

**THE RELATIONSHIP BETWEEN PERSONALITY TRAITS AND
VOCATIONAL INTERESTS IN A SOUTH AFRICAN CONTEXT**

by

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CONCEPT DECLARATION

I, **Christine Momberg**, declare that “**The Relationship between Personality Traits and Vocational Interests in a South African context**” is my own work. All the resources I used for this study are sited and referred to in the reference list by means of a comprehensive referencing system.

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

Christine Momberg

10 December 2004

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ABSTRACT

**THE RELATIONSHIP BETWEEN PERSONALITY TRAITS AND
VOCATIONAL INTERESTS IN A SOUTH AFRICAN CONTEXT**

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The purpose of this study is to determine if there is a relationship between personality traits and vocational interests in the South African context. A sample of 770 subjects completed the Sixteen Personality Factor Questionnaire (16PF) and the Interest Questionnaire (INQ). The Pearson's r indicates a number of low and moderate correlations between the factors on the 16PF and interest fields of the INQ. Partial correlations conducted shows that gender and race may influence these relationships, however these were slight changes. It is evident that a relationship exists between personality and vocational interest but seems to be weaker in the South African context than those found in studies conducted in Europe and the United States of America.

SAMEVATTING

DIE VERHOUDING TUSSEN PERSOONLIKHEIDSTREKKE EN BEROEPSBELANGSTELLINGS IN 'N SUID-AFRIKAANSE KONTEKS

deur

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LEIER

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MCom (Menslike Hulpbron Bestuur)

Die doel van die studie is om te bepaal of daar 'n verband is tussen persoonlikheidstreke en beroepsbelangstellings binne die Suid-Afrikaanse konteks. 'n Steekproef van 770 proefpersone het die Sixteen Personality Factor Questionnaire (16PF) en die Interest Questionnaire (INQ) voltooi. Pearson se r toon 'n hele aantal lae en gemiddelde korrelasies tussen die faktore op die 16PF en belangstellingsvelde op die INQ. Gedeeltelike korrelasies toon dat geslag en ras hierdie verhoudinge beïnvloed, alhoewel dit net klein veranderinge meebring. Die positiewe korrelasies wat tussen persoonlikheidstreke en belangstellingsvelde bevind is blyk swakker te wees as die korrelasies wat in verskeie studies, gedoen in die VSA en Europa, beskryf word.

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CHAPTER 1: INTRODUCTION TO STUDY

1.1 INTRODUCTION

The purpose of this study was to determine if there is a relationship between personality traits and vocational interests as measured by the Sixteen Personality Factor Questionnaire (16PF) and the Interest Questionnaire (INQ) in the South African context. Parametric associational tests (Pearson's correlation coefficient) were used to test the relationship between these two variables.

This chapter discusses the research problem relating to this study, as well as the background that preceded the formulation of this particular problem statement. Furthermore, it also examines the purpose, hypotheses and significance of the study. Operational definitions for the variables as well as chapter outlines for the remainder of the manuscript are provided.

1.2 PROBLEM STATEMENT

Numerous studies surrounding personality and interests have been conducted in the past. These studies were however mainly conducted on American and European samples (*see Chapter 4*). A need therefore exists to put this topic into a South African context, as will be discussed in *paragraph 1.3*.

1.3 BACKGROUND

1.3.1 Personality, Vocational Choice and Job Satisfaction

Congruence between an individual's personality style and his or her job selection has shown to be positively related to job satisfaction (Assouline &

Meir, 1987; Spokane, 1985). In this specific context of vocational psychology the idea of congruence is derived from Holland's theory of vocational choice. This theory is based on two statements. The first is that the choice of vocation is an expression of personality (Holland in Jagger & Neukrag, 1992). This implies that an individual's vocational interests and therefore choice stems from his/her personality. The second statement is that vocational satisfaction and achievement depend on the congruence between an individual's personality and work environment (Holland in Jagger & Neukrag, 1992). Therefore, by congruence the degree of fit between personality and environment is implied. In other words individuals tend to do best in those environments which correspond most closely with their personalities, since such environments provide them with the most opportunities, offer meaningful compensation and best fulfil their needs. This would imply that one must choose a career in which the work environment will best correspond with one's personality type (Holland in Stead & Watson, 1999:56).

In a study conducted by Brackney (1991) it was discovered that congruence between Holland's personality types and occupation chosen 10 years later predicted satisfaction with that occupation. Other studies also found a strong relationship between congruence between an individual's personality and work environment on the one hand and job satisfaction on the other (Elton & Smart, 1988; Smart, Elton & McLaughlin, 1986). However, little research has been conducted that specifically examined this relationship in a South African context.

1.3.2 The Influence of the Environment on Personality, Vocational Interests and Vocational Choice

When making a vocational choice it is not only personality that influences the choice, but also vocational interests and the environment. This can be explained as a triadic relationship (between personality, vocational interests and vocational choice) which takes place within the broader context

(environment). Here, the environment facilitates and influences the triadic relationship. Firstly, the environment influences the development of personality and vocational interests. But secondly it also determines the availability of career options that individuals can decide between. This implies then that on the one hand the individual has his/her unique composition of needs, while, on the other hand the environment has its own needs, opportunities and facilities (Potgieter, 1983). By implication, congruence between personality and the work environment is possible in an environment in which career possibilities are unlimited.

Although many factors in the South African context are not unique, it may be of such a nature that it presents certain limitations and opportunities that may influence the triadic relationship between personality, vocational interests and vocational choice. In South Africa, a new democratic government was selected during 1994. In 1996 a new constitution was adopted. Although, the country celebrated 10 years of democracy in 2004, the impact of Apartheid has not yet disappeared. According to Stead and Watson (1998:289-290), two of the most evident problems of South Africa are the country's high unemployment rate and unsatisfactory economic growth rate.

According to statistics provided by the Central Statistical Service (in Nicholas, Pretorius & Naidoo, 1999:10) the following was evident of the South African labour market during 1995 / 1996:

- Twenty nine percent of people under the age of 15 who had expressed a desire to work were jobless
- Unemployment was heavily divided along racial lines with 47% of African women and 29% of African men being unemployed
- Education statistics showed that 20% of the African men and women had a Standard 10 or higher level of education, compared to the 73% of white males and 67% of white females

Although the South African economy has seen a significant growth rate in 2003 – 2004 (approximately 5 – 10%) the rate of unemployment and the increasing gap between rich and poor is still a problem (Interface, 2004). In the period of 1995 – 2002, unemployment of White South Africans increased from 4,79% - 9,17%. During the same period, unemployment increased from 36,16% - 46,62% for Black South Africans. In a press statement by The Congress of South African Trade Unions (COSATU) concern over the report of Statistics South Africa in the third quarter of 2003 (COSATU, 2003) was raised. This report indicated that formal employment dropped by almost 1% in the third quarter of 2003. This means a loss of almost 60 000 jobs. Unemployment in South Africa is now at a record high of 31% and COSATU stated that more job losses could not be tolerated (COSATU, 2003). Regardless, large companies in South Africa are still considering considerable lay offs over the following years (Salie, 2004).

For a large proportion of the South African citizens, finding a job is becoming increasingly difficult and essential with the upward spiral of everyday living costs. Factors such as job satisfaction and even finding a job that suits the person's personality are of peripheral importance. Owing to this, unemployed citizens are struggling to meet in their basic needs i.e. food, clothing and shelter. Fulfilling these needs therefore becomes far more important to them than job satisfaction. This was confirmed by Watson, Foxcroft, Horn and Stead (in Stead & Watson, 1998:290) who indicated that the problem of unemployment in South Africa influences most disadvantaged students whereby their occupational aspirations are poorly matched to labour market trends.

In 1998, the Employment Equity Act, No 55 of 1998, was enforced by the South African Government. This act was compiled for six main reasons:

- (1) To promote the constitutional right of equality and the exercise of true democracy;
- (2) To eliminate unfair discrimination in employment;

- (3) To ensure the implementation of employment equity to redress the effects of discrimination;
- (4) To achieve a diverse workforce broadly representative of our people;
- (5) To promote economic development and efficiency in the workforce and
- (6) To give effect to the obligations of the Republic

This Act therefore stipulates that every employer in South Africa has a legal obligation to promote equal opportunities in the workplace by eliminating unfair discrimination on the basis of race, gender, sex, pregnancy, marital status, family responsibility, ethnic or social origin, colour, sexual orientation, age, disability, religion, HIV status, conscience, belief, political opinion, culture, language or birth.

A positive measure to increase representativity of previously under-represented groups was implemented, namely *affirmative action*. These under-represented groups are also referred to as designated groups and are (1) Black people, including Africans, Coloureds and Indians; (2) women and (3) people with disabilities.

The implementation of the Employment Equity Act and affirmative action has however brought about other problems. The major problem is that recruitment and selection of companies now favours designated groups. Therefore individuals who are not part of the designated groups now struggle to find jobs as they cannot choose the jobs they want anymore. For this reason, the congruence between their personalities and vocational choices are not as important as just finding employment. Therefore as mentioned earlier the absence of congruence leads to lower job satisfaction.

Not only is the availability of job opportunities tied to the environment, but also the development of interest. Interests are tied to learning experiences, opportunities and exposure during a person's life (Stead & Watson, 1999:97). According to this viewpoint, the vocational choice is directly linked to the goals and activities that develop out of interest. In 1997, Watson,

Foxcroft, Horn and Stead (in Stead and Watson, 1997:97) conducted a study which showed that Black South Africans did not aspire to scientific occupations, such as engineering, technical trades and computer science. Stead and Watson (1999:97) ascribes this to the inadequate educational opportunities and training in mathematics and science in secondary education and the lack of financial resources. This may be changing with the changes brought about in the educating system as well as the financial aid given to previously disadvantaged students. However, it should be kept in mind that these are new developments and will take a while to take effect.

1.3.3 A Holistic View of the Interrelationship between Personality, Vocational Interests, Vocational Choice and the Environment

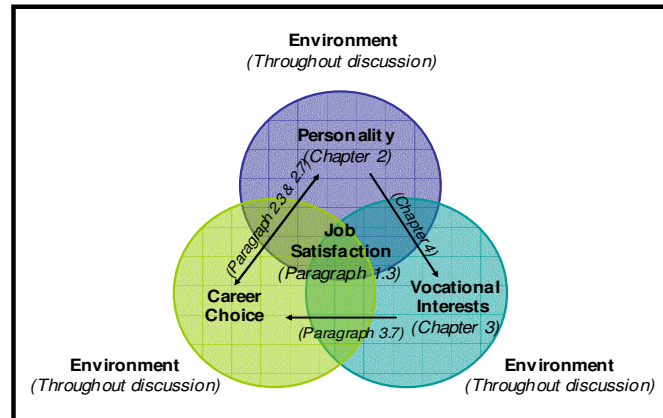
As discussed in section 1.3.2, the environment plays an important role when an individual needs to select a future career. On the one hand, the environment influences the amount of work opportunities and type of opportunities available to the people. On the other hand, the environment also influences the exposure to learning experiences, which shapes personal or vocational interests.

The ideal therefore is that an individual chooses a career that suits his/her capabilities, interests and personality and one that will contribute to a positive self-image. This however is not always achievable; due to other factors that also influences career choices. According to Louw, Van Ede and Louw (1998:445-449) these are social changes, socio-economic status, gender differences, the influence of parents and the mass media. It is therefore clear that personality is but one variable that influences an individual's vocational interests and vocational choice.

Figure 1.1 illustrates the interrelationship that exists between personality, vocational interest, vocational choice and the environment in which these variables are situated. The purpose of this figure is to provide a holistic view of the various interrelationships. Also indicated in the figure are the

sections in which each of the factors and the relationships between them will be discussed.

Figure 1.1
The Interrelationship between Personality, Vocational Interest, Vocational Choice and the Environment



1.4 PURPOSE OF THIS STUDY

The specific research question pertaining to this project can be stated as:

Is there a relationship between personality traits and vocational interests for the South African population?

The aim of this study can therefore be to obtain a clear picture on the existence and nature of the relationship between personality traits and vocational interests in a South African context. For this study, the Sixteen Personality Factor Questionnaire (16PF) is used to measure personality traits and the Interest Questionnaire (INQ) to measure vocational interests. The rationale behind the use of these instruments is discussed in *Chapter 5*.

From the above research question a very broad alternative hypothesis can be derived:

H₁ : There is a relationship between personality traits and vocational interests

The null hypothesis could therefore be stated as:

H₀ : There is no relationship between personality traits and vocational interests

In the light of the South African context, another hypothesis can be formulated:

H₂ : Gender and race do influence the relationship between personality traits and vocational interests

The null hypothesis of this second hypothesis can be stated as:

H₀ : Gender and race do not influence the relationship between personality traits and vocational interests

1.5 OPERATIONAL DEFINITIONS OF THE VARIABLES

The focus of this study was on the relationship between human attributes such as personality traits and vocational interests. *Chapter 2* and *3* respectively discusses definitions relating to the concepts personality traits (*paragraph 2.2.2*) and vocational interests (*paragraph 3.2.2*).

In this study personality traits were operationalized by the 16 PF (Form SA92) and vocational interests by the INQ. The following definitions of the two variables will serve as an introduction to the discussions in *Chapters 2* and *3*, which will analyse similar and opposite definitions of these two concepts.

For the purpose of this study personality traits are defined as: “The quality of condition of being a person. The totality of qualities or traits, as of character or behaviour, that is peculiar to a specific person...” (The American Heritage Dictionary of the English Language, 2000). And vocational interests are defined as: “a limited part of a larger or more complex unit or system, especially: an area of specialized skill or knowledge, especially academic or vocational, that is related to but separate from other areas...” (The American Heritage Dictionary of the English Language, 2000).

1.6 SIGNIFICANCE OF THIS PROJECT

Firstly, this study will put this theme into a South African context. As mentioned earlier most similar studies were on American and European samples and it could be valuable to get insight as to if South Africans show similar or dissimilar correlations.

Secondly, this study will also examine the influence of race and gender on the relationship between personality traits and vocational interests. Little research of this nature has been conducted on a South African sample up to date and therefore the results will indicate if the diversity of the South African population influences the existence and nature of the relationship in any way.

Lastly, this is the first ever project being conducted that used the INQ as part of the measuring instruments. This is of importance as this measure was developed for the South African population and the results of this study could indicate if this measure could be standardised for all the population groups of South Africa.

1.7 **CHAPTER OUTLINE**

The remaining chapters can be divided into a literature study (Chapters 2 to 4), a discussion on the methodology used (Chapter 5) and an article (Chapter 6).

The literature review covers the main concepts included in this study as they were reviewed in different literature sources. In this study the concepts are personality and vocational choice in Chapter 2 and vocational interests and vocational choice in Chapter 3. The relationship between personality traits and vocational interests will be discussed in Chapter 4.

Chapter 2 provides a brief introduction to personality and vocational choice. It defines the concepts personology and personality traits. The most prominent perspectives of personology are discussed in terms of several personality theories, namely the psychodynamic, humanistic / existential, cognitive-behavioural and the trait theory, with specific focus on the trait theory. The different views of these personality theories on vocational choice will also be discussed. Attention is also given to the measurement of personality in general and personality inventories in specific. Personality inventories will be investigated in terms of their origin, rational, different types, the advantages and disadvantages and the applications of these inventories. Personality in the work context will also be discussed.

Chapter 3 provides a brief introduction to vocational interests and vocational choice. It defines the concepts vocational psychology and vocational interests. The most prominent perspectives of vocational psychology are discussed in terms of several career theories, namely the trait-factor theory, John Holland's theory, Donald Super's theory and the social-cognitive theory. Attention is given to the measurement of interests in general and interest inventories in specific. Interest inventories will be investigated in terms of their origin, rational, different types, the advantages and disadvantages and

the applications of these inventories. The link from vocational interests to vocational choice will also be discussed.

Chapter 4 examines the relationship between personality traits and vocational interests. The aim of this chapter is to study previous research on this relationship as well as to determine what these contributed to the field. This will serve as an analysis of the possibility of the relationship between vocational interests and personality traits and will suggest if this current study's hypotheses will be supported or rejected.

Chapter 5 provides a detailed description of all the technical aspects which was involved in conducting the study. It includes discussions on the research design, data gathering procedure, population and sampling, measuring instruments and the procedure of statistical analysis used for this study. The results of this study and the discussion thereof are presented in Chapter 6.

Chapter 6 is an article. It includes important aspects from Chapter 1 through to 5 as well as the results and a discussion thereof. The limitations of the study are given and the recommendations for future research are presented complete with a conclusion and list of references for sources used in the article.

This will be followed by the list of references which includes all sources used in the various chapters and the article itself.

CHAPTER 2: PERSONALITY AND VOCATIONAL CHOICE

2.1 INTRODUCTION

This chapter explores the concept personality. The study of personality is known as personality psychology or personology. This field has been in existence since the 1900's.

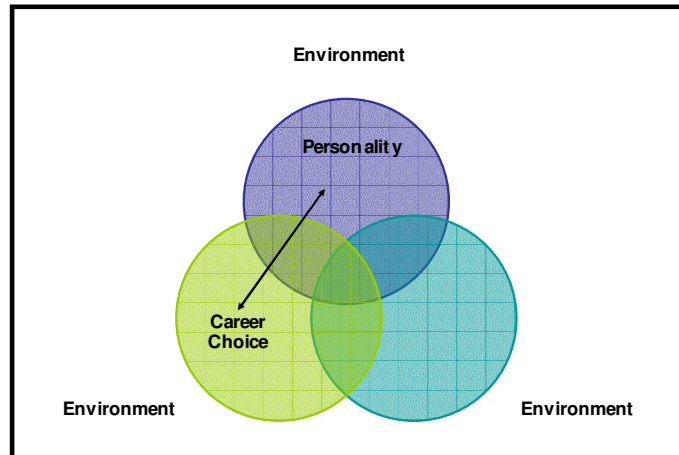
The aim of this chapter is to provide a clear understanding of the personality traits. This chapter will also examine this concept in relation to vocational interests and therefore vocational choice. This relates to the overall aim of the study, which was to investigate the relationship between personality traits and vocational interests.

In specific, this chapter defines the concepts personology and personality traits. The most prominent perspectives of personology are discussed in terms of several personality theories, namely the psychodynamic, humanistic / existential, cognitive-behavioural and the trait theory, with specific focus on the trait theory. The different views of these personality theories on vocational choice will also be discussed. Attention is also given to the measurement of personality in general and personality inventories in specific. Personality inventories will be investigated in terms of their origin, rational, different types, the advantages and disadvantages and the applications of these inventories. Personality in the work context will also be discussed.

Only certain parts of Figure 1.1 will be discussed in this chapter. These are presented in Figure 2.1.

Figure 2.1

The Interrelationship between Personality, Vocational Interest, Vocational Choice and the Environment as discussed in Chapter 2



2.2 DEFINING THE CONCEPTS

2.2.1 Personology

A variety of approaches to personology has evolved throughout the field's existence and is reflected in many different definitions; therefore, no universally accepted definition of personology exists.

According to Arnold, Cooper and Robertson (1995:20) personality psychology focuses on people's characteristic tendencies to behave, think and feel in certain ways. They argue that this field's focal point is on how people differ from each other psychologically and how these differences can be measured.

Sternberg (1995:63) mentioned that personality psychology focuses on the personal dispositions that lead people to behave as they do, and also on how these dispositions interact with situations to affect behaviour.

Another definition was that of Meyer, Moore and Viljoen (1997:6). They defined personology as the subdivision of psychology that is focused on the study of the characteristics of the individual and on differences between people. They also referred to it in short as the study of human behaviour (Meyer *et al.*, 1997:5).

Bergh (2003:279) referred to personology as a study about the consistent and repetitive patterns of behaviour, in both unique and universal aspects, which affect people's functioning in the various contexts of their environment.

Personality psychology was also defined as: "the holistic study of personality, seeking understanding of the aspects of a person through knowledge of the whole" (Saunders, 2002).

For the purpose of this study personality psychology is viewed as the study of individuals' distinct characteristics or personality traits that determine their differences in behaviour.

2.2.2 Personality Traits

Definitions of personality try to explain what people are. As with the numerous definitions regarding the field of personology, there is also no universally accepted definition of personality. However, Bergh (2003:291) argued that there is to some extent an agreement on some aspects which should be included in a personality definition. According to him, these are:

- The external visible or observable physical appearances, behaviour and traits, the original meaning of personality
- Possible invisible, covert or unconscious behaviours, emotions, attitudes, values, thoughts and feelings within people

- Enduring patterns and consistencies, but also the dynamic natures of behaviour, indicating motivation and change
- The uniqueness of each person
- Organisation or wholeness and differentiation in personality, a person being body and mind with all its separate and integrated functions
- The necessity to accept that personality refers to a living human able to adapt to situations

Contemporary definitions of personality that incorporated most of the above aspects were the following. Nadelson (2001:45) stated that personality is not something that a person has. It rather describes certain characteristics of an individual's behaviour and it is the distinctive way that each person thinks, feels, behaves or adapts to various situations. Meyer *et al.* (1997:12) explained personality as the ever changing, yet relative stable organization of all physical, psychological and spiritual characteristics of an individual that determines his/her behaviour in interaction with the environment. Aiken (1994:245) argued that personality is a composite of mental abilities, interests, attitudes, temperament, and other individual differences in thoughts, feelings, and behaviour.

Definitions of a trait share basically a common focus: that it is a feature of a person's behaviour. Freeman (1964:556) defines a trait as: "a generalized mode of behaviour or a form of readiness to respond with a marked degree of consistency to a set of situations that are functionally equivalent for the respondent". According to Neill (2003), traits are defined as distinguishing qualities or characteristics of a person. Traits are also a readiness to think or act in a similar fashion in response to a variety of different stimuli or situations. The American Heritage Dictionary of the English Language (2000) defines a trait as: "1. A distinguished feature, as of a person's character. 2. A genetically determined characteristic or condition..." The New Thesaurus (1995) defines a trait as: "A distinctive element: attribute, character, characteristic, feature, mark, peculiarity, property, quality, savor."

Arnold *et al.* (1995:24) refer to a trait as an underlying dimension in which people differ from one another.

When combining the above, it leads us to a fairly common perception of the term personality traits, which is well defined by Plug *et al.* (in Louw, Van Ede & Louw, 1998:523) that describes a personality trait as a relative constant characteristic of a person that is responsible for the consistency of his or her behaviour.

2.3 PERSPECTIVES OF PERSONALITY

Many theories of personality were developed throughout the years. Personality theories provide conceptual and integrative systems or paradigms. The aim of these is to logically and consistently explain, describe, assess and predict human behaviour (Bergh, 2003:279).

The four major theories are the psychoanalytic, humanistic / existential, cognitive-behavioural and trait theories. The four approaches with their major contributors (theorists) are discussed next; however the discussion will focus solely on how these different theories view personality. Each approach will be concluded by discussing its view of vocational interests and therefore choice. Special consideration will be given to the discussion of the trait approach in general and Cattell's theory in specific, through an in-depth discussion, since Cattell's 16PF was used as the measure of personality for this study.

Following the discussion of each approach is a critically evaluation in a table format. The five criteria used were:

- (1) Importance to and influence in psychology
- (2) Testability of proposition
- (3) Comprehensiveness
- (4) Parsimoniousness
- (5) Usefulness to and applications in assessment and therapeutic techniques

2.3.1 Psychodynamic Theories

The psychodynamic paradigm developed theories of personality and view each person as a complex system of diverse sources of psychic energy. Each of these energies is believed to push a person in a somewhat different direction. Biological drives and other biological forces play a key role in psychodynamic theories (Sternberg, 1995:597). This paradigm therefore emphasizes dynamic, biological oriented processes, particularly those that take place in the unconscious mind (Sternberg, 1995:595). According to Bergh (2003: 283) these theories claim that the structures of personality are largely unconscious; therefore people are mostly unaware of why they behave in certain ways and in turn strive to become aware of the reasons for their behaviours.

The primary theorist of this paradigm was Sigmund Freud. Theorists that followed Freud are referred to as neo-Freudians (Meyer *et al.*, 1997:48). Neo-Freudian theorists are in abundance, therefore only the most influential theorists will be discussed.

2.3.1 (a) The Psychoanalytical Theory of Sigmund Freud (1856 - 1939)

Freud proposed that a person's psychological functioning is governed by instinctive forces. He believed that these forces exercise their effect outside our consciousness (Arnold *et al.*, 1995:22). According to Sternberg (1995:595) Freud's psychoanalytic theory of personality described three components of the mind. The first was the id. This component centres on impulsive gratification of instinctual urges and desires. The second component was the ego. This component controls rational adaptations to the real world. The last component was the superego. This component generates irrational strategies for avoiding the punishment associated with internalised moral structures (Sternberg, 1995:595). Freud argued that these three components work together in order to attain three goals: (1) to keep the

individual alive, (2) to let the individual experience optimal joy and (3) to let an individual experience as little guilt as possible (Meyer *et al.*, 1997:60).

