of all the existing evidence gathered up to this point on the NEO-PI-3's items was constructed so as to visually illuminate which items need revision (see **Table 3.3** below). As based on the available evidence supporting each item's applicability within the South African context, a decision was made deeming the item worthy of revision or not. The evidence gathered thus far on each item in terms of it being identified as being problematic was supplied by Franklin, (2009), Laher, (2010), McCrae, Costa and Martin, (2004) and the two Lecturer Surveys. More generally, an item was adapted if most of the prior research from the above mentioned studies had indicated that the item was problematic.

The process of deciding whether or not an item should be revised was based on each individual item's case. There was no predefined rule or structure was set in place to orchestrate the process and as such the process was one of iteration and discussion between the researcher and the researcher's supervisor within the current study. Some of the decisions that were taken in terms of deciding on whether or not an item should be changed also revolved around whether or not the researcher of the current study could articulate a more appropriate item for that particular potentially problematic item. In some cases, even if the item was seen as being potentially problematic, but that no

appropriate alternative could be generated, the item was left unchanged. See **Table 3.3** below for a summary of all the research discussed above and whether or not a revision of the item was deemed necessary. If the item was seen as problematic in terms of the NEO-PI-R version of the item, and not in terms of the NEO-PI-3 version of the item, then the NEO-PI-3 item was ‘accepted’ as being an appropriate alternative, as highlighted in red in **Table 3.3**. In some cases however, the original NEO-PI-R item was seen as unproblematic, while the equivalent NEO-PI-3 was seen as being problematic. In such cases, the original NEO-PI-R was decided as being appropriate for the South African context, as highlighted in blue in **Table 3.3**. Finally, in some other cases, neither the NEO-PI-R item, nor the NEO-PI-3 alternative item were seen as being applicable for the South African context. In such cases, an entirely new item was needed to be generated as highlighted in green in **Table 3.3**.

Table 3.3

*Cross Tabulation of research on the NEO-PI-R and the NEO-PI-3 and decision to change item
(Items 1 - 130 are from the NEO-PI-R; items 131 – 167 are from the NEO-PI-3)*

No.	Item No.	Facet	Domain	Item	A. Lecturer Survey (No.1)	B. Laher (2010)	C. Franklin (2009)	D. Franklin (2009)	E. NEO-PI-3	F. Lecturer Survey (No.2)	G. Lecturer Survey (No.2)	H. Identified Problem/ or accept NEO-PI-3	I. Decision
1	1	Anxiety	N1	I am not a worrier.	1	.	.	.	.	1	1	No change	N
2	61	Anxiety	N1	I rarely feel fearful or anxious.	2	0.4	0.05	.	.	1	.	No Change	N
3	91	Anxiety	N1	I often feel tense and jittery.	3	0.4	.	.	.	3	.	'jittery'	Y
4	121	Anxiety	N1	I'm seldom apprehensive about the future.	1	2.6	0.05	Y	Y	4	.	Accept NEO-PI-3	Y
5	211	Anxiety	N1	Frightening thoughts sometimes come to my head.	.	.	0.00*	.	.	1	.	No Change	N
6	66	Angry Hostility	N2	I am known as hot-blooded and quick-tempered.	3	.	.	.	.	6	.	'hot-blooded'	Y
7	96	Angry Hostility	N2	I am not considered a touchy or temperamental person.	1	0.7	.	.	.	4	.	'touchy'; 'temperamental'	Y
8	156	Angry Hostility	N2	It takes a lot to get me mad.	1	.	.	.	.	2	1	'mad'	Y
9	186	Angry Hostility	N2	At times I have felt bitter and resentful.	3	.	.	.	.	1	.	No Change	N
10	11	Depression	N3	I rarely feel lonely or blue.	4	.	.	.	.	3	1	'blue'; double barreled	Y
11	71	Depression	N3	I am seldom sad or	1	0.4	.	.	.	1	.	No Change	N

12	101	Depression	N3	depressed. I have sometimes experienced a deep sense of guilt or sinfulness.	1	1	.	.	.	2	1	No Change	N
13	131	Depression	N3	I tend to blame myself when anything goes wrong.	.	.	0.07	.	.	.	.	No Change	N
14	161	Depression	N3	I have a low opinion of myself.	.	.	0.08	.	.	.	.	No Change	N
15	191	Depression	N3	Sometimes things look pretty bleak and hopeless to me.	2	.	.	.	.	3	.	'bleak'	Y
16	221	Depression	N3	Too often, when things go wrong, I get discouraged and feel like giving up.	1	.	.	.	.	1	.	No Change	N
17	16	Self-Consciousness	N4	In dealing with other people, I always dread making a social blunder.	3	1.7	0.09	Y	Y	4	.	Accept NEO-PI-3	Y
18	106	Self-Consciousness	N4	It doesn't embarrass me too much if people ridicule and tease me.	1	.	0.07	.	.	2	.	No Change	N
19	136	Self-Consciousness	N4	I often feel inferior to others.	.	.	.	.	Y	.	.	Accept NEO-PI-3	Y
20	226	Self-Consciousness	N4	When people I know do foolish things, I get embarrassed for them.	.	.	.	.	Y	.	.	Accept NEO-PI-3	Y
21	21	Impulsiveness	N5	I rarely overindulge in anything.	1	.	0.04*	.	Y	.	.	Accept NEO-PI-3	Y
22	81	Impulsiveness	N5	I have little difficulty resisting temptation.	.	0.4	.	.	Y	.	.	Accept NEO-PI-3	Y
23	171	Impulsiveness	N5	I sometimes eat myself sick.	2	0.7	0.02*	.	.	3	.	'eat myself sick'	Y
24	26	Vulnerability	N6	I often feel helpless and want someone else to solve my problems.	1	.	.	.	.	.	2	No Change	N
25	86	Vulnerability	N6	When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.	3	.	0.07	.	.	2	.	'going to pieces'	Y
26	116	Vulnerability	N6	I keep a cool head in emergencies.	3	.	.	.	.	4	.	'cool head'	Y
27	236	Vulnerability	N6	I'm pretty stable emotionally.	1	.	.	.	.	1	.	No Change	N
28	62	Warmth	E1	I'm known as a warm and friendly person.	1	.	.	.	.	2	.	No Change	N
29	92	Warmth	E1	Many people think of me as somewhat cold and distant.	2	0.2	.	.	.	3	.	'cold'	Y
30	212	Warmth	E1	I take a personal interest in the people I work with.	.	.	0.05	.	.	.	.	No Change	N
31	7	Gregariousness	E2	I shy away from crowds of people.	1	.	.	.	.	2	1	'shy'	Y
32	157	Gregariousness	E2	I'd rather vacation at a popular beach than an isolated cabin in the woods.	4	0.2	.	Y	.	2	6	'vacation'; 'isolated cabin in the woods'	Y
33	217	Gregariousness	E2	I enjoy parties with lots of people.	.	.	0.04*	.	.	.	.	No Change	N
34	12	Assertiveness	E3	I am dominant, forceful and assertive.	2	0.7	.	.	.	1	.	No Change	N
35	42	Assertiveness	E3	I sometimes fail to assert myself as much as I should.	.	.	.	.	Y	.	1	Accept NEO-PI-3	Y
36	17	Activity	E4	I have a leisurely style in work and play.	2	.	.	.	Y	2	.	'leisurely' – (NEO-PI-R) 'Laid-Back' – (NEO-PI-3)	Y
37	47	Activity	E4	When I do things, I do them vigorously.	2	1	.	Y	Y	4	.	Accept NEO-PI-3	Y
38	77	Activity	E4	My work is likely to be slow but steady.	.	.	0.06	.	.	.	1	No Change	N

39	137	Activity	E4	I'm not as quick and lively as other people.	2	.	.	.	.	2	.	No Change	N
40	167	Activity	E4	I usually seem to be in a hurry.	.	.	0.05	.	.	.	.	No Change	N
41	197	Activity	E4	My life is fast-paced.	1	0.2	0.01*	.	.	3	.	'fast-paced'	Y
42	22	Excitement-Seeking	E5	I often crave excitement.	1	.	.	.	.	1	.	No Change	N
43	52	Excitement-Seeking	E5	I wouldn't enjoy vacationing in Las Vegas.	5	2.4	.	Y	.	3	11	'vacationing'; 'Las Vegas'	Y
44	82	Excitement-Seeking	E5	I have sometimes done things just for "kicks" or "thrills."	4	.	.	.	.	3	.	'kicks'; thrills'	Y
45	112	Excitement-Seeking	E5	I tend to avoid movies that are shocking or scary.	1	.	0.07	Y	.	1	.	No Change	N
46	172	Excitement-Seeking	E5	I love the excitement of roller coasters.	2	0.2	.	Y	.	.	5	'excitement of roller coasters'	Y
47	202	Excitement-Seeking	E5	I'm attracted to bright colours and flashy styles.	1	0.2	.	.	Y	1	1	Accept NEO-PI-3	Y
48	27	Positive Emotions	E6	I have never literally jumped for joy.	3	0.2	.	Y	.	2	3	'jumped for joy'	Y
49	57	Positive Emotions	E6	I have sometimes experienced intense joy or ecstasy.	1	1	.	.	Y	2	.	Accept NEO-PI-3	Y
50	87	Positive Emotions	E6	I am not a cheerful optimist.	1	0.7	.	.	.	3	.	'optimist'	Y
51	117	Positive Emotions	E6	Sometimes I bubble with happiness.	3	0.2	.	Y	.	5	.	'bubble'	Y
52	147	Positive Emotions	E6	I don't consider myself especially "light-hearted."	.	1	.	Y	Y	5	.	'light-hearted' - (NEO-PI-R); 'happy-go-lucky' (NEO-PI-3)	Y
53	177	Positive Emotions	E6	I am a cheerful, high-spirited person.	2	.	.	.	.	3	.	'high-spirited'	Y
54	207	Positive Emotions	E6	I rarely use words like "fantastic!" or "sensational!" to describe my experiences.	2	.	.	.	.	3	2	'fantastic'; 'sensational'	Y
55	237	Positive Emotions	E6	I laugh easily.	.	.	0.03*	.	.	.	.	No Change	N
56	33	Fantasy	O1	I try to keep my thoughts directed along realistic lines and avoid flights of fancy.	3	.	.	.	.	4	1	'flights of fancy'	Y
57	63	Fantasy	O1	I have an active fantasy life.	1	.	.	.	.	2	1	'active fantasy life'	Y
58	153	Fantasy	O1	If I feel my mind starting to drift off into daydreams, I usually get busy and start concentrating on some work or activity instead.	1	.	.	.	.	.	.	No Change	N
59	183	Fantasy	O1	As a child I rarely enjoyed games of make believe.	2	.	.	.	.	2	1	'games of make believe'	Y
60	8	Aesthetics	O2	Aesthetic and artistic concerns aren't very important to me.	4	.	0.02*	.	Y	5	1	Accept NEO-PI-3	Y
61	68	Aesthetics	O2	Watching ballet or modern dance bores me.	.	.	0.05	.	.	.	6	'ballet'	Y
62	98	Aesthetics	O2	I am intrigued by the patterns I find in art and nature.	2	.	.	.	.	3	.	'intrigued'	Y
63	128	Aesthetics	O2	Poetry has little or no effect on me.	1	.	0.05	.	.	.	1	No Change	N
64	188	Aesthetics	O2	Sometimes when I am reading poetry or looking at a work of art, I feel a chill or wave of excitement.	1	.	.	.	.	2	2	No Change	N
65	218	Aesthetics	O2	I enjoy reading poetry that emphasizes feelings and	1	.	.	.	.	1	1	No Change	N

[illegible]

89	189	s Straightforwardness	A2	as a hypocrite. At times I bully or flatter people into doing what I want them to.	1	0.4	0.05	.	.	1	1	No Change	N
90	219	s Straightforwardness	A2	I pride myself on my shrewdness in handling people.	2	2.4	.	Y	Y	4	.	Shrewdness - (NEO-PI-R); Slick - (NEO-PI-3)	Y
91	14	Altruism	A3	Some people think I'm selfish and egotistical.	4	0.7	.	.	.	5	1	'egotistical'	Y
92	44	Altruism	A3	I try to be courteous to everyone I meet.	2	0.7	0.04*	.	.	3	.	'courteous'	Y
93	74	Altruism	A3	Some people think of me as cold and calculating.	2	0.4	.	.	.	4	1	'cold'; 'calculating'	Y
94	194	Altruism	A3	I think of myself as a charitable person.	1	.	.	.	.	1	1	No Change	N
95	49	Compliance	A4	I can be sarcastic and cutting when I need to be.	2	0.4	.	Y	.	3	.	'cutting'	Y
96	199	Compliance	A4	I'm hard-headed and stubborn.	1	0.7	.	.	.	4	.	'hard headed'	Y
97	229	Compliance	A4	I often get into arguments with my family and co-workers.	1	.	.	.	Y	.	.	Accept NEO-PI-3	Y
98	24	Modesty	A5	I don't mind bragging about my talents and accomplishments.	1	.	.	.	.	2	1	'bragging'	Y
99	84	Modesty	A5	I'm better than most people, and I know it.	.	0.7	.	Y	.	.	1	No change	N
100	114	Modesty	A5	I try to be humble.	1	.	.	.	Y	.	2	Accept NEO-PI-3	Y
101	174	Modesty	A5	I feel that I am no better than others, no matter what their condition.	.	.	.	Y	.	1	.	No Change	N
102	29	Tender-Mindedness	A6	Political leaders need to be more aware of the human side of their policies.	1	0.4	.	.	Y	1	.	Accept NEO-PI-3	Y
103	59	Tender-Mindedness	A6	I'm hard-headed and tough-minded in my attitudes.	1	0.2	.	Y	Y	4	.	Accept NEO-PI-3	Y
104	119	Tender-Mindedness	A6	I have no sympathy for panhandlers.	5	30	.	Y	Y	1	4	Accept NEO-PI-3	Y
105	149	Tender-Mindedness	A6	Human need should always take priority over economic considerations.	1	1	.	Y	Y	1	1	Accept NEO-PI-3	Y
106	239	Tender-Mindedness	A6	I would rather be known as "merciful" than as "just."	3	2.4	.	Y	.	3	1	'merciful'; 'just'	Y
107	5	Competence	C1	I'm known for my prudence and common sense.	4	1.4	.	Y	Y	8	.	Accept NEO-PI-3	Y
108	35	Competence	C1	I don't take civic duties like voting very seriously.	2	.	.	.	Y	.	1	Accept NEO-PI-3	Y
109	95	Competence	C1	I often come into situations without being fully prepared.	.	.	0.06	.	.	.	.	No Change	N
110	125	Competence	C1	I pride myself on my sound judgment.	1	.	0.05	.	Y	1	1	Accept NEO-PI-3	Y
111	155	Competence	C1	I don't seem to be completely successful at anything.	1	.	0.07	.	.	.	.	No Change	N
112	185	Competence	C1	I'm a very competent person.	.	.	.	.	Y	1	.	Accept NEO-PI-3	Y
113	215	Competence	C1	I am efficient and effective at my work.	1	.	.	.	.	1	.	No Change	N
114	10	Order	C2	I would rather keep my options open than plan everything in advance.	.	.	.	.	Y	.	.	NEO-PI-R Preferred	N
115	70	Order	C2	I am not a very methodical person.	.	1.4	.	.	Y	1	.	Accept NEO-PI-3	Y
116	160	Order	C2	I tend to be somewhat	3	16.	.	Y	Y	8	.	'fastidious'	Y

				fastidious or exacting.		7							(NEO-PI-R); 'picky' (NEO-PI-3)	
117	190	Order	C2	I'm not compulsive about cleaning.	1	0.7	.	.	.	4	.		'compulsive'	Y
118	15	Dutifulness	C3	I try to perform all the tasks assigned to me conscientiously.	2	0.4	.	.	.	3	.		'Conscientiously'	Y
119	45	Dutifulness	C3	Sometimes I'm not as dependable or reliable as I should be.	1	.	.	.	.	1	.		No Change	N
120	105	Dutifulness	C3	Sometimes I cheat when I play solitaire.	4	2.6	.	Y	Y	3	7		Accept NEO-PI-3	Y
121	165	Dutifulness	C3	I adhere strictly to my ethical principles.	1	.	.	.	Y	2	.		Accept NEO-PI-3	Y
122	225	Dutifulness	C3	I'd really have to be sick before I'd miss a day of work.	.	.	.	.	Y	.	.		Accept NEO-PI-3	Y
123	20	Achievement Striving	C4	I am easy-going and lackadaisical.	5	15.8	.	Y	Y	9	.		Accept NEO-PI-3	Y
124	80	Achievement-Striving	C4	When I start a self-improvement program, I usually let it slide after a few days.	1	0.4	.	.	.	5	.		'self improvement program'	Y
125	230	Achievement-Striving	C4	I'm something of a "workaholic."	1	.	.	.	.	4	2		'workaholic'	Y
126	25	Self-Discipline	C5	I'm pretty good about pacing myself so as to get things done on time.	1	.	.	.	.	.	.		No Change	N
127	115	Self-Discipline	C5	I have trouble making myself do what I should.	.	.	0.07	.	.	.	.		No Change	N
128	235	Self-Discipline	C5	I have a lot of self-discipline.	1	.	.	.	.	.	.		No Change	N
129	30	Deliberation	C6	Over the years I've done some pretty stupid things.	.	.	0.04*	.	.	.	.		No Change	N
130	150	Deliberation	C6	I often do things on the spur of the moment.	1	.	.	.	.	4	.		'spur of the moment'	Y
131	121	Anxiety	N1	I seldom feel nervous.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.		Accept NEO-PI-3	Y
132	16	Self-Consciousness	N4	When I'm around people, I worry that I'll make a fool of myself.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.		Accept NEO-PI-3	Y
133	136	Self-Consciousness	N4	I often feel that I am not as good as others.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.		Accept NEO-PI-3	Y
134	226	Self-Consciousness	N4	I feel awkward around people.	N.A.	N.A.	N.A.	N.A.	N.A.	1	.		Accept NEO-PI-3	Y
135	21	Impulsiveness	N5	It doesn't bother me too much if I can't get what I want.	N.A.	N.A.	N.A.	N.A.	N.A.	.	1		Accept NEO-PI-3	Y
136	81	Impulsiveness	N5	I'm always in control of myself.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.		Accept NEO-PI-3	Y
137	42	Assertiveness	E3	Sometimes I don't stand up for my rights like I should.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.		Accept NEO-PI-3	Y
138	17	Activity	E4	I have a laid-back style in work and play.	N.A.	N.A.	N.A.	N.A.	N.A.	2	.		'laid-back' - (NEO-PI-R); 'leisurely style' - (NEO-PI-3)	Y
139	47	Activity	E4	I act forcefully and energetically.	N.A.	N.A.	N.A.	N.A.	N.A.	1	.		Accept NEO-PI-3	Y
140	202	Excitement-Seeking	E5	I like loud music.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.		Accept NEO-PI-3	Y
141	57	Positive Emotions	E6	I have felt overpowering joy.	N.A.	N.A.	N.A.	N.A.	N.A.	1	.		Accept NEO-PI-3	Y
142	147	Positive Emotions	E6	I'm not happy-go-lucky.	N.A.	N.A.	N.A.	N.A.	N.A.	4	1		'light-hearted' - (NEO-PI-R);	Y