2.3.1 (b) The Individual Psychology of Alfred Adler (1870 – 1937)

According to Meyer *et al.* (1997:143), Adler's theory ignores the structural concepts of Freud. The basis of his theory was the fact that he viewed personality as a whole that functions in order to attain set goals. According to Adler's theory, people are born into the world with a sense of inferiority. People start as weak and helpless children and strive to overcome deficiencies by becoming superior to those around them (Heffner, 2002). Adler therefore argued that all psychological phenomena are directed toward the goal of superiority. However, some individuals feel that they cannot attain superiority, thus dwelling on feelings of inferiority and ultimately developing an inferiority complex (Sternberg 1995:602).

2.3.1 (c) The Analytical Psychology of Carl Jung (1875 – 1961)

Jung argued that the subconscious comprised of more than what Freud theorized. He believed that there were fears, behaviours and thoughts that children and adults display that are remarkably similar across time and culture. He believes this to be more than a coincidence and named it the collective unconscious (AllPsych, 2003). Therefore, he believed that the unconscious comprises of both a personal unconscious and a collective unconscious. He viewed the personal unconscious as distinct to each individual (Sternberg, 1995:604). He also argued that the personality was not a whole but that the self was in a constant struggle for unity among often opposing part of the personality (Sternberg, 1995:605).

2.3.1 (d) The Ego Psychology of Erik Erikson (1902 – 1994)

Erikson's theory is in agreement with Freud's regarding the structure of the personality. Erikson also believed in the id, the ego and the superego. However, Erikson placed much more importance on the role of the ego than did Freud or other neo-Freudians (Meyer *et al.*, 1997:216; Sternberg, 1995:605).

Table 2.1 critically evaluates this approach as follows:

Table 2.1
A Critical Evaluation of Psychodynamic Theories

Criteria	Psychodynamic Approaches
Importance to and influence in psychology	Have generated little research to test theories that developed within the approach
Testability of its propositions	Theories do not rate high on testability Relatively small number of experiments were conducted
Comprehensiveness	Reasonably complete account of personality phenomena
Parsimoniousness	Less parsimonious than some theories, but the number of constructs is not excessive
Usefulness to applications in: (a) assessment and (b) therapeutic techniques	(a) The TAT, Rorschach and other projective tests have arisen from this theory (b) It made an extensive influence on psychotherapy

(Adapted from Sternberg, 1995:613)

In summary, the psychodynamic paradigm developed theories of personality that emphasized dynamic, biological oriented processes, particularly those that take place in the unconscious mind. However, this paradigm did not research the influence of personality on vocational interests and therefore choice. However, when looking at the basic belief of this paradigm it may be speculated that this paradigm would have viewed biological drives and forces to play a key role in the development of vocational interests. It may also have viewed the development of vocational interests as part of the subconscious mind and therefore an individual would be unaware of why

he/she is interested in a specific career. It could therefore be assumed that this paradigm would have viewed the relationship between personality and vocational interests and choice as a biological process in the subconscious mind. Owing to insufficient research in specific on this relationship, this paradigm was not accepted as the basis for this study. Table 2.1 critically evaluates this approach.

2.3.2 Humanistic / Existential Theories

Humanistic / existential theories are often referred to as person-oriented approaches (Bergh, 2003:284). Meaning, they insist that people should be studied as individuals (Fontana, 2000:70). This approach is based on the humanistic tradition and emphasises individual responsibility and an appreciation of human experience (Sternberg, 1995:595). This paradigm developed in a reaction to the psychodynamic approach and includes the self theory of Rogers, the holistic – dynamic theory of Maslow and the existential theory of May.

These theorists differ widely in their particular beliefs, but they share a common view of humans: we are complex and distinct from other life forms (Sternberg, 1995:613). In this approach the person is recognized as an active, unique and free being and not necessarily controlled by unconscious motives and environmental factors (Bergh, 2003:284). As with the psychodynamic theory, humanistic / existential theorists are also in abundance and only the most influential theorists will be discussed here.

2.3.2 (a) The Self Theory of Carl Rogers (1902 -1987)

Roger's theory emphasizes the self and each person's perception of the self. He believed that all people strive towards self-actualisation and that people tend to become more and more complex as they strive to fulfil their potential (Sternberg, 1995:614). Another fundamental aspect of Roger's theory is the fact that he viewed people as basically good or healthy. In other words, he viewed mental health as the normal progression of life, and mental illness as

distortions of that natural tendency. He further recognised two selves: the real self and the ideal self. Disparities between the real self and the ideal self cause dissatisfaction and disturb the mental harmony. However, when the real self and the ideal self are harmonious, then the individual can be self-actualised and at peace with himself (Aiken 1993:178).

2.3.2 (b) The Holistic - Dynamic Theory of Abraham Maslow (1908 - 1970)

Maslow admitted that needs are only a partial explanation of human functioning, but still this was the fundament of his personality theory (Meyer, *et al.*, 1997:461). During his research, he identified a hierarchy of needs. At the bottom is physiological needs followed by safety and security needs, the need for love and affiliation and the need for self-worth. At the top of this hierarchy is the need for self-actualisation (Meyer *et al.*, 1997:461). Maslow agreed with Roger's with regards to this specific need. He argued that self-actualised people are free of mental illness and have reached their full potential (Sternberg, 1995:614).

2.3.2 (c) The Existential Psychology of Rollo May (1901 – 1994)

May developed an existential perspective on personality during his three years living in a sanitarium, recovering from tuberculosis. He noticed that a person's state of mind strongly related to the person's ability to recover (Sternberg, 1995:615). His work therefore focused on the positive aspects of human potential and on the will of individuals towards self-fulfilment (AllPsych, 2003).

In summary, the humanistic / existential paradigm developed in a reaction to the psychodynamic approach. The main focus of this paradigm was on self-actualisation and their belief that a person is unique and not controlled by his/her subconscious. When looking at the basic belief of this paradigm it can be speculated that this paradigm may have viewed individual responsibility and human experience to play a key role in the development of vocational interests. It may also have viewed the development of vocational

interests as part of a conscious decision. It could therefore be assumed that this paradigm would have viewed the relationship between personality and vocational interests and choice as a conscious decision based on human experience in order to achieve self-actualisation.

Table 2.2 critically evaluates this approach as follows:

Table 2.2
A Critical Evaluation of Humanistic / Existential Theories

Criteria	Humanistic / Existential Approaches
Importance to and influence in psychology	Has generated even less empirical research than psychodynamic theories
Testability of its propositions	Almost un-testable, by definition
Comprehensiveness	Theories lack comprehensiveness
Parsimoniousness	Reasonably parsimonious
Usefulness to applications in: (a) assessment and (b) therapeutic techniques	(a) Tends to be averse to assessment (b) Strongly influenced therapy during 1960's to 1970's

(Adapted from Sternberg, 1995:616)

2.3.3 Cognitive – Behavioural Theories

Cognitive-behavioural approaches to personality look at how people think, how they behave and how thinking and behaving interact (Sternberg, 1995:615). As with the previous two approaches, cognitive-behavioural theorists are also in abundance and only the most influential theorists will be discussed here.

2.3.3 (a) The Field Theory of Kurt Lewin (1890 – 1947)

Lewin viewed personality from a cognitive perspective. He termed his personality theory the field theory because he believed that life is played out in a psychological field, much like a mathematical field. He called the field in which personality and behaviour operate a life span. The life span is the sum of all the forces that act on a person at a particular time (Sternberg, 1995:617).

2.3.3 (b) The Social - Learning Theory of Julian Rotter (1916 - 1987)

Rotter challenged strict behaviourism by believing that humans are more complex than lower animals and that pure behaviourism does not explain the complex behaviours of humans (AllPsych, 2003). He further believed in the importance of environmental events on personality development, by noting that the importance of these environmental events lies in the meaning that the individual assigns to these events rather than in the actual stimuli or reinforces alone. Rotter was however more interested in the cognitive aspects of personality and believed that behaviour is not a function of just the person or just the environment, but rather the interaction between the two (Sternberg, 1995:617).

Owing to the fact that Rotter noted the importance of the context on the development of personality, his theory provides support to the assumption that the South African context may influence the development of personality traits. If one assumes that personality influences vocational interest, it may also be possible that vocational interest may be influenced by the context.

2.3.3 (c) The Social - Cognitive Theory of Albert Bandura (1925 - present)

Bandura argued that the one major difference between human and lower animals is our advanced ability to process information. He believed that two aspects of human nature determine behaviour: internal and external. He called these reciprocal determinants of behaviour because they act together and can not be separated (AllPsych, 2003). His theory also addresses the interaction between how we think and how we act (Sternberg, 1995:619).

Table 2.3 critically evaluates this approach as follows:

Table 2.3
A Critical Evaluation of Cognitive - Behavioural Theories

Criteria	Cognitive – Behavioural Approaches
Importance to and influence in psychology	Has generated much research by theorists in this area and others
Testability of its propositions	More testable than psychodynamic and humanistic-existential approaches
Comprehensiveness	Less comprehensiveness than other views
Parsimoniousness	These theories rate high on parsimony
Usefulness to applications in: (a) assessment and (b) therapeutic techniques	(a) Rotter’s locus of control and interpersonal trust scales are widely used (b) Have generated many different methods of psychotherapy and have been influential in health psychology

(Adapted from Sternberg, 1995:621)

In summary, the cognitive–behavioural approaches to personality look at how people think, how they behave and how thinking and behaving interact. This approach was an improvement on the previous two regarding the criteria as discussed in the above table.

When looking at the basic belief of this paradigm it can be speculated that this paradigm may have viewed an individual’s thinking to play a key role in the development of vocational interests. Roger made a substantial contribution to believe that the context influences the development of personality, therefore implicating that the South African context may influence the relationship between personality traits and vocational interests.

2.3.4 Trait Theories

The trait-based approach to personality is sometimes referred to as the descriptive approach because it is concerned with what personality is like, rather than speculating on its underlying psychological phenomena as is the case with psychoanalytical and humanistic / existential approaches (Fontana, 2000:100). According to trait theorists, human behaviour is characterised by enduring and consistent patterns of behaviour described as dimensions, traits, factors or types (Bergh, 2003:284). Arnold *et al.* (1995:24) explained that the trait approach is essentially concerned with measuring a person's psychological characteristics.

Characteristics of the trait approach, which distinguishes it from other approaches, are the following. Firstly, trait theories do not attempt to understand the development of personality. Secondly, predicting a person's behaviour in a given situation is not a concern for trait theorists. Thirdly, trait theorists are interested in the comparison of people based on aspects and degrees. Lastly, trait theory does not inherently provide a medium of personality change (Burger, 1993:193; Heffner, 2002).

Some theorists have developed personality types or pigeonholes in which any individual can be placed. A good example dates back to ancient Greek times with Hippocrates. He wrote of four types. These were phlegmatic (calm), choleric (quick-tempered), sanguine (cheerful, optimistic) and melancholic (sad, depressed). Today psychologists more often think in terms of traits than types (Arnold *et al.*, 1995:24).

There are also two paradigms on the dimensional trait approach: idiographic and nomothetic. Sternberg (1995:632) explained that idiographic theorists, such as Allport, believe each individual has a different set of traits that is fundamental to his/her personality. Whereas the nomothetic theorists (Cattell and Eysenck) believe that people have the same set of traits, but differ in the degree to which they manifest each trait.

2.3.4 (a) The Trait Theory of Raymond B Cattell (1905 - 1998)

Raymond B. Cattell was born in Staffordshire, England in 1905. He received a Bachelors of Science degree in chemistry from the University of London when he was 19 and his Ph.D. in psychology in 1929 (Ryckman, 1997:307). Cattell entered the field of psychology almost against his own better judgment. After working in a hospital during World War I, he decided that understanding human behaviour and interaction is the only way to get beyond the irrationality of the times. Cattell was hired as a research assistant to Charles Spearman, while a graduate student at London University (Heffner, 2002).

Spearman, a well-known name in the field of intellectual assessment, was a mathematician studying the quantification of intelligence. He developed a mathematical formula known as factor analysis. This statistical technique allows one to take raw data and determine groupings of data. By developing questionnaires and tests consisting of personality characteristics, and analysing data from report cards of students, evaluations from employees, etc., Cattell applied this new statistical technique (Heffner, 2002). Cattell viewed language as a useful source of information about personality. A quality described by many words, to him, was likely to be a more important part of personality. Cattell used this lexical criterion in determining his original list of trait names. Cattell narrowed Allport and Odbert's (1936) listing of 17,000+ words down to 4,500 words and then narrowed these down further to 171 trait names. Cattell then collected self-ratings on these words and then conducted factor analysis. He used both observer and behavioural data. The result was his 16 personality factors (16PF) (Neill, 2003). In 1949, he published his findings in an assessment device known as the 16PF. According to Cattell's research, human personality traits could be summarised by 16 personality factors (PF) or main traits (Heffner, 2002).

Cattell's structure-based systems theory considers personality as a system in relation to the environment and seeks to explain the complicated transactions

between them as they produce and change and sometimes grow in the person. Cattell's approach to theory is to begin with empirical observation and description and, on this basis, to generate a tentative rough hypothesis. From this hypothesis is derived an experiment for testing empirically. The resulting observations, or experimental data, are used to generate a more precise hypothesis, from which the investigator deduces a new experiment to test it. New data are collected, and the process begins again. He calls this the inductive-hypothetico-deductive spiral (Ryckman, 1997:310).

Cattell (1965: 117) defines personality as "that which tells what [a person] will do when placed in a given situation". He represented this in a formula:

$$R = f(S, P)$$

Meaning, the behavioral response (R) of a person is a function (f) of the situation (S) confronted and the individual's personality (P).

Ryckman (1997:348-350) provided a critical evaluation of Cattell's' trait theory as represented in Table 2.4:

Table 2.4
A Critical Evaluation of Cattell's Trait Theory

Criteria	Trait-Based Approaches
Comprehensiveness	Comprehensive theory of personality Addresses a wide range of diverse phenomena, both normal and abnormal
Precision and testability	Demonstrated concern with constructing a theory based on precise measurement
Parsimony	Economical without being over simplistic
Empirical validity	Considerable empirical support for reliability and validity
Heuristic value	Great deal to admire of Cattell and his efforts as a

	scientific investigator
Applied value	Had a considerable influence in the diagnosis of psychopathology and in the assessment of therapeutic growth Had an even bigger impact on occupational psychology

(Adapted from Ryckman, 1997:348-350)

2.3.4 (b) Gordon Allport (1897 - 1967)

Allport believed that much of personality is characterized by personal dispositions. These personal dispositions are traits that are unique to each individual. Allport also acknowledged common traits, which are common across individuals, but he believed that much of what makes each of us who we are can be found in the personal dispositions (Sternberg, 1995:629). According to (Bergh, 2003:338) Allport's view of personality was that:

- It is determined by the interaction of biological and psychological processes;
- Personality is an organized whole consisting of interdependent physical, cognitive and psychosocial aspects;
- Personality is dynamic. In other words, it develops, grows and changes as the individual matures and learns;
- Changes or variations in how personality is expressed may also occur from time to time or across situations;
- Personality motivates and directs behaviour and
- Personality provides recognizable or characteristic unique attributes, thoughts and behaviours, which enable the individual to adapt in his or her environment

Table 2.5 critically evaluates this approach as follows:

Table 2.5
A Critical Evaluation of Trait Theories

Criteria	Trait-Based Approaches
Importance to and influence in psychology	Has generated much empirical research
Testability of its propositions	Highly testable Most theories make fairly precise predictions
Comprehensiveness	Theories focusing on personality as a whole are comprehensive, but these focusing on specific traits are not
Parsimoniousness	Eysenck's theory and the "big five" theory are extremely parsimonious, Cattell's theory is not
Usefulness to applications in: (a) assessment and (b) therapeutic techniques	(a) Many trait theories have generated personality test (b) But these have generated far less therapeutic techniques than other theories

(Adapted from Sternberg, 1995:31)

Heffner (2002) also analyzed the trait theory according to strengths and weaknesses. He identified two strengths. These are:

- Objectivity
The biggest strength of trait theory is its reliance on statistical or objective data
- Ease of use and understanding
Trait theory has been used to develop a number of assessment devices. It provides an easy to understand continuum that provides a good deal of information regarding a person's personality, interaction, and beliefs about the self and the world

Some of the criticism Heffner (2002) identified was the following:

- Poor predictor of future behaviour

Trait theory fails to address a person's state, which is a temporary way of interacting and dealing with the self and others

- Does not address development

While statistics may be a strength of trait theory, it may also be its biggest criticism. Because it is based on statistics rather than theory, it provides no explanation of personality development.

- No means of change

Trait theory provides little or no guidance in the changing of negative aspects of a trait

In summary, the trait approaches characterise human behaviour as enduring and consistent patterns of behaviour described as dimensions, traits, factors or types. Cattell's personality theory has been proved to be empirically based and is generally accepted as inclusive enough to cover the broad spectrum of the personality domain (Zak *et al.*, 1979).

In conclusion, some theories cover personality quite extensively, while others do not. However, it can not be said that any of these theories are complete. It depends entirely on the situation and context in which they are used.

2.4 THE DEVELOPMENT AND STABILITY OF PERSONALITY

There are as much theories of the origin / development of personality as there are definitions. The four main theories were discussed in *paragraph 2.3*. Therefore there is no agreement on the development and stability of personality.

Personality development refers to growth, maturation and expansion of, and in, personality in physical, cognitive and psychosocial domains, development over time and influencing factors such as heredity and socio-environmental conditions (Bergh, 2003:292). It was seen from the discussion that the different theories differ quite drastically. However, recent authors agree to some extent that personality develops from early childhood and continues

until early adulthood. It is also clear that personality is the result of the interaction between inherited and environmental factors (Fontana, 2000:1). Although the development of personality is not part of the focus of his study, it is important to note that the environment plays an important role therein.

Another important factor to keep in mind is the consistency people display in their actions, thoughts and feelings between situations and over time. Thus, the assumption is made that personality characteristics are relatively stable over a long period (Burger, 1993:192). Most personality theories consider behaviour predictable, controllable and consistent. According to trait theorists personality traits remain stable over time. Studies of the Big Five personality traits (extraversion, agreeableness, conscientiousness, neuroticism and openness) shows stability and consistency increases, as individuals get older. People tend to become more agreeable and more conscientious as they get older. This pattern holds across cultures (University of Texas, n.d). Burger (1993:192) also stated that traits show stability across situations. This is important to this study as this study measures personality, which is a constant construct. The measurement of a constant construct implicates that for example circumstances and age are not really capable of affecting the results for personality.

2.5 THE MEASUREMENT OF PERSONALITY

For this study, personality was operationalised as the traits indicated by the 16PF. For the sake of comprehensiveness of this discussion, the measurement of personality is discussed here.

There are two distinct techniques to measure personality. The one is projective techniques and the other is objective techniques. Projective techniques encourage individuals to project their unconscious or preconscious personality characteristics and conflicts into their responses to the tests (Sternberg, 1995:608-611). According to Lilienfield (1999),

projective tests typically present subjects with an ambiguous stimulus and ask them to make sense of the stimulus. These tests grant subjects considerable leeway in their responses.

Objective techniques are administered using a standardised and uniform procedure for scoring (Sternberg, 1995:608-611). According to Lilienfeld (1999), objective tests contain relatively clear-cut stimuli and require subjects to respond in one of a few fixed ways. All objective tests are constructed on some theoretical basis and therefore a test maker must have some prior conception of what a test is designed to measure. However, some tests are more tightly linked to a particular theory and other tests have been created with a more general purpose in mind (Segal & Coolidge, 2003). Most personality inventories are based upon the principle that personality is a manifestation of certain traits and that they can evaluate the strengths of traits. Therefore, personality inventories attempt to estimate the presence and strength of each specified trait (Freeman, 1964:555; Sternberg, 1995: 611). Since the measuring instrument for personality in this study (the 16PF) is a personality inventory, the focus of this chapter will now shift to an in-depth discussion of personality inventories.

2.5.1 Personality Inventories

2.5.1 (a) The Origin of Personality Inventories

In the past 60 years, much has been written on the subject of personality, and many varied and interesting techniques and instruments were developed in an attempt to evaluate personality (Downie, 1967:331). Aiken (1994:246) explained that personality assessment developed partly from research on individual and group differences. Much background can be found in the history of abnormal psychology and psychiatry.

According to numerous authors (Nezami and Butcher, 2000:414; Downie, 1967:358), Woodworth introduced the first formal self-report questionnaire in 1917. He designed the Woodworth Personal Data Sheet (PDS) to serve as a

psychiatric screening for World War I draftees. It was a paper-and-pencil test targeting neurotic symptoms and could be administered to a large group of individuals at one time (Nezami and Butcher, 2000:414; Downie, 1967:358). After the war, many inventories were constructed. These early tests have been followed by continuous progress in test development. Since then, the field of psychological testing has grown remarkably and recorded a lengthy list of breakthroughs (Nezami and Butcher, 2000:414).

Since the breakthrough of Woodworth, researchers developed numerous other prominent tests to identify and measure personality traits (Nadelson, 2001:57). Today we can distinguish between two groups of personality tests, namely projective tests and objective tests. In this chapter, we will focus on objective personality tests, as the 16PF falls in this category.

When using these inventories, it is assumed that personalities have a certain amount of stability and that over a range of similar situations the same reactions will be elicited (Downie, 1967:358). Taljaard and Prinsloo (1995:379) added by stating that personality inventories measure personality traits with such a nature of accuracy that specific and relatively reliable conclusions of human functioning can be drawn.

2.5.1 (b) The Rationale of Personality Inventories

Nadelson (2001:53) argues that personality tests seek to determine the various traits that make individuals unique, common or somehow in between. Anastasi & Urbina (1997:348) agreed by mentioning that personality tests are instruments for the measurement of emotional, motivational, interpersonal and attitudinal characteristics. Furthermore, Aiken (1994:287-288) stated that personality inventories measure adjustment and temperament and consist of items concerning personal characteristics, thoughts, feelings and behaviour.

2.5.1 (c) Types of Personality Inventories

The three major objective tests, according to Anastasi and Urbina (1997:352) and De Bruin (2001:238-241) are:

- The Myers Briggs Type Indicator (MBTI)

This measure is based on Jung's theory of psychological types. It consists of four bipolar scales, namely Introversiion-Extroversiion (E-I), thinking-Feeling (T-F), Sensing-Intuition (S-N) and Judgement-Perception (J-P). By combining the four poles of the scales, it is possible to identify sixteen personality types. The emphasis falls on assigning the individual to one of these sixteen different types. People, who are then assigned to the same type, are assumed to share similar characteristics. It is widely used for career counselling, team building and for organizational and personal development

- The Minnesota Multiphase Personality Inventory (MMPI)

This measurement was developed by using a key criterion approach. The test-taker is confronted with 567 statements, to which the response must be either "True" or "False". It was originally developed to assess personality characteristics indicative of psychopathology. Only after revision this measure was able to measure personalities other than psychopathology. It was then renamed the MMPI-2

- The Sixteen Factor Personality Questionnaire (16PF)

This measure was designed by Raymond B Cattell and will be discussed in detail in *Chapter 5*, as this was one of the measuring instruments of this study.

2.5.1 (d) The Advantages and Disadvantages of Personality Inventories

Downie (1967:359-360) discussed a few problems with personality inventories that were relevant to that time. He based these on four questions. The first problem was whether the responses of the individuals were honest and true. The second was whether the individual understood the questions. The third was how such inventories could be interpreted when there was no ideal type of behaviour. The last was how the inventory was validated and if it was reliable (Downie, 1967:359-360). Although the outlook on personality inventories has changed dramatically since then, there remain a few limitations today. Firstly, there is an excessive amount of difficult vocabulary and this prohibits the understanding of these questions. Thus,

some items are open to interpretation, which influences validity. Secondly, some items are transparent and can lead to dishonest answering. In other words, it can be faked. Thirdly, there is the possibility of always receiving socially acceptable choices. Fourthly, the ethics of personality assessors are not always as they should be and fifthly ethnic bias is also a problem (Aiken, 1994:255, 394; Anastasi & Urbina, 1997:374-379; Cronbach, 1990:515-518; Smit, 1991:288-289).

Several advantages of personality inventories, according to Smit (1991:288), are: (1) personality traits of a large amount of individuals can be obtained and compared (2) the administration of objective inventories require less training than for projective techniques and (3) test-objectivity.

2.5.1 (e) Applications of Personality Inventories

Personality assessment plays the most crucial role in clinical and counselling psychology. Here it is used to obtain information to help make a diagnosis, to select a treatment option and quantify therapeutic change. Individuals also undertake it to better understand their own personalities. Personality assessment is also used in other settings like business, education and in the legal system as screening instruments. These are also of use to individuals in marriage and family counselling settings. In career psychology it is applied to understand and assess behaviour for job descriptions, selection, career development and occupational choice, work motivation, occupational well-being, education and training, management and leadership, entrepreneurship, work satisfaction and productivity, as well as work-counselling and therapy (Anastasi & Urbina, 1997:349; Bergh, 2003:278; Nadelson, 2001:57; Nezami & Butcher, 2000:414).

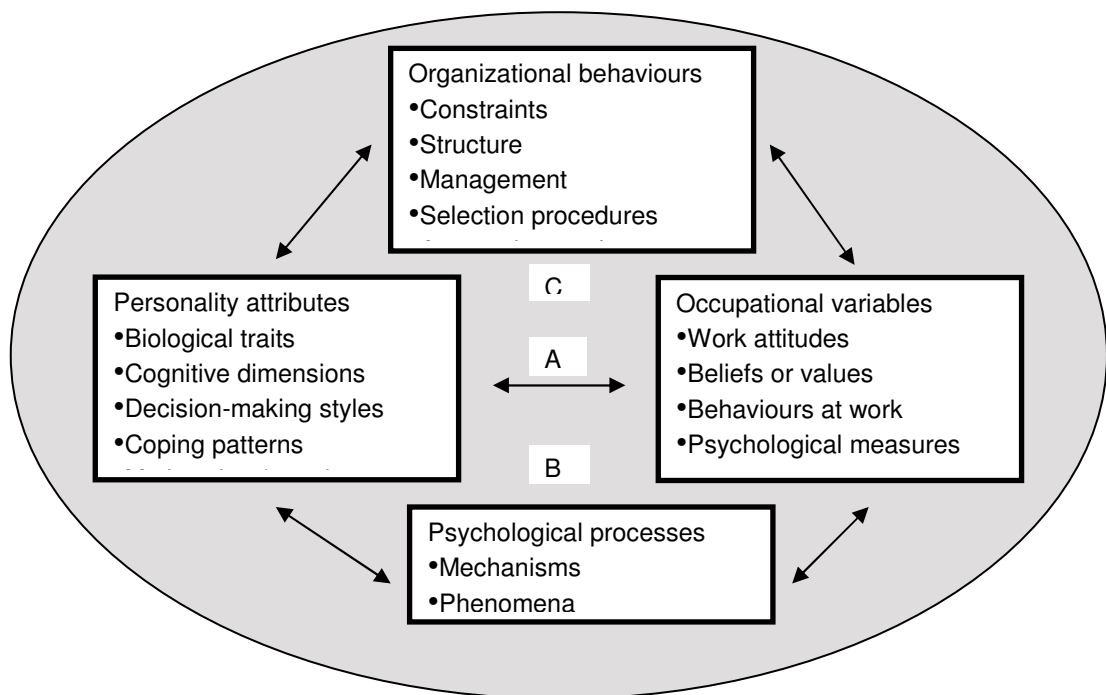
2.6 PERSONALITY IN THE WORK CONTEXT

The management and development of human resources in organizations depend on the ability (1) to determine individual differences in employees'

personalities and on (2) determining how congruent these are with the organizational attributes. The reason for this is the fact that an organization's effectiveness are dependent on the collective personality profile which employees attribute to the organization (Bergh & Theron, 2003:276). Therefore, the goal of personality research in the work context is to facilitate the best fit between an employee and the work environment (Bergh, 2003:296).

Furnham in Bergh (2003: 296) suggested a research model to illustrate the relationships between personality and work. This model illustrates the complex possibilities between personality and work-related variables and is presented in the following Figure 2.2.

Figure 2.2
A Research Model of the Relationship between Personality and Work



(Adapted from Bergh, 2003:297)

Bergh (2003:298) explained the model as follows:

Line A is the line between personality factors and work variables. It is not a direct line and can be influenced by many other factors. This direction may be bi-directional, that is, personality and work factors may have mutual or interactional influences. In other words; personality may influence work behaviours (for example: an emotionally stable personality will not be prone to emotional outburst at work), but work variables may also influence the expression of personality (for example: a friendly workplace leads to a happy and effective workforce).

Box B The relationship is further affected by the way the psychological processes underlie the personality variables in relation to the work variables. Similar personality concepts are defined or explained differently by different theoretical approaches. Some are more concerned with biological and situational influences and others with the influence of emotional or cognitive processes in behaviour. In this study, the trait theory of Cattell forms the theoretical background. It is evident from the discussion on the four major theories in *paragraph 2.3* that each of these views personality differently. This therefore ultimately influences the way they view personality variables in relation to work variables.

Box C Another influence on personality and work variables are the formal and informal organizational behaviours and constraints. The way an organization functions can have a facilitating or inhibiting effect on the work personality of employees and on the fit between the employee and the organization. For example: in some situations, an employee must do a task in one way only, thereby leaving little space for creativity.

The Circle is the broader environment in which the organization and individual exist. This also influences the relationship between the personality of an employee and his/her organization. In times of change and transformation, both employee and organization must adapt, and these adjustments will be reflected in the expression of personality and work behaviours. This is of particular importance in the South African context and

therefore this study. As mentioned in Chapter 1 due to the high unemployment rate in South Africa, citizens are assumed to be more concentrated on just finding a job than a job-personality fit and therefore job satisfaction.

This model provides an effective overview of the relationship between work and personality. This study assumes that personality influences vocational interest which in turn influences vocational choice. In this model, it is clear that the environment plays a crucial role in the relationship between personality and work.

2.7 CONCLUSION

The purpose of this chapter was to provide an overview of personality and the influence thereof on an individual's vocational choice. This is related to the overall aim of the study which was to investigate the relationship between personality traits and vocational interests.

In this chapter, It was determined that although there are many definitions of the field of personology, it is generally accepted that personology is the study of human behaviour. Everyone agrees that it is a relatively constant characteristic of a person and it is responsible for the consistency of his or her behaviour.

The most prominent perspectives of personality theories were also discussed in terms of several personality theories, namely the psychodynamic, humanistic / existential, cognitive-behavioural and the trait theories. Personality inventories were investigated in terms of their origin, rational, different types, the advantages, disadvantages and the applications of these inventories. In the discussion on the different types of personality inventories it was determined that the most known objective personality measures are the MBTI, MMPI and the 16PF. Personality in the work context was also discussed.

CHAPTER 3: VOCATIONAL INTERESTS AND VOCATIONAL CHOICE

3.1 INTRODUCTION

This chapter explores the concept vocational interests, which falls under the field of vocational psychology. This field, like personology, has also been in existence since the 1900's.

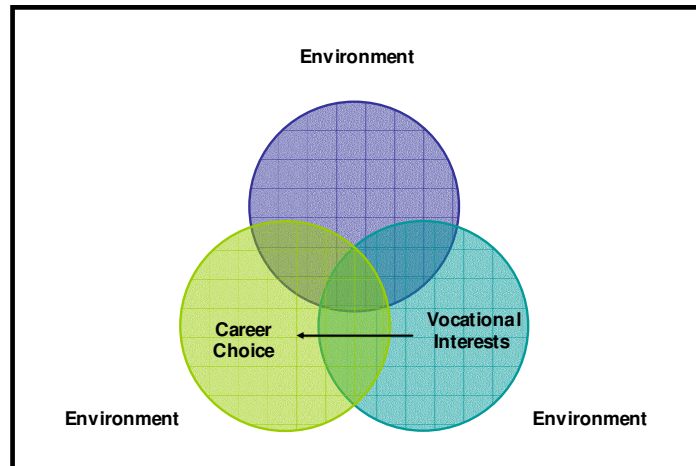
The aim of this chapter in relation to the overall purpose of this study is to provide a clear understanding of vocational interests. This concept will also be put in relation with vocational choice.

Specifically, the concepts of vocational psychology and vocational interests are defined in this chapter. The most prominent perspectives of vocational psychology are discussed in terms of several career theories, namely the trait-factor theory, John Holland's theory, Donald Super's theory and the social-cognitive theory. The South African context relating to these vocational theories will also be discussed. Attention is also given to the measurement of interests in general and interest inventories in specific. Interest inventories will be investigated in terms of their origin, rational, different types, the advantages and disadvantages and the applications of these inventories. The link from vocational interests to vocational choice will also be discussed.

In other words, only certain parts of Figure 1.1 will be discussed in this chapter. These are presented in Figure 3.1.

Figure 3.1

The Interrelationship between Personality, Vocational Interest, Vocational Choice and the Environment as discussed in Chapter 3



3.2 DEFINING THE CONCEPTS

3.2.1 Vocational Psychology

As with personology, a variety of approaches to vocational psychology has evolved throughout the field's existence. In contrast to personology, not as many definitions reflect these.

The most widely known definition is that of Crites (1969:16). He defines vocational psychology as the study of vocational behaviour and development. A more recent definition viewed vocational psychology as the study of the psychological aspects of work-related behaviour and experience (Carson, 2003).

3.2.2 Vocational Interests

Definitions of what a vocation is focus on two aspects. Firstly, a vocation is seen as a person's career. Sears (in De Bruin, 2001:248) defines a career as: "the totality of work one does in a lifetime". The New Thesaurus (1995) defines a vocation as an: "1. Activity pursued as a livelihood: art, business, calling, career, craft, employment, job, line, metier, occupation, profession, pursuit, trade, work..." The American Heritage Dictionary of the English Language (2000) defines a vocation as: "1. A regular occupation, especially one for which a person is particularly suited or qualified. Secondly a vocation is seen as a calling. Davidson, Seaton and Simpson (1994:1117) describe a vocation as a calling, a way of living or sphere of activity to which one has been called, or for which one has a fitness: one's occupation, business or profession. The New Thesaurus (1995) defines a vocation also as an: "... 2. An inner urge to pursue an activity or perform a service, calling, mission". The American Heritage Dictionary of the English Language (2000) defines a vocation also as: "... 2. An inclination, as if in response to a summons, to undertake a certain work, especially a religious career; a calling".

Definitions regarding interests have mostly the same focus, i.e. that it is a preference for something. Greenhaus, Callanan and Godshalk (2000:43) stated that interest refers to likes and dislikes attached to specific activities or objects. It is therefore expressions of what a person likes to do. Owen and Taljaard (1995:428) view interest as an aspect of personality and define it as: "a spontaneous preference for certain activities as well as a spontaneous disinclination for other activities". Carson (2002) argues interests are a species of desire. In particular, interests are that which people desire to understand or do. Smith (1991:354) evaluated a number of definitions on interests and concluded that interests can be related to the satisfaction of needs. He explained this by stating that interests go hand-in-hand with a dynamic drive to search for the object/action that will lead to the satisfaction of a need or to do something about this object/action. The only contradictory definition found was the one of Super and Crites (1962:410). They define

interests as: “the product of interaction between inherited, neural and endocrine factors on the one hand, and opportunity and social evaluation on the other”. This might be due to the age of the source.

Super & Crites (1962:378-380) classified interests into 4 groups. These were classified depending on the way in which information about them is obtained.

- Expressed interests
The individual verbally states that he/she is interested in a particular object, activity, task or occupation. Thus, the subject states that he/she likes or dislikes something. Visser (1977:46) stated that although the fact that an individual may express an interest, it does not always ensure the validity. Therefore, manifest interests should always support expressed interests.
- Manifest interests
This is synonymous with participation in an activity, task or occupation. Here Visser (1977:46) assumes that an individual, who spends a great deal of time on a particular activity, is interested in that activity.
- Tested interests
Interests measured by objective tests. If a person knows something or has gained specific information or skills related to that subject and scores high on an achievement test in that area, he has an interest in that subject (Visser, 1977:46).
- Inventoried interests
Interests are assessed by a list of activities and occupations, which bear a superficial resemblance to some questionnaires for the study of expressed interests. Each item in the list is responded to with an expression of preference. Visser (1977:46) states that preferences about activities and occupations are listed and processed statistically to reveal occupational trends.

When combining the above definitions, it leads us to a fairly common perception of the term vocational interests, which is well defined by Carson

(2002) that describes that vocational interests refer specifically to those activities, objects or processes associated with work activities.

3.3 PERSPECTIVES OF VOCATIONAL PSYCHOLOGY

There is not one career theory that has been specifically developed in order to explain the career behaviour of South Africa's diverse population groups. Stead and Watson (1999:1) described career psychology in South Africa as being nascent, emerging or still in its formative stages. Therefore, an examination of the relevance of international career theories to our context is required in order to describe individual career development in a South African context (Stead & Watson, 1999:13).

Theories that attempted to explain career behaviour reflected the times they were constructed in (Stead & Watson, 1999:36). The four major theories are the trait-factor, John Holland's, Donald Super's and the social-cognitive career theories. These four approaches are discussed next; however, the discussion will focus solely on how these different theories view career interests. Each approach will be concluded by discussing its relevance in the South African context. Special consideration will be given to Holland's theory, through a more in-depth discussion, as the measuring instrument in this study (the INQ's) development was based on this theory.

3.3.1 Trait – Factor Theory

Frank Parsons is generally accepted as the pioneer of the trait-factor theory. Parsons in (Stead & Watson, 1999:37) argued that three steps are needed to match individuals and occupations successfully. These are:

- (1) A clear understanding of oneself, one's attitude, abilities, interests, ambitions, resources and their causes. This first step of the model defines the "trait" aspect. It was defined as the characteristics of an individual who is making a choice in career.

- (2) A knowledge of the requirements and conditions of success, advantages and disadvantages, compensation, opportunities and prospects in different lines of work. This second step of the model defines the "factor" aspect. It emphasises the differential nature of work itself. The rationale was the thinking that requirements and rewards of a career differ for each individual because of the difference in the nature of work.
- (3) Deliberation on the relationships between these two groups of facts. By matching the differentials of the work to the differentials of the individual, a better matching of the individual to the work can be obtained.

Over time the matching model of Parsons developed into a congruence model. Early congruence models were person-environment fit formulations and today these formulations have largely replaced pure trait-factor theory.

Trait-factor counselling is used to assist an individual in making an effective vocational choice and it is mainly a cognitive process during which the counsellor assumes the readiness of the individual to make a vocational choice. This however is a shortcoming as not all individuals are ready to make a vocational choice.

In a South African context, the influence of this theory on career psychology and guidance has been difficult to determine. Concerns have been expressed about the reliability and validity of many psychometric measures that have been standardised for various South African population groups, therefore indicating the importance of testing the theoretical assumptions on which measures are based as much as the measures themselves (Stead & Watson, 1999:44). There is therefore a need for South African career counsellors to research the efficacy of this theory in terms of future use in this country.

In summary, the trait-factor theory was argued to have two major shortcomings. Firstly, it assumes that an individual is ready to make a vocational choice. However not all individuals are ready to make a vocational choice. This theory was therefore inapplicable, as the researchers did not agree that vocational choice is a cognitive decision made by an individual, but rather viewed it as a subconscious decision influenced by a combination of personality and environmental influences. Secondly, it was also inapplicable due to that it has not been proven to be effective or applicable in the South African context.

3.3.2 John Holland's Theory

John L Holland (in Cronbach, 1990:464) believed that persons obtain satisfaction by performing the particular kind of work activity that closely fits their personality. He called this the personality-job fit theory. This theory is based on the notion that an individual's personality characteristics and his/her occupational environment should correspond. Holland presented six personality types and proposes that satisfaction and the propensity to leave a job depend on the degree to which individuals successfully match their personalities to a congruent occupational environment (Robbins, 1996:104). His personality types include the following:

Realistic individuals value nature, common sense, honesty and practicality. They are reliable, straightforward, self-reliant and generally conservative in political opinions. They enjoy manual and mechanical activities, using machines, tools and objects (Holland, n.d).

Investigative individuals value inventiveness, accuracy, achievement and independence. They are curious, logical, precise, analytical and reserved. They enjoy analytical or intellectual activity and learning by reading, study or investigation (Holland, n.d).

Artistic individuals value beauty, self-expression, imagination and creativity. They are creative, independent, open, unconventional and original. They enjoy creative work in music, writing, performance, sculpture and intellectual work (Holland, n.d).

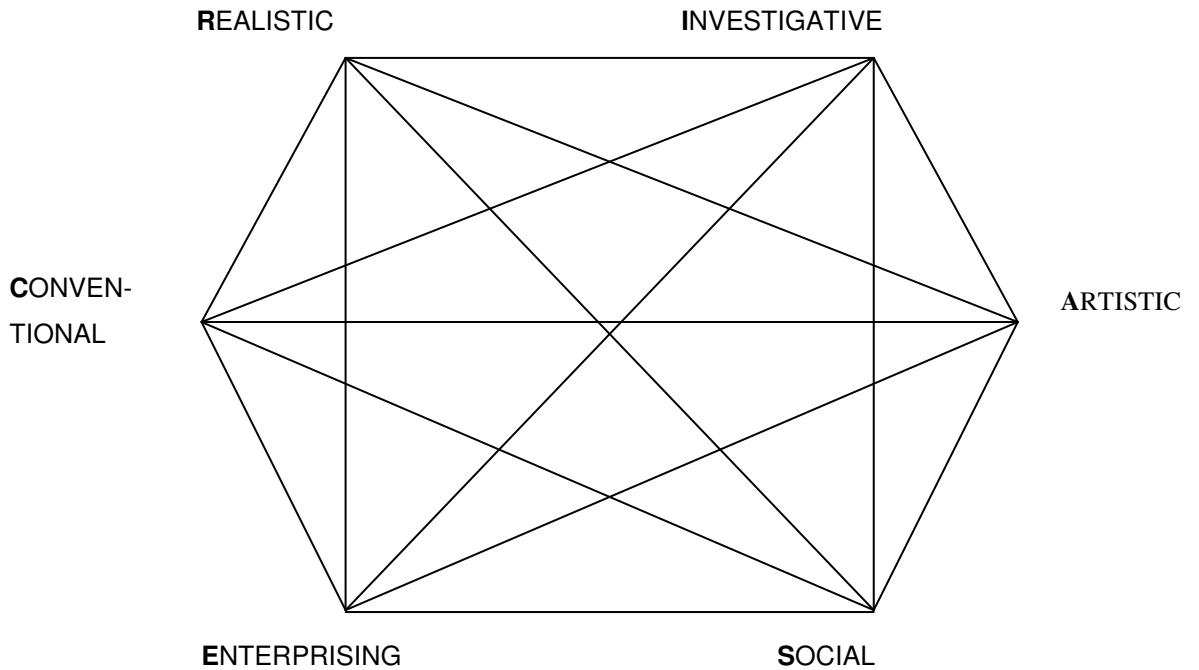
Social individuals value service to other, fairness, understanding and empathy. They are friendly, trusting, helpful, kind, generous and warm. They enjoy working with others, prefer team approaches and will sacrifice personally to forward the group goals (Holland, n.d).

Enterprising individuals value success, status, responsibility and initiative. They are ambitious, extroverted, enthusiastic, persuasive and self-confident. They enjoy leading, selling, motivating, persuading others and producing a lot of work (Holland, n.d).

Conventional individuals value accuracy, honesty, persistence and order. They are practical, efficient, generally conservative and attentive to detail. They enjoy working with things, numbers or machines to meet precise standards (Holland, n.d).

Holland arranged these themes into a hexagonal model (also referred to as the RAISEC model - presented in Figure 3.1). These themes characterise not only a type of person but also the type of working environment that such a person finds most pleasant. Each of these environments tends to be populated and dominated by persons of the corresponding type. Persons are not classified rigidly into one of the six major types, but they are characterised by degree of resemblance to one or more types (Anastasi & Urbina, 1997).

Figure 3.2
Themes in the RAISEC Model



(from Cronbach, 1990:464)

Robbins (1996:104) summarised Holland’s theory as presented in Table 3.1.

Table 3.1
Holland’s Typology of Personality and Congruent Occupations

TYPE	PERSONALITY CHARACTERISTICS	CONGRUENT OCCUPATIONS
<i>Realistic</i> Prefers physical activities that require skills, strength and coordination	Shy, genuine, persistent, stable, conforming, practical	Mechanic, drill press operator, assembly-line worker, farmer
<i>Investigative</i> Prefers activities that involve thinking, organizing and understanding	Analytical, original, curious, independent	Biologist, economist, mathematician, news reporter

<i>Social</i> Prefers activities that involve helping and developing others	Sociable, friendly, cooperative, understanding	Social worker, teacher, counsellor, clinical psychologist
<i>Conventional</i> Prefers rule-regulated, orderly and unambiguous activities	Conforming, efficient, practical, unimaginative, inflexible	Accountant, corporate banker, bank teller, file clerk
<i>Enterprising</i> Prefers verbal activities where there are opportunities to influence others and to attain power	Self-confident, ambitious, energetic, domineering	Lawyer, real estate agent, public relations specialist, small business manager
<i>Artistic</i> Prefers ambiguous and unsystematic activities that allow creative expression	Imaginative, disorderly, idealistic, emotional, impractical	Painter, musician, writer, interior decorator

In summary, this theory argues that satisfaction is highest and turnover lowest where personality and occupation are in agreement. The key points of this model are: (1) there do appear to be intrinsic differences in personality among individuals, (2) there are different types of jobs and (3) people in job environments congruent with their personality types should be more satisfied and less likely to voluntarily resign than people in incongruent jobs. This theory has therefore been accepted as the basis for this study as the researchers agreed with the foundations of this theory.

However, Watson, Stead and Schonegevel (1997) did a study on Grade 10 to 12 Black students and found that the structure of Holland's hexagon was misshapen. The order of the RAISEC model was also not maintained. Wheeler (1992) also conducted a study among Black Grade 12 students and found that there was no correct ordering of interests. Owing to this, the applicability of this theory in the South African context is doubted. However, it is used for this study since the measuring instrument of this current study

(the INQ) was based on Holland's theory. This study will then therefore also provide answers to the applicability and racial bias of the INQ.

3.3.3 Donald Super's Theory

Super did not view his contribution to career psychology as a theory. He preferred to view it as a range of different constructs that he used to enrich, extend and elaborate career theory and practice (Langley, 1999:67). His original ten propositions have been modified several times and integrated into the following 14 propositions (Langley, 1999:68-69):

1. People differ in their abilities and personalities, needs, values, interests, traits and self-concepts.
2. People are qualified, by virtue of these characteristics, each for a number of occupations.
3. Each occupation requires a characteristic pattern of abilities and personal traits, with tolerances wide enough to allow some variety of occupations for each individual, as well as some variety of individuals in each occupation.
4. Vocational preferences and competencies, the situations in which people live and work, and hence their self-concepts, change with time and experience, although self-concepts as products of social learning are increasingly stable from late adolescence until late maturity, providing some continuity in choice and adjustment.
5. The process of change may be summarised in a series of life stages characterised as a sequence of Growth, Exploration, Establishment, Maintenance and Disengagement.
6. The nature of career pattern - i.e. the occupational level attained and the sequence, frequency and duration of trial and stable jobs - is determined by the individual's parental socio-economic level, mental ability, education, skills, personality characteristics (needs, values, interests and self-concepts), career maturity and by the opportunities to which he or she is exposed.

7. Success in coping with the demands of the environment and of the organism in that context at any given life-career stage depends on the readiness of the individual to cope with these demands to his or her career maturity.
8. Career maturity is a psychosocial construct that denotes an individual's degree of vocational development along the continuum of life stages and substances from Growth through to Disengagement.
9. Development through the life stages can be guided, partly by facilitating the maturity of abilities, interests and coping resources, and partly by aiding with reality testing and in the development of self-concepts.
10. The process of career development is essentially that of developing and implementing occupational self-concepts.
11. The process of synthesis and compromise between individuals and social factors, between self-concepts and reality, is one of role-playing and learning from feedback, whether the role is played in fantasy, in the counselling interview, or in such real-life activities as classes, clubs, part-time work and entry jobs.
12. Work satisfaction and life satisfaction depend on the extent to which an individual finds adequate outlets for abilities, needs, values, interests, personality traits and self-concepts.
13. The degree of satisfaction people attain from work is proportional to the degree to which they have been able to implement their self-concepts.
14. Work and occupation provide a focus for personality organisation for most men and women, although for some individuals the focus is peripheral, incidental or even non-existent.

In summary, some important facets of his theory were identified as important to this current study. These were: (1) people differ in terms of their personalities and their interests (2) every occupation requires a characteristic pattern of abilities and personal traits (3) vocational interests are increasingly stable from late adolescence until late maturity and (4) the degree of job satisfaction is related to the degree to which people have been able to implement their self-concepts.