													'happy-go-lucky' – (NEO-PI-3)	
143	8	Aesthetics	O2	I'm not really interested in the arts.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	
144	78	Actions	O4	I like the old-fashioned methods I'm used to.	N.A.	N.A.	N.A.	N.A.	N.A.	1	3	Prefer NEO-PI-R	N	
145	168	Actions	O4	I believe variety is the spice of life.	N.A.	N.A.	N.A.	N.A.	N.A.	4	1	Prefer NEO-PI-R	N	
146	118	Values	O6	Our ideas of right and wrong may not be right for everyone in the world.	N.A.	N.A.	N.A.	N.A.	N.A.	1	.	Accept NEO-PI-3	Y	
147	148	Values	O6	I believe that it's better to stick to your own principles than to be open-minded.	N.A.	N.A.	N.A.	N.A.	N.A.	1	.	Accept NEO-PI-3	Y	
148	238	Values	O6	People should honour traditional values, not question them.	N.A.	N.A.	N.A.	N.A.	N.A.	.	2	Accept NEO-PI-3	Y	
149	4	Trust	A1	Often, people aren't as nice as they seem to be.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	
150	219	Straightforwardness	A2	I'm pretty slick when it comes to dealing with people.	N.A.	N.A.	N.A.	N.A.	N.A.	6	.	'shrewdness' – (NEO-PI-R); 'slick' – (NEO-PI-3)	Y	
151	229	Compliance	A4	I sometimes get into arguments.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	
152	114	Modesty	A5	I'm not a show-off.	N.A.	N.A.	N.A.	N.A.	N.A.	1	1	Accept NEO-PI-3	Y	
153	29	Tender-Mindedness	A6	When making laws and social policies, we need to think about who might be hurt.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	
154	59	Tender-Mindedness	A6	I don't worry much about the homeless.	N.A.	N.A.	N.A.	N.A.	N.A.	.	1	Accept NEO-PI-3	Y	
155	119	Tender-Mindedness	A6	I have no sympathy for beggars.	N.A.	N.A.	N.A.	N.A.	N.A.	.	1	Accept NEO-PI-3	Y	
156	149	Tender-Mindedness	A6	Human need is more important than economics.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	
157	5	Competence	C1	I'm known for my common sense.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	
158	35	Competence	C1	I sometimes act thoughtlessly.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	
159	125	Competence	C1	I have good judgement.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	
160	185	Competence	C1	I have many skills.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	
161	10	Order	C2	I don't mind a little clutter in my room.	N.A.	N.A.	N.A.	N.A.	N.A.	5	.	Prefer NEO-PI-R	N	
162	70	Order	C2	I'm not a very orderly or methodical person.	N.A.	N.A.	N.A.	N.A.	N.A.	2	.	Accept NEO-PI-3	Y	
163	160	Order	C2	I'm picky about how jobs should be done.	N.A.	N.A.	N.A.	N.A.	N.A.	4	.	'fastidious or exacting' – (NEO-PI-R); 'picky' – (NEO-PI-3)	Y	
164	105	Dutifulness	C3	I ignore a lot of silly little rules.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	
165	165	Dutifulness	C3	I follow my ethical principles strictly.	N.A.	N.A.	N.A.	N.A.	N.A.	1	.	Accept NEO-PI-3	Y	
166	225	Dutifulness	C3	I try to go to work or school even when I'm not feeling well.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	
167	20	Achievement Striving	C4	I'm not very ambitious.	N.A.	N.A.	N.A.	N.A.	N.A.	.	.	Accept NEO-PI-3	Y	

KEY:	
Yellow – Item needs to be modified	A. Lecturer Survey (No.1): Items Lecturers found problematic in the NEO-PI-R (n=5)
Red – Accept NEO-PI-3	B. Laher (2010): Displaying percentage of students that found the item problematic (n=5)
Green – Neither NEO-PI-3 nor NEO-PI-3 acceptable – item needs to be modified	C. Franklin (2009) – Quantitative Research: Displaying P-values (n=28) Significant at $p < 0.1$, *significant at $p < 0.05$
Blue – Prefer NEO-PI-R to NEO-PI-3 alternative	D. Franklin (2009) – Qualitative Research: Y = problematic (n=10)
	E. NEO-PI-3: Y = NEO-PI-3 Changes
	F. Lecturer Survey (No.2): Linguistically Inappropriate (n=12)
	G. Lecturer Survey (No.2): Culturally Inappropriate (n=12)
	H. Identified Issue, Problem or Concern with Item, and course of action taken (represented by the colour key)
	I. Decision to Change the item? Yes (Y) or No (N)

Table 3.3 above provides an in-depth look at each item in terms of deciding whether or not a revision of the item was deemed necessary. This procedure of deciding on which items need to be changed or modified comprised **Stage 3 of Phase A**. Through looking at each item, and identifying the potential problem, either linguistically or culturally within a South African context, the researcher along with his supervisor engaged in a long process of deciding on suitable alternatives to the problematic items. This process was an iterative one, where some items were revised three or four times before arriving at an accepted alternative. A final list of alternatives to the ‘problematic’ items was decided upon (see **Table 3.4** below). The items were changed by keeping a close reference to the definition of the domain and facets as set out by the NEO-PI-R professional manual by Costa and McCrae (1992), without losing the essence of the item. The problematic items were conceptualized in close reference to the representing facet for each item, where the ‘spirit’ of the item was retained throughout the adaption procedure.

The final stage to **Phase A, Stage 4**, involved sending **Table 3.3**, as well as the decided alternatives (see **Table 3.4**), to Professor McCrae for his approval and commentary, as well as the publishers of the NEO-PI-3 for approval for use in **Phase B** of the study. Through extensive correspondence between McCrae and the researcher over the proposed items to be changed, suitable alternatives were arrived upon. All of the suggested alternative items were accepted by Professor McCrae without comment saying that most of the changes proposed appeared to preserve both the literal sense of

the item and the psychological sense, but noted the following items as needing revision (R. McCrae, Personal Communication, July 29, 2009):

- **Item 82, (E5):** Original item was “*I have sometimes done things just for “kicks” or “thrills”*”. The words “*kicks*” and “*thrills*” were not well received within the South African context, as these words are a cultural way of expression yourself in the American context. The researcher of this study proposed to change the item to: “*I will sometimes do pointless things just for fun*”. However, Professor McCrae suggested to the researcher that the item should be changed to be more “South African”, as “*pointless*” and “*fun*” according to McCrae didn’t seem to convey the excitement of dangerous risk taking such as speeding or bungee-jumping. The item was eventually changed to “*I will sometimes do things like speed in a car or bungee jump, just because they are exciting and fun*”.
- **Item 92, (E1):** Original item was “*Many people think of me as somewhat cold and distant*”. The word “*cold*” was not received in the correct manner to which it was intended within the South African context. As many South African’s speak English as a second or third language, many items such as this one, contained words that the participants within South Africa understood from a literal perspective. In other words, the word “*cold*” was understood to be relating to temperature within the South African context and not emotionally unavailable, as is the essence of the item. Professor McCrae was surprised that the word “*cold*” was not well received within the South African context. Also the word “*distant*” was also understood in the literal sense as in meaning ‘far away’, and not emotional available. The researcher of the current study proposed a variety of alternatives to “*cold and distant*”, including “*unapproachable and unfeeling*”, “*unfriendly and withdrawn*” and “*introverted and reserved*”. Professor McCrae suggested that the researcher used “*reserved and unapproachable*” as the best available alternatives. The item was therefore changed to “*Many people think of me as somewhat reserved and unapproachable*”.

- **Item 96, (N2):** The original item was "*I am not considered a touchy or temperamental person*". Again, within the South African context, the word "touchy" was interpreted in a literal sense, resulting in confusion. The researcher originally proposed to replace "touchy" with "emotional" or "unpredictable", but were seen by Professor McCrae as not capturing the Angry-Hostility spirit contained within the item's facet. McCrae suggested that the researcher should use either "irritable" or "moody". The researcher went with "moody". As such, the changed item was "*I am not considered a moody or temperamental person*".
- **Item 183, (O1):** The original item was: "*As a child I rarely enjoyed games of make believe*". The word "make believe" is an American cultural phrase, not well understood within the South African context. The original suggestion offered by the researcher of this study was: "*As a child I never enjoyed games using my imagination*". However, McCrae felt that the item became a bit awkward and clumsy. As such, the researcher just added in the word "pretend" to the item for clarification in the South African context. Therefore, the adapted item became: "*As a child I rarely enjoyed games of make believe or pretend*".
- **Item 188, (O2):** The original item was "*Sometimes when I am reading poetry or looking at a work of art, I feel a chill or wave of excitement*". The words "chill or wave of excitement" were not well received within the South African context, as the phrase is an American cultural phrase. Originally the researcher wanted to use the phrase "emotionally moved" in place of "chill or wave of excitement". However, McCrae thought that "emotionally moved" was not appropriate, saying that it could refer to all kinds of experiences that are qualitatively different, such as anger, for example. The item was therefore left as the original.
- **Item 190, (C2):** Original item was "*I'm not compulsive about cleaning*". The word "compulsive" was not well received within the South African context. The researcher wanted to change the item to "*I don't ever get uncontrollable or overwhelming urges to clean*". McCrae suggested to the researcher of this study

to use *"overly concerned"* in place of *"compulsive"*. However, the researcher of this study felt that the phrase *"overly concerned"* was still a bit complex for the South African context. Through some further correspondence with McCrae, the word *"compulsive"* was agreed to be changed to *"obsessive"*. The adapted item was therefore *"I'm not obsessive about cleaning"*.

- **Item 197, (E4):** Original item was *"My life is fast-paced"*. The phrase *"fast-paced"* wasn't well received within the South African context. The suggested alternatives for this phrase as offered by the researcher of this study were *"rushed"* or *"pressurised"*. McCrae wasn't completely satisfied with the alternatives suggested for this item, and said that *"pressurised"* is what they would say in America when trying to emphasize a perception of externally imposed stress. McCrae suggested that the alternative should indicate constant, voluntary, activity, like *"on the go"*. *"Fast-paced and hurried"* was the alternative eventually settled upon in this item. The item therefore changed to *"I feel that everything I do is always fast paced and hurried"*.
- **Item 207, (E6):** Original item was *"I rarely use words like 'fantastic!' or 'sensational!' to describe my experiences"*. The words *"fantastic"* and *"sensational"* were seen by the South African participants as being uncommon phrases used within the South African context. The item was proposed to be changed by the researcher of this study to *"I don't over-exaggerate the words I use when I speak"*. McCrae wasn't completely satisfied with the alternative suggested, and asked if *"great!"* or *"wonderful!"* would be suitable. The researcher accepted the alteration and incorporated these two words for this item. The item changed to *"I rarely use words like 'great!' or 'wonderful!' to describe my experiences"*.

After all the feedback from McCrae was incorporated into changing the problematic items, a final list of alternative items in the NEO-PI-3 was decided upon. In **Table 3.4** below, the new items created within this study are highlighted in yellow, followed by the items accepted from the NEO-PI-3, highlighted in red. This is followed by the items

where neither the NEO-PI-R nor the NEO-PI-3 version of a particular item was appropriate for the South African context, and as such a new item was generated. These items are highlighted in green. Next, as highlighted in blue, some of the NEO-PI-R items were preferred and seen as more appropriate for the South African context, than the NEO-PI-3 alternative. Finally, there were some items that contained American Spelling. These words spelt in American English were then changed back to South African English, and are highlighted in grey.

Table 3.4

Table of Alternative Items from the NEO-PI-R, generated for the Modified Version of the NEO-PI-3 for the South African context

New Items				
		ITEM NO.	DOMAIN FACET	FACET NAME
1.	I often feel tense and nervous.	91	N1	Anxiety
2.	I tend to lose my temper easily.	66	N2	Angry Hostility
3.	I am not considered a moody or temperamental person.	96	N2	Angry Hostility
4.	It takes a lot to get me really angry.	156	N2	Angry Hostility
5.	I don't often feel lonely or sad.	11	N3	Depression
6.	Sometimes things look hopeless to me.	191	N3	Depression
7.	I sometimes over-eat to the point where I feel sick.	171	N5	Impulsiveness
8.	When I'm under a great deal of stress, sometimes I feel like it's just too much for me to take.	86	N6	Vulnerability
9.	I am able to handle things in an emergency without panicking.	116	N6	Vulnerability
10.	Many people think of me as somewhat reserved and unapproachable	92	E1	Warmth
11.	I don't like being around crowds of people.	7	E2	Gregariousness
12.	I'd rather go on holiday to a popular beach resort than a chalet deep in the mountains.	157	E2	Gregariousness
13.	I feel that everything I do is always fast paced and hurried.	197	E4	Activity
14.	I wouldn't enjoy a holiday in a busy place with bright lights and lots of night clubs.	52	E5	Excitement-Seeking
15.	I will sometimes do things like speed in a car or bungee jump, just because they are exciting and fun.	82	E5	Excitement-Seeking
16.	I often find doing dangerous things exciting.	172	E5	Excitement-Seeking
17.	I have never felt so happy that I actually jumped up and down for joy.	27	E6	Positive Emotions
18.	I tend to see the negative side of things more often than I see the positive side.	87	E6	Positive Emotions
19.	Sometimes I feel so happy that I feel like I'm floating in the air.	117	E6	Positive Emotions
20.	I am a cheerful, energetic person.	177	E6	Positive Emotions
21.	I rarely use words like "great!" or "wonderful!" to describe my experiences.	207	E6	Positive Emotions
22.	I try to keep my thoughts based in reality and avoid dreaming.	33	O1	Fantasy
23.	I often day-dream.	63	O1	Fantasy
24.	As a child I rarely enjoyed games of make believe or pretend.	183	O1	Fantasy
25.	Watching a stage show bores me.	68	O2	Aesthetics
26.	I am interested by the patterns I find in art and nature.	98	O2	Aesthetics

27.	Unusual things like certain smells or names can make me feel emotional.	223	O3	Feelings
28.	I prefer going on holiday to places I know and have gone to before.	198	O4	Actions
29.	I enjoy games that make me think and challenge my mind.	143	O5	Ideas
30.	I have little interest in thinking about the nature of the universe or the human condition.	173	O5	Ideas
31.	I enjoy learning about new places, people and things.	203	O5	Ideas
32.	I consider myself open-minded and tolerant of other people's lifestyles.	178	O6	Values
33.	I'm not a sly person.	9	A2	Straightforwardness
34.	Some people think I'm selfish and only think about myself.	14	A3	Altruism
35.	I try to be polite to everyone I meet.	44	A3	Altruism
36.	Some people think of me as manipulative and not caring about other's feelings.	74	A3	Altruism
37.	I can be sarcastic and hurtful when I need to be.	49	A4	Compliance
38.	Others would describe me as stubborn and inflexible.	199	A4	Compliance
39.	I don't mind boasting about my talents and accomplishments.	24	A5	Modesty
40.	I would rather be known as "kind" than "fair".	239	A6	Tender-Mindedness
41.	I'm not obsessive about cleaning.	190	C2	Order
42.	I try to perform all the tasks assigned to me responsibly.	15	C3	Dutifulness
43.	If I start an exercise programme, I am most likely to stop after a few days.	80	C4	Achievement – Striving
44.	I tend to spend most of my time working.	230	C4	Achievement – Striving
45.	I often do things spontaneously or impulsively.	150	C6	Deliberation

Accepted NEO-PI-3 Items				
		ITEM NO.	DOMAIN FACET	FACET NAME
1.	I seldom feel nervous.	121	N1	Anxiety
2.	When I'm around people, I worry that I'll make a fool of myself.	16	N4	Self-Consciousness
3.	I often feel that I am not as good as others.	136	N4	Self-Consciousness
4.	I feel awkward around people.	226	N4	Self-Consciousness
5.	I'm always in control of myself.	81	N5	Impulsiveness
6.	It doesn't bother me too much if I can't get what I want.	21	N5	Impulsiveness
7.	Sometimes I don't stand up for my rights like I should.	42	E3	Assertiveness
8.	I act forcefully and energetically.	47	E4	Activity
9.	I like loud music.	202	E5	Excitement-Seeking
10.	I have felt overpowering joy.	57	E6	Positive Emotions
11.	I'm not really interested in the arts.	8	O2	Aesthetics
12.	Our ideas of right and wrong may not be right for everyone in the world.	118	O6	Values
13.	I believe that it's better to stick to your own principles than to be open-minded.	148	O6	Values
14.	People should honour traditional values, not question them.	238	O6	Values
15.	Often, people aren't as nice as they seem to be.	4	A1	Trust
16.	I sometimes get into arguments.	229	A4	Compliance
17.	I'm not a show-off.	114	A5	Modesty
18.	When making laws and social policies, we need to think about who might be hurt.	29	A6	Tender-Mindedness
19.	I don't worry much about the homeless.	59	A6	Tender-Mindedness
20.	I have no sympathy for beggars.	119	A6	Tender-Mindedness
21.	Human need is more important than economics.	149	A6	Tender-Mindedness
22.	I'm known for my common sense.	5	C1	Competence
23.	I sometimes act thoughtlessly.	35	C1	Competence
24.	I have good judgement.	125	C1	Competence
25.	I have many skills.	185	C1	Competence
26.	I'm not a very orderly or methodical person.	70	C2	Order
27.	I ignore a lot of silly little rules.	105	C3	Dutifulness

28.	I follow my ethical principles strictly.	165	C3	Dutifulness
29.	I try to go to work or school even when I'm not feeling well.	225	C3	Dutifulness
30.	I'm not very ambitious.	20	C4	Achievement-Striving

Neither the NEO-PI-R item, nor the NEO-PI-3 item appropriate, therefore New Item

		ITEM NO.	DOMAIN FACET	FACET NAME
1.	I have a relaxed attitude towards life.	17	E4	Activity
2.	I wouldn't describe myself as easy-going or happy-go-lucky.	147	E6	Positive Emotions
3.	I'm very good at handling and dealing with people.	219	A2	Straightforwardness
4.	I tend to be somewhat fussy and want things done just the right way.	160	C2	Order

Prefer NEO-PI-R item to the NEO-PI-3 item

		ITEM NO.	DOMAIN FACET	FACET NAME
1.	Once I find the right way to do something, I stick to it.	78	O4	Actions
2.	Sometimes I make changes around the house just to try something different.	168	O4	Actions
3.	I would rather keep my options open than plan everything in advance.	10	C2	Order

Spelling Changes (American – South African English)

		ITEM NO.	DOMAIN FACET	FACET NAME
1.	When I am having my favourite foods, I tend to eat too much.	111	N5	Impulsiveness
2.	I find it easy to empathise -to feel myself what others are feeling.	193	O3	Feelings
3.	I enjoy reading poetry that emphasises feelings and images more than story lines.	218	O2	Aesthetics
4.	People should honour traditional values, not question them.	238	O6	Values
5.	I never seem to be able to get organised .	130	C2	Order
6.	If I start an exercise programme , I am most likely to stop after a few days.	80	C4	Achievement – Striving

In summary, 45 new items were generated to construct the modified NEO-PI-3 for the South African context. 30 of the original 37 new NEO-PI-3 items were accepted as appropriate for a South African Context. 3 items from the NEO-PI-R were preferred to the alternative suggested by the new item in the NEO-PI-3. 4 of the 37 new NEO-PI-3 items were seen as problematic, where the original NEO-PI-R item was also seen as

inappropriate from a South African perspective and hence a completely new alternative item had to be constructed. If one were to look at all the changes made for the modified version of the NEO-PI-3 from the perspective of the original NEO-PI-R, one can see that the changes have happened very evenly over the five domains within the FFM (see **Table 3.5** below).