However, Super's construct of career development was devised in a context where an individual may have different options when making a career decision. In South Africa widespread unemployment makes this difficult to apply to its society (Stead & Watson, 1999:77). Van Niekerk and Van Daalen (1991) also questioned the relevance of Super's theory among Black South Africans. They suggested that Super's developmental stages do not adequately reflect the career paths of Black youth. Their reasoning was that the Black youth previously had seldom the opportunities to explore and commit themselves to long-term careers. This was in accordance with Stead and Watson (1998:290) who suggested that the developmental stages, self-concept, career maturity and decision-making aspects of Super's theory need to be re-examined or even redefined if they are to become more meaningful constructs in the South African context. Other factors lacking from Super's theory are ethnic identity, discrimination, unemployment and worldview (Stead & Watson, 1999:77).

3.3.4 Social Cognitive Career Theory

The social-cognitive career theory has several concepts (De Bruin, 1999:92-95). These are:

(1) Triadic reciprocity

According to social-cognitive theory there is a triadic reciprocity between personal attributes (such as feelings, attitudes, gender and aptitude), the external environment and overt behaviour.

(2) Self-efficacy expectations

Self-efficacy refers to people's beliefs about their capabilities to perform particular tasks, i.e. "Can I do it?" Those who believe that they can perform a task successfully are more likely to attempt a particular task and tend to perform better at it than those who do not believe they can perform the task successfully.

(3) Outcome expectations

This refers to what people believe the results of particular behaviours will be, i.e. "Will I be happy with the results if I do it?".

(4) Goals

Goals help people organise and guide their actions and behaviour. Through the emphasis goals, this theory promotes a view of people as individuals who give direction to their own lives.

(5) Interests

People will develop interests in activities for which they have positive self-efficacy and outcome expectations.

(6) Career choices

The career choice process flows from the goals and activities that develop out of interests. People are likely to set career-related goals and pursue career-related activities in the fields in which they are interested.

The social-cognitive career theory recognises the importance of the context or the environment on the development of self-efficacy expectations, outcome expectations and career choices. The influence of personal attributes, such as gender, ethnicity and socio-economic status, is also recognised.

In summary, the social-cognitive career theory has been proven useful as a model in understanding and changing the career behaviour of South African youth. It gives the counsellor a model for intervention at several levels. Some important facets of this theory that were identified as important to this current study were (1) people develop interests in activities for which they have positive self-efficacy and outcome expectations and (2) people are likely to set career-related goals and pursue career-related activities in the fields in which they are interested.

In conclusion, it was determined that there is not one career theory that has been specifically developed in order to explain the career behaviour of South Africa's diverse population groups. The trait-factor theory was argued to

have two major shortcomings, which lead the researchers to view it as inapplicable to this study. However, specific factors of the other theories were argued to be of importance to this current study. Some facets of Super's theory were argued to be valuable and applicable. However, the relevance of Super's theory among Black South Africans has been questioned. The social-cognitive career theory was proven useful as a model in understanding and changing the career behaviour of South African youth. Some important facets of this theory were also identified as important to this current study. In general, Holland's theory was accepted as the basis for this study. Owing to the fact that this theory might also be biased on the grounds of race, the applicability of this theory in the South African context was doubted. However, it was not rejected since the measuring instrument of this current study (the INQ) was based on Holland's theory.

3.4 THE DEVELOPMENT AND STABILITY OF VOCATIONAL INTERESTS

It is believed that a person's vocational interests originate from childhood. Here there is typically an element of fantasy. These fantasies are about being glamorous, talented, heroic or adventurous. Such fantasies hold little knowledge about abilities and what an occupation entails. In late childhood and early adolescence we go through a transition phase and finally to a more realistic stage in late adolescence and early adulthood (Aiken, 1994:211). Of importance here is that interests result from differential reinforcement for engaging in certain activities, as well as modelling of people who are important to the individual (Aiken, 1994:211). Bandura (1997:3) believed that not only personality will influence the development of interests but also self-efficacy. He defined self-efficacy as: "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments". He proposed that individuals who perceive themselves as capable tend to attempt and successfully execute tasks or activities (Bandura, 1997:3).

Stability is the degree to which vocational interests are stable and has been a focus of attention since the birth of interest measurement. According to Aiken (1994:212) a person's interest patterns begin in early childhood. These early interests are relatively unstable and keep developing until grade nine or eleven, where they seem to be stable. However, some people change their interests even in adulthood. Therefore caution should be exerted when using interest inventories on a person grade nine and younger.

3.5 MEASUREMENT OF INTERESTS

Career counsellors use different methods to measure vocational interests (Downie, 1967:379). These include the question method, the activities method, the test method and the questionnaire method (Taljaard & Prinsloo, 1995:434-435).

The question method involves a person being asked directly about interests. This is the fastest and most direct method, but is very unreliable and unrealistic.

The activities method involves observing a person's interests by determining with what he / she keeps themselves busy with most often. Information obtained in this way should be interpreted very carefully, because a person's choice is influenced by circumstances that may force him/her to participate in an activity which they do not necessarily prefer.

The test method involves objective tests for instance mathematical tests. However, this method is not widely used as its results depend on a variety of things.

The questionnaire method is the most common and practical method for the measurement of interests. Interests are measured through a whole lot of

questions about certain activities from which a person should indicate his/her feeling towards the activities. An advantage is that a person's interests in a variety of fields can be compared to each other.

In South Africa, career counsellors mainly use standardised vocational inventories. The specific interest inventory used in this study to measure vocational interests was the Interest Questionnaire (INQ). An in-depth discussion of this questionnaire follows in *Chapter 5*. The focus of this chapter will now shift to an in-depth discussion of interest inventories.

3.5.1 Interest Inventories

3.5.1 (a) The Origin of Interest Inventories

According to Hansen (2000:203), the importance of an individual's interest in job selection was first recognised by educators in the 1900s and shortly thereafter by industry. The earliest method for assessing interest was estimation. This was accomplished by asking individuals to indicate how they felt about various activities. To improve accuracy, people were encouraged to try out activities before making their estimates. This was extremely time-consuming and costly and therefore led to the need for the development of interest inventories (Hansen, 2000:203). The development of standardised methods of measuring interests began in an applied context, that of vocational counselling and selection (Aiken, 1994:210).

Modern interest testing was born in Pittsburgh, Pennsylvania, through Edward K Strong. He published the Strong Vocational Interest Blank (SVIB) in 1927. This was a pencil-and-paper survey that consisted of more than 300 items. It was designed to determine the occupational path that the individual should follow (Nadelson, 2001:71). Strong felt that women and men differ in the career paths that they choose, and therefore published a "women version" of the test in 1933. Subsequent revisions of the SVIB in the 1960's abandoned these gender differences and the tests were combined into the Strong-Campbell Interest Inventory (SCII). Since then, it has been revised

several times, but still remains one of the most researched and widely used interest inventories in the United States of America (De Bruin, 2001:252).

Interest tests have originally been developed with essentially practical purposes in mind. This was to improve vocational selection and vocational guidance (Kline, 1975:129). Today interest inventories are administered for a number of reasons in a variety of situations (Aiken, 1994:210). These include career planning where it is used to predict success in an organization and educational settings where it is used to determine admission and classroom selection.

Since the breakthrough of Strong, numerous other tests were developed by other researchers to measure vocational interests (Nadelson, 2001:71). These include the Jackson Vocational Interest Survey and the Kuder Occupational Interest Survey (Anastasi & Urbina, 1997:397-399).

3.5.1 (b) The Rationale of Interest Inventories

The large majority of interest inventories are designed to assess the individual's interests in different fields of work (Anastasi & Urbina, 1997:386). Hood and Johnson (1997:151) stated that interest inventories ask clients to report their likes and dislikes for various activities. De Bruin (2001:252) argued that interest inventory scores reveal an individual's preference for engaging in specific occupations.

A comprehensive definition was also provided by The Pennsylvania State University (2004). This institution defines interest inventories as measures that measure your likes and dislikes in a wide range of general activities. Psychologists then use this information to develop a personal interest profile. It does not, however, tell a person what he/she should or should not do or pursue.

3.5.1 (c) Different Types of Interest Inventories

Three interest inventories that have been developed and standardised in South Africa or adapted for the South African context are the following:

- Self-Directed-Search (SDS)

This is one of the best-known interest inventories in the world. It is based on the theory of John L Holland and was adapted for South African conditions. It was designed as a self-administered, self-scored and self-interpreted vocational counselling instrument. The SDS was standardised for all South African groups and can be used with high school students and adults. The SDS measures the six broad interest fields, namely Realistic, Investigative, Artistic, Social, Enterprising and Conventional. These six fields are also used to describe working environments. The major disadvantage of the SDS is that it was found to be invalid for black South Africans (Anastasi & Urbina, 1997:400; Taljaard & Prinsloo, 1995:458; Watson, Stead & Schonegevel in De Bruin, 2001:252-253).

- 19 Field Interest Inventory (19FII)

This inventory provides scores for nineteen different interest fields. These fields are more specific than the six broad fields of the SDS and give a more detailed picture of an individual's interests. However De Bruin and Du Toit (1995) showed that these could be summarised into six factors that resembles Holland's fields. It was designed for high school students from standard eight to ten, students and adults (Taljaard & Prinsloo, 1995:442). This measure was only standardised for white high school students and due to old research, it might be gender biased as well (De Bruin, 2001:252-253).

- MB-10

This is a revised version of the KODUS Interest Inventory. It measures interests for ten different fields. It was standardised for high school learners that are representative of the total Western Cape population and first year students at the University of Stellenbosch.

- Interest Questionnaire (INQ)

This measure was designed by Inette A Taylor and is discussed in *Chapter 5*. The reason it was developed is, as was seen from the above

three measures, there is not one interest measuring instrument that is suitable for use on the whole South African population. A need therefore exists to standardise a measure which is unbiased and standardised on all the population groups.

3.5.1 (d) The Advantages and Disadvantages of Interest Inventories

According to Anastasi & Urbina (1997:387), more recently developed or revised inventories reflect major changes in career counselling. The first is a change in the emphasis on self-exploration. More and more instruments provide opportunities for the individual to study the detailed test results and relate them to occupational information and other data about personal qualifications and experience. A second change concerns the goal of interest measurement. Today there is more and more emphasis on expanding the career options open to the individual. The third change relates to a concern about the sex fairness of interest inventories (Anastasi & Urbina, 1997:387).

Although the outlook on interest inventories has changed dramatically, there remain a few weaknesses. Firstly, it can be faked. Secondly, there is an excessive amount of difficult vocabulary and that prohibits the understanding of what is involved in many of the occupations that appear on these scales. Thirdly, there is the possibility of always receiving socially acceptable choices. Fourthly, there is a tendency to respond to the form rather than to the content of items. Lastly, there is the difficulty of socio-economic status. Working-class people are not as aware of different occupations as the wealthier (Downie, 1967:396-397; Aiken, 1994:212-214).

3.5.1 (e) Applications of Interests Inventories

Experts use psychological testing to help individuals better understand their interests and work habits so that they can pursue careers that will be personally satisfying. In career counselling, the aim of personality assessment is to identify an individual's salient personality characteristics

and these are then matched to the requirements of occupations. The underlying assumption is that personality traits reflect basic and relatively stable tendencies to behave in certain ways and that individuals seek out environments that correspond with their personality traits. Three general purposes of interest inventories in career counselling are: (1) to identify interests of which the client was not aware, (2) to confirm the client's stated interests and (3) to identify discrepancies between a client's abilities and interests. Colleges and universities use these so that students can more easily select their majors and identify careers that fit their skills. Human resource departments use these tests to screen job applicants, evaluate the suitability of current employees for specific assignments and to select candidates for promotions (De Bruin, 2001:255; MacAleese in De Bruin, 2001:252; Nadelson, 2001:71).

3.6 VOCATIONAL INTERESTS AND VOCATIONAL CHOICE

A very old but still true statement regarding vocational choice was that of Vaughan (1970:10). He described a career choice as ultimately the most important choice an individual will ever make. He continued by explaining that there are little other choices that have such a drastic impact on the rest of an individual's life as this one. The impact of this choice influences not only the individual self, but also his/her immediate family, the community in which the individual makes a contribution, the providers of educational and training facilities as well as the users of this labour force. Therefore, it is of utmost importance for an individual to make the correct decision (Vaughan, 1970:10). Louw, Van Ede and Louw (1998:441) also emphasis the importance of making the right career choice as it contributes to the defining of an individual's identity and is the first step in the performance of an adult role.

Hoppock (1957:1-4) described five reasons as to why an individual must make the correct career choice. Although this is a very old source, it is still just as true and applicable in today's societies. These are:

- The choice of a career can determine if an individual will be employed or not
- The choice of a career can determine if an individual succeeds or fails
- The choice of career can determine if an individual will experience satisfaction or frustration in the job
- The choice of a career influences almost all other aspects of life
- Career choices determine the way in which a democratic society will utilise its labour force

According to Gerdes, Moore, Ochse and Van Ede (in Louw, Van Ede & Louw, 1998:442) an individual should keep the following in mind, in order to make a realistic career choice:

- His/her interests, abilities, values and personality characteristics
- Information regarding different careers as well as the qualifications necessary should be acquired
- The characteristics of the career should be in line with the characteristics of the individual
- Alternative careers should also be decided on

As depicted in Figure 1.1, personality influences an individual's vocational interests which in turn influence an individual's vocational choice which ultimately influences an individual's job satisfaction. This whole process takes place in the environment (in this case South Africa). In *Chapter 2* it was already discussed how personality influences vocational choice and vice versa. Of importance still is how vocational interests influence vocational choice.

It is not just what an individual wants to do that influences and determines his/her vocational choice, but also a combination of preferences, attitudes, interests, personality and the self concept of the person. This study

specifically focuses on the influence of personality on vocational interests and therefore on vocational choice. Therefore the following is true regarding the final vocational choice of an individual: (1) an individual attempts to make his/her final career choice so that he/she can live out his/her strongest interests and (2) personality composition determines in what situations a person is the most comfortable in and in what situations a person functions at his/her optimal level (Potgieter, 1983:15). However, due to the situation in South Africa, it is not always possible for an individual to obtain a job in the vocational choice he/she made.

3.7 CONCLUSION

The purpose of this chapter was to provide an overview of vocational interests and vocational choice. This related to the overall aim of the study which was to investigate the relationship between personality traits and vocational interests.

In this chapter, it was determined that there are not as many definitions of vocational psychology as with personology. Vocational interests are generally accepted as those activities, objects or processes associated with work activities.

The most prominent perspectives of vocational psychology were discussed in terms of several career theories, namely the trait-factor, John Holland's, Donald Super's and the social-cognitive career theories. This was in order to determine what aspects of the different theories were applicable to this study. The South African context relating to each of these theories was also discussed. It was concluded that Holland's theory was the most appropriate theory to use, because it presented six personality types and proposed that satisfaction and the propensity to leave a job depend on the degree to which individuals successfully match their personalities to a congruent occupational environment. This theory is in line with the hypothesis of this

study in which it was assumed that there will be a relationship between personality traits and vocational interests.

However, useful aspects of the other theories that may explain the relationship between the variables in the South African context better were identified from Super and the social–cognitive career theory. Super contributed that people differ in terms of their personalities and their interests, every occupation requires a characteristic pattern of abilities and personal traits, vocational interests are increasingly stable from late adolescence until late maturity and the degree of job satisfaction is related to the degree to which they have been able to implement their self-concepts. The social-cognitive career theory contributed that people develop interests in activities for which they have positive self-efficacy and outcome expectations and people are likely to set career-related goals and pursue career-related activities in the fields in which they are interested.

This chapter also defined the concepts vocational psychology and vocational interests and examined the measurement of interests. Interest inventories were investigated in terms of their origin, rational, different types, the advantages and disadvantages and the applications of these inventories. In the discussion on the different types of interest inventories it was determined that the most known interest measures (the SDS, 19FII and the MB-10) were not standardised for all the population groups in South Africa. The INQ was therefore developed in order to have a measure that is standardised for the whole population regarding race and gender. The relationship between vocational interests and vocational choice was also discussed.

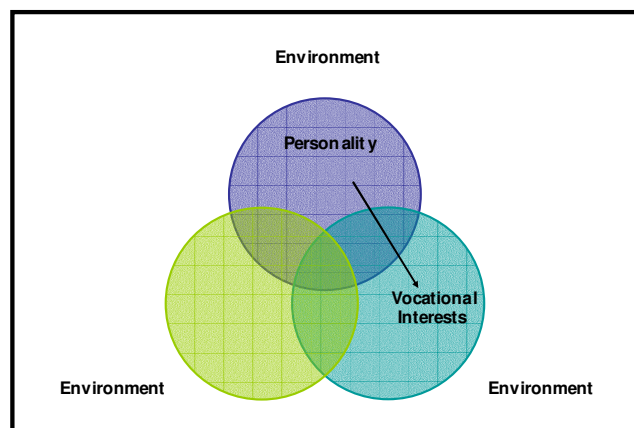
CHAPTER 4: THE RELATIONSHIP BETWEEN PERSONALITY TRAITS AND VOCATIONAL INTERESTS

4.1 INTRODUCTION

Chapter 2 explored personality and vocational choice, while Chapter 3 explored vocational interests and vocational choice. In this chapter the relationship between the personality traits and vocational interests will be examined.

In other words, only certain parts of Figure 1.1 will be discussed in this chapter. These are presented in Figure 4.1.

Figure 4.1
The Interrelationship between Personality, Vocational Interest,
Vocational Choice and the Environment as discussed in Chapter 4



The aim of this chapter therefore is to study previous research on the relationship between personality traits and vocational interests as well as to determine what these contributed to the field. This will serve as an analysis of the possibility and the nature of the relationship between vocational interests and personality traits and will suggest if this current study's hypotheses will be supported or rejected.

4.2 THE RATIONALE BEHIND THE RELATIONSHIP

Although the constructs of personality and interests form two distinct fields in psychology, many theorists have portrayed these two constructs as entwined human qualities (Staggs, Larson & Borgen, 2003:244). Within the field of vocational counselling, most psychologists agree that vocational interests and personality traits are related; however the nature of the relationship is unclear (Zagar *et al.*, 1983:203).

The proposed relationship between these two variables is important for two reasons. Firstly, if an overlap does exist, it enables a counsellor to make assumptions about the personality of a client from interest inventory results or to make assumptions about interests given a client's personality structure. Without empirical support for this overlap, making any assumptions about personality from interests, or vice versa, is extremely risky. Secondly, an overlap can lead to a reduction in testing time in situations when information about personality and interests is beneficial (Pietrzak & Page, 2001:2).

The nature of this relationship are characterised by two points of view. The first viewpoint is that interests are a manifestation of personality traits. Aiken (1994:211) argued that a contemporary conception of interest is that they are reflections or expressions of deep-seated individual needs and personality traits. According to this view, vocational selection is therefore influenced by personality traits. Similarly, Anastasi and Urbina (1997:386) views interests as expressions of individual personality traits. In other words, the nature and

strength of one's interests represent an important aspect of one's personality. Owen and Taljaard (1995:428) also interpreted interests as a facet of personality.

The second viewpoint is that a career decision which was based on a careful match with one's personality and/or interests, leads to higher job satisfaction. Greenhaus *et al.* (2000:43) argued that people who choose career fields that are compatible with their interests tend to be more satisfied with their jobs. According to Nordvik (1994), people have differential preferences for coping, which they have to exercise in order to do and feel well in their work and life situation. This viewpoint is also in line with various theories of vocational choice or career psychology, including the trait-factor theory and Holland.

Furnham in Bergh (2003:298) distinguished between six different approaches that are used to research personality in the work context. These are:

- Biographical or case history research. This type of research is aimed at analysing personal life details and experiences
- Classic personality theory. This measures many different personality attributes and these are then related to work-related personality variables
- Specific personality measures for specific work applications
- Analysing the attributes of work environments and employees to find the best fit (or misfit) in order to take decisions in occupational choice or selection
- Classical organizational or occupational psychology, in which work-related variables are researched for their relationship with personality
- Longitudinal studies of people at work on how various personal and personality factors stay consistent or change over time

4.3 RESEARCH ON THE RELATIONSHIP

Ackerman (1997) proposed two reasons why the study of the relationships between interests and personality traits are important. Firstly, it is a common

scientific goal to investigate the relationships between different constructs. This strategy may result in new scientific discoveries. Secondly, the study of the relationships between interests and personality traits will reveal what they have in common and what unique information they can provide. Ackerman (1997) argued that this information is potentially useful in the career-counselling context.

4.3.1 Studies conducted in countries other than South Africa

Some studies found that personality and vocational interest are unrelated. Pietrzak and Page (2001:2) did an investigation of Holland types and the Sixteen Personality Factor Questionnaire – Fifth edition. The aim of the investigation was two-fold. The first was to determine the stability of the 16PF predictors in predicting Holland types as measured by the Self-Directed Search. The second was to examine the domain overlap of the 16PF and SDS. The data supported the stability of the global factor predictors. However, none of the multiple regression equations met the criteria for practical significance in predicting the SDS scales from the 16PF factors (Pietrzak & Page, 2001:1-19).

Other studies did find a significant relationship. As mentioned earlier many theorists have portrayed these two constructs as entwined human qualities. One study that wanted to explore this assumption was the study of Zak *et al.* (1979:424-428). They conducted a study about the common space of personality traits and vocational interests. Their study investigated relationships between these two variables and had two hypotheses. The first alternative hypothesis (H_1) stated that a relationship exists between personality traits and vocational interest. The second alternative hypothesis (H_2) stated that personality traits, which characterize occupational profiles, are arranged in circular order corresponding to the formation of the vocational fields, which represent those occupations. Both these hypotheses were supported by the data. The analysis of H_1 indicated that at least four

independent relationships exist between Cattell's personality traits and Ramak vocational interests (Zak *et al.*, 1979:424-428).

Another study that also found these two constructs to be entwined was the study of Zagar *et al.* (1983:203-214). They conducted a study about vocational interests and personality. In this study, they tested the hypothesis that vocational interest and personality tests measure a common domain. The study's data supported their hypothesis. Evidence was produced that there are six dimensions which describe a common domain of personality and vocational interest (Zagar *et al.*, 1983:203-214).

A study that verified the results found by the above two studies was the study of Larson *et al.* (2002:217-234). They conducted a meta-analysis of Big Six Interests and Big Five Personality Factors. They took previous research done on this subject and summarised it in a meta-analysis study. They looked at 12 previous studies and evaluated the overlap of personality and interest using measures of the Big Five personality traits and the RIASEC interest types. The meta-analysis confirmed the findings of individual empirical studies, namely that several strong relationships exist between some broad domains of interests and personality (Larson *et al.*, 2002:217-234).

Larson and Borgen collaborated a year later again, this time with another researcher. Staggs *et al.* (2003: 243-261) did a study about the convergence of specific factors in vocational interests and personality. In their results, they found that specific MPQ (Multidimensional Personality Questionnaire) primary scales contribute significantly to the prediction of SII (Strong Interest Inventory) scales (Staggs *et al.* 2003: 243-261). Thus, yet again it was proven that personality traits and vocational interests are two entwined human qualities.

In all the above studies, it was confirmed that a relationship does not exist between vocational interests and personality traits. These studies have in

common the fact that they all found a significant relationship. They differ in the fact that they were all conducted using different measures for personality traits as well as different measures for vocational interests, but this did not appear to affect the findings.

This is of significance as this current study's hypothesis also indicated that there is a relationship between vocational interests and personality traits. However, this study differs from the above-mentioned as it will be conducted using two South African developed or standardised measures. Thus, from the findings indicated in the above-mentioned studies, it seems quite possible that this study's hypothesis will be supported by the data.

4.3.2 Studies conducted in South Africa

South African career research has largely been dominated by career theories and research in the United States. The reason behind this was that most of the research in South Africa before 1990 focused on the White South African and assumed that this western heritage would justify European and American derived theories and instruments. Only after 1990 researchers started to question the relevance of these theories and instruments on South Africans (Stead & Watson, 1998:290).

Although researchers started to question the relevance of indigenous theories and instruments for South Africa, little research has been conducted. De Bruin (2002) is one of the few South Africans that conducted a study. His study examined the relationship between vocational interests (as measured by the 19FII) and basic personality traits (as measured by the 16PF). The interest fields of the 19-Field-Interest Inventory were related to the second order factors of the 16 Personality Factor Questionnaire by means of a factor extension analysis (De Bruin, 2002: 49-52).

The results showed that extroverts tend to be interested in fields related to social contact and the influencing of other people, i.e. sociability and public

speaking. Emotionally sensitive individuals tend to be interested in the arts and languages as well as the welfare of others. Independent individuals tend to be interested in creative thinking, suggesting that they like to generate alternative and new ideas (De Bruin, 2002: 49-52).

The participants were 1502 first year university students at a South African university. The mean age of the students was 18 years and there were approximately equal numbers of males and females (De Bruin, 2002:50). Regarding gender, his sample was representative of the South African population where 51% are female and 49% are male. His study did not mention any figures regarding race.