Table 3.5

Changes in respect to the modified NEO-PI-3 for the South African context, from the perspective of the original NEO-PI-R domains

Agreeableness				
Facet	New Item	NEO-PI-3 Accepted	Neither NEO-PI-R nor NEO-PI-3, therefore, new item	Total
A1	0	1	0	1
A2	1	0	1	2
A3	3	0	0	3
A4	2	1	0	3
A5	1	1	0	2
A6	1	4	0	5
Total	8	7	1	16

Neuroticism				
Facet	New Item	NEO-PI-3 Accepted	Neither NEO-PI-R nor NEO-PI-3, therefore, new item	Total
N1	1	1	0	2
N2	3	0	0	3
N3	2	0	0	2
N4	0	3	0	3
N5	1	2	0	3
N6	2	0	0	2
Total	9	6	0	15

Extraversion				
Facet	New Item	NEO-PI-3 Accepted	Neither NEO-PI-R nor NEO-PI-3, therefore, new item	Total
E1	1	0	0	1
E2	2	0	0	2
E3	0	1	0	1
E4	1	1	1	3
E5	3	1	0	4
E6	5	1	1	7
Total	12	4	2	18

Conscientiousness				
Facet	New Item	NEO-PI-3 Accepted	Neither NEO-PI-R nor NEO-PI-3, therefore, new item	Total
C1	0	4	0	4
C2	1	1	1	3
C3	1	3	0	4
C4	2	1	0	3
C5	0	0	0	0
C6	1	0	0	1
Total	5	9	1	15

Openness to Experience				
Facet	New Item	NEO-PI-3 Accepted	Neither NEO-PI-R nor NEO-PI-3, therefore, new item	Total
O1	3	0	0	3
O2	2	1	0	3
O3	1	0	0	1
O4	1	0	0	1
O5	3	0	0	3
O6	1	3	0	4
Total	11	4	0	15

As one can see from **Table 3.5** above, the changes were very evenly made across all the domains, indicative of not any particular domain being problematic, but rather that each domain possessed some problematic items from the South African contextual perspective (see **Figure 3.1** below). From a construct validity perspective, this even spread of problematic items as seen from the perspective of the NEO-PI-R suggests that no overarching domain seems to be substantially more problematic than any other domain. This provides support for the FFM's applicability within the South African context, in that no domain was seen as particularly problematic. Even though Extraversion was slightly more problematic than the other domains, from changes made from both the perspective of the NEO-PI-R and NEO-PI-3 (see below), the difference is fairly minimal. The problems seem to lie more at the facet and item level within the NEO-PI-3, and not with any overall domain.

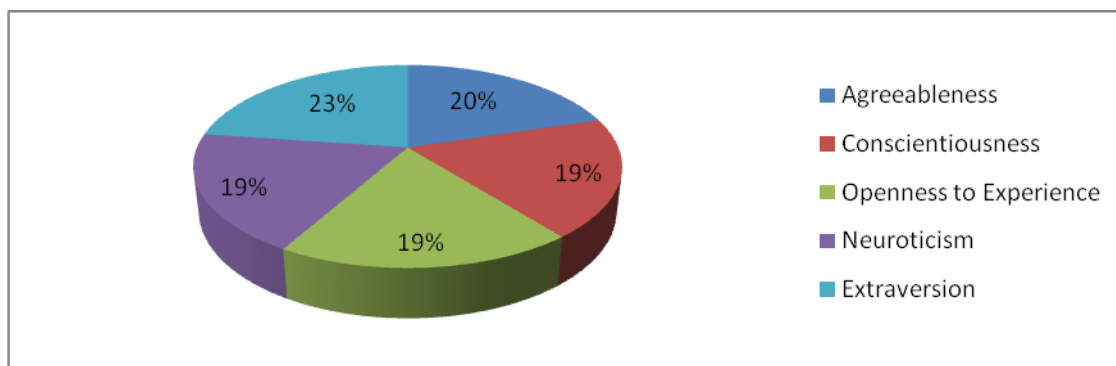


Figure 3.1

Proportion of changes made to the NEO-PI-R in generating the modified version of the NEO-PI-3 for the South African context according to Personality Domain.

If one were to look at all the changes made from a South African perspective, in respect to either the original NEO-PI-R or the NEO-PI-3, 49 new items were generated for the South African context. As both the NEO-PI-R and the NEO-PI-3 are American instruments, it is of interest to analyse which domains and facets these 49 items belonged to. Of the 49 adapted items, 9 came from the N domain, 14 from the E domain, 11 from the O domain, 9 from the A domain, and 6 from the C domain. In summary, the domain of Extraversion seemed to emerge as the most problematic in terms of its linguistic and cultural applicability to the South African context. This was followed by the Openness to Experience domain, then the Neuroticism domain, next the Agreeableness domain and lastly, the least problematic domain was the Conscientiousness domain within the South African context. It had been suggested by other theorists that within the South African context the domains of O and A are difficult to replicate, and that many studies obtain only 3 and sometimes four of the five-factor structure (Heaven et al., 1994; Horn, 2000; Piedmont et al., 2002). Interestingly, the literature on Collectivist cultures such as African and Asian cultures, indicates that the domains of O and C are in fact problematic while the domain of A is arguably the least problematic (Cheung et al., 2008; Heuchert et al., 2000; Horn, 2000; Piedmont et al., 2002; Vogt, 2009). However, this study seemed to indicate that from a linguistic perspective, Extraversion seemed to emerge as being the most problematic. Even though Extraversion received the most number of adapted items, with Conscientiousness being the least, this is by no means a suggestion that the entire

domain of Extraversion is somehow problematic for a South African context from an ontological or theoretical perspective. Only 29% of the items within the Extraversion domain needed revision, while 13% of the Conscientiousness domain needed revision. Even though more than twice the number of items were problematic in the Extraversion domain, when compared to the Conscientiousness domain, the author of the current research contends that this is a function of the articulation of the items within the domain of Extraversion being inappropriate, and not the underlying domain of Extraversion being invalid. Especially at the facet level, there may simply be no universal concept articulated within the individual items that transcends Western and non-Western communities. This afore mentioned proposition is in agreement with what Cheung et al., (2008); Heuchert et al., (2000); Horn, (2000); McCrae and Terracciano, (2005); and Piedmont et al., (2002) proposed. Perhaps the most intriguing part of this analysis of problematic domains and facets, relates to whether or not one looks at the NEO-PI-3 from a macro or micro level of analysis. From a micro level of analysis, the most problematic facet was by far the Positive Emotions (E6) facet with 6 of the 8 items within this facet needing to be adapted. The next most problematic domains that emerged were Angry Hostility (N2), Excitement-Seeking (E5), Fantasy (O1), Ideas (O5), and Altruism (A3), all of which had 3 items that needed to be adapted. However, if one looks at **Table 3.6** below, summarising the reasons for the particular items being problematic, it becomes clear that of the 6 problematic items in Positive Emotions (E6), 5 were problematic from a “Cultural Phrasing” perspective, with one item being problematic from being too “Linguistically Complex”. Words like “bubble with happiness” for Item 117 and “happy-go-lucky” from Item 147 simply need a culturally appropriate alternative phrase for the South African context. It is of the author’s opinion, that many of the problematic domains and facets in general as discussed in previous studies within the South African context are a function of utilising cross-culturally inappropriate phrases within the individual items.

If one were to look at the changes made to generate the modified NEO-PI-3 from the perspective of the original NEO-PI-3, 52 items were modified, comprising 49 completely new items, and 3 original items from the NEO-PI-R being preferred to their NEO-PI-3 equivalent (see **Table 3.6** below). **Table 3.6** below summarises these changes,

providing reasons why each item was seen as problematic within a South African context.

Table 3.6
Summary of changes made to the NEO-PI-3

NEO-PI-3 Item	Modified NEO-PI-3 Item	Reason for Being Problematic within the South African Context	Item No.	Facet	Facet Name
1. I often feel tense and jittery.	I often feel tense and nervous.	Linguistically Complex: "jittery"	91	N1	Anxiety
2. I am known as hot-blooded and quick-tempered.	I tend to lose my temper easily.	Cultural Phrase: "hot-blooded"	66	N2	Angry Hostility
3. I am not considered a touchy or temperamental person.	I am not considered a moody or temperamental person.	Cultural Phrase: "touchy"	96	N2	Angry Hostility
4. It takes a lot to get me mad.	It takes a lot to get me really angry.	Cultural Phrase: "mad"	156	N2	Angry Hostility
5. I rarely feel lonely or blue.	I don't often feel lonely or sad.	Cultural Phrase: "blue"	11	N3	Depression
6. Sometimes things look pretty bleak and hopeless to me.	Sometimes things look hopeless to me.	Cultural Phrase: "bleak"	191	N3	Depression
7. I sometimes eat myself sick.	I sometimes over-eat to the point where I feel sick.	Cultural Phrase: "eat myself sick"	171	N5	Impulsiveness
8. When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.	When I'm under a great deal of stress, sometimes I feel like it's just too much for me to take.	Cultural Phrase: "going to pieces"	86	N6	Vulnerability
9. I keep a cool head in emergencies.	I am able to handle things in an emergency without panicking.	Cultural Phrase: "cool head"	116	N6	Vulnerability
10. Many people think of me as somewhat cold and distant.	Many people think of me as somewhat reserved and unapproachable	Cultural Phrase: "cold"	92	E1	Warmth
11. I shy away from crowds of people.	I don't like being around crowds of people.	Cultural Phrase: "shy"	7	E2	Gregariousness
12. I'd rather vacation at a popular beach than an isolated cabin in the woods.	I'd rather go on holiday to a popular beach resort than a chalet deep in the mountains.	Cultural Phrase: "vacation" Cultural Reference: "cabin in the woods"	157	E2	Gregariousness
13. I have a laid-back style in work and play.	I have a relaxed attitude towards life.	Cultural Phrase: "laid-back"	17	E4	Activity
14. My life is fast-paced.	I feel that everything I do is always fast paced and hurried.	Cultural Phrase: "fast-paced"	197	E4	Activity
15. I wouldn't enjoy vacationing in Las Vegas.	I wouldn't enjoy a holiday in a busy place with bright lights and lots of night clubs.	Cultural Phrase: "vacationing" Cultural Reference: "Las Vegas"	52	E5	Excitement-Seeking
16. I have sometimes done things just for "kicks" or "thrills."	I will sometimes do things like speed in a car or bungee jump, just because they are exciting and fun.	Cultural Phrase: "kicks" and "thrills"	82	E5	Excitement-Seeking
17. I love the excitement of roller coasters.	I often find doing dangerous things exciting.	Cultural Reference "roller coasters"	172	E5	Excitement-Seeking
18. I have never literally jumped for joy.	I have never felt so happy that I actually jumped up and down for joy.	Cultural Phrasing "jumped for joy"	27	E6	Positive Emotions
19. I am not a cheerful optimist.	I tend to see the negative side of things more often than I see the positive side.	Linguistically Complex: "cheerful optimist"	87	E6	Positive Emotions
20. Sometimes I bubble with happiness.	Sometimes I feel so happy that I feel like I'm floating in the air.	Cultural Phrasing: "bubble with happiness"	117	E6	Positive Emotions
21. I'm not happy-go-lucky.	I wouldn't describe myself as easy-going or happy-go-lucky.	Cultural Phrasing: "happy-go-lucky"	147	E6	Positive Emotions
22. I am a cheerful, high-	I am a cheerful, energetic person.	Cultural Phrasing: "high-spirited"	177	E6	Positive

	spirited person.					Emotions
23.	I rarely use words like “fantastic!” or “sensational!” to describe my experiences.	I rarely use words like “great!” or “wonderful!” to describe my experiences.	Cultural Phrasing: “fantastic”, “sensational”	207	E6	Positive Emotions
24.	I try to keep my thoughts directed along realistic lines and avoid flights of fancy.	I try to keep my thoughts based in reality and avoid dreaming.	Cultural Phrasing: “flights of fancy”	33	O1	Fantasy
25.	I have an active fantasy life.	I often day-dream.	Cultural Phrasing: “fantasy life”	63	O1	Fantasy
26.	As a child I rarely enjoyed games of make believe.	As a child I rarely enjoyed games of make believe or pretend.	Cultural Phrasing: “make believe”	183	O1	Fantasy
27.	Watching ballet or modern dance bores me.	Watching a stage show bores me.	Cultural Reference: “ballet” “modern dance”	68	O2	Aesthetics
28.	I am intrigued by the patterns I find in art and nature.	I am interested by the patterns I find in art and nature.	Linguistically Complex: “intrigued”	98	O2	Aesthetics
29.	Odd things-like certain scents or names of distant places can evoke strong moods in me.	Unusual things like certain smells or names can make me feel emotional.	Linguistically Complex: “odd things”, “scents” and “evoke” Cultural Phrasing: “strong moods”	223	O3	Feelings
30.	I like the old-fashioned methods I’m used to.	Once I find the right way to do something, I stick to it.*	Cultural Phrasing: “old-fashioned”	78	O4	Actions
31.	I believe variety is the spice of life.	Sometimes I make changes around the house just to try something different.*	Cultural Phrasing: “variety is the spice of life”	168	O4	Actions
32.	On a vacation, I prefer going back to a tried and true spot.	I prefer going on holiday to places I know and have gone to before.	Cultural Phrasing: “vacation”, “tried and true”	198	O4	Actions
33.	I enjoy working on “mind-twister” –type puzzles.	I enjoy games that make me think and challenge my mind.	Cultural Reference: “mind-twister”	143	O5	Ideas
34.	I have little interest in speculating on the nature of the universe or the human condition.	I have little interest in thinking about the nature of the universe or the human condition.	Linguistically Complex: “speculating”	173	O5	Ideas
35.	I have a lot of intellectual curiosity.	I enjoy learning about new places, people and things.	Linguistically Complex: “intellectual curiosity”	203	O5	Ideas
36.	I consider myself broad-minded and tolerant of other people’s lifestyles.	I consider myself open-minded and tolerant of other people’s lifestyles.	Cultural Phrasing: “broad-minded”	178	O6	Values
37.	I’m not crafty or sly.	I’m not a sly person.	Cultural Phrasing: “crafty”	9	A2	Straightforwardness
38.	I’m pretty slick when it comes to dealing with people.	I’m very good at handling and dealing with people.	Cultural Phrasing: “pretty slick”	219	A2	Straightforwardness
39.	Some people think I’m selfish and egotistical.	Some people think I’m selfish and only think about myself.	Linguistically Complex: “egotistical”	14	A3	Altruism
40.	I try to be courteous to everyone I meet.	I try to be polite to everyone I meet.	Linguistically Complex: “courteous”	44	A3	Altruism
41.	Some people think of me as cold and calculating.	Some people think of me as manipulative and not caring about other’s feelings.	Linguistically Complex: “calculating”	74	A3	Altruism
42.	I can be sarcastic and cutting when I need to be.	I can be sarcastic and hurtful when I need to be.	Linguistically Complex: “cutting”	49	A4	Compliance
43.	I’m hard-headed and stubborn.	Others would describe me as stubborn and inflexible.	Cultural Phrasing: “hard-headed”	199	A4	Compliance
44.	I don’t mind bragging about my talents and accomplishments.	I don’t mind boasting about my talents and accomplishments.	Cultural Phrasing: “bragging”	24	A5	Modesty
45.	I would rather be known as “merciful” than as “just.”	I would rather be known as “kind” than “fair”.	Linguistically Complex: “merciful” and “just”	239	A6	Tender-Mindedness
46.	I don’t mind a little clutter in my room.	I would rather keep my options open than plan everything in advance.*	Cultural Phrasing: “clutter”	10	C2	Order
47.	I’m picky about how jobs should be done.	I tend to be somewhat fussy and want things done just the right way.	Cultural Phrasing: “picky”	160	C2	Order

48.	I'm not compulsive about cleaning.	I'm not obsessive about cleaning.	Linguistically Complex: "compulsive"	190	C2	Order
49.	I try to perform all the tasks assigned to me conscientiously.	I try to perform all the tasks assigned to me responsibly.	Linguistically Complex: "conscientiously"	15	C3	Dutifulness
50.	When I start a self-improvement program, I usually let it slide after a few days.	If I start an exercise programme, I am most likely to stop after a few days.	Cultural Phrasing: "self-improvement"	80	C4	Achievement - Striving
51.	I'm something of a "workaholic."	I tend to spend most of my time working.	Cultural Phrasing: "workaholic"	230	C4	Achievement - Striving
52.	I often do things on the spur of the moment.	I often do things spontaneously or impulsively.	Linguistically Complex: "spontaneously" and "impulsively"	150	C6	Deliberation

**Bolded items represent the preferred items from the NEO-PI-R*

In terms of these 52 changes made to the NEO-PI-3, the adapted items can be broadly summarized into being problematic by virtue of "Linguistic Complexity", "Cultural Phrasing" or through "Cultural References", as is evident in Table below. These three categories are often related, where sometimes an item could be problematic as a function of 2 of the 3 above mentioned categories, with one word being linguistically complex, while another word in the same item was problematic as it was an American cultural phrase. In other instances, it was fairly difficult to precisely delineate the problem within the item into one of the defined categories, as often the problem could be seen as possibly both a cultural phrase, and linguistically complex for a South African audience. For example, Item 91 mentioned the word "jittery". Jittery could be argued to be both linguistically complex, as well as a cultural phrase. In such instances, a decision was made to define the problem according to only one category of inappropriateness. However, having said that, most of the items were clearly either a cultural reference, such as Item 52, mentioning "Las Vegas", cultural phrase, such as Item 147 mentioning "happy-go-lucky", or linguistically complex, such as Item 173, mentioning the word "speculating".

In total, of the 52 adapted items, 33 were deemed to be problematic by containing cultural phrases within the item, 13 were linguistically complex and 3 had cultural references. One item had both a linguistically complex word as well as a cultural phrase, and 2 other items had both a cultural reference as well as a cultural phrase contained within the item. If we divide the items into being either problematic linguistically or culturally, we culturally includes both the cultural phrases and

reference, we find that 38 of the items are problematic from a cultural perspective, 13 from a linguistic perspective, with one item having both linguistic and cultural problems for a South African context. Therefore, 75% of the items were problematic from a cultural perspective, if we excluding the one item that contains both linguistic and cultural inappropriate words from the analysis. This result pays testament to the modifications made when the authors created the NEO-PI-3. McCrae, Costa and Martin (2004) were specifically targeting the most linguistically complex items within the NEO-PI-R in order to generate the NEO-PI-3. Therefore, many of the linguistically complex items within the NEO-PI-R were modified within the NEO-PI-3. Therefore, one could conclude that the majority of the problematic items within the NEO-PI-3 from a South African perspective were problematic by virtue of the cultural nuances contained within the items. Further, some facets within the NEO-PI-3, such as Positive Emotions (E6), were problematic by having a predominance of culturally specific phrases or culturally specific references, and not that the entire facet is somehow invalid within the South African context.

3.2: Phase B

Phase B of the study involved the piloting of the modified version of the NEO-PI-3 on a sample of 175 University students at the University of the Witwatersrand. What follows is a discussion of the results obtained from these 175 participants. Firstly descriptive statistics for the modified NEO-PI-3's scales will be displayed, followed by results on the instrument's internal consistency coefficients. The analysis done on the internal consistency coefficients was done to access the reliability of the instrument. The modified NEO-PI-3's construct validity was analysed by conducting an exploratory factor analysis using a principal components analysis with a varimax rotation. Results and discussion pertaining to the instrument's construct validity will be discussed next. The final section of this chapter details the results from the thematic content analysis conducted on the linguistic and cultural appropriateness feedback received from the participants on this modified version of the NEO-PI-3. This final section will first discuss the face validity of the instrument, followed by the open and closed ended responses

received in relation to each of the items applicability within the South African context as seen by the 175 students in the sample.

3.2.1. Descriptive Statistics – NEO-PI-3 Scales

The scales were analysed for skewness in order to assess the appropriateness of using parametric tests. To indicate that the scales are normally distributed, the skewness coefficients must be between –1 and 1 (Babbie & Mouton, 2004), (see **Table 3.7** below for results on the Skewness coefficients obtained).

Table 3.7
Descriptive Statistics for the NEO-PI-3 Scales

Variable	N	Mean	Std. Dev.	Min	Max	Skewness
Neuroticism	175	99.77	21.14	50.00	173.00	0.25
Anxiety	175	18.38	4.76	8.00	29.00	-0.08
Angry Hostility	173	16.66	5.67	3.00	30.00	0.13
Depression	174	16.72	5.08	4.00	32.00	0.26
Self Consciousness	175	16.67	4.26	8.00	32.00	0.62
Impulsivity	175	17.91	4.41	3.000	29.00	-0.28
Vulnerability	175	13.49	4.34	3.43	26.00	0.38
Extraversion	175	111.42	17.46	57.00	154.43	-0.41
Warmth	174	20.66	4.31	5.00	32.00	-0.19
Gregariousness	174	16.60	5.15	3.00	30.000	-0.18
Assertiveness	175	16.93	4.60	0.00	29.00	-0.26
Activity	175	16.56	3.52	2.00	26.00	-0.50
Excitement Seeking	175	19.27	4.90	7.00	32.000	-0.00
Positive Emotions	173	21.45	4.53	7.00	32.00	-0.56
Openness to Experience	175	118.17	17.78	66.00	156.00	-0.28
Fantasy	174	20.99	5.63	5.00	32.00	-0.26
Aesthetics	174	20.26	5.26	7.00	32.00	-0.29
Feelings	175	20.70	4.25	9.00	31.00	-0.14
Actions	173	14.75	3.56	0.00	22.00	-0.58
Ideas	174	20.89	4.83	2.00	32.00	-0.53
Values	174	20.69	4.21	11.00	31.00	0.19
Agreeableness	175	112.50	18.63	61.00	164.00	-0.10
Trust	173	14.82	4.66	1.00	26.00	-0.21
Straightforwardness	173	18.91	4.71	8.00	30.00	0.04
Altruism	175	22.87	4.21	11.00	32.00	-0.25
Compliance	175	16.40	4.87	4.57	28.00	-0.29
Modesty	173	17.60	5.08	2.29	31.00	-0.09
Tender Mindedness	175	21.90	4.31	9.00	32.00	-0.31
Conscientiousness	175	116.65	19.18	64.34	160.00	-0.28
Competence	175	19.76	4.11	7.00	29.00	-0.34
Order	175	18.97	5.06	4.00	30.00	-0.43
Dutifulness	173	21.01	3.96	8.00	31.00	-0.13
Achievement Striving	174	21.21	4.07	10.00	30.00	0.01
Self discipline	174	18.04	4.76	2.00	29.00	-0.31
Deliberation	166	17.32	4.65	5.71	29.71	-0.15

The modified NEO-PI-3 had skewness coefficients ranging from 0.0014 – 0.6225 indicative of all the scales being normally distributed. In terms of answering the various questions from each facet scale, only the 'Deliberation' facet had 166 participants answering this facet, while the other facets were answered by between 173 and 175 participants.

In terms of the range of the scores within the domains as exhibited in the above table, Neuroticism ranged from 50 – 173; Extraversion ranged from 57 – 154.43; Openness to Experience ranged from 66 – 156; Agreeableness ranged from 61 – 164 and finally Conscientiousness ranged from 64.34 – 160. The mean scores displayed on the above table for the domain scales ranged from 99.77 for Neuroticism to 118.17 for the Openness to Experience domain scale. Standard deviations for the domain scales ranged from 17.46 for Extraversion to 21.14 for the Neuroticism domain scale. Therefore, the Neuroticism domain had the lowest mean, but varied the most in terms of answers given.

3.2.2. *Internal Consistency Reliability Coefficients*

Internal consistency reliability is an objective procedure determined by Cronbach Alpha coefficients (Moerdyk, 2009; Murphy & Davidshofer, 2005). The domain and facet scales of the modified NEO-PI-3 were analysed for internal consistency, reflecting on the reliability of the instrument. In terms of the domains of the modified NEO-PI-3, good internal consistency was demonstrated with Alpha coefficients ranging from .61-.90 for the domain scales. The different domains, Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness and Conscientiousness (C) yielded Alpha coefficients of .90; .85; .86; .88 and .61 respectively. All the domain's Alpha coefficients were above .85, with the exception of Conscientiousness, which had an Alpha Coefficient of .61.

In terms of all the facet scales, Alpha coefficients ranged from .36 for Activity (Extraversion subscale), to .80 for Fantasy (Openness to Experience subscale). The

Activity and Action facets were the only scales that had alpha coefficients below .50, with alpha coefficients of .36 and .43 respectively. The best performing facets were Fantasy (O) with alpha coefficients of .80, followed by Angry-Hostility (N) with .76, then Self-Discipline and Deliberation (C) both with alpha coefficients of .75. The next highest facet alpha came from Order (C) with .74; followed by Ideas (O) with .73; Trust (A), Depression (N) and Competence (C) all with .72; Aesthetics (O), Anxiety (N) and Gregariousness (E) all with .71 and finally Modesty (A) and Warmth (E) with .70. Approximately 47% of the facets produced moderately high to strong reliabilities with alpha values above .70.

Table 3.8
Internal Consistency Reliability Coefficients of the Modified NEO-PI-3

Facet Scale	Cronbach Alpha Coefficient
Neuroticism*	.90
Anxiety	.71
Angry-Hostility	.76
Depression	.72
Self Consciousness	.58
Impulsivity	.60
Vulnerability	.68
Extraversion*	.85
Warmth	.70
Gregariousness	.71
Assertiveness	.67
Activity	.36
Excitement Seeking	.59
Positive Emotions	.66
Openness to Experience*	.86
Fantasy	.80
Aesthetics	.71
Feelings	.66
Actions	.43
Ideas	.73
Values	.53
Agreeableness*	.88
Trust	.72
Straightforwardness	.63
Altruism	.68
Compliance	.65
Modesty	.70
Tender Mindedness	.61
Conscientiousness*	.61
Competence	.72
Order	.74
Dutifulness	.61
Achievement Striving	.66
Self Discipline	.75
Deliberation	.75

**Bolted scales refer to the domain scales*

The results from the reliability analysis were then further scrutinised in order to identify the most statistically problematic facets from each domain. According to the results obtained in **Table 3.8**, Neuroticism was the most reliable domain ($\alpha = .90$) with the

facets producing a mean alpha of .68. Extraversion had a domain alpha of .85, with an average facet alpha of .62. Openness to Experience had a domain alpha of .86 with a facet average alpha of .64, similar to the overall performance of the Extraversion scale. The Agreeableness scale produced an overall domain alpha of 0.88 with an average facet alpha of .67. Conscientiousness on the other hand, had the lowest domain alpha of .61, but had the highest average facet alpha of .71.

Cross cultural research has consistently showed that the Openness to Experience domain and facet scales generally exhibits alpha coefficients lower than the norms for their American counterparts. In a study by Piedmont et al. (2002), the overall internal consistency was also slightly lower than the American normative sample of the manual, when using a bilingual Zimbabwean sample. The low alpha coefficients for Excitement seeking (E), Actions (O) and Values (O) were of particular concern. In addition, the Openness to Experience facets were not found neither by Heuchert et al. (2000) nor Heaven et al. (1994) in their predominantly second language English speaking sample. Horn (2000) also encountered problems with internal consistency, with alphas ranging between .57 and .83, which is perhaps closer to the results of the present study. Horn (2000) found that the Openness to Experience domain, and especially the Values facet, was particularly difficult to measure in a sample of 75 bilingual isiXhosa undergraduate students. The present study's Value facet results is congruent with the findings from Horn (2000), where the Values facet had a fairly low alpha value of .53, however the overall average alpha value for the Openness domain was actually fairly high. In contrast to previous studies, the overall performance of the modified NEO-PI-3 has been very good, with the Openness to Experience domain having an alpha of .86 with a facet average alpha of .64. The present study had Conscientiousness as exhibiting the lowest domain alpha, of .61, but at a facet level, the lowest average was seen in the Extraversion domain, with an average facet alpha of .62. This is still a good alpha value and indicative that one single domain seemed to be profoundly lacking in terms of replication, suggesting that the sample understood the items in a similar manner for each domain and facet.

In Piedmont's et al. (2002) study, the researcher noted that only five of the thirty facet scales had an alpha value above .60, which is considerably lower than the American normative values of the NEO-PI-R. In the present study however, 25 facet scales had alpha coefficients over .60, a far better result than in Piedmont's (2002) study.

In a study by Heaven et al. (1994), a list of adjectives relating to the FFM was given to university students, it was found that adjectives relating to the Agreeableness and Conscientiousness domains were problematic. This again is in stark contrast to the current study, whereby the Agreeableness domain actually produced the highest alphas for both the domain and for the average of the facets. It had previously been argued that one should question the applicability of the reliability of the Openness and Agreeableness domains for a multicultural South African user group (Franklin, 2009), but this study suggests that the problem in previous studies was by virtue of inappropriate items. Having modified 20% of the Agreeableness items, and 19% of the Openness to Experience items, the researcher deduces that these modifications could have resulted in the sample better understanding the items, thereby producing substantially better alpha coefficients when compared to previous studies within the South African context using the NEO-PI-R.

In light of the above discussion, there may be numerous influences acting upon the test scores, making them recurrently lower than the American normative counterparts. The results of the reliability analysis within this study however, suggest that the problems inherent in the reliability of previous research studies could be a matter of misunderstanding and comprehension of the items in second language English speakers. It is suggested that there may be specific problems relating to the use of language, specifically Americanised English, within the NEO-PI-3 which become problematic facets in non-western settings. Heaven's et al. (1994) study found that the five factors did not replicate within the South African sample used, using the NEO-PI-R. According to the researchers, the results were problematic on three levels, namely home language, response-sets and basic personality structures. Heaven et al. (1994) found that the use of advanced English vocabulary and sentence structures,

constructed in a foreign context, were the likely source of hesitation, misunderstanding or confusion for English-speakers, and more profoundly for second-language English speakers. Secondly, the study pointed out that the response styles with which South Africans attempt the test items, and perhaps testing in general, differs from Western counterparts. Thirdly it was proposed, although not established, that the FFM did not adequately represent personality structures in a South African socio-cultural milieu. In light of these findings however, and given the modifications in the NEO-PI-3 and the fairly good internal consistencies documented, it seems that the primary factor involved in Heaven's et al. (1994) study was through the first level of explanation, in that the language used within the NEO-PI-R was most likely inappropriate for the South African context.

Heuchert et al. (2000) used a mixed racial group of 408 South African university students who were administered the NEO-PI-R in English. The results indicated that the five-factor structure of personality was obtained; however, the five-factor replication was clearer among the individuals for whom English was a home language. Regardless of population group, however, those for whom English was not a home language (first language), reported significant difficulty in understanding the abstract concepts contained in the items in the NEO-PI-R. The problematic domain within this study was again Openness to Experience. This results of this study bolsters the afore mentioned assertion that language is the primary issue impacting on the results of the previous studies using the NEO-PI-R in the South African context. The modifications made in the current study were not only aimed at addressing the cultural disparities between the American and the South African culture, but also in simplifying the items to be linguistically more understandable and simple.

In summary, Heaven et al. (1994), Horn (2000) and Piedmont et al. (2002) all experienced problems with the Openness domain and facets. Heuchert et al. (2000) suggested that the common problem may point to two possibilities; either the Westernised English was too unfamiliar for South Africans, therefore creating barriers in comprehension and appropriateness, or the actual domains of the FFM were not

entirely suitable for indigenous South African personalities. Given the results of the current study, receiving an alpha of .86 for the Openness to Experience domain, it seems highly likely that the problem lay in the language used, and not in the actual facet not replicating well in a South African context.

Using the reasoning as purported by Satz-Miracle (1981), it is therefore very plausible that the use of language in the NEO-PI-R (and by extension the NEO-PI-3) may be largely responsible for the problems experienced by participants in non-Western settings. Succinctly, the English that would be fully understood and appropriate for an American cultural context may be misinterpreted and inappropriate for South Africans, which is why the current study modified the items within the NEO-PI-3 to be more culturally and linguistically appropriate.

However, even though there are generally good improvements to the internal consistencies associated with the modified NEO-PI-3 within this study, as when compared to previous studies on the NEO-PI-R within a South African context, this does not mean that the instrument is necessarily more reliable than before. It may be that within each scale, the items asked are very similar to other items within the scale, ostensibly asking the same question a number of times. If this is that case, then an artificially high internal consistency will be reported, thereby providing misleading reliability data. However, with this in mind, the researcher of the current study made every effort to maintain each item's unique spirit, as is evident from the previous discussion surrounding **Phase A**.

However, even though substantial improvements were made in making the modified NEO-PI-3 more applicable in the South African context, the reliability coefficients obtained are somewhat lower than what McCrae, Costa and Martin (2004) obtained in their study when generating the NEO-PI-3, as is evident in **Table 3.9** below.

Table 3.9
Internal Consistency Reliability Coefficients of the NEO-PI-3 and the Modified NEO-PI-3

Internal Consistencies for the NEO-PI-3 and the Modified NEO-PI-3 for the South African context		
Scale	NEO-PI-3	Modified NEO-PI-3
Domains		
N	.91	.90
E	.89	.85
O	.89	.86
A	.87	.88
C	.92	.61
Facets		
N1	.77	.71
N2	.71	.76
N3	.77	.72
N4	.75	.58
N5	.66	.60
N6	.72	.68
E1	.76	.70
E2	.75	.71
E3	.75	.67
E4	.57	.36
E5	.64	.59
E6	.77	.66
O1	.77	.80
O2	.81	.71
O3	.76	.66
O4	.48	.43
O5	.79	.73
O6	.63	.53
A1	.77	.72
A2	.67	.63
A3	.72	.68
A4	.67	.65
A5	.75	.70
A6	.66	.61
C1	.70	.72
C2	.79	.74
C3	.69	.61
C4	.78	.66
C5	.77	.75
C6	.76	.75

Bolded items are indicative of being larger in magnitude

At the domain level, the NEO-PI-3 exhibited a median alpha of .89, where the modified version of the NEO-PI-3 only exhibited a median alpha of .85. As is evident from the **Table 3.9** above, the NEO-PI-3 exhibited stronger alpha coefficients for almost all the domain and facet scales over the modified NEO-PI-3. The modified NEO-PI-3 only performed better on the domain of A, as well as the facets of N2, O1 and C1. This result is expected in that it is firstly indicative of the fact that the modified NEO-PI-3 still represents a pilot attempt at modifying an American instrument for the South African context, as well as the fact that the sample used within McCrae, Costa and Martin's (2004) study was substantially larger (n=500), compared to the sample used in this study (n=175). By having a larger sample, one can expect higher internal consistencies to emerge from the data.

3.2.3. *Construct Validity*

Exploratory factor analysis with orthogonal (Varimax) rotation was used to examine the construct validity within the modified version of the NEO-PI-3, since theoretically, factors were presumed to be unrelated and Varimax rotation will extract uncorrelated orthogonal factors. Varimax rotation maximizes high correlations and minimizes small ones, and allows for maximum factor and variable correlations. Varimax rotation also provides better data interpretation, and also maximizes variance (Ferketich, 1991).

3.2.3.1. *Eigenvalues*

The result of the factor analysis produced the following list of Eigenvalues as evidenced in **Table 3.10** below:

Table 3.10
List of Eigenvalues produced by Factor Analysis (showing only the first 10 Eigenvalues)

	Actual Eigenvalue	Random Eigenvalue PA Mean	Random Eigenvalue PA 95 th percentile
1	6.14	1.87	2.00
2	3.39	1.74	1.83
3	2.96	1.64	1.72
4	2.59	1.56	1.63
5	1.99	1.49	1.55
6	1.27	1.42	1.48
7	1.06	1.36	1.42
8	0.92	1.31	1.36
9	0.92	1.25	1.30
10	0.80	1.20	1.25
Factors to retain: 5			

According to **Table 3.10** above, using the Guttman-Kaiser Eigenvalue greater-than-one rule (K1) rule, 7 factors emerged from the factor analysis conducted. However, if we conduct a parallel analysis on the data, it becomes clear that 5 factors emerge. Parallel analysis is technique in which the focus is on the number of factors that account for more variance than the components derived from random data.

3.2.3.2. Scree Plot

If we look at the scree plot generated within this study (see Figure 3.2 below) again, 5 factors seem to emerge. According to Kline (1994), Cattell's Scree Test is one of the best methods for selecting the correct number of factors. The rationale for the scree test is that a few major factors account for most of the variance, resulting in a steep 'cliff' as these factors are identified first. This is followed by a shallow 'scree' describing the small and relatively consistent variance accounted for by the numerous minor factors. Only factors which occur before the scree and above the breakpoint between the scree and cliff are retained (Hayton et al., 2004). Five factors are to be retained as is evident

in **Figure 3.2**. If one looks at the differential space between the 5th and 6th Eigenvalue, it is evident that there exists a fairly large gap, indicative of 5 factors being potentially adequate in describing this set of results.