However, when comparing De Bruin's sample to the current study's sample, it is evident that they differ quite drastically. De Bruin's (2002:50) sample (1502) was nearly double the size than the current study's sample (770). His mean age (18) was almost half of the current study's mean age (31.21). And his sample was equally distributed regarding gender. In this current study's sample the males are about two thirds.

4.4 CONCLUSION

In this chapter, the possible relationship between personality traits and vocational interests was analysed according to two perspectives. The first perspective was that personality and vocational interests are unrelated concepts. Not much evidence for this perspective was found. The second perspective was that personality and vocational interests are related and correlated concepts. The evidence for this perspective were in abundance and exceptionally significant.

CHAPTER 5: RESEARCH METHODOLOGY

5.1 INTRODUCTION

In the previous chapters (Chapters 2 - 4), a literature review covered the main concepts included in this study as they were reviewed in different literature sources. Chapters 2 and 3 explored the concepts of personality and vocational choice respectively, by focusing on the history of these two concepts, definitions and the measurements thereof. Chapter 4 examined the relationship between personality traits and vocational interests by exploring scientifically published research. The aim of Chapter 4 was to link personality and interests. This literature review therefore then provided a thorough discussion of all the concepts involved in this study and the purpose of this was to provide the reader with a brief background on the topic.

The aim of this chapter in relation to the overall purpose of this study is to provide a detailed description of all the technical aspects which was involved in conducting the study. This chapter therefore includes discussions on the research design, data gathering procedure, population and sampling, measuring instruments and the procedure of statistical analysis used for this study.

5.2 RESEARCH APPROACH AND DESIGN

The specific research approach of this study was a basic associational / correlational approach. Basic associational designs have a specific associational approach. It determines whether and to what degree variables are related (Morgan & Griego, 1998:7). In other words, relationships among two or more variables are studied without any attempt to influence them (Rao, n.d). This approach was relevant as this study attempted to find an

association between the two variables personality traits and vocational interests and to determine to what degree these variables are related.

Rao (n.d) proposed the following steps when associational research is conducted:

STEP 1: Problem selection

The problem statement must be derived from theory and must be logical
(*Chapter 1, paragraph 1.2*)

STEP 2: Sample and instrument selection

A minimum of 30 participants is necessary (*see paragraph 5.3 and 5.4*)
Instruments must be valid and reliable (*see paragraph 5.5*)

STEP 3: Design and procedure

Collect data on two or more variables for each participant (*paragraph 5.2*)

STEP 4: Data analysis and Interpretation

Correlation coefficients (*see paragraph 5.6*)
Interpretation (*Chapter 6*)

In this study, the researchers aimed to find an association between the two variables, namely personality traits and vocational interests. Steps one to four were used to construct the methodology, which is discussed in this chapter.

5.3 DATA GATHERING

Research projects can be categorized into two categories according to their data gathering techniques: quantitative and qualitative. Quantitative is the collection of data in the form of numbers. Qualitative is the collection of data in the form of words or pictures (Neuman, 1997:30). This research study's

data was collected in the form of numbers, thereby making it a quantitative study. As was seen in *Chapter 4*, this is the most popular technique used when studying the relationship between the two constructs vocational interests and personality traits.

This study's data was obtained from the registered counselling psychologist who developed the INQ, namely Dr. Inette A Taylor. The data was in the form of a secondary data set. Therefore, the data was already in a useful format.

5.4 POPULATION AND SAMPLE

The population used for this study was the secondary data set mentioned above. The complete data set consisted of 901 subjects. The sample used was a purposive sample drawn from the data set using the individuals that had completed both the 16PF as well as the INQ. The rationale for this was that this research study was only relating the variables vocational interests (measured by the INQ) and personality traits (measured by the 16PF); therefore, all other data was discarded. In total, the sample then consisted of 770 subjects (N=770). The biographical composition of the sample is described below:

Table 5.1
Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	557	72.3	72.3	72.3
	Female	213	27.7	27.7	100.0
Total		770	100.0	100.0	

The majority of the sample were males (N=557). This indicates that this sample is not truly representative of the South African population regarding gender. As this study's main aim was not to investigate the influence of

gender on the relationship between personality traits and vocational interests, the fact that the males are more represented was not expected to influence the findings for H₁ of this study. However, in the discussion of the results the influence of this on H₂ will be evaluated.

Table 5.2
Race

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid White	367	47.7	47.8	47.8
Black	351	45.6	45.7	93.5
Coloured	11	1.4	1.4	94.9
Indian	39	5.1	5.1	100.0
Total	768	99.7	100.0	
Missing System	2	.3		
Total	770	100.0		

Slightly more than half of the sample was white (N=367), while the remainder was black (N=351). Small groups of Indian (N=39) and Coloured (N=11) respondents made up the rest of the sample. Owing to their small numbers, they were grouped together with black respondents for the purposes of all analyses involving race. Although this is not a true reflection of the South African population regarding the lower number of black respondents, it was still acceptable that the races blacks and whites were about equal. As this study's main aim was not to investigate the influence of race on the relationship between personality traits and vocational interests, the fact that the blacks were slightly underrepresented was not expected to influence the findings for H₁ of this study. However, in the discussion of the results the influence of this on H₂ will be evaluated.

Table 5.3**Age**

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	768	15	60	31.21	8.234
Valid (N) (listwise)	768				

The age of the sample ranged from 15 to 60 with an average age of 31.21 years.

5.5 MEASURING INSTRUMENTS

The Sixteen Personality Factor Questionnaire (16PF) was used to measure personality traits and the Interest Questionnaire (INQ) to measure vocational interests. In order to determine exactly what personality traits correlate with what vocational interests it was necessary to use a personality questionnaire with as many dimensions as possible. The 16PF is the personality questionnaire with the most dimensions that is suitable for usage on a South African sample.

5.5.1 16 Personality Factor Questionnaire (16PF)

Raymond B. Cattell made extensive use of factor analysis and identified a list of about twenty primary personality traits. He selected sixteen of these traits to be included in a personality questionnaire for adults. He called this the 16 Personality Factor Questionnaire (16PF). It is one of the most widely used tests of normal personality in the world. All the traits are bipolar, in other words on the one pole, there is a low indication of the trait and on the other pole there is a high indication of the trait (De Bruin, 2001:233-234).

There are four versions of the 16PF available in South Africa, namely Forms A, B, E and SA92. All the subjects in this study were tested using form SA92. Form SA92 was developed in response to psychologists'

dissatisfaction with the low internal consistency reliabilities of Forms A and B (De Bruin, 2001:233-236). Abrahams (1996) and Van Eeden and Prinsloo (1997) summarised the need for the development of a South African version as (1) it was not determined whether gender and ethnic bias existed with the Forms of A and B, (2) new norms were needed as a result, (3) poor items could be eliminated with item bias and (4) poor reliability coefficients could be improved with a new SA version. De Bruin (2001:233) mentioned that the best advantage of the development of the SA92 version was that because of the extensive research its development led to the elimination of bias in terms of gender and ethnicity.

Prinsloo (in Owen & Taljaard, 1995:402) mentioned that this form is shorter and quicker to apply, as it consists of only 160 items. It was developed for persons 18 years and older, out of any racial group that is English or Afrikaans and has a formal education of at least matric (or equivalent). The reliability coefficient reported for Form SA92 is between 0,51 and 0,81. The reliability coefficient for males and females relates closely to the total group.

Table 5.4
The Sixteen Personality Factors measured by the 16PF

FACTOR	LOW SCORE	HIGH SCORE
A: Warmth	Reserved Tend to be reserved and cautious about involvement and attachment. Like solitude, often focusing attention on intellectual, mechanical or artistic pursuits, where they can be quite effective.	Warm Tend to have an intrinsic interest in people and often seek situations that call for closeness with other people. Friends describe them as sympathetic and comforting.
B: Reasoning	Concrete Less able to solve verbal and numerical problems of an academic nature. This can indicate lower intellectual ability, but it is also related to educational level.	Abstract More able to solve verbal and numerical problems of an academic nature. This is often indicative of intellectual ability, but is also related to educational level. This index should not replace full-length measures of cognitive ability.
C: Emotional Stability	Reactive Tend to feel a lack of control over life's challenges and to react to life rather than making adaptive or	Stable Tend to take life in stride and to cope with day-to-day life and its challenges in a calm, balanced,

	proactive choices.	adaptive way. Tolerate frustration well, can delay gratification, and do not let emotions obscure realities.
E: Dominance	Cooperative Tend to accommodate others' wishes, and are cooperative and agreeable. Likely to avoid conflict by acquiescing to the wishes of others, and they are willing to set aside their own wishes and feelings.	Dominant Tend to be vocal in expressing their opinions and wishes. While dominance can create a commanding, take-charge social presence, at times it can be seen as overbearing, stubborn or argumentative.
F: Liveliness	Restrained Though they may not be the life of the party or the most entertaining person in a group, their quiet attentiveness can make them reliable and mature. At the extreme, they can inhibit their spontaneity, sometimes to the point of appearing constricted.	Lively Are high spirited, stimulating and drawn to lively social situations. Extreme scores may reflect an impulsive or unreliable quality. May find it hard to rein in their enthusiasm in situations that call for restraint or decorum.
G: Rule-Consciousness	Expedient May not worry about conventions, obligations or following rules and regulations. This may be because they lack internalized standards or simply because they follow unconventional values.	Rule-Conscious Tend to be proper and conscientious, and conform to conventional cultural standards. At the extreme, they can be perceived as inflexible, moralistic or self-righteous.
H: Social Boldness	Shy Find speaking in front of groups to be difficult, and may feel intimidated when facing stressful situations of an interpersonal nature. However, they may be sensitive listeners, who are more aware of risks in situations.	Socially Bold Tend to boldly initiate social contacts, be fearless in the face of new or intimidating social settings, and to be risk-takers seeking adventure.
I: Sensitivity	Utilitarian Focus more on how things work than on aesthetics or refined sensibilities, and may be so concerned with utility and objectivity that they exclude emotions from consideration.	Sensitive High scorers are attuned to sensitive feelings, and thus are empathetic, sympathetic and tender-minded. Tend to be artistic and refined in their interests and tastes.
L: Vigilance	Trusting Tend to be easy-going and expect fair treatment and good intentions from others, and to have trusting relationships.	Suspicious Tend to be attentive to others' motives and intentions and sensitive to being misunderstood or taken advantage of. May be unable to relax their vigilance.
M: Abstractedness	Practical Tend to focus on practical, observable realities of their environment and may be better at working on a specific solution than at imagining possible solutions.	Imaginative Are more oriented to abstract ideas than to external facts and practicalities. Being focused on thinking, imagination and fantasy, high scorers generate many ideas and theories and are often creative.
N: Privatness	Forthright Tend to be open, artless and transparent. Are willing to talk	Private Tend to be guarded, and reluctant to disclose personal information.

	about themselves readily, even about personal matters. Tend to genuine and unguarded.	May be tactful, diplomatic and calculating regarding others' motives.
O: Apprehension	Self-Assured Tend to be self-confident and untroubled by self-doubt. While this may make them more resilient in stressful situations, at the extreme, the person's confidence may be unshaken, even in situations that call for self-evaluation and self-improvement.	Apprehension Tend to worry about things and to feel anxious and insecure. These feelings may be in response to current life events or they may be characteristic. While worrying can help the person anticipate dangers, be sensitive to others' reactions and anticipate consequences of actions, it can also be painful and make a poor social impression on others.
Q2: Self-Reliance	Group-Oriented Tend to prefer being around other people, and enjoy social groups and working in teams.	Self-Reliant Enjoy spending time alone and prefer to rely on their own thinking and judgment. Are autonomous in their thoughts and actions.
Q3: Perfectionism	Unexacting They tend to be comfortable leaving things to chance, tending to be spontaneous rather than planful, organized, and structured.	Perfectionistic Tend to be organized, plan ahead, persevere, and work conscientiously. Are most effective in organized and structured situations, and may find it hard to deal with unpredictability.
Q4: Tension	Relaxed Are laid back, easy-going, and composed. Are not easily upset or aroused, and frustrations rarely bother them.	Tense Tend to have a lot of drive, to be high strung, and to be fidgety when made to wait. A certain amount of tension is necessary to focus effectively and can motivate action.

(Adapted from De Bruin, 2001:233-236; Russell, Heather & Cattell: n.d).

Only the primary factors of the 16PF were correlated with the INQ. Secondary factors were totally discarded.

5.5.2 Interest Questionnaire (INQ)

This questionnaire was developed in 1996 by Dr. Inette A Taylor, a registered counselling psychologist. This questionnaire is in the process of being standardised and validated for the South African population. As this was the first study done using this questionnaire, no previous research was available at the time this study was conducted.

This questionnaire's development was based on the trait theory of Holland, namely the RAISEC theory (*Chapter 3*). Unlike the theory of Holland that distinguishes between six types of interests, the INQ makes provision for ten interest fields, as depicted in Table 5.5.

This questionnaire consists of 90 questions. Each question presents the reader with two possible activities. The task is to choose the one that appeals the most to the respondent.

As mentioned earlier there has not been any research done on this questionnaire, therefore no information was available on the reliability, validity and culture fairness of this questionnaire at the time of this study.

Table 5.5
The Ten Interest Fields measured by the INQ

A	Outdoor	Interested in nature, physical activities, plants, animals, etc
B	Mechanical	Interested in technical and mechanical equipment, machinery, etc
C	Computational	Interested in numeric analysis, data analysis, etc
D	Scientific	Interested in science, facts, physics, chemistry, etc
E	Persuasive	Dynamic persuasive nature, example management, sales, negotiator, preacher, etc
F	Creative	Interested in music, art, creative handwork, etc
G	Social Science	Caring nature, example social work, counselling, education, nursing, etc
H	Clerical	Interested in administrative, clerical work, office work
I	Literary	Interested in literature, journalism, research, etc
J	Medical	Interested in medical and related work

(Adapted from Taylor, 2003)

5.6 STATISTICAL ANALYSIS

Statistical analysis was conducted by using the SPSS 11.5 computer software. Summary statistics was used to describe the sample. Correlation analysis was conducted to assess the relationship between the variables and partial correlation analysis to assess the influence of biographical variables such as race and gender on the relationship.

Biographical data are presented in the form of summary statistics. These presentations give the reader a quantitative description of the sample and its characteristics (*as seen in paragraph 5.3 above*). Gender and race were represented in frequency tables (Table 5.1 and 5.2 respectively) and age was represented using a measure of central tendency, namely the mean (Table 5.3).

A parametric bivariate test for association was used to test the hypothesis H_1 . Since the data complied with the requirements for parametric associational tests, the appropriate test to use was Pearson's correlation coefficient. This determined if there was a relationship and the significance of the relationship (Morgan & Griego, 1998: 84). This analysis is relevant as it was in line with the objective of this study which was to find a relationship between vocational interests and personality traits. An analysis of variance (ANOVA) was also conducted to determine if there were differences between the results of the different groups. H_2 was tested using partial correlations controlling for the moderator variables gender and race.

The correlation coefficient may take on any value between plus and minus one (Stockburger, 1996).

$$-1.00 \leq r \leq + 1.00$$

The sign of the correlation coefficient (+, -) defines the direction of the relationship, either positive or negative. A positive correlation coefficient implies that as the value of one variable increases; the value of the other

variable also increases. A negative correlation coefficient indicates that as one variable decreases, the other decreases.

In this study the correlation coefficients (r) are interpreted as presented in Table 5.6 below:

Table 5.6
Interpretation of the Correlation Coefficient

POSITIVE CORRELATIONS	RELATIONSHIP	NEGATIVE CORRELATIONS
$r = .01$ to $.20$	WEAK	$r = -.01$ to $-.20$
$r = .21$ to $.50$	MODERATE	$r = -.21$ to $-.50$
$r = .51$ to $.80$	STRONG	$r = -.51$ to $-.80$
$r = .81$ to 1	VERY STRONG	$r = -.81$ to -1

(Adapted from Stockburger, 1996)

5.7 CONCLUSION

The aim of this chapter in relation to the overall purpose of this study was to provide a detailed description of all the technical aspects which was involved in conducting the study. It was determined that this was a quantitative research study with a basic associational research design that related the two variables, personality traits and vocational interests. The data gathering procedure was described as a secondary data set from which the sample of 770 subjects ($N=770$) was drawn. The measuring instruments were identified as the 16PF (for personality traits) and the INQ (for vocational interests).

CHAPTER 6: ARTICLE

**THE RELATIONSHIP BETWEEN PERSONALITY TRAITS AND
VOCATIONAL INTERESTS IN A SOUTH AFRICAN CONTEXT**

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THE RELATIONSHIP BETWEEN PERSONALITY TRAITS AND VOCATIONAL INTERESTS IN A SOUTH AFRICAN CONTEXT

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ABSTRACT

The purpose of this study is to determine if there is a relationship between personality traits and vocational interests in the South African context. A sample of 770 subjects completed the Sixteen Personality Factor Questionnaire (16PF) and the Interest Questionnaire (INQ). The Pearson's r indicates a number of low and moderate correlations between the factors on the 16PF and interest fields of the INQ. Partial correlations conducted shows that gender and race may influence these relationships, however these were slight changes. It is evident that a relationship exists between personality and vocational interest but seems to be weaker in the South African context than those found in studies conducted in Europe and the United States of America.

OPSOMMING

Die doel van die studie is om te bepaal of daar 'n verband is tussen persoonlikheidstrekke en beroepsbelangstellings binne die Suid-Afrikaanse konteks. 'n Steekproef van 770 proefpersone het die Sixteen Personality Factor Questionnaire (16PF) en die Interest Questionnaire (INQ) voltooi. Pearson se r toon 'n hele aantal lae en gemiddelde korrelasies tussen die faktore op die 16PF en belangstellingsvelde op die INQ. Gedeeltelike korrelasies toon dat geslag en ras hierdie verhoudinge beïnvloed, alhoewel dit net klein veranderinge meebring. Die positiewe korrelasies wat tussen persoonlikheidstrekke en belangstellingsvelde bevind is blyk swakker te wees as die korrelasies wat in verskeie studies, gedoen in die VSA en Europa, beskryf word.

The purpose of the study was to determine if there is a relationship between personality traits and vocational interests in the South African context. Ackerman (1997) proposed two reasons why the study of the relationships between interests and personality traits are important. Firstly, it is a common scientific goal to investigate the relationships between different constructs. This strategy may result in new scientific discoveries. Secondly, the study of the relationships between interests and personality traits will reveal what they have in

common and what unique information they can provide. Ackerman (1997) argued that this information is potentially useful in the career-counselling context.

Although numerous studies were conducted on this topic, most of them were conducted in the United States of America (USA)¹ and Europe². Studies conducted in South Africa before 1990, used mostly white samples. After the 1990's little research has been conducted. One of the few studies conducted was that of De Bruyn (2002).

De Bruyn (2002) examined the relationship between vocational interests (as measured by the 19-Field-Interest Inventory - 19FII) and basic personality traits (as measured by the 16 Personality Factor Questionnaire -16PF). The interest fields of the 19FII were related to the second order factors of the 16PF by means of a factor extension analysis (De Bruyn, 2002: 49-52). The participants were 1502 first year university students at a South African university. The mean age of the students was 18 years and there were approximately equal numbers of males and females (De Bruyn, 2002:50). Regarding gender, his sample was representative of the South African population where 51% are female and 49% are male. His study did not mention any figures regarding race.

The results showed that extroverts tend to be interested in fields related to social contact and the influencing of other people, i.e. sociability and public speaking. Emotionally sensitive individuals tend to be interested in the arts and languages as well as the welfare of others. Independent individuals tend to be interested in creative thinking, suggesting that they like to generate alternative and new ideas (De Bruyn, 2002: 49-52).

¹ Larson, Rottinghaus and Borgen (2002); Staggs, Larson & Borgen (2003); Zagar, Arbit, Falconer & Friedland (1983); Zak, Lindley and Borgen (2000)

² Nordvik (1994); Zak, Meir and Kraemer (1979)

De Bruin's (2002:51) results indicated the existence of relationships between interest fields and personality factors. However, he described these correlations between personality factors and interest scales as relatively weak. He even went as far as stating that personality traits and vocational interests appear to represent two clearly different domains of behaviour in South Africa.

Since little research of this nature has been conducted in the present South African context a need for research similar to De Bruyn's (2002) study existed. The current study does not only share the aims of De Bruyn's (2002) study, but will also build on some of the limitations presented by it. Although the sample size De Bruyn (2002) used (N=1502) was nearly double the size of the current study (N=770), the mean age of the group was 18. Since interest is said to stabilise with age, it may be possible that an older sample may yield different results. The mean age of the sample used in the current study is 31.21.

Another difference between these two studies is the measuring instruments used. For the current study, the INQ is used to measure vocational interests and the first order factors of the 16PF to operationalise personality traits. Since the first order factors of the 16PF are used instead of the second order factors, the range of personality factors used in this study is wider. It is also correlated with less interest scales; since the INQ consist of 10 interest fields, while the 19FII measures 19.

The current study may not only contribute to general knowledge of the relationship between personality and vocational interest alone. Since the influence of race on this relationship is brought into account, it may also shed light on the nature of this relationship in a multi-cultural environment such as South Africa.

Personality and Personality Traits

Nadelson (2001:45) stated that personality is not something that a person has. It rather describes certain characteristics of an individual's behaviour and it is the distinctive way that each person thinks, feels, behaves or adapts to various situations. Meyer, Moore and Vijoen (1997:12) explained personality as the ever changing, yet relative stable organization of all physical, psychological and spiritual characteristics of an individual that determines his/her behaviour in interaction with the environment. Aiken (1994:245) argued that personality is a composite of mental abilities, interests, attitudes, temperament, and other individual differences in thoughts, feelings, and behaviour.

Definitions of a trait share basically a common focus: that it is a feature of a person's behaviour. Freeman (1964:556) defines a trait as: "a generalized mode of behaviour or a form of readiness to respond with a marked degree of consistency to a set of situations that are functionally equivalent for the respondent". According to Neill (2003), traits are defined as distinguishing qualities or characteristics of a person. Traits are also a readiness to think or act in a similar fashion in response to a variety of different stimuli or situations. The American Heritage Dictionary of the English Language (2000) defines a trait as: "1. A distinguished feature, as of a person's character. 2. A genetically determined characteristic or condition..." The New Thesaurus (1995) defines a trait as: "A distinctive element: attribute, character, characteristic, feature, mark, peculiarity, property, quality, savor." Arnold, Cooper and Robertson (1995:24) refer to a trait as an underlying dimension in which people differ from one another.

When combining the above, it leads us to a fairly common perception of the term personality traits, which is well defined by Plug et al. (in Louw, Van Ede & Louw, 1998:523) that stated that a personality trait is as a relative constant characteristic of a person that is responsible for the consistency of his or her behaviour.

Vocational Interests

Definitions of what a vocation is focus on two aspects. Firstly, a vocation is seen as a person's career. Sears (in De Bruin, 2001:248) defines a career as: "the totality of work one does in a lifetime". The New Thesaurus (1995) defines a vocation as an: "1. Activity pursued as a livelihood: art, business, calling, career, craft, employment, job, line, metier, occupation, profession, pursuit, trade, work..." The American Heritage Dictionary of the English Language defines a vocation as: "1. A regular occupation, especially one for which a person is particularly suited or qualified. Secondly a vocation is seen as a calling. Davidson, Seaton and Simpson (1994:1117) describes a vocation as a calling, a way of living or sphere of activity to which one has been called, or for which one has a fitness: one's occupation, business or profession. The New Thesaurus (1995) defines a vocation also as an: "... 2. An inner urge to pursue an activity or perform a service, calling, mission". The American Heritage Dictionary of the English Language defines a vocation also as: "... 2. An inclination, as if in response to a summons, to undertake a certain work, especially a religious career; a calling".

Definitions regarding interests have mostly the same focus, i.e. that it is a preference for something. Greenhaus, Callanan and Godshalk (2000:43) stated that interest refers to likes and dislikes attached to specific activities or objects. It is therefore expressions of what a person likes to do. Owen and Taljaard (1995:428) views interest as an aspect of personality and define it as: "a spontaneous preference for certain activities as well as a spontaneous disinclination for other activities". Carson (2002) argues interests are a species of desire. In particular, interests are that which people desire to understand or do. Smith (1991:354) evaluated a number of definitions on interests and concluded that interests can be related to the satisfaction of needs. He explained this by stating that interests go hand-in-hand with a dynamic drive to search for the object/action that will lead to the satisfaction of a need or to do something about this object/action. The only contradictory definition found was

the one of Super and Crites (1962:410). They define interests as: “the product of interaction between inherited, neural and endocrine factors on the one hand, and opportunity and social evaluation on the other”.

When combining the above definitions, it leads us to a fairly common perception of the term vocational interests, which is well defined by Carson (2002) that describes that vocational interests refer specifically to those activities, objects or processes associated with work activities.