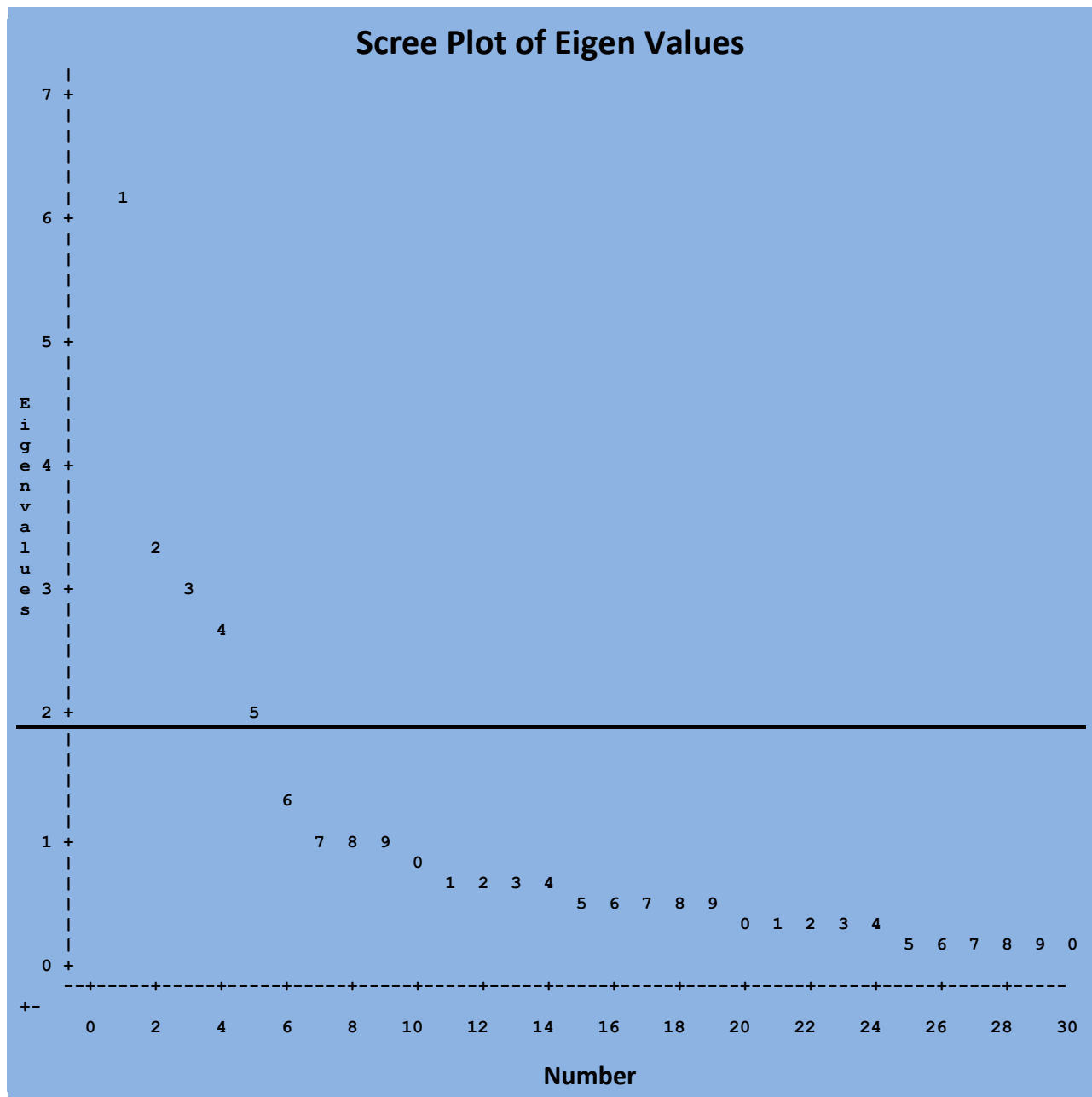


Figure 3.2:
Scree Plot of Eigenvalues

3.2.3.3. *Factor Analysis Interpretation*

The five factors that emerged provide strong support for the construct validity within the modified version of the NEO-PI-3, in that the theoretical foundation, within the FFM, seems to emerge through the factor analysis conducted, as postulated by Costa and McCrae (1992). This provides good evidence for the broad theoretical bases for the modified version of the NEO-PI-3; however, one must interpret these results cautiously. Laher's (2010) study concluded that while the five factors are generally replicable in a South African context, subtle differences do exist and as argued by Cheung & Leung (1998) it may be that Africans cut the social perceptual world differently. In terms of the NEO-PI-R, Laher (2010) found that arguments can be made for the validity and reliability of the instrument at the domain level, however, the instrument did exhibit evidence of bias at the facet level. It seems that the FFM does seem to hold some validity within a South African context. However, the question arises, are the difference within in the FFM at the facet level within a South African context as found by Laher (2010) a function of the NEO-PI-R being invalid in terms of language used at the item level, or is the FFM an invalid epistemological framework to base personality on in South Africa. Therefore, even though 5 factors did emerge, this cannot be seen as categorical evidence for complete alignment with earlier cross cultural studies conducted on the NEO-PI-R finding five factors emerging (McCrae and Allik, 2002; McCrae, Costa, & Yik, 1996; Yik & Bond, 1993; Pulver, Allik, Pulkkinen, & Hämäläinen, 1995; McCrae, Costa, del Pilar, Rolland, & Parker, 1998; Lodhi, Deo, & Belhekar, 2002; Lima, 2002; Martin, Oryol, Rukavishnikov, & Senin, 2000; Piedmont & Chae, 1997; Gülgöz, 2002; Leininger, 2002; Piedmont, Bain, McCrae, & Costa, 2002). The results detailed above are merely indicative of five factors being evident within the data obtained from the current study, extrapolated to be aligned with the five factor model on the domain level, and not necessarily completely aligned on a facet level as detailed by Laher (2010).

3.2.3.4. *Varimax Rotation*

As two of the three methods used in determining the number of factors to extract from the above analysis suggested that five factors emerged, the rotated factor loadings as presented in **Table 3.11** below were constructed in accordance with five factors. Studies using the NEO-PI-R generally only consider loadings above .40 (see McCrae & Terraccianno, 2005). This decision does seem to be rule of thumb but agreement amongst researchers in personality research appears to be that factor loadings above the .30 cut-off are generally acceptable but .40 is preferable. **Table 3.11** is presented indicating the loading for each of the five factors extracted.

Table 3.11
Varimax Rotated Results on the Modified NEO-PI-3

		Rotated Factor Pattern <i>(Loadings over 0.4 are bolded and shaded)</i>				
Facet		Factor1	Factor2	Factor3	Factor4	Factor5
N1	Anxiety	.81	-.02	.15	-.07	.07
N2	Angry Hostility	.60	-.55	-.05	-.01	-.11
N3	Depression	.80	-.00	-.22	-.10	.00
N4	Self Consciousness	.70	-.19	-.09	-.19	-.03
N5	Impulsivity	.49	-.18	-.40	.39	.04
N6	Vulnerability	.75	-.03	-.37	-.10	-.11
E1	Warmth	-.05	.51	.15	.63	.08
E2	Gregariousness	-.17	.21	-.08	.74	-.08
E3	Assertiveness	-.34	-.24	.19	.45	.16
E4	Activity	.03	-.21	.08	.55	.04
E5	Excitement Seeking	-.15	-.19	-.31	.66	.13
E6	Positive Emotions	-.21	.37	.07	.51	.24
O1	Fantasy	.31	-.04	-.11	.29	.49
O2	Aesthetics	.09	.19	.11	.05	.73
O3	Feelings	.36	.19	.14	.32	.53
O4	Actions	-.28	.11	-.20	.06	.51
O5	Ideas	-.13	-.10	.16	.09	.73
O6	Values	-.07	-.00	-.13	-.13	.60
A1	Trust	-.36	.61	-.10	.17	.03
A2	Straightforwardness	-.03	.73	.19	-.14	.07
A3	Altruism	-.14	.68	.20	.12	.13
A4	Compliance	-.21	.71	.13	-.25	.06
A5	Modesty	.12	.53	-.18	-.22	-.11
A6	Tender Mindedness	.15	.66	.14	.25	.02
C1	Competence	-.40	-.05	.70	.05	.21
C2	Order	.13	-.10	.65	-.06	-.12
C3	Dutifulness	-.08	.28	.76	-.04	.06
C4	Achievement Striving	.07	.11	.63	.40	-.05
C5	Self Discipline	-.33	.13	.72	.14	-.13
C6	Deliberation	-.22	.18	.66	-.27	.08

Table 3.11 above presents the results obtained from the five factor solution that was extracted using varimax rotation. From the varimax solution it is evident that the five factors load as expected. In total the five factor solution explained 59.93% of the shared variance. Factor 1 explains 20.47% of the variance. Factor 2 explains 11.31% of the variance, Factor 3 9.88%, Factor 4 8.64%, and Factor 5 6.63%. Factor 1 may be described as the Neuroticism factor with all six Neuroticism facets loading positively with moderate to high loadings on this factor. Only Impulsivity (.49) had a fairly low loading

on this factor. Factor 2 can be described as the Agreeableness factor, with all six Agreeableness facets loading positively with moderate to high loadings on this factor. Factor 3 can be described as the Conscientiousness factor, with all six conscientiousness facets loading positively with high loadings on this factor. Factor 4 can be described as the Extraversion factor, with all six Extraversion facets loading positively with moderate to high loadings on this factor. Only Assertiveness (.45) had a fairly low factor loading on this factor. Finally, Factor 5 can be described as the Openness to Experience factor, with all six Openness to Experience facets loading positively with moderate to high loadings on this factor. Only Fantasy (.49) had a low factor loading on this factor.

There were only 4 loadings that produced cross-loadings over .40 for two factors. Two of these cross-loadings were found in the Agreeableness factor, having loadings of -.55 and .51 to the Angry-Hostility and the Warmth facets respectively. The Conscientiousness factor also produced a cross-loading of -.40 to the Impulsivity facet. Finally Extraversion also produced a loading of .40 to Achievement Striving. As discussed by Costa and McCrae (1992) these cross loadings will occur since aspects of personality are related but the higher loading will always be seen on the factor on which the facet should load theoretically and these cross loadings were congruent with this argument. It would make sense for someone who is agreeable to have a negative loading to the Angry-Hostility facet and a positive loading to the Warmth facet. Also, the fact that Conscientiousness had a negative loading of -.40 to Impulsivity also makes sense in that someone who is conscientious and studious in their work will generally have good impulse control. Finally, Extraversion had a loading of .40 to Achievement Striving which again is not entirely unexpected in that someone who is ambitious could be argued to be quite outgoing in terms of the expression of that ambition.

3.2.3.5. *Procrustes Rotation*

McCrae et al. (1996) suggest that the degree of replication can be evaluated by orthogonal Procrustes rotation and congruence coefficients. This is supported by Van

de Vijver and Leung (1997) who argue that this should become the standard for factor analytic studies of construct equivalence. **Table 3.12** below details the rotated loadings from both the NEO-PI-3 and the modified NEO-PI-3, from which a Procrustes rotation was conducted on.

Table 3.12

Factor Structure for NEO-PI-3 and the Modified NEO-PI-3 Facet Scales after Targeted Rotation

Rotated Factor Pattern (Loadings over 0.4 are bolded and shaded)											
Facet		N		E		O		A		C	
		M3	3	M3	3	M3	3	M3	3	M3	3
N1	Anxiety	.81	.81	-.07	.03	.07	-.01	-.02	.11	.15	.05
N2	Angry Hostility	.60	.64	-.01	-.02	-.11	-.07	-.55	-.51	-.05	-.03
N3	Depression	.80	.79	-.10	-.14	.00	.02	-.00	.01	-.22	-.15
N4	Self Consciousness	.70	.74	-.19	-.31	-.03	-.10	-.19	.18	-.09	-.12
N5	Impulsivity	.49	.52	.39	.33	.04	.10	-.18	-.22	-.40	-.38
N6	Vulnerability	.75	.77	-.10	-.04	-.11	-.10	-.03	.07	-.37	-.30
E1	Warmth	-.05	-.13	.63	.75	.08	.25	.51	.28	.15	.18
E2	Gregariousness	-.17	-.12	.74	.79	-.08	-.03	.21	-.07	-.08	-.04
E3	Assertiveness	-.34	-.38	.45	.46	.16	.19	-.24	-.39	.19	.30
E4	Activity	.03	.02	.55	.64	.04	.05	-.21	-.23	.08	.37
E5	Excitement Seeking	-.15	-.01	.66	.60	.13	.19	-.19	-.25	-.31	-.12
E6	Positive Emotions	-.21	-.10	.51	.65	.24	.30	.37	.24	.07	.10
O1	Fantasy	.31	.18	.29	.34	.49	.53	-.04	.01	-.11	-.25
O2	Aesthetics	.09	.17	.05	.10	.73	.73	.19	.18	.11	.03
O3	Feelings	.36	.34	.32	.42	.53	.57	.19	.11	.14	.17
O4	Actions	-.28	-.20	.06	.25	.51	.51	.11	.05	-.20	-.11
O5	Ideas	-.13	-.07	.09	.01	.73	.08	-.10	.01	.16	.16
O6	Values	-.07	-.02	-.13	.07	.60	.67	-.00	.23	-.13	-.00
A1	Trust	-.36	-.25	.17	.29	.03	.07	.61	.61	-.10	.05
A2	Straightforwardness	-.03	-.03	-.14	.04	.07	-.08	.73	.70	.19	.19
A3	Altruism	-.14	-.11	.12	.42	.13	.23	.68	.56	.20	.23
A4	Compliance	-.21	-.16	-.25	-.14	.06	-.08	.71	.75	.13	-.03
A5	Modesty	.12	.24	-.22	-.18	-.11	.12	.53	.50	-.18	-.02
A6	Tender Mindedness	.15	.19	.25	.32	.02	.30	.66	.51	.14	.00
C1	Competence	-.40	-.35	.05	.16	.21	.10	-.05	.04	.70	.74
C2	Order	.13	.07	-.06	-.08	-.12	-.10	-.10	-.03	.65	.65
C3	Dutifulness	-.08	-.10	-.04	.02	.06	.23	.28	.27	.76	.78
C4	Achievement Striving	.07	-.08	.40	.24	-.05	-.07	.11	-.04	.63	.79
C5	Self Discipline	-.33	-.28	.14	.07	-.13	.06	.13	.06	.72	.79
C6	Deliberation	-.22	-.09	-.27	-.25	.08	.35	.18	.35	.66	.66

A Procrustes rotation was conducted on the above data in **Table 3.12**, producing **Table**

3.13 below. Factor congruence coefficients within the Procrustes rotation are computed to quantify the degree that a factor structure is replicated (Wrigley & Neuhaus, 1955). When determining the level of agreement, Cheung, et al. (2003) and Mulaik (1972) propose that factor congruence coefficients of .90 or larger generally indicate adequacy of fit. McCrae et al. (1996) argue that the .90 cut-off is a valid one since values of .90 or larger are virtually never produced by chance.

Table 3.13:
Procrustes Rotation with Congruence Coefficients

Procrustes Rotation with Congruence Coefficients						
Facet	N	E	O	A	C	Congruence
N1	.81	-.10	.06	.03	.14	.97
N2	.61	-.15	-.10	-.52	-.05	.99
N3	.80	-.09	-.01	.04	-.24	.99
N4	.70	-.23	-.04	-.12	-.11	.93
N5	.50	.35	.06	-.27	-.37	1.00
N6	.74	-.08	-.12	.00	-.39	.99
E1	-.05	.72	.10	.34	.19	.98
E2	-.16	.78	-.05	.01	-.02	.99
E3	-.32	.36	.18	-.34	.23	1.00
E4	.05	.47	.07	-.34	.13	.93
E5	-.13	.61	.17	-.36	-.25	.97
E6	-.20	.57	.26	.23	.11	.99
O1	.32	.25	.49	-.09	-.08	.93
O2	.09	.06	.73	.20	.12	.99
O3	.37	.32	.54	.13	.16	.99
O4	-.28	.08	.52	.09	-.19	.95
O5	-.12	.02	.73	-.10	.18	.99
O6	-.07	-.14	.60	.04	-.13	.89
A1	-.37	.33	.03	.53	-.08	.96
A2	-.05	.03	.05	.75	.17	.98
A3	-.15	.27	.12	.63	.20	.96
A4	-.23	-.07	.04	.75	.10	.97
A5	.10	-.06	-.13	.56	-.21	.82
A6	.14	.39	.02	.59	.15	.89
C1	-.39	-.02	.21	-.04	.71	.96
C2	.14	-.13	-.13	-.06	.64	.99
C3	-.08	-.03	.04	.31	.75	1.00
C4	.08	.37	-.04	.03	.66	.93
C5	-.32	.12	-.13	.10	.73	.99
C6	-.22	-.26	.06	.26	.64	.95
Factor Congruence	.98	.96	.95	.97	.96	.96

As is evident in **Table 3.13**, all the congruence coefficients produced are larger than .90, with the exception of Modesty (A5) and Tender-Mindedness (A6) producing congruence coefficients of .82 and .89 respectively. Modesty (A5) is particularly low, indicative of not very good congruency between the original NEO-PI-3 and the modified NEO-PI-3. Only one item from A5 was modified within the modified version of the NEO-PI-3, and such, this result is potentially indicative of further revision needed within the A5 facet items for the South African context. When one looks at the overall congruence for the entire domains, the congruence coefficients range from .95 for O, to .98 for N, with an overall congruence of .96, indicative of generally strong congruence between the NEO-PI-3 and the modified NEO-PI-3.

3.2.4. *Thematic Content Analysis*

The relevance and appropriateness of the items within the modified NEO-PI-3 was addressed by analysing the responses given by the participants to the open ended questions contained in the questionnaire. The final open-ended question within the questionnaire asked the participants to comment on what they thought the questionnaire was measuring, allowing the researcher to assess the themes that emerged from the questionnaire. Even though English was the most common language spoken within the sample (49%), the majority of participants had a non-English home language (51%). It is therefore very important to receive feedback from the participants on their thoughts of which items within the modified version of the NEO-PI-3 still required further modification in terms of linguistic and cultural applicability within a South African context. Responses to these items were analysed using basic content analysis. In this study, the focus was largely empirical in that responses were considered in terms of general themes being recorded and generated. Once a theme was noted and another response corresponds to an already developed theme, the response was coded as contributing to that theme. There was no process of open coding followed by re-analysis and development of coding frames. This procedure resulted in frequencies for each

theme and item being generated. Hence the focus in this study was on a simplified thematic content analysis that was by no means intended to be a content analysis per se as defined by the qualitative paradigm. This process ultimately resulted in further problematic items being identified that were not adequately addressed in **Stage 3** of the research. As is presented in section 3.2.4.2. below, 17 problematic items were identified in the modified NEO-PI-3, 2 coming from the N domain, 2 from the E domain, 9 from the O domain, 3 from the A domain and 1 from the C domain. In particular, the most problematic facet was Values (O6), which contained 4 problematic items. Horn (2000) also found that the O domain, and especially the Values facet, was particularly difficult to measure in a sample of 75 bilingual isiXhosa undergraduates students when the participants completed the NEO-PI-R. It is worth pondering the possibility that this facet within Horn's (2000) study was not exhibited adequately by virtue of there being significant problems with the items in terms of linguistic and cultural applicability, and not that the underlying facet of Values was not present in the sample. It becomes clear through the analysis of the open-ended responses received that there exists a specific South African English vernacular that is distinctly different from the American normative sample on which the NEO-PI-3 is based on. The idiosyncrasies of the South African English lexicon cannot be the same as the American English lexicon, because neither operates within the same socio-cultural milieu. Language can be seen as a mirror to culture, and forms a means with which to describe socio-cultural existence (Babbie & Mouton, 2004). The English language utilised within the South African context has a particular flavor that needs to be incorporated into the linguistic fabric of the NEO-PI-3, if it is to be truly appropriate for the South African context.

3.2.4.1. Face Validity

Frequencies obtained on the third question following each instrument, "*What in your opinion is this instrument measuring?*" are presented in **Table 3.14**. 79% (n=101) of respondents agreed that the modified NEO-PI-3 does appear to be assessing personality. 9% (n=12) were of the opinion that it did not appear to be assessing personality, while 12% (n=15) provided responses that the researcher found difficult to

assess whether or not the participant thought that the instrument was measuring personality or not. In total, 128 participants answered this question, 87 only answering this question, while the remaining 41 also answered one or both of the other two questions on cultural and linguistic appropriateness of the items.

The respondents who were of the opinion that the questionnaire appeared to be measuring personality substantiated their responses with a brief statement like *“It is measuring the average South African personality”* (participant 123), *“Personalities of diverse groups of people”* (participant 114) or *“A broader study of personality in a South African context”* (participant 076). From the 12 respondents who were of the opinion that the modified NEO-PI-3 did not measure personality, example of responses that were received included *“No clue”* (participant 017), *“Our feelings about poetry and how happy and energetic we are”* (participant 127) and *“I think its measuring people’s ability to remember what they have said”* (participant 024). 15 responses were deemed by the researcher as being difficult to determine whether the respondent thought that the instrument was measuring personality or not. Examples of such responses included *“My uniqueness”* (participant 057), *“Accurate representation of peoples values and beliefs”* (participant 075) and *“The manner in which humans behave and react socially as well as whether that coincides with their own personal beliefs”* (participant 140).

Table 3.14
Face Validity Analysis

Face Validity			
Category	Frequency	Percentage (%)	Cumulative Percentage (%)
Yes	101	79	79
No	12	9	88
Unsure	15	12	100
Total	128	100	100

3.2.4.2. *Linguistic and Cultural reception of the Modified NEO-PI-3's Items*

This part of **Phase B** involved analysing the responses given by the participants to the open and closed ended questions contained in the questionnaire on each item's cultural and linguistic appropriateness for the South African context. This process resulted in further problematic items being identified that were not adequately addressed in **Stage 3** of **Phase A**. Not unlike **Stage 3**, this part of **Phase B** first generated a list of items that were seen as problematic by the participants (see **Table 3.15** below). **Table 3.15** presents the collective number of times the participants found the item problematic, either linguistically and culturally, as well as presenting the break down in the 5th column on how the participants found the item problematic. The 6th column in **Table 3.15** presents the results of whether or not any of the participants offered a reason as to why the identified item was problematic, either Linguistically (L) or Culturally (C).

Table 3.15

*Tabulation of Items identified as problematic (displaying item where 2 or more participants stated that the item was problematic >1%
(L=Linguistically Inappropriate, C=Culturally Inappropriate)*

No.	Item Number	Facet	Number of times seen as problematic (N=175)	Cultural (C) or Linguistically (L) Problematic?	Was there a reason suggested by participants as to why the item is problematic?	Decision to Change? Y = (n>4 / >2%)
1	1	N1	11	(L-8) (C-3)	C & L	Y
2	6	N2	2	(C-2)	.	N
3	36	N2	2	(L-1) (C-1)	.	N
4	101	N3	2	(C-2)	C	N
5	46	N4	3	(L-2) (C-1)	.	N
6	51	N5	2	(C-2)	.	N
7	141	N5	8	(C-2) (L-6)	L	Y
8	2	E1	2	(L-1) (C-1)	.	N
9	182	E1	2	(L-1) (C-1)	.	N
10	97	E2	2	(L-1) (C-1)	.	N
11	157	E2	7	(L-4) (C-3)	.	Y

12	12	E3	3	(L-3)	.	N
13	77	E4	2	(L-2)	L	N
14	167	E4	2	(L-1) (C-1)	.	N
15	22	E5	2	(L-2)	.	N
16	172	E5	2	(L-1) (C-1)	.	N
17	27	E6	2	(L-1) (C-1)	.	N
18	57	E6	3	(L-2) (C-1)	.	N
19	117	E6	2	(L-2)	.	N
20	147	E6	4	(C-3) (L-1)	.	Y
21	123	O1	4	(L-4)	.	Y
22	8	O2	4	(L-2) (C-2)	C & L	Y
23	158	O2	2	(L-2)	L	N
24	13	O3	2	(L-2)	.	N
25	73	O3	2	(L-2)	.	N
26	163	O3	3	(L-3)	.	N
27	193	O3	6	(L-6)	.	Y
28	223	O3	2	(L-2)	.	N
29	18	O4	5	(L-4) (C-1)	L	Y
30	23	O5	2	(L-2)	.	N
31	53	O5	4	(L-3) (C-1)	.	Y
32	113	O5	2	(L-2)	.	N
33	28	O6	4	(L-2) (C-2)	C	Y
34	58	O6	7	(L-4) (C-3)	.	Y
35	88	O6	8	(L-2) (C-6)	C	Y
36	118	O6	2	(L-1) (C-1)	C	N
37	238	O6	5	(C-5)	C	Y
38	34	A1	7	(L-6) (C-1)	L	Y
39	9	A2	19	(L-19)	L	Y
40	99	A2	2	(C-2)	C	N
41	74	A3	2	(L-1) (C-1)	.	N
42	194	A3	2	(L-1) (C-1)	.	N
43	49	A4	2	(L-2)	.	N
44	169	A4	2	(L-1) (C-1)	.	N
45	84	A5	2	(C-2)	.	N
46	234	A5	3	(C-2) (L-1)	C	N
47	29	A6	3	(C-2) (L-1)	.	N
48	89	A6	2	(L-1) (C-1)	.	N
49	119	A6	3	(C-3)	C	N
50	149	A6	6	(L-6)	L	Y
51	5	C1	2	(L-1) (C-1)	L	N
52	70	C2	2	(L-2)	.	N
53	130	C2	2	(L-2)	.	N
54	75	C3	2	(C-2)	C	N
55	105	C3	2	(L-2)	.	N

56	165	C3	2	(L-1) (C-1)	.	N
57	80	C4	2	(L-1) (C-1)	.	N
58	140	C4	2	(L-2)	.	N
59	145	C5	2	(L-2)	.	N
60	30	C6	3	(C-2) (L-1)	.	N
61	150	C6	5	(L-5)	.	Y
62	180	C6	2	(L-2)	.	N

Table 3.15 above displays the results where at least 2 (>1%) participants in the sample of 175 students indicated that the item was either culturally or linguistically inappropriate for a South African context. In totality, out of 240 items within the modified version of the NEO-PI-3, only 35 items had 2 or more participants thinking the item to be *linguistically* inappropriate, while there were only 19 items that had 2 or more participants thinking that the items was *culturally* inappropriate. Items that had 4 (>2%) or more participants identifying it as problematic, either linguistically or culturally or both were thereafter decided to be modified, and are highlighted in **Table 3.15**. In McCrae, Costa and Martin's (2004) study, they too decided to change the item if more than 2% of the participants found it problematic, and as such, the same rule was applied in this study.

This resulted in 17 further items being seen as potentially problematic within this study (see *highlighted items in Table 3.15*). As a possible future area of research and adaptation on the NEO-PI-3, alternatives to these items are suggested (see **Table 3.16 below**). This process is indicative of an iterative procedure, necessary when modifying psychometric instruments, implying that questionnaires will always have room for improvement or criticism. This is a vital attitude to possess when modifying psychometric instrument in general, and personality instruments in particular. Each personality instrument is situated and constructed within a particular context, culture, time and space, and needs to be constantly revised and modified in order to remain valid and appropriate within your selected sample of analysis. Of the 17 items deemed as needing to be further modified, 10 were from the original NEO-PI-R, 3 from the NEO-PI-3, and 4 were created within the current study.

Only 10 of 17 identified potentially problematic items received any open-ended

feedback regarding the nature of the potential problem inherent in the item. The most problematic item within the modified NEO-PI-3 as purported by the feedback from the participants in this study, was *Item 9* received 19 (10.86%) participants who thought the item to be linguistically inappropriate. This item contained the word “sly” which many of the participants thought to be inappropriate. In addition, *Item 1* also receive a fair amount of criticism, with 11 participants stating that the item was both linguistically (8) and culturally (3) inappropriate. The word “worrier” within this item was not well received by the participants. All other items had fewer than 10 participants thinking it either linguistically or culturally inappropriate. For a complete summary of the problematic items and potential problems see **Table 3.16** below.

Generally, however, in terms of all the open-ended feedback provided, four themes emerged. The first theme that emerged within the analysis of the open-ended feedback provided by the participants was that the participants found the items to contain unfamiliar phrases and grammatical sentence structures. In these instances, participants reported that the order in which words appeared in a sentence was not only confusing but also difficult to read fluidly, as is evidenced by what Participant 092 stated: “*I’m pretty set in my ways*” *unsure of what was meant*” – **Item 18** (O4) and Participant 044 stated: “*What does ‘seldom give in to my impulses’ mean?*” – **Item 141** (N5).

The second theme to emerge from the open-ended feedback on that data revolved around the use of unfamiliar words. Participant 153 stated that “*Sly is an old word and is not used often in South Africa today*” – referring to **Item 9** (A2). Participant 136 stated that “*‘controversial’, such words are not popular amongst our culture*” – referring to **Item 28** (O6). Further, Participant 069 stated that “*Some words were difficult to understand because I barely use them in my sentences or when I talk to someone*”

The third theme to emerge within the analysis of the open-ended feedback involved participants not being clear as to how to interpret the particular concepts mentioned within certain items. “*By ‘arts’ do you mean drawing, music etc? What if I love music but*

not drawing? Both are 'arts' but are vastly different. Therefore my answer will be highly inaccurate”, Participant 036 stated when referring to **Item 8** (02).

Finally, the fourth theme to emerge from the open-ended feedback revolved around the use of culturally inappropriate references within the items. *“Religious statements can be culturally inappropriate.”* – Participant 031 stated in reference to **Item 88** (06).

Participant 120 also stated: *“Yes, I do not feel comfortable questioning traditional values”* –in reference to **Item 238** (06). In terms of cultural appropriateness, general concerns raised by the participants included mentioning that some of the items involved unfamiliar scenarios being presented, were maybe they don’t have the resources to experience such situations, and therefore find it hard to comment on the item. *“Perhaps there could have been more items relating specifically to the South African culture”*, Participant 095 mentioned.

In terms of the general, item non-specific feedback given, what seemed to emerge where the following general particular areas of concern. In terms of the linguistically inappropriateness of certain items, the word “seldom” was not well received. Participant 161 stated that: *“The term “seldom” it was difficult to understand what it meant as it is not often used”*. Further, Participant 031 mentioned that *“Some of the statements were worded very strangely which made it difficult to follow. Especially when using words like ‘don’t and seldom’”*. One participant also noted that the use of “double negatives” within the items was confusing.

In total, 37 participants (21%) provided an answer to the open-ended question on Culturally Inappropriate items, where only 20 participants (11%) answered the Linguistically Inappropriate open-ended question. 41 participants (23%) did not answer any of the 3 questions at the end of the questionnaire.

Table 3.16 details the 17 most problematic items as identified by more than 2% of the participants in the study. Of these 17 items, only 1 item had more than 10% of the participants stating that the item was inappropriate. 13 of the 17 problematic items were

identified by less than 5% of the sample as being problematic. As such, the questionnaire was very well received by the most of the participants, indicative that the overwhelming majority of the participants had no concerns over the appropriateness of the items in the questionnaire.

Table 3.16

Result of closed and open-ended questions – 17 additional items need to be modified

No.	Item No.	FACET	Number of times item found to be problematic	Original Item (in Revised NEO-PI-3)	Possible Reasons for item being Problematic	Possible New Item
1	1	N1	11 (L-8) (C-3)	I am not a worrier.	Word “worrier”, is not commonly used – could be confused with “warrior”	I am not someone who worries a lot
2	141	N5	8 (C-2) (L-6)	I seldom give in to my impulses.	Word “seldom” and “give in”	I can resist temptation and control my impulses
3	147	E6	4 (C-3) (L-1)	I wouldn’t describe myself as easy-going or happy-go-lucky.	Cultural Phrase “Easy-going”, “Happy-go-lucky”.	I wouldn’t describe myself as a relaxed and care-free person
4	157	E2	7 (L-4) (C-3)	I’d rather go on holiday to a popular beach resort than a chalet deep in the mountains.	Problematic item	I’d rather go on holiday to a place where there are lots of people
5	123	O1	4 (L-4)	I enjoy concentrating on a fantasy or daydream and exploring all its possibilities, letting it grow and develop.	Problematic Item	I enjoy dreaming about possibilities for the future
6	8	O2	4 (L-2) (C-2)	I’m not really interested in the arts.	Word “arts”, is too broad; could relate to both music and painting, or different things across different contexts.	I’m not really interested in the visual arts.
7	193	O3	6 (L-6)	I find it easy to empathise - to feel myself what others are feeling.	Linguistically Complex: “empathise”	I find it easy to put myself in another’s shoes, and feel what they are feeling
8	18	O4	5 (L-4) (C-1)	I’m pretty set in my ways.	Needs to be rephrased	I don’t like change

9	53	O5	4 (L-3) (C-1)	I find philosophical arguments boring.	"Philosophical" may be too vague	No alternative suggested.
10	28	O6	4 (L-2) (C-2)	I believe letting students hear controversial speakers can only confuse and mislead them.	Complex Item	No alternative suggested
11	58	O6	7 (L-4) (C-3)	I believe that laws and social policies should change to reflect the needs of a changing world.	Complex Item	No alternative suggested
12	88	O6	8 (L-2) (C-6)	I believe we should look to our religious authorities for decisions on moral issues.	Problematic reception of the word "religious authorities"	I believe we should look to our elders for decisions on moral issues
13	238	O6	5 (C-5)	People should honour traditional values, not question them.	Problematic usage of the word "traditional" in the South African context.	People should respect their parent's values
14	34	A1	7 (L-6) (C-1)	I believe that most people are basically well-intentioned.	"Well-Intentioned" problematic	I believe that most people have good-intentions
15	9	A2	19 (L-19)	I'm not a sly person.	Word "sly" very problematic	I'm not a tricky or devious person
16	149	A6	6 (L-6)	Human need is more important than economics.	Complex word: "Economics"	Looking after the sick and elderly is more important than making profits
17	150	C6	5 (L-5)	I often do things spontaneously or impulsively.	Linguistically Complex "Spontaneously", "Impulsively"	I often do things just for the sake of fun.

Within **Table 3.16**, some possible alternative items are suggested, with reference to the problem associated with the item. These suggestions are by no means definitive, and merely represent possible alternative items for future research. Some of these problematic items could not be further modified at this stage, providing scope for future research.

3.3: Conclusion

In conclusion, the modified version of the NEO-PI-3 seems to be well received in the South African context. In terms of the reliability of the instrument, internal consistency coefficients produced within the study suggested that the instrument is reliable, producing moderate to good alpha values, ranging from Neuroticism with the most reliable domain, having an alpha value of .90, to Conscientiousness having an alpha value of .61. The facets within the instrument ranged from .62 for the facets within the Extraversion domain, to .71 for the facets within the Conscientiousness domain. These alpha values are indicative of good reliability within the modified version of the NEO-PI-3. The modified NEO-PI-3 also produced evidence of good construct validity, where through the parallel analysis and the scree plot, 5 factors emerged, concomitant with the theory behind the FFM. In addition, the Procrustes rotation conducted on the data, suggested good congruence with the original NEO-PI-3, producing an overall congruence coefficient of .96. From this analysis however, the facet Modesty A5 emerged as being incongruent with the original NEO-PI-3. As suggested earlier, the items within this facet should be further examined for appropriateness within the South African context. In terms of the modified NEO-PI-3's face validity, approximately 80% of the participants who answered this question recognised that the instrument was a personality inventory, indicative of good face validity. The results obtained within this study provide strong support for the validity of the FFM within the South African context. After having modified the items within the NEO-PI-3, the instrument produced good reliability coefficients, as well as good construct validity. The results suggest that the FFM is valid within the South African context, and that problematic domains and facets concluded on in prior research was most likely a function of invalid items being administered to the participants. One simply cannot comment on the criteria of validity whilst utilising an invalid inventory with invalid, inappropriate items. As was evident through the results of the current study, once the problematic items were addressed, and modified, the NEO-PI-3 seemed to be well received within the South African context, where the 5 factors emerged, concomitant with the FFM of personality.

In terms of inappropriate items remaining within the questionnaire, as evidenced through the thematic content analysis and the closed ended questions on the linguistic and cultural applicability of the items within the South African context, only 17 items emerged as being potentially problematic. Of these 17 items, only 1 item had more than 10% of the participants stating that the item was inappropriate. 13 of the 17 problematic items were identified by less than 5% of the sample as being problematic. As such, the questionnaire was very well received by the most of the participants, indicative that the overwhelming majority of the participants had no concerns over the appropriateness of the items in the questionnaire. However, this final analysis conducted on the questionnaire is indicative of the continued, iterative process needed to revise a psychometric instrument. As is evident in the title of the current study, this research is a pilot study, and as such is explorative in nature. Therefore, as is evident in **Table 3.16**, many items will need to be further refined and addressed so as to adequately adapt the NEO-PI-3 for a South African context, both linguistically and culturally.

Chapter 4: *Limitations, Recommendations and Concluding Comment*

4.1: *Introduction*

This research study set out to examine the suitability of the NEO-PI-3 to be used in a South African context in terms of the language used within the instrument, both from a linguistic and a cultural perspective. Van de Vijver and Rothman (2004) as well as Meiring (2007) have pointed out that the research on cultural applicability of imported personality instruments in South Africa is gaining momentum within South Africa. Several issues complicate the use of Westernized theories and instruments in non-Western communities (Cheung et. al., 2008), and that inappropriate item usage is one. This study sought to identify which items within the NEO-PI-3 were seen as inappropriate for the South African context; either linguistically or culturally, or both, and thereafter modify the item to become more suitable for a South African context, with the primary aim of assessing the modified instrument's reliability and validity.

This section is concerned with the theoretical and methodological limitations which emerged during the study which may have impacted on the study's integrity and conclusions. Recommendations are given as to how these limitations can be overcome, accommodated, or at least acknowledged, so that future research is encouraged and facilitated.

4.2: *Theoretical Limitations*

A paradoxical limitation exists in light of this being a reasonably new area of research, with relatively little research supporting the literature, which could allow confirmatory comparisons. There is only a handful of research available in terms of the NEO-PI-R's applicability within the South African context, and no prior research on the NEO-PI-3 in

the same context. There is therefore a weakness within the research in that comprehensive comparative analysis is lacking.

Personality, as defined within the FFM of personality has been critiqued and criticised by many theorists and researchers (Paunonen & Jackson, 2000 and Saucier & Goldberg, 2001). Of absolute crucial importance within this study is to first ask the question of whether or not the FFM is an appropriate theoretical foundation for an inventory that assesses personality amongst all South Africans. If this theoretical ideology is not entirely appropriate, as previous studies have suggested (Heuchert, Parker, Stumpf & Myburg, 2000; Heaven, Connors & Stones, 1994; Horn, 2000), then it seems necessary to conclude that the primary concern within this study should not be on the operationalisation of personality, as embodied in the NEO-PI-3, but on the theoretical foundation of how personality is constructed within the FFM. This issue relates to an on-going debate that emerges when evidence of invalidity is seen to exist when measuring a particular construct in a non-Western population group. This invalidity could be a result of either the theoretical foundations of what you are trying to measure being Western specific, such as the FFM in this study, or that the operationalisation used to measure that construct is not appropriate for this particular non-Western population, such as the NEO-PI-3 in this study; or both could be an issue. Throughout the literature review, it was argued that the FFM was seen to be a less likely cause for invalidity being exhibited within the measurement of personality in non-Western population groups, and that the likely cause of invalidity lay in the operationalisation of the FFM; within the NEO-PI-3. Therefore, given the scope of the current study, a decision was made to essentially accept the theoretical foundation inherent within the FFM, as being valid within all human beings, Western or not, and to focus exclusively on the operationalisation of the FFM within the NEO-PI-3.

Therefore, from a conceptual perspective, a rather important limitation exists within this study in that the study did not address the issue of whether or not the FFM was indeed appropriate within a South African context, and instead focused on the operationalisation of this theoretical ideology within a South African context. This point

becomes both a limitation and a possible recommendation for future research. When dealing of issues of validity in non-Western contexts, while using Western instruments, a researcher has the choice of either adapting the instrument to be more applicable to that specific context, as was done in this study, or to question the entire validity of the theoretical foundations onto which the instrument rests. This second form of research would encourage entirely new non-Westernized epistemologies to emerge, specific to that context. This second type of research can be more difficult and ontologically challenging. This point is further elaborated on in the recommendations section below.