Personality and the Work Environment

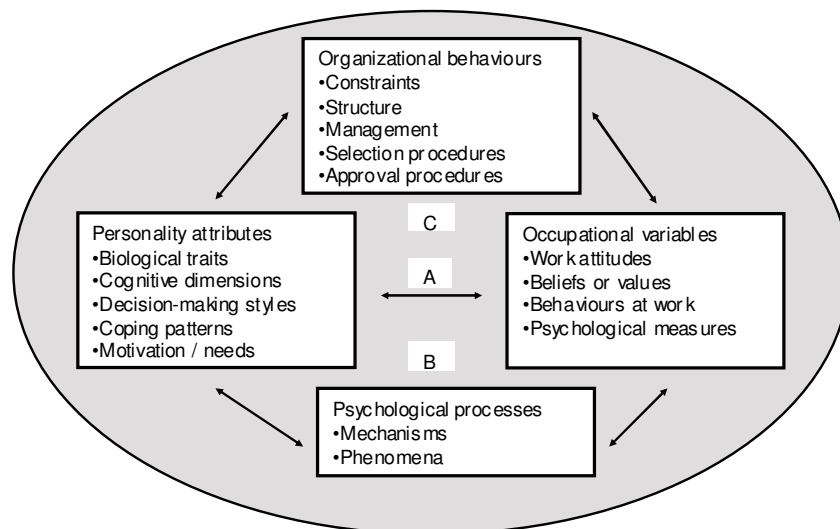
Congruence between an individual's personality style and his or her job selection has shown to be positively related to job satisfaction (Assouline & Meir, 1987; Spokane, 1985). By implication, individuals tend to do best in those environments, which correspond most closely with their personalities, since such environments provide them with the most opportunities, offer meaningful compensation and best fulfil their needs.

In a study conducted by Brackney (1991) it was discovered that congruence between Holland's personality types and occupation chosen 10 years later predicted satisfaction with that occupation. Other studies also found a strong relationship between the congruence and job satisfaction (Elton & Smart, 1988; Smart, Elton & McLaughlin, 1986).

The management and development of human resources in organizations depend on the ability (1) to determine individual differences in employees' personalities and on (2) determining how congruent these are with the organizational attributes. The reason for this is the fact that an organization's effectiveness are dependent on the collective personality profile which employees attribute to the organization (Bergh & Theron, 2003:276). Therefore, the goal of personality research in the work context is to facilitate the best fit between an employee and the work environment (Bergh, 2003:296).

Furnham in Bergh (2003: 296) suggested a research model to illustrate the relationships between personality and work. This model illustrates the complex possibilities between personality and work-related variables and is presented in the following Figure 1.

Figure 1
A Research Model of the Relationship between Personality and Work



(Adapted from Bergh, 2003:297)

Bergh (2003:298) explained the model as follows:

Line A is the line between personality factors and work variables. It is not a direct line and can be influenced by many other factors. This direction may be

bi-directional, that is, personality and work factors may have mutual or interaction influences. In other words; personality may influence work behaviours (for example: an emotionally stable personality will not be prone to emotional outburst at work), but work variables may also influence the expression of personality (for example: a friendly workplace leads to a happy and effective workforce).

Box B The relationship is further affected by the way the psychological processes underlie the personality variables in relation to the work variables. Similar personality concepts are defined or explained differently by different theoretical approaches. Some are more concerned with biological and situational influences and others with the influence of emotional or cognitive processes in behaviour. In this study, the trait theory of Cattell forms the theoretical background.

Box C Another influence on personality and work variables are the formal and informal organizational behaviours and constraints. The way an organization functions can have a facilitating or inhibiting effect on the work personality of employees and on the fit between the employee and the organization. For example: in some situations, an employee must do a task in one way only, thereby leaving little space for creativity.

The Circle is the broader environment in which the organization and individual exist. This also influences the relationship between the personality of an employee and his/her organization. In times of change and transformation, both employee and organization must adapt, and these adjustments will be reflected in the expression of personality and work behaviours. This is of particular importance in the South African context and therefore this study. Work in the South African context is discussed in a later section.

This model provides an effective overview of the relationship between work and personality. In this study it is assumed that personality influences vocational interest which in turn influences vocational choice in order to enter into the working environment.

The Relationship between Personality Traits and Vocational Interest

Within the field of vocational counselling, most psychologists agree that vocational interests and personality traits are related; however the nature of the relationship is unclear (Zagar *et al.*, 1983:203).

The proposed relationship between these two variables is important for two reasons. Firstly, if a relationship does exist, it enables a counsellor to make assumptions about the personality of a client from interest inventory results or to make assumptions about interests given a client's personality structure. Without empirical support for this relationship, making any assumptions about personality from interests, or vice versa, is extremely risky. Secondly, a relationship can lead to a reduction in testing time in situations when information about personality and interests are beneficial (Pietrzak & Page, 2001:2).

Interests are sometimes seen as a manifestation of personality traits. Aiken (1994:211) argued that a contemporary conception of interest is that it is reflections or expressions of deep-seated individual needs and personality traits. According to this view, vocational selection is therefore influenced by personality traits. Similarly, Anastasi and Urbina (1997:386) view the nature and strength of one's interests as representing an important aspect of one's personality. Owen and Taljaard (1995:428) also interpreted interests as a facet of personality.

When a career decision is based on a careful match with one's personality and/or interests, it leads to higher job satisfaction. Greenhaus *et al.* (2000:43) argued that people who choose career fields that are compatible with their

interests tend to be more satisfied with their jobs. According to Nordvik (1994), people have differential preferences for coping, which they have to exercise in order to do and feel well in their work and life situation. This viewpoint is also in line with various theories of vocational choice or career psychology, including the trait-factor theory and the career choice theory of Holland.

Some studies found that personality and vocational interest are unrelated. Pietrzak and Page (2001:2) did an investigation of Holland types and the 16PF – Fifth edition. The aim of the investigation was two-fold. The first was to determine the stability of the 16PF predictors in predicting Holland types as measured by the Self-Directed Search. The second was to examine the domain overlap of the 16PF and SDS. The data supported the stability of the global factor predictors. However, none of the multiple regression equations met the criteria for practical significance in predicting the SDS scales from the 16PF factors (Pietrzak & Page, 2001:1-19).

Other studies did find a significant relationship. Zak *et al.* (1979:424-428) conducted a study about the common space of personality traits and vocational interests. Their study investigated relationships between these two variables and had two hypotheses. The first alternative hypothesis (H_1) stated that a relationship exists between personality traits and vocational interest. The second alternative hypothesis (H_2) stated that personality traits, which characterize occupational profiles, are arranged in circular order corresponding to the formation of the vocational fields, which represent those occupations. Both these hypotheses were supported by the data. The analysis of H_1 indicated that at least four independent relationships exist between Cattell's personality traits and Ramak vocational interests (Zak *et al.*, 1979:424-428).

Another study that also found these two constructs to be entwined was the study of Zagar *et al.* (1983:203-214). In this study, they tested the hypothesis that vocational interest and personality tests measure a common domain. The

study's data supported their hypothesis. Evidence was produced that there are six dimensions which describe a common domain of personality and vocational interest (Zagar *et al.*, 1983:203-214).

A study that verified the results found by the above two studies was the study of Larson *et al.* (2002:217-234). They conducted a meta-analysis of Big Six Interests and Big Five Personality Factors using 12 research studies. The meta-analysis confirmed the findings of individual empirical studies, namely that several strong relationships exist between some broad domains of interests and personality (Larson *et al.*, 2002:217-234).

Staggs *et al.* (2003: 243-261) did a study about the convergence of specific factors in vocational interests and personality. In their results, they found that specific MPQ (Multidimensional Personality Questionnaire) primary scales contribute significantly to the prediction of SII (Strong Interest Inventory) scales (Staggs *et al.* 2003: 243-261). Thus, it was proven again that personality traits and vocational interests are two entwined human qualities.

Although different measurements were used in the above mentioned studies, most of them found strong relationships between personality traits and vocational interests.

The South African Context

When making a vocational choice it is not only personality that influences the choice, but also vocational interests and the environment. This can be explained as a triadic relationship (between personality, vocational interests and vocational choice) which takes place within the broader context (environment). Here, the environment facilitates and influences the triadic relationship. Firstly, the environment influences the development of personality and vocational interests. But secondly it also determines the availability of career options that individuals can decide between. This implies then that on the one hand the

individual has his/her unique composition of needs, while, on the other hand the environment has its own needs, opportunities and facilities (Potgieter, 1983). By implication, congruence between personality and the work environment is possible in an environment in which career possibilities are unlimited.

Although many factors in the South African context are not unique, it may be of such a nature that it presents certain limitations and opportunities that may influence the triadic relationship between personality, vocational interests and vocational choice. In South Africa, a new democratic government was selected during 1994. In 1996 a new constitution was adopted. Although, the country celebrated 10 years of democracy in 2004, the impact of Apartheid on the labour market has not yet disappeared. According to Stead and Watson (1998:289-290), two of the most evident problems of South Africa are the country's high unemployment rate and unsatisfactory economic growth rate.

Although the South African economy has seen a significant growth rate in 2003 – 2004 (approximately 5 – 10%) the rate of unemployment and the increasing gap between rich and poor is still a problem (Interface, 2004). What is most apparent from these figures that are the high unemployment rate is not directly linked to the economy or its growth, but rather to the large number of unskilled workers in the South African population (Interface, 2004).

For a large proportion of the South African citizens, finding a job is becoming increasingly difficult and essential with the upward spiralling of everyday living costs. Factors such as job satisfaction and even finding a job that suits the person's personality are of peripheral importance. Owing to this, unemployed citizens are struggling to fulfil in their basic needs i.e. food, clothing and shelter. Fulfilling these needs therefore becomes far more important to them than job satisfaction. This was confirmed by Watson, Foxcroft, Horn and Stead (in Stead & Watson, 1998:290) who indicated that the problem of unemployment in South

Africa influences most disadvantaged students whereby their occupational aspirations are poorly matched to labour market trends.

In 1998, the Employment Equity Act, No 55 of 1998, was enforced by the South African Government. This Act stipulates that every employer in South Africa has a legal obligation to promote equal opportunities in the workplace by eliminating unfair discrimination on the basis of race, gender, sex, pregnancy, marital status, family responsibility, ethnic or social origin, colour, sexual orientation, age, disability, religion, HIV status, conscience, belief, political opinion, culture, language or birth.

A positive measure to increase representivity of previously under-represented groups was implemented also. This is known as *affirmative action*. These under-represented groups are also referred to as designated groups and are (1) Black people, including Africans, Coloureds and Indians; (2) women and (3) people with disabilities.

The implementation of the Employment Equity Act and affirmative action has however brought about other problems. The major problem is that recruitment and selection of companies now favours designated groups. Therefore individuals who are not part of the designated groups may struggle to find jobs and cannot necessarily choose the jobs they want. For this reason, the congruence between their personalities and vocational choices are not as important as just finding employment.

Not only is the availability of job opportunities tied to the environment, but also the development of interest. Interests are tied to learning experiences, opportunities and exposure during a person's life (Stead & Watson, 1999). According to this viewpoint, the career choice is directly linked to the goals and activities that develop out of interest. In 1997, Watson, Foxtrot, Horn and Stead conducted a study which showed that black South Africans did not aspire to

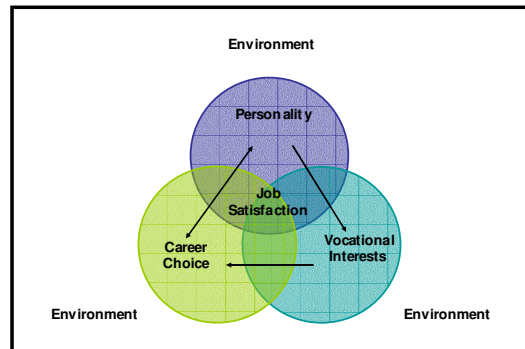
scientific occupations, such as engineering, technical trades, and computer science. Stead and Watson (1999) ascribes this to the inadequate educational opportunities and training in mathematics and science in secondary education and the lack of financial resources. This may be changing with the changes brought about in the educating system as well as the financial aid given to previously disadvantaged students. However, it should be kept in mind that these are new developments and should take a while to take effect.

The context plays an important role when it comes to the selection of a future career. On the one hand, the environment influence the amount of work opportunities and types of opportunities available to people. On the other hand, the environment also influences the exposure to learning experiences, which shapes personal or vocational interest.

Figure 2 illustrates the interrelationship that exists between personality, vocational interest, vocational choice and the environment in which these variables are situated.

Figure 2

The Interrelationship between Personality, Vocational interest, Vocational choice and the Environment



The purpose of this figure was to provide a holistic view of the various interrelationships that exist. It is now clear that the relationship between personality traits and vocational interests is part of a much larger and complex interrelationship. However, the discussion of these interrelationships falls outside the scope of this study.

METHOD

Hypotheses

This study had two hypotheses:

H₁: There is a relationship between personality traits and vocational interests

H₂: Gender and race do influence the relationship between personality traits and vocational interests

Research Design

The specific research approach of this study was a basic associational / correlational approach. Basic associational designs have a specific associational

approach. It determines whether and to what degree variables are related (Morgan & Griego, 1998:7).

Sample Description

The complete data set consisted of 901 subjects. The sample used was a purposive sample drawn from the data set using the individuals that have completed both the INQ as well as the 16PF (SA92). The rationale for this was that this research study was only relating the variables vocational interests (measured by the INQ) and personality traits (measured by the 16PF); therefore, all other data was discarded. In total, the sample then consisted of 770 subjects (N=770). The biographical composition of the sample is described below:

**TABLE 1
GENDER**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	557	72.3	72.3	72.3
Female	213	27.7	27.7	100.0
Total	770	100.0	100.0	

The majority of the sample were males (N=557). This indicates that this sample is not truly representative of the South African population regarding gender. The influence of gender on the relationships found in H₁ will be tested in H₂.

**TABLE 2
RACE**

	Frequency	Percent	Valid	Cumulative
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			Percent	Percent
Valid White	367	47.7	47.8	47.8
Black	351	45.6	45.7	93.5
Coloured	11	1.4	1.4	94.9
Indian	39	5.1	5.1	100.0
Total	768	99.7	100.0	
Missing System	2	.3		
Total	770	100.0		

Slightly more than half of the sample was white (N=367), while most of the remainder was black (N=351). Small groups of Indian (N=39) and Coloured (N=11) respondents make up the rest of the sample. Owing to their small numbers, they were grouped together with black respondents for the purposes of all analyses involving race. The influence of race on the relationships found in H_1 will be tested in H_2 .

TABLE 3
AGE

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	768	15	60	31.21	8.234
Valid (N) (listwise)	768				

The age of the sample ranged from 15 to 60 with an average age of 31.21 years.

The sample further consisted mostly of individuals who were already employed, had at least a matric / equivalent qualification and were not as underprivileged as the larger part of other South Africans.

Measuring Instruments

The Sixteen Personality Factor Questionnaire (16PF) was used to measure personality traits and the Interest Questionnaire (INQ) to measure vocational interests. The reason the 16PF was chosen was, in order to determine exactly what personality traits correlate with what vocational interests it was necessary to use a personality questionnaire with as many dimensions as possible. The 16PF is the personality questionnaire with the most dimensions that is suitable for usage on a South African sample. The INQ is in the process of being standardised and validated for the South African population and this was the first study conducted using this questionnaire.

16 Personality Factor Questionnaire (16PF)

The 16PF is one of the most widely used tests of normal personality in the world. All the traits are bipolar, in other words on the one pole, there is a low indication of the trait and on the other pole there is a high indication of the trait (De Bruin, 2001:233-234). The factors are based on a normed rating scale, ranging from one to ten, with between four and seven indicating an average rating.

There are four versions of the 16PF available in South Africa, namely Forms A, B, E and SA92. All the subjects in this project were tested using form SA92. The reliability coefficient reported for Form SA92 is between 0,51 and 0,81. The reliability coefficient for males and females relates closely to the total group.

TABLE 4
THE 16 BIPOLAR TRAITS OF THE 16PF

LOW SCORE	FACTOR	HIGH SCORE
Reserved	A	Warm
Concrete	B	Abstract
Reactive	C	Stable
Cooperative	E	Dominant
Restraint	F	Lively
Expedient	G	Rule-conscious

Shy	H	Socially bold
Utilitarian	I	Sensitive
Trusting	L	Suspicious
Practical	M	Imaginative
Forthright	N	Private
Self-assured	O	Apprehensive
Traditional	Q1	Open to change
Group-oriented	Q2	Self-reliant
Unexacting	Q3	Perfectionistic
Relaxed	Q4	Tense

(Adapted from De Bruin, 2001:233-234)

Interest Questionnaire (INQ)

The INQ's development was based on the trait theory of Holland, namely the RAISEC theory. Unlike the theory of Holland that distinguishes between six types of interests, the INQ makes provision for ten interest fields, as depicted in Table 4. The questionnaire consists of 90 questions. Each question presents the reader with two possible activities. The task is to choose the one that appeals the most to the respondent. At the time of the study the reliability and validity of the INQ was not yet available.

TABLE 5
THE TEN INTEREST FIELDS MEASURED BY THE INQ

A	Outdoor	Interested in nature, physical activities, plants, animals, etc
B	Mechanical	Interested in technical and mechanical equipment, machinery, etc
C	Computational	Interested in numeric analysis, data analysis, etc
D	Scientific	Interested in science, facts, physics, chemistry, etc
E	Persuasive	Dynamic persuasive nature, example management, sales, negotiator, preacher, etc
F	Creative	Interested in music, art, creative handwork, etc
G	Social Science	Caring nature, example social work, counselling, education, nursing, etc
H	Clerical	Interested in administrative, clerical work, office work
I	Literary	Interested in literature, journalism, research, etc
J	Medical	Interested in medical and related work

(Adapted from Taylor, 2004).

Statistical analysis

Summary statistics was used to describe the sample. Since the data complied with the requirements for parametric associational tests, the appropriate test to use for H_1 was Pearson's correlation coefficient. This determined if there was a relationship and the significance of the relationship (Morgan & Griego, 1998: 84).

In this study the correlation coefficients (r) were interpreted as presented by Stockburger (1996) as follows:

- $r = 0.01$ to 0.20 : weak relationship;
- $r = 0.21$ to 0.50 : moderate relationship;
- $r = 0.51$ to $.80$: strong relationship;
- $r = .81$ to 1 : very strong relationship

Analyses of variance (ANOVA's) were used to test if gender and race had any influence on personality and interest between the different biographical groups. Partial correlations were used to assess the influence of biographical variables such as race and gender on the relationships found in the tests for H_1 (H_2).

RESULTS

Summary statistics for the 16PF and the INQ are presented below in Table 6 and Table 7 respectively.

TABLE 6
SUMMARY STATISTICS FOR THE 16PF

Primary Factor	N	Min	Max	Mean	Std. Deviation
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A Warmth	770	1	10	6.09	2.039
B Reasoning	770	1	10	5.50	1.935
C Emotional Stability	770	1	10	6.64	2.161
E Dominance	770	1	10	6.42	2.210
F Liveliness	770	1	10	5.97	2.250
G Conscientiousness	770	1	10	6.27	2.183
H Social Boldness	770	1	10	6.55	2.386
I Sensitivity	770	1	10	4.46	2.222
L Vigilance	769	1	10	4.60	2.439
M Abstractedness	770	1	10	5.46	1.976
N Privatness	769	1	10	6.57	2.107
O Apprehension	770	0	10	4.47	2.252
Q1 Openness to Change	770	1	10	6.92	2.185
Q2 Self-Reliance	770	1	10	4.31	2.339
Q3 Perfectionism	770	1	10	7.14	2.109
Q4 Tension	768	0	10	3.87	2.229
Valid N (Listwise)	766				

Summary statistics for the 16PF indicated that most of the respondents obtained average sten scores between four and seven. However, the average of factor Q4 was below a four stanine. Thus, the sample appears to be less tense than most people. The high average (more than stanine seven) on Factor Q3 indicates that the sample might be more self-disciplined and organised than most people.

TABLE 7
SUMMARY STATISTICS FOR THE INQ

	N	Min	Max	Mean	Std. Deviation
Outdoor	770	0	18	9.45	4.166
Mechanical	770	0	18	10.50	3.744
Computational	769	0	18	10.00	4.264
Scientific	770	0	17	8.88	4.057
Persuasive	770	1	18	8.81	3.432
Creative	770	0	16	7.34	3.028
Social Science	770	0	18	9.48	3.645
Clerical	770	0	18	7.51	3.308
Literary	770	1	18	8.31	3.272
Medical	770	0	17	8.89	3.082
Valid N (Listwise)	769	0			

Table 7, indicates that all the scores on the INQ ranged between 7 and 11. It was determined that the respondents in this sample were mostly interested in mechanical (10.50) and computational occupations (10.00). Outdoor (9.45) and social sciences (9.48) were also high interests. Respondents in the sample were less interested in literary (8.31) and creative activities (7.34).

The correlations for H_1 are presented in Table 8. Only the scales that correlated are presented, the entire correlation table is available in Annexure A.

TABLE 8: CORRELATIONS BETWEEN THE 16PF AND INQ

	Outdoor	Mechanical	Computational	Scientific	Persuasive	Creative	Social Sciences	Clerical	Literary
A: Warmth	0.032	-0.223**	-0.096**	-0.340**	0.443**	-0.028	0.230**	0.146**	-0.051
Sig. (2-tailed)	0.380	0.000	0.008	0.000	0.000	0.442	0.000	0.000	0.160
E: Dominance	-0.039	0.070	0.114**	-0.009	0.276**	-0.069	-0.145**	-0.090*	-0.089*
Sig. (2-tailed)	0.280	0.053	0.002	0.801	0.000	0.056	0.000	0.013	0.014
F: Liveliness	0.135**	0.009	-0.029	-0.106**	0.245**	0.029	0.026	-0.106**	-0.139**
Sig. (2-tailed)	0.000	0.793	0.419	0.003	0.000	0.415	0.479	0.003	0.000
G: Rule-consciousness	-0.219**	0.079*	0.228**	0.194**	-0.111**	-0.279**	0.010	0.065	-0.069
Sig. (2-tailed)	0.000	0.028	0.000	0.000	0.002	0.000	0.775	0.070	0.057
H: Social Boldness	-0.079*	0.028	0.105**	0.020	0.345**	-0.152**	-0.054	-0.028	-0.137**
Sig. (2-tailed)	0.027	0.440	0.004	0.583	0.000	0.000	0.132	0.443	0.000
I: Sensitivity	0.008	-0.390**	-0.307**	-0.284**	0.124**	0.162**	0.313**	0.104**	0.282**
Sig. (2-tailed)	0.829	0.000	0.000	0.000	0.001	0.000	0.000	0.004	0.000
M: Abstractedness	-0.025	0.024	-0.178**	0.008	0.013	0.168**	0.027	-0.214**	0.194**
Sig. (2-tailed)	0.495	0.514	0.000	0.830	0.708	0.000	0.450	0.000	0.000
N: Privatness	-0.149**	0.083*	0.198**	0.204**	0.046	-0.145**	-0.138**	-0.033	-0.032
Sig. (2-tailed)	0.000	0.021	0.000	0.000	0.199	0.000	0.000	0.367	0.360
Q1: Openness to change	-0.215**	0.086*	0.233**	0.208**	0.140**	-0.167**	-0.131**	0.215**	0.038
Sig. (2-tailed)	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.293
Q2: Self-reliance	0.238**	-0.069	-0.136**	-0.144**	-0.152**	0.286**	-0.107**	0.061	0.100**
Sig. (2-tailed)	0.000	0.057	0.000	0.000	0.000	0.000	0.003	0.091	0.005
Q3: Perfectionism	-0.056	0.095**	0.204**	0.184**	0.004	-0.178**	-0.127**	-0.084**	-0.071*
Sig. (2-tailed)	0.120	0.008	0.000	0.000	0.917	0.000	0.000	0.020	0.049
Q4: Tension	0.145**	-0.088**	-0.210**	-0.164**	-0.076*	0.209**	0.037	0.089*	0.056
Sig. (2-tailed)	0.000	0.015	0.000	0.000	0.034	0.000	0.302	0.013	0.124

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 8 shows that there are a number of statistically significant relationships between the 16PF factors and the INQ interest fields.

Factor A (warmth) correlated significantly with most interest scales, but noticeably a positive correlation with the Persuasive interest scale ($r = 0,443$; $p = 0.000$). Factors E (dominance), F (liveliness) and H (social boldness) all also correlated positively with the Persuasive interest scale ($r = 0,276$; $p = 0.000$; $r = 0,245$; $p = 0.000$ and $r = 0,345$; $p = 0.000$ respectively). Moderately positive correlations were also obtained between Factor A and the Social Sciences ($r = 0.230$; $p = 0.000$) interest scale. It also showed a moderate negative correlation with the Scientific ($r = -0,340$; $p = 0.000$) and Mechanical ($r = -0.223$; $p = 0.000$) interest scales.

Factor G (rule-consciousness) showed a moderate positive correlation with the Computational interest scale ($r = 0.228$; $p = 0.000$). Factors Q1 (openness to change) and Q3 (perfectionism) also correlated positively with the Computational interest scale ($r = 0,233$; $p = 0.000$ and $r = 0,204$ $p = 0.000$ respectively). Factor G further indicated negative correlations with the Outdoor ($r = -0,219$; $p = 0.000$) and Creative ($r = -0,279$; $p = 0.000$) interest scales. However Factor Q2 (self-reliant) correlated positively with both these interest scales (Outdoor $r = 0,238$; $p = 0.000$ and Creative $r = 0,286$; $p = 0.000$).

The next significant relationship was Factor I (sensitivity). It showed moderate positive correlations with the Social Sciences ($r = 0,313$; $p = 0.000$) and Literary ($r = 0,282$; $p = 0.000$) interests scales. It yielded negative correlations with the Mechanical ($r = -0,390$; $p = 0.000$), Computational ($r = -0,307$; $p = 0.000$) and Scientific ($r = -0,284$; $p = 0.000$) interest scales.

Factor Q1 (openness to change) further correlated positively with both the Scientific ($r = 0,208$; $p = 0.000$) and Clerical ($r = 0,215$; $p = 0.000$) interest scales, but negatively with the Outdoor ($r = -0,215$; $p = 0.000$) interest scale.

Other correlations were Factor M (abstractedness) that correlated negatively with the Clerical interest scale ($r = -0,214$; $p = 0.000$), Factor N (privateness) that correlated positively with the Scientific interest scale ($r = 0.204$; $p = 0.000$) and Factor Q4 (tension) that correlated positively with the Creative interest scale ($r = 0,209$; $p = 0.000$) and negatively with the Computational interest scale ($r = -0,210$; $p = 0.000$).

No significant correlations were obtained between Factor B (reasoning) and any field of interest and neither with Factor C (emotional stability), nor Factors L (vigilance) and O (apprehension).

The results indicated then in short the following correlations:

- (1) Personality traits correlated with Outdoor were G- (expedient), Q1- (traditional) and Q2+ (self-reliant).
- (2) Personality traits correlated with Mechanical were A- (reserved) and I- (utilitarian).
- (3) Personality traits correlated with Computational were G+ (rule-conscious), I- (utilitarian), Q1+ (open to change), Q3+ (perfectionistic) and Q4- (relaxed).
- (4) Personality traits correlated with Scientific were A- (reserved), I- (sensitive), and Q1+ (open to change).
- (5) Personality traits correlated with Persuasive was A+ (warm), E+ (dominant), F+ (lively) and H+ (socially bold).
- (6) Personality traits correlated with Creative were G- (expedient), Q2+ (self-reliant) and Q4+ (tense).
- (7) Personality traits correlated with Social Sciences were A+ (warm) and I+ (sensitive).
- (8) Personality traits correlated with Clerical were A+ (warm), M- (practical) and Q1+ (open to change).
- (9) The personality trait correlated with Literary was I+ (sensitive).

(10) No personality traits were correlated with Medical.

In particular, at least six specific personality dimensions of the 16PF seemed to be correlated to interests on the INQ. Several studies were used to compare these results with. These were the studies of De Bruin (2002:49-52), Larson *et al.* (2002:217-234), Pietrzak and Page (2001:1-19), Staggs *et al.* (2003:243-261) and Zak *et al.* (1979:424-428). All of these studies' contexts, samples and results were discussed in the literature review. The six specific personality dimensions of the 16PF that seemed to be correlated to interests on the INQ, were the following.

Factor A (warmth): Measures a person's emotional orientation toward others - the degree to which contact with others is sought and found rewarding as an end in itself (Business Development Group, 2001). This factor correlated positively with the Persuasive ($r = 0.443$) and Social Sciences ($r = 0.230$) interest scales. This indicates that individuals who score high on this factor (A+ warm) have a dynamic persuasive as well as a caring nature. Pietrzak and Page (2001) found similar results in a study they conducted between the 16PF and Holland's typology. They discovered that individuals who scored high on Factor A had social and enterprising interests. This factor also correlated negatively with the Mechanical ($r = -0.223$) and Scientific ($r = -0.340$) interest scales. This indicates that individuals who score low on this factor (A- reserved) have an interest in technical, mechanical, science, physics or chemistry. Zak *et al.* (1979:427) also concluded that individuals who score low on Factor A had scientific interests. Staggs *et al.* (2003:250) also found that individuals who score low on the MMPI's Social Closeness scale had an interest in mechanical activities.

Factor G (rule-consciousness): Measures a person's orientation to rules, procedures and social expectations. To a considerable extent, it is a measure of ethical and moral responsibility and dutifulness (Business Development Group, 2001). This factor correlated positively with the Computational ($r = 0.228$)

interest scale. This indicates that individuals who score high on this factor (G+ rule-conscious) have an interest in numeric and data analysis. This factor also correlated negatively with the Outdoor ($r = -0.219$) and Creative ($r = -0.279$) interest scales. This indicates that individuals who score low on this factor (G- expedient) have an interest in nature, physical activities, plants, animals, music, art, etc. No other study was found that confirmed or contradicted the above findings.

FACTOR I (sensitivity): Is a complex factor that is difficult to summarize in a single phrase. It has to do with two related qualities: objectivity versus subjectivity, and tough-mindedness versus tender-mindedness (Business Development Group, 2001). This factor correlated positively with the Social Sciences ($r = 0.313$) and Literary ($r = 0.282$) interest scales. This indicates that individuals who score high on this factor (I+ sensitive) have a caring nature and an interest in literature, journalism and research. This finding was consistent with research done by De Bruin (2002:51). His results indicated that emotionally sensitive individuals tend to be interested in the arts and languages. Pietrzak and Page (2001) also concluded that individuals who score high on Factor I had artistic and social interests. This factor also correlated negatively with the Mechanical ($r = -0.390$), Computational ($r = -0.307$) and Scientific ($r = -0.284$) interest scales. This indicates that individuals who score low on this factor (I- utilitarian) have an interest in technical and mechanical equipment, numeric and data analysis and science, physics and chemistry. Staggs *et al*, (2003:250) concluded in a study that individuals who score high on the MMPI's Harm Avoidance scale had an interest in mechanical activities, scientific and computer activities. Harm avoidance was associated with the avoidance of social contact. Therefore utilitarian and harm avoidance were seen as to be anonymous to some extent.

FACTOR Q1 (openness to change): Has to do with a person's orientation to change, novelty, and innovation (Business Development Group, 2001). This

factor correlated positively with the Computational ($r = 0.233$), Scientific ($r = 0.208$) and Clerical ($r = 0.215$) interest scales. This indicates that individuals who score high on this factor (Q1+ open to change) have an interest in numeric and data analysis, science, physics and chemistry and administrative, clerical and office work. The scientific result was consistent with the study of Larson *et al*, (2002), which indicated a strong correlation between openness and investigative interests. This factor also correlated negatively with the Outdoor ($r = -0.215$) interest scale. This indicates that individuals who score low on this factor (Q1- traditional) have an interest in nature, physical activities, plants and nature.

FACTOR Q2 (self-reliant): Has to do with a propensity to seek group support - or to strike out on one's own (Business Development Group, 2001). This factor correlated positively with the Outdoor ($r = 0.238$) and Creative ($r = 0.286$) interest scales. This indicates that individuals who score high on this factor (Q2+ self-reliant) have an interest in nature, physical activities, plants, animals, music and art. This finding was also supported by the results of the study done by De Bruin (2002:51), which indicated that independent individuals tend to be interested in creative thinking. In the study done by Pietrzak and Page (2001), individuals who scored high on Factor Q2 had artistic interests. Zak *et al*, (1979:427) also concluded that individuals that score high on Q2 are interested in arts and entertainment.

FACTOR Q4 (tension): Is about patience or impatience in response to environmental delays, stresses and demands (Business Development Group, 2001). This factor correlated positively with the Creative ($r = 0.209$) interest scale. This indicates that individuals who score high on this factor (Q4+ tense) have an interest in music and art. This was consistent with the results obtained in a study by Zak *et al*, (1979:427). Their results indicated that individuals who score high on this factor were interested in arts and entertainment. This factor also correlated negatively with the Computational ($r = -0.210$) interest scale. This

indicates that individuals who score low on this factor (Q4- relaxed) have an interest in numeric and data analysis.

The mean scores on the 16PF and the INQ were compared for the biographical subgroups of gender and race using the one-way analysis of variance (ANOVA). Significant differences are presented next. The descriptive tables and the complete tables for the ANOVA's are presented in Annexure B through to E.

TABLE 9
ANOVA's FOR GENDER AND THE 16PF

		Sum of Squares	Df	Mean Square	F	Sig.
B	Between Groups	32.511	1	32.511	8.767	.003
	Within Groups	2847.987	768	3.708		
	Total	2880.499	769			
G	Between Groups	56.991	1	56.991	12.133	.001
	Within Groups	3607.431	768	4.697		
	Total	3664.422	769			
N	Between Groups	57.426	1	57.426	13.135	.000
	Within Groups	3353.239	767	4.372		
	Total	3410.666	768			
Q1	Between Groups	63.417	1	63.417	13.500	.000
	Within Groups	3607.591	768	4.697		
	Total	3671.008	769			
Q2	Between Groups	131.680	1	131.680	24.809	.000
	Within Groups	4076.373	768	5.308		
	Total	4208.053	769			

It was evident that scores on the 16PF differed significantly between males and females on Factor B, G, N, Q1 and Q2. Females tended to be slightly less conscientious (G) and private (N) than males, with a slightly more traditional way of thinking (Q1). The females were also more group-oriented (Q2) than the males. The Anova's in Annexure B revealed that the difference between males and females on the 16PF was statistically significant at $p < 0.01$ on the subscales G ($F = 12.133$), N ($F = 13.135$), Q1 ($F = 13.500$) and Q2 ($F = 24.809$).

TABLE 10
ANOVA's FOR GENDER AND THE INQ

		Sum of Squares	df	Mean Square	F	Sig.
MECHANICAL	Between Groups	1892.160	1	1892.160	163.530	.000
	Within Groups	8886.335	768	11.571		
	Total	10778.495	769			
COMPUTATIONAL	Between Groups	576.579	1	576.579	33.039	.000
	Within Groups	13385.415	767	17.452		
	Total	13961.995	768			
SCIENTIFIC	Between Groups	1078.001	1	1078.001	71.488	.000
	Within Groups	11581.007	768	15.079		
	Total	12659.008	769			
CREATIVE	Between Groups	882.756	1	882.756	109.919	.000
	Within Groups	6167.775	768	8.031		
	Total	7050.531	769			
SOCIAL SCIENCES	Between Groups	795.966	1	795.966	64.879	.000
	Within Groups	9422.158	768	12.268		
	Total	10218.125	769			
CLERICAL	Between Groups	300.810	1	300.810	28.473	.000
	Within Groups	8113.607	768	10.565		
	Total	8414.417	769			
LITIRACY	Between Groups	127.311	1	127.311	12.061	.001
	Within Groups	8106.632	768	10.556		
	Total	8233.943	769			
MEDICAL	Between Groups	86.440	1	86.440	9.192	.003
	Within Groups	7222.039	768	9.404		
	Total	7308.479	769			

The Anova results in Annexure C revealed that females tended to show a higher interest in the Outdoor, Persuasive, Creative, Social, Clerical, Literary and Medical fields. Males scored higher on the Mechanical, Computational and Scientific fields. A one-way analysis of variance (ANOVA) was calculated for participants' scores on the INQ, as depicted in Table 10. The Anova's revealed that the difference between males and females on the INQ was statistically significant at the $p < 0.01$ in the subscales Literary ($F = 12.061$) and Medical ($F = 9.192$).

TABLE 11
ANOVA's FOR RACE AND THE 16PF

		Sum of Squares	Df	Mean Square	F	Sig.
B	Between Groups	29.782	1	29.782	8.026	.005
	Within Groups	2842.213	766	3.710		
	Total	2871.995	767			
G	Between Groups	52.646	1	52.646	11.208	.001
	Within Groups	3598.099	766	4.697		
	Total	3650.745	767			
H	Between Groups	64.508	1	64.508	11.481	.001
	Within Groups	4303.710	766	5.618		
	Total	4368.217	767			
M	Between Groups	30.583	1	30.583	7.897	.005
	Within Groups	2966.603	766	3.873		
	Total	2997.186	767			
N	Between Groups	9.686	1	9.686	2.187	.140
	Within Groups	3388.048	765	4.429		
	Total	3397.734	766			

Differences between race groups on the 16PF, as depicted in Annexure D indicated that white respondents seemed to be more self-reliant (Q2) and tense (Q4), while black respondents seemed more rule-conscious (G), socially bold (H) and open-minded (Q1). A one-way analysis of variance (ANOVA) was calculated for participants' scores on the 16PF, as depicted in Table 11. The Anova's revealed that the difference between blacks and whites on the 16PF was statistically significant at the $p < 0.01$ in the subscales G ($F = 11.208$) and H ($F = 11.481$).

TABLE 12
ANOVA's FOR RACE AND THE INQ

		Sum of Squares	df	Mean Square	F	Sig.
OUTDOOR	Between Groups	3982.902	1	3982.902	326.275	.000
	Within Groups	9350.722	766	12.207		
	Total	13333.624	767			
MECHANICAL	Between Groups	157.251	1	157.251	11.348	.001
	Within Groups	10614.728	766	13.857		
	Total	10771.979	767			
COMPUTATIONAL	Between Groups	1257.677	1	1257.677	75.810	.000
	Within Groups	12691.311	765	16.590		
	Total	13948.988	766			
SCIENTIFIC	Between Groups	825.176	1	825.176	53.587	.000
	Within Groups	11795.573	766	15.399		
	Total	12620.749	767			
CREATIVE	Between Groups	652.902	1	652.902	78.507	.000
	Within Groups	6370.426	766	8.316		
	Total	7023.328	767			

On the INQ, as depicted in Annexure E, it would seem that White respondents seemed to have a preference for the Outdoor, Persuasive, Creative, Clerical and Medical fields. Black respondents showed a higher preference for the Mechanical, Computational, Scientific, Social and Literary fields. A one-way analysis of variance (ANOVA) was calculated for participants' scores on the INQ, as depicted in Table 12. The Anova's revealed that the difference between blacks and whites on the INQ was statistically significant at the $p < 0.01$ for the subscale Mechanical ($F = 11.348$).

Partial correlations were conducted to test if race and gender influence the relationships found in the correlations conducted to test H_1 . There are a number of relationships that changed from weak to moderate correlations and visa versa, when the relationship between personality traits and vocational interests was controlled for gender. The tables with the partial correlations are presented in Annexure F and G.

Tables 13 and 14 respectively indicates only the significant correlations as discussed in Table 8, that changed when Table 8 and Annexure F and G was compared.

TABLE 13
CORRELATIONS THAT CHANGED WHEN THE RELATIONSHIP BETWEEN
THE 16PF AND THE INQ WAS CONTROLLED FOR GENDER

	Not controlled (as in Table 8)	Controlled for Gender (as in Annexure F)
Factor M + Clerical Sign.	-0.214 0.000	-0.2012 0.000
Factor M + Computational Sign.	-0.178 0.000	-0.2002 0.000
Factor M + Creative Sign.	0.168 0.000	0.2100 0.000
Factor M + Literary Sign.	0.194 0.000	0.2050 0.000
Factor N + Scientific Sign.	0.204 0.000	0.1728 0.000
Factor Q1 + Scientific Sign.	0.208 0.000	0.1848 0.000
Factor Q1 + Clerical Sign.	0.215 0.000	-0.1909 0.000
Factor Q3 + Computational Sign.	0.204 0.000	0.1936 0.000

The relationships that changed from weak to moderate correlations were Factor M (abstractedness) and the Computational ($r = -0.2002$; $p = 0.000$), the Creative ($r = 0.2100$; $p = 0.000$) and the Literary interest scales ($r = 0.2050$; $p = 0.000$).

The relationships that changed from moderate to weak correlations were Factor N (privateness) and the Scientific interest scale ($r = 0.1728$; $p = 0.000$), Factor Q1 (openness to change) and the Scientific interest scale ($r = 0.1848$; $p = 0.000$) and Factor Q3 (perfectionism) and the Computational interest scale ($r = 0.1936$; $p = 0.000$)

There was only one correlation that changed direction when the relationship was controlled for gender and it was Factor Q1 (openness to change) and the Clerical interest scale ($r = -0.1919$; $p = 0.000$). This can be ascribed to the fact that from the ANOVA's in Table 9 and 10 it was determined that the females were more traditional in their thinking and as well as more interested in clerical related tasks, than males.

TABLE 14
CORRELATIONS THAT CHANGED WHEN THE RELATIONSHIP BETWEEN
THE 16PF AND THE INQ WAS CONTROLLED FOR RACE

	Not Controlled (as in Table 9)	Controlled for Race (as in Annexure G)
Factor G + Outdoor Sign.	-0.219 0.000	-0.1820 0.000
Factor M + Computational Sign.	-0.178 0.000	-0.2185 0.000
Factor M + Creative Sign.	0.168 0.000	.0238 0.000
Factor N + Scientific Sign.	0.204 0.000	0.1943 0.000
Factor Q1 + Computational Sign.	0.233 0.000	0.1570 0.000
Factor Q1 + Scientific Sign.	0.208 0.000	0.1494 0.000
Factor Q1 + Clerical Sign.	0.215 0.000	-0.2098 0.000
Factor Q2 + Outdoor Sign.	0.238 0.000	0.0583 0.000
Factor Q2 + Creative Sign.	0.286 0.000	0.1969 0.000
Factor Q4 + Computational Sign.	-0.210 0.000	-0.1557 0.000
Factor Q4 + Creative Sign.	0.209 0.000	0.1514 0.000

The relationship that changed from weak to a moderate correlation was Factor M (abstractedness) and the Computational ($r = -0.2185$; $p = 0.000$) and Creative interest scales ($r = 0.2038$; $p = 0.000$).

The relationships that changed from moderate to weak correlations were Factor G (rule-consciousness) and the Outdoor interest scale ($r = -0.1820$; $p = 0.000$), Factor N (privateness) and the Scientific interest scales ($r = 0.1943$; $p = 0.000$), Factor Q1 (openness to change) and the Computational ($r = 0.1570$; $p = 0.000$) and Scientific interest scales ($r = 0.1494$; $p = 0.000$), Factor Q2 (self-reliant) and the Outdoor ($r = 0.0583$; $p = 0.000$) and Creative interest scales ($r = 0.1969$; $p = 0.000$) and Factor Q4 (tension) and the Computational ($r = -0.1557$; $p = 0.000$) and Creative interest scales ($r = 0.1541$; $p = 0.000$).

There was only one correlation that changed direction when the relationship was controlled for race and it was Factor Q1 (openness to change) and the Clerical interest scale ($r = -0.2098$; $p = 0.000$). This can be ascribed to the fact that from the ANOVA's in Table 11 and 12 it was determined that the Blacks were more open-minded in their thinking than the Whites. The Whites were more interested in clerical related tasks, than the Blacks.

DISCUSSION

The first alternative hypothesis (H_1) of this study was stated as: ***There is a relationship between personality traits and vocational interests.*** Dating back to 1984, empirical studies have supported the contention that broad dimensions of interests with broad dimensions of personality (Carless, 1999; Fuller, Holland and Johnston, 1999; Larson, Rottinghaus and Borgen, 2002; Costa, McCrae & Holland, 1984; Nordvik, 1994; Staggs, Larson and Borgen, 2003; Zagar, Arbit, Falconer and Friedland, 1983; Zak, Meir & Kraemer, 1979). The results obtained from this study also indicated that there were a number of statistically significant relationships between the 16PF and the INQ.

In particular, at least six specific personality dimensions of the 16PF seemed to be related to interests on the INQ: Outdoor, Mechanical, Computational, Scientific, Persuasive, Creative, Social Sciences and Clerical. However, all the results discussed were moderate correlations, with the strongest correlation being 0.443 (A: warmth and the persuasive interest scale). In another study conducted in South Africa, De Bruin (2002:51) also described his correlations between personality factors and interest scales as relatively weak. Thus although he found psychologically meaningful relationships between three second-order factors of the 16PF, namely Extroversion, Tough Poise and Independence, with several of the interest scales on the 19FII, his strongest correlation was 0.33 (Tough Poise and Welfare). The number of the relationships he found can be ascribed to the fact that he used only the second-order factors and this current study used the first-order factors, which are much more.

De Bruin (2002:51) even went as far as stating that personality traits and vocational interests appear to represent two clearly different domains of behaviour in South Africa. However, this current study found much more correlations than De Bruin (2002:51). Meaningful relationships were (1) extroversion and interest fields related to social contact and the influencing of other people, (2) emotionally sensitive individuals tend to be interested in the arts and languages as well as the welfare of others and (3) independent individuals tend to be interested in creative thinking, suggesting that they like to generate alternative and new ideas (De Bruin, 2002: 49-52). The current study found at least six specific personality dimensions that seemed to be related to interests. The larger number of significant correlations may possibly be ascribed to the fact that the first order, instead of second order factors were used in this study. It is also possible that the age of the current sample could have had an influence on the relationships found in this study. Since interests stabilise as age increase, one would expect a stronger relationship between personality traits and interests with older subjects.

The second alternative hypothesis (H_2) of this study was stated as: ***Gender and race do influence the relationship between personality traits and vocational interests.*** There are a number of relationships that changed from weak to moderate correlations and visa versa, when the relationship between personality traits and vocational interests was controlled for gender and race. Although changes existed; it seemed to be very slight.

In the ANOVA's presented in Table 9 it was determined that gender influences many of the personality factors. From Table 10 it was also determined that gender also influences many of the vocational interests. Interestingly enough, the results indicated that interest fields for women were mostly those viewed as traditional "women roles", for example Creative, Clerical and Literary. The results showed the same for men, for example Mechanical, Computational and Scientific. It is possible that women and men in South Africa are still socialised in terms of traditional male/female roles and therefore develop such interests. This assumption may however be true for the older population used in this sample. This assumption should however be further explored.

From the partial correlations it was visible that gender does influence the relationship between personality traits and vocational interests, however slight. In the ANOVA's it was visible that there are definite and significant differences between personality traits and interest fields between males and females. It may be that these differences brought about the differences visible between the correlations and partial correlations. However, the significance of the differences between the correlations and partial correlations were not tested in this study.

In the ANOVA's presented in Table 11 it was determined that race influences many of the interest scales. From Table 12 it was also determined that race also influences many of the vocational interests. When looking to the racial divided background of South Africa it is clear that the previously disadvantaged groups

lacked the learning opportunities and exposure to a wide variety of interest fields. Under the Apartheid system, white and black pupils did not share the same education and support systems as white pupils. When the mean age of the sample used in this study is taken into account it is possible that a large proportion of the sample may have been schooled during the “apartheid years”. It may therefore be possible that the differences in the ANOVA’s may be ascribed to these factors and may not be applicable to a younger South African Population. This should be tested in future research.

From the partial correlations it was visible that race does influence the relationship between personality traits and vocational interests, however slight. In the ANOVA’s it was visible that there are definite and significant differences between personality traits and interest fields between Whites and Blacks. It may be that these differences brought about the differences visible between the correlations and partial correlations. However, the significance of the differences between the correlations and partial correlations were not tested in this study.

In the results discussed in Table 13 and 14, a number of correlations changed from weak to moderate and visa versa, when the relationship between personality traits and vocational interests was controlled for gender and race. Most of these changed by not more than 0.1, meaning only a very slight change, but the fact remains that the correlations did change. A significant change however was Factor Q1 (openness to change) and the Clerical interests scale. When this relationship was controlled for gender it changed from a positive correlation ($r = 0.215$) to a negative correlation ($r = -0.1919$). When this relationship was controlled for race, the same was noticed. Here it also changed from a positive correlation ($r = 0.215$) to a negative correlation ($r = -0.2098$).

LIMITATIONS AND RECOMMENDATIONS

A limitation to this study was that since the INQ has not been used in any studies, it was extremely difficult to compare results.

A further limitation to this study was that the extent of the influence of the South African context on the relationship between personality traits and vocational interests was not really determined. This might have been due to the fact that the sample consisted mostly of individuals who were already employed, had at least a matric / equivalent qualification and that they may not have been as underprivileged as the larger part of other South Africans.

From the partial correlations it was visible that gender and race do influence the relationship between personality traits and vocational interests, although slight. However, the significance of the differences between the correlations and partial correlations were not tested in this study. This is viewed as another limitation to the study.