The reason this second type of research may be of great value, is that different people that use these instruments in different cultural contexts may interpret some personality constructs differently because of the influence that cultural and contextualised language has upon their cognitive processes. If one is using inappropriate theoretical foundations to assess one's personality, the instrument user's alternate channels of meaning-making may translate into problems with understanding the language in the inventory. In this study of the NEO-PI-3, the possibility that the FFM is not entirely appropriate for all South Africans is a possibility that cannot be ignored. According to Laher (2008), there are particular factors that exist outside of a Euro-American context, in which if a model or theory is to be regarded as truly universal, they should be considered and incorporated. McCrae & Allik (2002) have adopted a critical and skeptical stance within their research and have questioned whether the foundations of personality processes are indeed universal, or whether significant disparities exist across cultures. They have yet to circumscribe or delineate an exact answer to these queries and concerns, and continue to suggest that in some respects personality structure does seem to transcend the boundaries of language and culture, yet in other respects it is most definitively molded by socio-cultural and historical forces.

4.3: *Methodological Limitations*

The most appropriate method of assessing the validity of the modified NEO-PI-3 would be to address the issue both quantitatively and qualitatively, using a mixed methods

approach. Even though this study utilised both methods of data analysis, the overwhelming focus was of a quantitative nature. The design of the research was quantitatively orientated, with statistical procedures used to analyse the data. Quantitative research has the advantage of statistical support and allows for trends and norms to be established, by being able to analyse large numbers of people. However, given the nature of the study, and the ontological assumptions associated with personality, perhaps a true qualitative approach could have yielded deeper insightful understandings behind the individual item's applicability within South Africa. However, given the large quantity of data that needed to be processed, a true qualitative design would have demanded a much smaller sample size.

This limitation represents an on-going trade off in research between quantitatively and qualitatively orientated designs. Quantitative designs can establish broad trends in a particular construct by processing large samples, while qualitative designs can usually only accommodate a very small sample size but achieve a deeper, richer understanding of the construct being measured. Broadly speaking, this research was predominantly quantitative in nature and as such would always possess a qualitative limitation, in that the qualitative analysis was fairly elementary.

In terms of design within the research, the cross-sectional correlational design used in this study has the advantage of being flexible, versatile, easy to implement and inexpensive (Rosnow & Rosenthal, 1996). In this study, the questionnaires were easy to distribute and relatively inexpensive. Extraneous variable effects (Huck, 2004) however, such as fatigue and time of measurement, as due to the considerable length of the questionnaire, could have affected the responses given. However, for the purposes of this study, these effects were considered to be negligible. The cross-sectional correlational design, however, has the disadvantage of being only descriptive in nature and only establishes an association between variables. This precludes the determination of causality. Further, the students were allowed to take the questionnaires home to complete, and as such the assessment procedure was not standardised across the test taking participants. This could affect the reliability of the answers, however, for

the purposes of the study, and given the length of the questionnaire, these effects were not only considered negligible, but necessary.

As a non-probability convenience sample was used, issues with regards to random selection arose, as not every potential participant had a chance of being included in the sample. The major strength however with this sampling technique is convenience. However, given the fact that the questionnaires were given during tutorial and lecture times, it is hoped that each potential participant was present to take part in the study. Further methodological limitations associated with the sample involve only utilizing 175 participants within the exploratory factor analysis. Ordinarily one would need at least 3 participants for each item under investigation within the study to adequately and comprehensively assess the reliability and validity associated with the instrument (Child, 2006); making the sample size needed approximately 720. However, given the nature of the current study being a pilot study, 175 participants provided an adequate sample size to provide preliminary results on the reliability and validity of the modified version of the NEO-PI-3.

Even though demographic information such as age, gender, population grouping and religious affiliation were included and presented, issues surrounding the external validity of the study need to be highlighted. Problems associated with population and ecological validity that are pertinent in the study are that the results may only apply and be relevant to the student sample. It may not be appropriate to generalise the findings of the student population to the general population, or to people in different contexts. However, over the past decade, some research has been conducted on inventories such as the 16PF and the SA92 (Abrahams, 1996; Heuchert, Parker, Stumpf & Myburg, 2000; Laher, 2001); where in many cases the current trends show that students are often used. Students are seen to represent a homogenous group, especially for research that addresses issues of reliability, validity and appropriateness of certain psychometric instruments. In these cases, where the constructs under study are sensitive to the composition of the sample, the relative homogeneity of a student group ensures a degree of reliability in their test scores. Another reason students were used within this

research study, was owing to the fact that the instrument was administered in English. The University of the Witwatersrand is an English speaking university, and as such one can assume that the general population within that population group would be comprised of individuals who are proficient in the English language.

In terms of this assumption of homogeneity within the student sample, the results from the reliability analysis seem to ratify this assumption. The analysis revealed that the domain scales performed well, yielding generally high reliabilities with high Cronbach Alpha (α) coefficients ranging from .61-.90 for the domains. All the domain's Alpha coefficients were above .85, with the exception of Conscientiousness, which had an Alpha Coefficient of .61. The domains have an average Alpha Coefficient of .82, indicative of generally very good internal consistency. Overall the results support the claim that the student population provided a stable and homogenous sample, and therefore provided a good degree of reliability and internal consistency within the instrument under study. However, having said this, the sample used would certainly not constitute an accurate representation of the South African nation's socioeconomic or demographic composition, even though a fairly diverse and varied sample was achieved.

In terms of the item adaption process of the test, it is often the case that test specifications need to be adapted (Cook, Schmitt, & Brown, 1999; Hambleton & Kanjee, 1993; Tanzer & Sim, 1999; van der Vijver & Tanzer & Sim 1999; Woodcock & Muñoz-Sandoval, 1999). This process of adapting specifications is sometimes referred to as decentering or decentrification (Beller, Gafni, & Hanani, 1999). Decentrification encompasses every aspect of a psychometric test. These aspects include item formats, the number of items within the test, timing, constructs of interest, scoring rubrics and specific wording of the specifications (Tanzer & Sim 1999). The researcher within the current study however, only addressed inappropriate items within the NOE-PI-3, with no attention given to the other aspects included in the test specifications, such as the speediness of the instrument, as the participants were allowed to take the instrument home. The impetus behind this process of addressing each aspect of the test

specification is validity, since it is imperative that test instruments fit their intended target audience (Hambleton & Kanjee, 1993).

Items used on adapted instruments come from one of three sources: translated items, adapted items, or custom-developed items (Hambleton, 1996; Woodcock & Muñoz-Sandoval, 1999). Test items can be produced by internal or external item writers. Internal item writers are regular researchers whereas external item writers function exclusively as consultants. In the case of the current research, the items were developed and adapted by the researcher in correspondence with his supervisor, and as such no external consultants were used. This has both limitations as well as advantages. The limitations are that neither the researcher nor the researcher's supervisor are experts in the field of linguistics or cultural studies. In the case of the entirely new items needing to be developed, the test adaption process usually relies on well-trained, external item writers (Hambleton & Patsula, 2000). Item writers who are native to the language and culture of the target population are most beneficial to the quality of the final instrument produced (Hambleton & Patsula, 2000). However, the advantage of not using external consultants was that both the researcher and the researcher's supervisor are native to South Africa and as such possess a level of understanding of the South African culture concomitant with what Church (2001) refers to as 'indigenisation'. The general idea is that persons living in a given geographical and/or cultural environment will have current skills in the language and culture of that area of analysis (Hambleton, 1993).

In terms of the analysis of the data, a few issues need to be highlighted as potential limitations. The analysis involved in assessing the reliability of the modified NEO-PI-3 within the South African context, involved conducting an internal consistency analysis. High internal consistency, indicative of high item homogeneity, can be found spuriously from the inadvertent inclusion of essentially similar items within each of the scales of the NEO-PI-3. Internal consistency or item homogeneity is often used for estimating intra-scale reliability, in terms of the item variances and covariances derived from a single instance of measurement. While it is desirable that items in a psychometric scale

measure something in common (i.e. exhibit uni-dimensionality), Hattie (1985) has indicated that there is still no satisfactory index. A uni-dimensional scale, for example the facet Positive emotions (E6), is suppose to be indicative of an underlying latent trait. However, Hattie (1985) further elaborated and stated that and alpha coefficient can be high even if there is no general factor, since (1) it is influenced by the number of items and parallel repetitions of items, (2) it increases as the number of factors pertaining to each item increases , and (3) it decreases moderately as the item communalities increase. There, as a measurement of reliability, internal consistency coefficients need to be interpreted with extreme caution, bearing in mind that a high alpha coefficient does not necessarily translate into being indicative of good reliability.

The explanatory power of non-experimental research can be raised or strengthened through cross-validation or replication (Rosenthal & Rosnow, 1996). In this respect, the external validity of the study could have been improved by presenting the modified version of the NEO-PI-3 to another sample other than university students. It is therefore recommended for further research that the study be done in a different context within South Africa, with a different sample type. Further recommendations are reported in the following section.

4.4: *Recommendations*

As this study was exploratory in nature, by piloting an instrument within the South African context, it is hoped that the results of this study will form the basis for further research. It is hoped that personality measurement will be seen in a different, more comprehensive light in South Africa by virtue of this study. As the current study was exploratory in nature, representing a pilot study, there are many areas of improvement for future research. Firstly, it is recommended that a more representative sample be chosen in future personality research on the NEO-PI-3 in terms of age, gender, population grouping and religious affiliation. Although the sample within the current study represented a fairly diverse composition in terms of the above mentioned

demographic criteria, it is by no means representative of the South African demographic composition. Future research could possibly conduct a similar study with participants not attending a university, and possibly try to attain a larger sample size. It is also recommended that future research analyse the impact each demographic criteria within the sample has on personality in terms of reliability and validity. For instance, in a discussion on cross-cultural theory and research on personality amongst different sub-cultures in Canada, Gibson, McKelvie and DeMan (2008) found that the replication of domains C and A was generally better in females than in their male counterparts. Although this parameter was not attended to nor considered in the present study, it is worth noting here because further research into the NEO-PI-3 is required to determine whether South African males and females would differ in their expression of the FFM of personality or specific domains of the NEO-PI-3. This recommendation extends to a differential analysis needed on the different expressions of personality across population groupings, as well as home language. The demographic information obtained within the current study was used only for descriptive purposes, and as such, a major recommendation is to fully explore each of the different demographic criteria in terms of their impact on the expression of personality within the modified NEO-PI-3.

Further recommendations involve the item adaptation procedure. The items were adapted within the current study through agreement and discussion between the researcher and the researcher's supervisor, and as such no experts in linguistics or cultural studies were used. A further recommendation for the current study would be to redress the revisions made to the items with an expert in the field of linguistics within South Africa, so as to analyse each item specifically from an expert linguistic perspective.

As previously mentioned, the present study is one amongst very few other studies that deal with the biases and cultural-contextual inadequacies of the NEO-PI-R and NEO-PI-3 in their current format. According to Gill and Hodgkinson (2007), cross-cultural studies exploring the specific aspects of "national" personality, enables psychology to better understand how to accommodate all natives of that nation in the testing environment, and also develop a reliable and valid instrument. By that rationale, the following

recommendation for future research is to endeavour to identify and define the socio-cultural specificities of South Africans, by doing research on what the national character embodies. Throughout the literature review, it was evident that there have been few research efforts investigating these constructs. The challenge within South Africa is that South Africa represents such a huge diversity of cultures, where a definable “national identity” is a difficult task to achieve. The advantage of doing this type of research is that it enables psychology to respond more accurately to South Africans in a testing environment.

It is further recommended that the NEO-PI-3’s test specifications be assessed within the South African context in entirety. As was mentioned above, the current study only investigated the particular items within the NEO-PI-3, with no attention given to the test taking procedures, such as answering on a Likert-type format, the speediness of the test, or the environment in which the test was completed in. Additional recommendations associated with the modified version of the NEO-PI-3 would be to investigate the convergent validity of the instrument by correlating the results obtained from the modified NEO-PI-3 with other similar personality questionnaires such as the 16 Personality Factor questionnaire (Abrahams, 1996, 1999, 2002; Prinsloo & Ebersöhn, 2002; Prinsloo & Van Eeden, 2005), and the 15FQ personality test (Meiring, 2007).

4.5: *Concluding Comment*

This study sought to investigate the applicability of a modified version of the NEO-PI-3 which in turn is a modified version of the NEO-PI-R within the South African context. It utilized a modest approach that can be described as exploratory, and is hence a pilot study. In terms of the reliability of the modified version of the NEO-PI-3, internal consistency coefficients produced within the study suggested that the instrument is reliable, producing moderate to good alpha values. The modified NEO-PI-3 also produced evidence of good construct validity, where through the parallel analysis and the scree plot, 5 factors emerged, concomitant with the theory behind the FFM. In addition, the Procrustes rotation conducted on the data, suggested good congruence

with the original NEO-PI-3 instrument, producing an overall congruence coefficient of .96. In terms of the modified NEO-PI-3's face validity, approximately 80% of the participants who answered this question recognised that the instrument was a personality inventory, indicative of good face validity. Only 17 items emerged as still being potentially problematic within the modified version of the NEO-PI-3.

It is hoped that through this study, further avenues for research into personality theory and personality assessment in South Africa and internationally can be opened and explored. It is further hoped that this study will highlight issues pertaining to reliability, validity and fairness in test-taking procedures, especially within the South African context and that these concerns become of central importance in assessment design and implementation in psychology in general, and personality theory in particular. Supporting this sentiment, Cheung *et.al.* (2008) emphasises that by now personality psychology should be feeling a strong need to go beyond structural replication of the FFM, towards cross-cultural investigations of personality, behaviour and concepts of the self in different cultural contexts. It was with this sentiment in mind that the current research attempted to modify the NEO-PI-3 to be more culturally and linguistically applicable in the South African context. In order to understand what makes human beings different, and why some are the same requires a holistic multi-dimensional view of humanity. By being sensitive to the cultural and contextual nuances within the South African culture, this research has attempted to modify the NEO-PI-3 to be more attune to the culture idiosyncrasies inherent within the nation of South Africa. The primary impetus behind the current study was to provide a preliminary investigation into providing the population of South Africa with a personality instrument, grounded in the FFM, that only contains linguistically and culturally appropriate items, but this is also reliable and valid for the South African context.

Reference List

- Abrahams, F. & Mauer, K.F. (1999). Qualitative and statistical impacts of home language on responses to the items of the Sixteen Personality Factor Questionnaire (16PF) in South Africa. *South African Journal of Psychology*, 29 (2), 76-86.
- Abrahams, F. (1996). *The Cross-Cultural Comparability of the 16 Personality Factor Inventory (16PF)*. Unpublished Doctoral Thesis. Pretoria: UNISA.
- Abrahams, F. (2002). The (un)fair usage of the 16PF (SA92) in South Africa: a response to C.H. Prinsloo and I. Ebersöhn. *South African Journal of Psychology*, 32 (3), 58-61.
- Al-Ansari, S. S., & Bella, H. (1997). Translation and adaptation of the revised Denver pre-screening developmental questionnaire for Madinah children, Saudi Arabia. *Ann Saudi Med*, 18 (1), 42-46.
- Allik, J. & McCrae, R.R. (2002). A Five-Factor Theory Perspective. In, McCrae, R.R. & Allik, J. (Eds). *The Five-Factor Model of Personality Across Cultures*. Library of Congress, New York: Kluwer Academic.
- Allport, G.W. (1961) *Pattern and Growth in Personality*. New York: Holt, Rinehart and Winston.
- Angleitner, A., & Ostendorf, F. (2000). *The FFM: A comparison of German speaking countries (Austria, Former East and West Germany, and Switzerland)*. Handout of the paper presented at the XXVIIth International Congress of Psychology, Stockholm, Sweden.
- Ashton, M.C. & Lee, K. (2005). The lexical approach to the study of personality

- structure: Toward the identification of cross-culturally replicable dimensions of personality variation. *Journal of Personality Disorders*, 19 (3), 303-308.
- Auchter, J. E., & Stanfield, C. W. (1997, June). *Developing parallel tests across languages: Focus on the translation and adaptation process*. A paper presented at the Annual Large Scale Assessment Conference, Colorado Springs, CO.
- Babbie, E. & Mouton, J. (2004). *The Practice of Social Research*. Oxford: Oxford University Press.
- Bailey, D. (1997). *Research for the Health Professional*. (2nd Ed). Philadelphia: F.A. Davis Company.
- Bedell, B., Van Eeden, R. & Van Staden, F. (1999). Culture as a moderator variable in psychological test performance: Issues and trends in South Africa. *South African Journal of Industrial Psychology*, 25, 1 -7.
- Beller, M., Gafni, N., & Hannani, P. (1999). *Consulting, adapting, and validating admissions tests in multiple languages*. A paper presented at the International Conference on Test Adaptation, Washington, DC.
- Berry, J.W., Poortinga, Y.H., Segall, M.H. & Dasen, P.R. (1992). *Cross-cultural Psychology: Research and Applications*. Cambridge: Cambridge University Press.
- Berry, J.W., Poortinga, Y.P. & Pandey, J. (1997). *Theory and Method: Handbook of Cross-cultural Psychology*. Boston: Allyn & Bacon.
- Boyle, G. J. (1991). *Does item homogeneity indicate internal consistency or item redundancy in psychometric scales?* Department of Psychology, University of Queensland, Australia.

- Braun, V. and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.
- Chang, C. Y. (1999). *Cross-cultural assessment: A call for test adaptation*. Newsnotes. Summer Edition. Association for Assessment in Counseling. Retrieved on February 20, 2010, from <http://aac.ncat.edu/newsnotes/y99sum1.html>.
- Cheung, F. M., & Leung, K. (1998). Indigenous personality measures: Chinese examples. *Journal of Cross-Cultural Psychology*, 29, 233–248.
- Cheung, F., Cheung, S., Leung, K., Ward, C., & Leong, F. (2003). The English version of the Chinese Personality Inventory. *Journal of Cross-Cultural Psychology*, 34, 433-452.
- Cheung, F., Cheung, S., Zhang, J., Leung, K., Leong, F., & Yeh, K.H. (2008). Relevance of Openness as a personality dimension in Chinese culture: Aspects of its cultural relevance. *Journal of Cross-Cultural Psychology*, 39, 81-108.
- Child, D. (2006). *The Essentials of Factor Analysis*, London: Continuum Publishing Group.
- Church, A.T. & Katigbak, M.S. (2002). The Five-Factor Model in the Philippines. In, McCrae, R.R. and Allik, J. (Eds). *The Five-Factor Model of Personality Across Cultures*. Library of Congress, New York: Kluwer Academic.
- Church, A.T. & Lonner, W.J. (1998). The cross-cultural perspective in the study of personality. *Journal of Cross-Cultural Psychology*, 29 (1), 32-62.
- Church, T.A. (2000). Culture and personality: Toward an integrated cultural trait psychology. *Journal of Personality*, 68 (4), 651-704.
- Claasen, N.C.W. (1997). Culture differences, politics and test bias in South Africa.

European Review of Applied Psychology, 47 (2), 297-307.

Cooper, C.L. & Pervin, L.A. (1998). *Personality: Critical concepts in Psychology*. New York: Routledge.

Costa, P.T. & McCrae, R.R. (1992). *Revised NEO Personality Inventory and NEO Five-factor Inventory Professional Manual*. Florida: Psychological Assessment Resources, Inc.

Cramer, D. (2003) *Advanced Quantitative Data Analysis*. London: Open University Press.

Cuningham, K. (1986). *Educational and Psychological Measurement*. New York: Macmillan Publishing.

Ercikan, K. (1998). Translation Effects in International Assessments. *International Journal of Educational Research*, 29, 543-553.

Eriksen, T.H. (2001). *Small Places, Large Issues: An Introduction to Social and Cultural Anthropology*. (2nd Ed.). London: Pluto Press.

Ferketich, S. (1991). Focus on psychometric aspects of item analysis. *Research in Nursing and Health*, 14 (2), 165-168.

Foxcroft, C. (2004). Planning a psychological test in the multicultural South African context. *South African Journal of Industrial Psychology*, 30 (4), 8-15.

Franklin, D. R. (2009). *Exploring language bias in the NEO-PI-R*. Unpublished master's thesis, Johannesburg: University of the Witwatersrand.

Geertz, C. (1975). *Thick Description: Toward an Interpretive Theory of Culture*. The

Interpretation of Cultures. London: Hutchinson of London.

Geisinger, K .F. (2003). Testing and assessment in cross-cultural psychology. In J. Graham & J. Naglieri (Eds.), *Handbook of psychology: Assessment psychology*. New York: Wiley.

Gibson, K.L., McKelvie, S.J. & DeMan, A.F. (2008). Personality and culture: a comparison of Francophones and Anlgophones in Quebec. *Journal of Social Psychology*, 148 (2), 133-165.

Gill, C.M. & Hodgkinson, G.P. (2007). Development and validation of the Five-Factor Model Questionnaire (FFMQ). *Personnel Psychology*, 60 (3), 731-757.

Glorfeld, L.W. (1995). An improvement on Horn's parallel analysis methodology for selecting the correct number of factors to retain. *Educational and Psychological Measurement*, 55, 377-393.

Goldberg, L. R. (1990). An Alternative "Description of personality": The big-five structure. *Journal of Personality and social Psychology*, 59, 1216-1229.

Government Gazette. (1998). *Employment Equity Act. Republic of South Africa*, 400 (19370), www.hpcsa.org.

Gülgöz, (2002). Five-Factor Model and NEO-PI-R in Turkey. In R. R. McCrae & J. Allik (Eds.), *The Five-Factor model of personality across cultures* (175–196). New York: Kluwer Academic Publisher.

Hambleton, R. K. (1994). Guidelines for adapting educational and psychological tests: A progress report. *European Journal of Psychological Assessment*, 10 (3), 229-244.

- Hambleton, R. K. (1996). *Guidelines for adapting educational and psychological tests*. A paper presented at the Annual Meeting of the National Council on Measurement in Education, New York.
- Hambleton, R. K. (2002). *Adapting achievement tests into multiple languages for international assessments*. In *the Center for Education's Methodological Advances in Cross-National Survey of Educational Achievement*. Washington, DC: The National Academic Press.
- Hambleton, R. K., & Bollwark, J. (1991). *Adapting tests for use in different cultures: Technical issues and methods*. Abstract retrieved February 21, 2010, from ERIC database.
- Hambleton, R. K., & Patsula, L. (2000). *Adapting tests for use in multiple languages and cultures*. (Report N. LR-304). Laboratory of Psychometrics and Evaluative Research Report, University of Massachusetts, Amherst.
- Hambleton, R. K., & Kanjee, A. (1993). *Enhancing the validity of cross-cultural studies: Improvements in instrument translation methods*. A paper presented at the Annual Meeting of the American Educational Research Association, Atlanta, GA.
- Hayton, J.C., Allen, D.G., & Scarpello, V. (2004). Factor retention decisions in EFA: A tutorial on parallel analysis. *Organisational Research Methods*, 7, 191-205.
- Heaven, P.C.L. & Pretorius, A. (1998). Personality structure among black and white South Africans. *The Journal of Social Psychology*, 138 (5), 664-666.
- Heaven, P.C.L., Connors, J. & Stones, C.R. (1994). Three or five personality dimensions? An analysis of natural language terms in two cultures. *Journal of Personality & Individual Differences*, 17 (2), 181-189.

- Henson, R.K., & Roberts, J.K. (2006). Use of EFA in published research: Common errors and some comment on improved practice. *Educational and Psychological Measurement*, 66, 393 - 416.
- Hergenhahn, B. R. (1994) *An Introduction to Theories of Personality (4th Ed.)*, New Jersey: Prentice Hall, Englewood Cliffs.
- Heuchert, J. W. P., Parker, W. D., Stumpf, H. & Myburg, C. P. H. (2000). The five-factor model for South African college students. *American Behavioural Scientist*, 44 (2),112-125.
- Horn, B.S. (2000). *A Xhosa translation of the NEO Personality Inventory*. Unpublished masters dissertation. Port Elizabeth: University of Port Elizabeth (UPE).
- Howell, D. C. (2004) *Fundamental Statistics for the Behavioural Sciences*. (5th Ed.), New York: Thomson Brooks/Cole.
- Hrebíckova, M., Urbánek, T., Cermák, I., Szarota, P., Ficková, E. & Orlická, L. (2002). The NEO Five-factor Inventory in Czech, Polish, and Slovak contexts. In A. J. Marsella (Series Ed.), R. R. McCrae, J and Allik (Eds.), *The Five-Factor Model of Personality Across Cultures*, New York: Kluwer Academic / Plenum Publishers, 53-78.
- Huck, S. W. (2004), *Reading Statistics and Research (4th Ed.)*, New York: Pearson Education Inc.
- International Test Commission (2010). International Test Commission Guidelines for Translating and Adapting Tests. [<http://www.intestcom.org>]
- Irvine, S.H. & Berry, J.W. (1983). *Human Assessment and Cultural Factors*. New York: Plenum Press.

Kassin, S. (2003). *Psychology*. USA: Prentice-Hall, Inc.

Kline, M. (1983). Cultural equivalence. In, Irvine, S.H. & Berry, J.W. (Eds.). *Human Assessment and Cultural Factors*. New York: Plenum Press

Kline, P. (1993). *Personality: The psychometric view*. New York: Routledge.

Kline, P. (1994). *An easy guide to factor analysis*. London: Routledge.

Krippendorff, K. (1980). *Content analysis: An introduction to its methodology*. London: Sage Publications.

Laher, S. (2008). Structural equivalence and the NEO-PI-R: implications for the applicability of the Five Factor Model of personality in an African context. *South African Journal of Industrial Psychology*, 34 (1) 76-80.

Laher, S. (2010). *Exploring the applicability of the NEO-PI-R and the CPAI-2 in the SA Context*. Unpublished PhD Dissertation, University of the Witwatersrand, Johannesburg.

Laher, S. & Quay, G. (2009). Exploring the Role of Spirituality in the Context of the Five Factor Model of Personality in a South African Sample. *Journal of Psychology in Africa*, 19, 513-521.

Larsen, R.J. & Buss, D.M. (2005). *Personality Psychology: Domains of Knowledge About Human Nature*. (2nd Ed). New York: McGraw-Hill International.

Ledesma, R.D., & Valero-Mora, P. (2007). Determining the number of factors to retain in EFA: An easy-to-use computer program for carrying out parallel analysis. *Practical Assessment, Research and Evaluation*, 12, 1-11.

- Leininger, A. (2002). Vietnamese American personality and acculturation: An exploration between personality traits and cultural goals. In R. R. McCrae & J. Allik (Eds.), *The Five-Factor model of personality across cultures* (197-227). New York: Kluwer Academic Publisher.
- Lima, M. P. (2002). Personality and culture: The Portuguese case. In R. R. McCrae & J. Allik (Eds.), *The Five-Factor model of personality across cultures*, New York: Kluwer Academic Publisher.
- Lyons, E & Chryssochoou, X. (2002). Cross Cultural Research Methods. In, Breakwell, G.M., Hammond, S. & Fife-Schaw, C. (Eds.). *Research Methods in Psychology*. (2nd Ed.). London: Sage Publications.
- Marcus, G.E. & Fischer, M.M.J. (1986). *Anthropology As Cultural Critique: An Experimental Moment in the Human Sciences*. Chicago: University of Chicago Press.
- Martin, T. A., Oryol, V. E., Rukavishnikov, A. A., & Senin, I. G. (2000). *Applications of the Russian NEO-PI-R*. Paper presented at the XXVIIth International Congress of Psychology, Stockholm, Sweden.
- McCrae R. R., Terracciano, A., & 79 Members of the Personality Profiles of Cultures Project. (2005). Personality Profiles of Cultures: Aggregate Personality Traits. *Journal of Personality and Social Psychology*, 89 (3), 407–425.
- McCrae, R. R. & Costa, P. T. (1992). Discriminant Validity of the NEO-PI-R Facet Scales. *Educational and Psychological Measurement*, 52 (1), 229-237.
- McCrae, R. R. & Costa, P. T. (1997) Personality Trait Structure as a Human Universal. *American Psychologist*, 52 (5), 509-516.

- McCrae, R. R. & Costa, P. T. & Martin, T. A. (2004). The NEO-PI-3: A More Readable Revised NEO Personality Inventory. *Journal of Personality Assessment*, 84 (3), 261-270.
- McCrae, R. R. (2001). 5 Years of Progress: A Reply to Block. *Research in Personality*, 3 (1), 108-113.
- McCrae, R. R. (2001). Trait psychology and culture: exploring intercultural comparisons. *Journal of Personality*, 69, 819-846.
- McCrae, R. R. (2002). NEO-PI-R data from 36 cultures: Further Intercultural comparisons. In R. R. McCrae & J. Alik. (Eds.), *The Five-Factor model of personality across cultures*. New York: Kluwer Academic.
- McCrae, R. R., Costa, P. T. & Martin, T. (2004). The NEO-PI-3: A More Readable Revised NEO Personality Inventory. *Journal of Personality Assessment*, 84 (3), 261- 270.
- McCrae, R. R., Costa, P. T. Jr., & Yik, M. S. M. (1996). Universal aspects of Chinese personality structure. In M. H. Bond (Ed.), *The Handbook of Chinese psychology*. Hong Kong: Oxford University Press.
- McCrae, R. R., Costa, P. T. Jr., del Pilar, G. H., Rolland, J. P., & Parker, W. D. (1998). Corss-cultural assessment of the five-factor model: The revised NEO Personality Inventory. *Journal of Cross-Cultural Psychology*, 29, 171-188.
- McCrae, R. R., Costa, P. T. Jr., Lima, M. P., Simões, A., Ostendorf, F., Angleitner, A., Marušić, I., Bratko, D., Caprara, G. V., Barbaranelli, C., Chae, J. H., & Piedmont, R. L. (1999). Age differences in personality across the adult life span: Parallels in five cultures. *Developmental Psychology*, 35, 466-477.

- McCrae, R. R., Terracciano, A., & 78 Members of the Personality Profiles of Cultures Project. (2005). Universal features of personality traits from the observers perspective: Data from 50 cultures. *Journal of Personality and Social psychology*, 88, 547-561.
- McCrae, R.R. & Allik, J. (2002). *Introduction. The Five-Factor Model of Personality Across Cultures*. Library of Congress, New York: Kluwer Academic.
- McCrae, R.R. & Costa, P.T. (1989). Rotation to maximize the construct validity of factors in the NEO-Personality Inventory. *Multivariate Behavioural Research*, 24, 107-124.
- McCrae, R.R. & Costa, P.T. (1997). Personality trait structure as a human universal. *American Psychologist*, 52 (5), 509-516.
- McCrae, R.R. (2000). Trait psychology and the revival of personality and culture studies. *American Behavioural Psychologist*, 44 (1),10-31.
- McCrae, R.R. (2002). Cross-cultural research on the five-factor model of personality. In, Lonner, W.J., Dinnel, D.L. & Hayes, S.A. (Eds.). *Online readings in psychology and culture*. Available online: <http://www.wvu.edu/~culture>.
- McCrae, R.R. (2002). NEO-PI-R data from 36 cultures. In, McCrae, R.R. & Allik, J. (Eds). *The Five-Factor Model of Personality Across Cultures*. Library of Congress, New York: Kluwer Academic.
- McCrae, R.R., Yik, M.S., Trapnell, P.D., Bond, M.H. & Paulhus, D. (1998b). Interpreting personality profiles across cultures: Bilingual, acculturation, and peer rating studies of Chinese undergraduates. *Journal of Personality and Social psychology*, 74 (4), 1041-1055.

- McCrae, R.R., Zonderman, A.B., Bond, M.H., & Paunonen, S.V. (1996). Evaluating replicability of factors in the Revised NEO Personality Inventory: Confirmatory factor analysis versus procrustes rotation. *Journal of Social and Personality Psychology*, 70, 552-566.
- Meiring, D., (2007). *Bias and Equivalence of Psychological Measure in South Africa*. Ridderkerk: Labyrinth Publications.
- Meiring, D., Van der Vijver, A.J.R., Rothman, S. & Barrick, M.R. (2005). Construct, item and method bias of cognitive and personality tests in South Africa. *SA Journal of Industrial Psychology*, 31 (1), 1-8.
- Meyer, W., Moore, C. & Viljoen, H. (2003). *Personology: From individual to ecosystem. Third Edition*, Heinemann Publishers (Pty) Ltd.
- Moerdyk, A. (2009). *The principles and practice of psychological assessment*. Pretoria: Van Schaik Publishers.
- Murphy, K. R. & Davidshofer, C. O. (2005) *Psychological testing: Principles and Applications*, Pearson Education International. New Jersey.
- Millon, T. (1994). *Millon Index of Personality Styles Manual*. Orlando: The Psychological Corporation.
- O'Connor, B. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavior Research Methods, Instruments and Computers*, 32, 396-402.
- Ortner, S. (1974). Is Female to Male as Nature is to Culture? In, Rosaldo, M. & Lamphere, L. (Eds). *Women, Culture and Society*. Stanford: Stanford University

Press.

Paunonen, S. V. & Jackson, D. N. (2000) What is Beyond the Big Five? Plenty! *Journal of Personality* 68, (5), 821-835.

Piedmont, R. L., & Chae, J. H. (1997). Cross-cultural generalizability of the five-factor model of personality: Development and validation of the NEO-PI-R for Koreans. *Journal of Cross-Cultural Psychology*, 28, 131-155.

Piedmont, R. L., Bain, E., McCrae, R. R., & Costa, P. T. (2002). The applicability of Five Factor Model in sub Saharan culture: The NEO-PI-R in Shona. In R. R. McCrae & J. Allik (Eds.), *The Five-Factor model of personality across cultures* N.Y.: Kluwer Academic Publisher.

Piedmont, R.L. (1998). *The Revised NEO Personality Inventory: Clinical and Research Applications*. Library of Congress, New York: Plenum Press.

Poortinga, Y.H. & Van der Vijver, F.J.R. (1987). Explaining cross-cultural differences: bias analysis and beyond. *Journal of Cross-Cultural Psychology*, 18 (3), 259-282.

Poortinga, Y.H., Van der Vijver, F.J.R. & Van Hemert, D.A. (2002). Cross-cultural equivalence of the Big-Five. In, McCrae, R.R. & Allik, J. (Eds). *The Five-Factor Model of Personality Across Cultures*. Library of Congress, New York: Kluwer Academic

Prinsloo, C.H. & Ebersöhn, I. (2002). Fair usage of the 16PF in personality assessment in South Africa: A response to Abrahams and Mauer with special reference to issues of research methodology. *South African Journal of Psychology*, 32 (3), 48-57.

- Pulver, A., Allik, J., Pulkkinen, L., & Härmäläinen, M. (1995). The Big Five Personality Inventory in two non-Indo-European languages. *European Journal of Personality*, 9, 109-124.
- Rolland, J. P. (2000). *Cross-cultural validity of the five factor model of personality*. Paper presented at the XXVIIth International Congress of Psychology, Stockholm, Sweden.
- Rolland, J.P. (2002). The cross-cultural generalizability of the Five-Factor Model of Personality. In, McCrae, R.R. & Allik, J. (Eds). *The Five-Factor Model of Personality Across Cultures*. Library of Congress, New York: Kluwer Academic.
- Rosenthal, R. & Rosnow, R.L. (1991). *Essentials of behavioral research: Methods and data analysis*. New York: McGraw Hill.
- Rosnow, R. & Rosenthal, R. (1996). *Beginning Behavioural Research: conceptual primer 2nd Ed*. Published by Prentice Hall, New Jersey.
- Satz-Miracle, C. (1981). *The Aymara language in its social and cultural context*. In, Hardman, M.J. (Eds). Tallahassee: University Presses of Florida
- Saucier, G. & Goldberg, L. R. (1998). What is beyond the Big Five? *Journal of Personality*, 66, 495-524.
- Saucier, G. & Goldberg, L. R. (2001). Lexical studies of Indigenous Personality. *Journal of Personality*, 74, (5), 1257-1292.
- Sehlapelo, M. & Terre Blanche, M. (1996). Psychometric testing in South Africa: Views from above and below. *Psychology in Society*, 21, 49-59.
- Tanzer, N. K., & Sim, C. Q. E. (1999). Adapting instruments for use in multiple

- languages and cultures: A review of the ITC Guidelines for test adaptation. *European Journal of Psychological Assessment*, 15 (3), 258-269.
- Taylor, I.A. (2000). *The construct comparability of the NEO-PI-R Questionnaire for Black and White employees*. Unpublished doctoral thesis, Bloemfontein: University of the Free State.
- Taylor, N & De Bruin, G P (2005) *Basic Traits Inventory: Technical manual*. Johannesburg: J P van Rooyen & Partners.
- Van de Vijver, F. & Leung, K. (1997). *Methods and data analysis for cross cultural research*. Newbury Park, CA: Sage.
- Van de Vijver, F. J. R., & Tanzer, N. K. (1998). Bias and equivalence in cross-cultural assessment: An overview. *European Review of Applied Psychology*, 47 (4), 263-279.
- Van de Vijver, A .J. R. & Rothmann, S. (2004). Assessment in multicultural groups: The South African case. *South African Journal of Industrial Psychology*, 30 (4), 1-7.
- Van der Vijver, A. J. R. & Rothmann, S. (2004). Assessment in multicultural groups: the South African case. *SA Journal of Industrial Psychology*, 30 (4),1-7.
- Van Eeden, R. & Prinsloo, C.H. (1997). Using the South African version of the 16PF in a multicultural context. *South African Journal of Psychology*, 27 (3),151-159.
- Van Hemert, D.A., Van der Vijver, F.J.R., Poortinga, Y.H. & Georgas, J. (2002). Structural and functional equivalence of Eysenck's Personality Questionnaire within and between countries. *Personality and Individual Differences*, 33 (4), 1229-1249.

- Velicer, W.F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika*, 41, 321-327.
- Vogt, L.T. (2009). *The relationship between the Five-Factor Model and Individualism / Collectivism among South African students*. Psychology in Society 35 paper reference in press.
- Wallis, T. & Birt, M. (2003). A comparison of native and non-native English-speaking groups' understanding of the vocabulary contained in the 16PF (SA92). *South African Journal of Psychology*, 33 (3), 182-190.
- Woodcock, R. W., & Muñoz-Sandoval, A. (1999). *Test translation guidelines: A "consensus translation" approach*. A paper presented at the International Conference on Test Adaptation, Georgetown University, Washington, DC.
- Wrigley, C.S., & Neuhaus, J.O. (1955). The matching of two sets of factors. *American Psychologist*, 10, 418-419.
- Yik, M. S. M., & Bond, M. H. (1993). Exploring the dimensions of Chinese person perception with indigenous and imported constructs: Creating a culturally balanced scale. *International Journal of Psychology*, 28, 75-95.