A recommendation for future research is to conduct a study that compares the INQ to Holland's hexagon model, as most studies use this model to some extent to measure or describe vocational interests. This will then enable other researchers to compare future results based on the INQ with previous studies. Although the INQ's development was based on Holland's model, his measuring instrument (Self-Directed-Search) has only six interest fields, whereas the INQ has ten. This will indicate as to how the ten fields of the INQ overlap with the six fields of the SDS.

A further recommendation is to standardise and validate the INQ in the South African context as it is a meaningful measuring instrument of interests.

CONCLUSION

The purpose of this study was to determine if there is a relationship between personality traits and vocational interests as measured by the Sixteen Personality Factor Questionnaire (16PF) and the Interest Questionnaire (INQ) respectively. The rationale to execute this research project was to obtain clear

and specific results on the existence and nature of the relationship between personality traits and vocational interests in a South African context.

The results obtained concluded that there is a relationship between personality traits and vocational interests in a South African context. The results further concluded that gender and race do influence the relationship between personality traits and vocational interests. Therefore, H₁ and H₂ of this study were accepted.

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ANNEXURE A: CORRELATIONS BETWEEN THE 16PF AND THE INQ

	Outdoor	Mechanical	Computational	Scientific	Persuasive	Creative	Social Sciences	Clerical	Literary	Medical
A: Warmth	0.032	-0.223**	-0.096**	-0.340**	0.443**	-0.028	0.230**	0.146**	-0.051	-0.002
Sig. (2-tailed)	0.380	0.000	0.008	0.000	0.000	0.442	0.000	0.000	0.160	0.955
B: Reasoning	0.089*	0.128**	0.131**	0.013	0.001	0.017	-0.161**	-0.158**	0.007	-0.100**
Sig. (2-tailed)	0.013	0.000	0.000	0.713	0.975	0.640	0.000	0.000	0.857	0.006
C: Emotional Stability	0.027	0.100**	0.122**	0.105**	0.030	-1.02**	-0.092*	-0.137**	-0.051	-0.062
Sig. (2-tailed)	0.449	0.005	0.001	0.004	0.407	0.005	0.011	0.000	0.158	0.088
E: Dominance	-0.039	0.070	0.114**	-0.009	0.276**	-0.069	-0.145**	-0.090*	-0.089*	-0.110*
Sig. (2-tailed)	0.280	0.053	0.002	0.801	0.000	0.056	0.000	0.013	0.014	0.002
F: Liveliness	0.135**	0.009	-0.029	-0.106**	0.245**	0.029	0.026	-0.106**	-0.139**	-0.042
Sig. (2-tailed)	0.000	0.793	0.419	0.003	0.000	0.415	0.479	0.003	0.000	0.242
G: Rule-consciousness	-0.219**	0.079*	0.228**	0.194**	-0.111**	-0.279**	0.010	0.065	-0.069	-0.008
Sig. (2-tailed)	0.000	0.028	0.000	0.000	0.002	0.000	0.775	0.070	0.057	0.829
H: Social Boldness	-0.079*	0.028	0.105**	0.020	0.345**	-0.152**	-0.054	-0.028	-0.137**	-0.078*
Sig. (2-tailed)	0.027	0.440	0.004	0.583	0.000	0.000	0.132	0.443	0.000	0.031
I: Sensitivity	0.008	-0.390**	-0.307**	-0.284**	0.124**	0.162**	0.313**	0.104**	0.282**	0.151**
Sig. (2-tailed)	0.829	0.000	0.000	0.000	0.001	0.000	0.000	0.004	0.000	0.000
L: Vigilance	-0.060	-0.009	-0.029	0.005	-0.091*	0.013	0.049	0.102**	-0.026	0.031
Sig. (2-tailed)	0.094	0.811	0.427	0.883	0.012	0.724	0.179	0.005	0.400	0.306
M: Abstractedness	-0.025	0.024	-0.178**	0.008	0.013	0.168**	0.027	-0.214**	0.194**	0.043
Sig. (2-tailed)	0.495	0.514	0.000	0.830	0.708	0.000	0.450	0.000	0.000	0.023
N: Privatness	-0.149**	0.083*	0.198**	0.204**	0.046	-0.145**	-0.138**	-0.033	-0.032	-0.117**
Sig. (2-tailed)	0.000	0.021	0.000	0.000	0.199	0.000	0.000	0.367	0.360	0.001
O: Apprehension	-0.026	-0.069	-0.137**	-0.083*	-0.069	0.089*	0.108**	0.130**	0.066	0.050
Sig. (2-tailed)	0.479	0.056	0.000	0.021	0.055	0.013	0.003	0.000	0.068	0.163
Q1: Openness to change	-0.215**	0.086*	0.233**	0.208**	0.140**	-0.167**	-0.131**	0.215**	0.038	-0.088**
Sig. (2-tailed)	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.293	0.015
Q2: Self-reliance	0.238**	-0.069	-0.136**	-0.144**	-0.152**	0.286**	-0.107**	0.061	0.100**	0.018
Sig. (2-tailed)	0.000	0.057	0.000	0.000	0.000	0.000	0.003	0.091	0.005	0.614
Q3: Perfectionism	-0.056	0.095**	0.204**	0.184**	0.004	-0.178**	-0.127**	-0.084**	-0.071*	-0.052
Sig. (2-tailed)	0.120	0.008	0.000	0.000	0.917	0.000	0.000	0.020	0.049	0.149
Q4: Tension	0.145**	-0.088**	-0.210**	-0.164**	-0.076*	0.209**	0.037	0.089*	0.056	0.074*
Sig. (2-tailed)	0.000	0.015	0.000	0.000	0.034	0.000	0.302	0.013	0.124	0.040

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

ANNEXURE B: DESCRIPTIVES FOR GENDER & 16PF

GENDER	N	Mean	Std. Deviation
A Male	557	6.1293	2.02267
Female	213	5.9812	2.08309
B Male	557	5.6284	1.87182
Female	213	5.1690	2.06031
C Male	557	6.6302	2.04351
Female	213	6.6620	2.44531
E Male	557	6.4919	2.11759
Female	213	6.2207	2.42883
F Male	557	5.9515	2.20761
Female	213	6.0282	2.35908
G Male	557	6.4345	2.17939
Female	213	5.8263	2.13525
H Male	557	6.6679	2.31649
Female	213	6.2394	2.53726
I Male	557	4.4686	2.27700
Female	213	4.4425	2.07861
L Male	556	4.6043	2.53443
Female	213	4.5822	2.17383
M Male	557	5.5745	1.97017
Female	213	5.1784	1.96817
N Male	556	6.7374	2.02136
Female	213	6.1268	2.26288
O Male	557	4.4075	2.26662
Female	213	4.6197	2.21082
Q1 Male	557	7.0969	2.10633
Female	213	6.4554	2.31975
Q2 Male	557	4.0521	2.32111
Female	213	4.9765	2.25799
Q3 Male	557	7.2424	2.09070
Female	213	6.8873	2.13826
Q4 Male	555	3.8180	2.15241
Female	213	4.0141	2.41747

ANOVA's

		Sum of Squares	Df	Mean Square	F	Sig.
A	Between Groups	3.377	1	3.377	.812	.368
	Within Groups	3194.618	768	4.160		
	Total	3197.995	769			
B	Between Groups	32.511	1	32.511	8.767	.003
	Within Groups	2847.987	768	3.708		
	Total	2880.499	769			
C	Between Groups	.156	1	.156	.033	.855
	Within Groups	3589.475	768	4.674		
	Total	3589.631	769			
E	Between Groups	11.338	1	11.338	2.326	.128
	Within Groups	3743.843	768	4.875		
	Total	3755.181	769			
F	Between Groups	.905	1	.905	.179	.673
	Within Groups	3889.522	768	5.064		
	Total	3890.427	769			
G	Between Groups	56.991	1	56.991	12.133	.001
	Within Groups	3607.431	768	4.697		
	Total	3664.422	769			
H	Between Groups	28.281	1	28.281	4.995	.026
	Within Groups	4348.343	768	5.662		
	Total	4376.625	769			
I	Between Groups	.327	1	.327	.066	.797
	Within Groups	3798.672	768	4.946		
	Total	3798.999	769			
L	Between Groups	.076	1	.076	.013	.910
	Within Groups	4566.762	767	5.954		
	Total	4566.837	768			
M	Between Groups	24.175	1	24.175	6.232	.013
	Within Groups	2979.379	768	3.879		
	Total	3003.553	769			
N	Between Groups	57.426	1	57.426	13.135	.000
	Within Groups	3353.239	767	4.372		
	Total	3410.666	768			
O	Between Groups	6.937	1	6.937	1.369	.242
	Within Groups	3892.686	768	5.069		
	Total	3899.622	769			
Q1	Between Groups	63.417	1	63.417	13.500	.000
	Within Groups	3607.591	768	4.697		
	Total	3671.008	769			
Q2	Between Groups	131.680	1	131.680	24.809	.000
	Within Groups	4076.373	768	5.308		
	Total	4208.053	769			
Q3	Between Groups	19.423	1	19.423	4.388	.037
	Within Groups	3399.576	768	4.427		
	Total	3418.999	769			
Q4	Between Groups	5.917	1	5.917	1.191	.275
	Within Groups	3805.578	766	4.968		
	Total	3811.495	767			

ANNEXURE C: DESCRIPTIVES FOR GENDER & INQ

GENDER		N	Mean	Std. Deviation
OUTDOOR	Male	557	9.2639	4.35192
	Female	213	10.0563	3.58148
MECHANICAL	Male	557	11.4668	3.50350
	Female	213	7.9624	3.11849
COMPUTATIONAL	Male	557	10.5368	3.90593
	Female	213	8.5991	4.82043
SCIENTIFIC	Male	557	9.6122	3.88787
	Female	213	6.9671	3.87102
PERSUASIVE	Male	557	8.7343	3.40880
	Female	213	9.0141	3.49232
CREATIVE	Male	557	6.6768	2.70286
	Female	213	9.0704	3.15178
SOCIAL SCIENCES	Male	557	8.8492	3.51496
	Female	213	11.1221	3.40711
CLERICAL	Male	557	7.1239	3.06126
	Female	213	8.5211	3.70056
LITERARY	Male	557	8.0628	3.28305
	Female	213	8.9718	3.15767
MEDICAL	Male	557	8.6876	2.89928
	Female	213	9.4366	3.46709

ANOVA's

		Sum of Squares	df	Mean Square	F	Sig.
OUTDOOR	Between Groups	96.752	1	96.752	5.608	.018
	Within Groups	13249.529	768	17.252		
	Total	13346.281	769			
MECHANICAL	Between Groups	1892.160	1	1892.160	163.530	.000
	Within Groups	8886.335	768	11.571		
	Total	10778.495	769			
COMPUTATIONAL	Between Groups	576.579	1	576.579	33.039	.000
	Within Groups	13385.415	767	17.452		
	Total	13961.995	768			
SCIENTIFIC	Between Groups	1078.001	1	1078.001	71.488	.000
	Within Groups	11581.007	768	15.079		
	Total	12659.008	769			
PERSUASIVE	Between Groups	12.062	1	12.062	1.024	.312
	Within Groups	9047.633	768	11.781		
	Total	9059.695	769			
CREATIVE	Between Groups	882.756	1	882.756	109.919	.000
	Within Groups	6167.775	768	8.031		
	Total	7050.531	769			
SOCIAL SCIENCES	Between Groups	795.966	1	795.966	64.879	.000
	Within Groups	9422.158	768	12.268		
	Total	10218.125	769			
CLERICAL	Between Groups	300.810	1	300.810	28.473	.000
	Within Groups	8113.607	768	10.565		
	Total	8414.417	769			
LITIRACY	Between Groups	127.311	1	127.311	12.061	.001
	Within Groups	8106.632	768	10.556		
	Total	8233.943	769			
MEDICAL	Between Groups	86.440	1	86.440	9.192	.003
	Within Groups	7222.039	768	9.404		
	Total	7308.479	769			

ANNEXURE D: DESCRIPTIVES FOR RACE & 16PF

GENDER	N	Mean	Std. Deviation
A White	367	6.1853	2.17122
Black	401	6.0075	1.91114
B White	367	5.7084	2.06969
Black	401	5.3142	1.78494
C White	367	6.6485	2.26258
Black	401	6.6284	2.06012
E White	367	6.2207	2.38914
Black	401	6.5885	2.02059
F White	367	6.1226	2.39163
Black	401	5.8180	2.09387
G White	367	5.9946	2.31058
Black	401	6.5187	2.02738
H White	367	6.2452	2.52633
Black	401	6.8254	2.21798
I White	367	4.5559	2.35428
Black	401	4.3716	2.09263
L White	367	4.4005	2.48829
Black	400	4.7850	2.37864
M White	367	5.2589	2.07931
Black	401	5.6584	1.86024
N White	367	6.4660	2.18353
Black	400	6.6800	2.02926
O White	367	4.4959	2.39635
Black	401	4.4414	2.11948
Q1 White	367	6.2371	2.29062
Black	401	7.5436	1.88646
Q2 White	367	5.1798	2.21405
Black	401	3.5112	2.15766
Q3 White	367	7.1117	2.14401
Black	401	7.1671	2.07834
Q4 White	367	4.3733	2.37695
Black	499	3.4185	1.98050

ANOVA's

		Sum of Squares	Df	Mean Square	F	Sig.
A	Between Groups	6.058	1	6.058	1.456	.228
	Within Groups	3186.378	766	4.160		
	Total	3192.436	767			
B	Between Groups	29.782	1	29.782	8.026	.005
	Within Groups	2842.213	766	3.710		
	Total	2871.995	767			
C	Between Groups	.077	1	.077	.017	.898
	Within Groups	3571.293	766	4.662		
	Total	3571.370	767			
E	Between Groups	25.925	1	25.925	5.335	.021
	Within Groups	3722.230	766	4.859		
	Total	3748.155	767			
F	Between Groups	17.786	1	17.786	3.541	.060
	Within Groups	3847.193	766	5.022		
	Total	3864.979	767			
G	Between Groups	52.646	1	52.646	11.208	.001
	Within Groups	3598.099	766	4.697		
	Total	3650.745	767			
H	Between Groups	64.508	1	64.508	11.481	.001
	Within Groups	4303.710	766	5.618		
	Total	4368.217	767			
I	Between Groups	6.508	1	6.508	1.319	.251
	Within Groups	3780.241	766	4.935		
	Total	3786.749	767			
L	Between Groups	28.289	1	28.289	4.784	.029
	Within Groups	4523.630	765	5.913		
	Total	4551.919	766			
M	Between Groups	30.583	1	30.583	7.897	.005
	Within Groups	2966.603	766	3.873		
	Total	2997.186	767			
N	Between Groups	9.686	1	9.686	2.187	.140
	Within Groups	3388.048	765	4.429		
	Total	3397.734	766			
O	Between Groups	.570	1	.570	.112	.738
	Within Groups	3898.617	766	5.090		
	Total	3899.186	767			
Q1	Between Groups	327.132	1	327.132	74.938	.000
	Within Groups	3343.862	766	4.365		
	Total	3670.995	767			
Q2	Between Groups	533.533	1	533.533	111.775	.000
	Within Groups	3656.330	766	4.773		
	Total	4189.863	767			
Q3	Between Groups	.587	1	.587	.132	.717
	Within Groups	3410.225	766	4.452		
	Total	3410.813	767			
Q4	Between Groups	174.257	1	174.257	36.686	.000
	Within Groups	3628.961	764	4.750		
	Total	3803.218	765			

ANNEXURE E: DESCRIPTIVES FOR RACE & INQ

GENDER		N	Mean	Std. Deviation
OUTDOOR	White	367	11.8583	3.53307
	Black	401	7.2993	3.45763
MECHANICAL	White	367	10.0218	3.68790
	Black	401	10.9277	3.75397
COMPUTATIONAL	White	366	8.6557	4.50833
	Black	401	11.2195	3.63066
SCIENTIFIC	White	367	7.7902	3.97150
	Black	401	9.8653	3.88031
PERSUASIVE	White	367	8.8992	3.65495
	Black	401	8.7357	3.22567
CREATIVE	White	367	8.2997	3.21584
	Black	401	6.4539	2.54234
SOCIAL SCIENCES	White	367	9.2289	3.94317
	Black	401	9.7257	3.33460
CLERICAL	White	367	7.6376	3.38947
	Black	401	7.4040	3.23518
LITERARY	White	367	8.1281	3.41764
	Black	401	8.4863	3.13535
MEDICAL	White	367	9.0599	3.21144
	Black	401	8.7556	2.9597

ANOVA's

		Sum of Squares	df	Mean Square	F	Sig.
OUTDOOR	Between Groups	3982.902	1	3982.902	326.275	.000
	Within Groups	9350.722	766	12.207		
	Total	13333.624	767			
MECHANICAL	Between Groups	157.251	1	157.251	11.348	.001
	Within Groups	10614.728	766	13.857		
	Total	10771.979	767			
COMPUTATIONAL	Between Groups	1257.677	1	1257.677	75.810	.000
	Within Groups	12691.311	765	16.590		
	Total	13948.988	766			
SCIENTIFIC	Between Groups	825.176	1	825.176	53.587	.000
	Within Groups	11795.573	766	15.399		
	Total	12620.749	767			
PERSUASIVE	Between Groups	5.124	1	5.124	.434	.510
	Within Groups	9051.250	766	11.816		
	Total	9056.374	767			
CREATIVE	Between Groups	652.902	1	652.902	78.507	.000
	Within Groups	6370.426	766	8.316		
	Total	7023.328	767			
SOCIAL SCIENCES	Between Groups	47.295	1	47.295	3.573	.059
	Within Groups	10138.599	766	13.236		
	Total	10185.895	767			
CLERICAL	Between Groups	10.458	1	10.458	.955	.329
	Within Groups	8391.355	766	10.955		
	Total	8401.813	767			
LITERARY	Between Groups	24.589	1	24.589	2.295	.130
	Within Groups	8207.155	766	10.714		
	Total	8231.745	767			
MEDICAL	Between Groups	17.748	1	17.748	1.868	.172
	Within Groups	7278.731	766	9.502		
	Total	7296.479	767			

ANNEXURE F:
PARTIAL CORRELATIONS WITH THE CONTROLLING VARIABLE GENDER BETWEEN THE 16PF AND THE INQ

	Outdoor	Mechanical	Computational	Scientific	Persuasive	Creative	Social Science	Clerical	Literary	Medical
Factor A	.0328	-.2629**	-.1074**	-.3666**	.4466**	-.0201	.2494**	.1581**	-.0468	.0046
Sign.	.365	.000	.003	.000	.000	.580	.000	.000	.197	.900
Factor B	.0997**	.0922**	.1149**	-.0138	.0007	.0586	-.1443**	-.1382**	.0185	-.0893**
Sign.	.006	.011	.001	.703	.984	.106	.000	.000	.610	.014
Factor C	.0297	.1143**	.1285**	.1161**	.0262	-.1108**	-.1038**	-.1414**	-.0548	-.0631
Sign.	.412	.002	.000	.001	.469	.002	.004	.000	.130	.081
Factor E	-.0301	.0541	.1061**	-.0267	.2792**	-.0518	-.1361**	-.0854*	-.0857*	-.1072**
Sign.	.406	.135	.003	.461	.000	.152	.000	.018	.018	.003
Factor F	.1340**	.0154	-.0310	-.1093**	.2491**	.0239	.0239	-.1120**	-.1410**	-.0392
Sign.	.000	.671	.392	.002	.000	.510	.509	.002	.000	.279
Factor G	-.2083**	.0320	.2126**	.1668**	-.1102**	-.2508**	.0458	.0930*	-.0558	.0041
Sign.	.000	.378	.000	.000	.002	.000	.206	.010	.124	.910
Factor H	-.0736*	-.0078	.0904*	-.0024	.3499**	-.1334**	-.0355	-.0116	-.1285**	-.0677
Sign.	.042	.829	.012	.946	.000	.00	.327	.748	.000	.062
Factor I	.0090	-.4336**	-.3159**	-.3007**	.1222**	.1735**	.3293**	-.1085**	-.2830**	-.1539**
Sign.	.804	.000	.000	.000	.001	.000	.000	.003	.000	.000
Factor L	-.0585	-.0085	-.0266	.0074	-.0938**	.0158	.0501	.1046**	-.0291	.0272
Sign.	.106	.814	.464	.838	.009	.662	.166	.004	.422	.452
Factor M	-.0198	-.0142	-.2002**	-.0116	.0121	.2100**	.0503	-.2012**	.2050**	.0521
Sign.	.586	.694	.000	.749	.737	.000	.165	.000	.000	.151
Factor N	-.1410**	.0297	.1753**	.1728**	.0567	-.1045**	-.1044**	-.0104	-.0118	-.1037**
Sign.	.000	.413	.000	.000	.117	.004	.004	.774	.744	.004
Factor O	-.0269	-.0531	-.1298**	-.0718*	-.0742*	.0777*	.0996**	.1238**	.0572	0.430
Sign.	.458	.143	.000	.047	.040	.032	.006	0.001	.114	.236
Factor Q1	-.2110**	.0320	.2125**	.1848**	.1423**	-.1346**	-.1062**	-.1909**	.0543	-.0691
Sign.	.000	.377	.000	.000	.000	.000	.003	.000	.134	.056
Factor Q2	.2309**	.0101	-.1045**	-.1004**	-.1605**	.2430**	-.1618**	.0224	.0783*	-.0060
Sign.	.000	.780	.004	.005	.000	.000	.000	.537	.030	.868
Factor Q3	-.0535	.0669	.1936**	.1695**	.0096	-.1605**	-.1102**	-.0693	-.0576	-.0428
Sign.	.139	.065	.000	.000	.791	.000	.002	.055	.111	.237
Factor Q4	.1413**	-.0780*	-.2063**	-.1579**	-.0789*	.2061**	.0274	.0840*	.0501	.0694
Sign.	.000	.031	.000	.000	.029	.000	.449	.020	.167	.055

** Correlation is significant at the 0.01 level (2-tailed) * Correlation is significant at the 0.05 level (2-tailed)

**ANNEXURE G:
PARTIAL CORRELATIONS WITH THE CONTROLLING VARIABLE RACE BETWEEN THE 16PF AND THE INQ**

	Outdoor	Mechanical	Computational	Scientific	Persuasive	Creative	Social Science	Clerical	Literary	Medical
Factor A	.0101	-.2207**	-.0885*	-.3414**	.4445**	-.0443	.2318**	.1455**	-.0486	-.0032
Sign.	.781	.000	.015	.000	.000	.222	.000	.000	.180	.931
Factor B	.0397	.1433**	.1740**	.0486	-.0062	-.0174	-.1628**	-.1600**	.0101	-.1062**
Sign.	.274	.000	.000	.180	.864	.632	.000	.000	.781	.003
Factor C	.0322	.1003**	.1331**	.1112**	.0276	-.1043**	-.0961**	-.1392**	-.0518	-.0626
Sign.	.374	.006	.000	.002	.447	.004	.008	.000	.153	.084
Factor E	.0093	.0621	.0940**	-.0319	.2800**	-.0475	-.1500**	-.0894*	-.0965**	-.1071**
Sign.	.798	.086	.009	.379	.000	.191	.000	.014	.008	.003
Factor F	.1161**	.0162	-.0165	-.0975**	.2501**	.0049	.0356	-.1082**	-.1356**	-.0380
Sign.	.001	.655	.650	.007	.000	.893	.326	.003	.000	.295
Factor G	-.1820**	.0655	.2087**	.1692**	-.1112**	-.2509**	.0014	.0707	-.0761*	-.0047
Sign.	.000	.071	.000	.000	.002	.000	.970	.051	.036	.898
Factor H	-.0159	.0112	.0721*	-.0125	.3524**	-.1207**	-.0648	-.0231	-.1444**	-.0705
Sign.	.661	.758	.047	.730	.000	.001	.074	.525	.000	.052
Factor I	-.0163	-.3861**	-.3093**	-.2183**	.1201**	.1519**	.3153**	.1029**	.2817**	.1493**
Sign.	.654	.000	.000	.000	.001	.000	.000	.004	.000	.000
Factor L	-.0205	-.0150	-.0509	-.0092	-.0936**	.0366	.0410	.1066**	-.0344	.0305
Sign.	.572	.679	.160	.800	.010	.313	.258	.003	.343	.401
Factor M	.0351	.0151	-.2185**	-.0081	.0104	.2038**	.0133	-.2121**	.1861**	.0462
Sign.	.333	.677	.000	.822	.774	.000	.714	.000	.000	.203
Factor N	-.1430**	.0744*	.1916**	.1943**	.0534	-.1292**	-.1416**	-.0353	-.0299	-.1162**
Sign.	.000	.040	.000	.000	.141	.000	.000	.330	.410	.001
Factor O	-.0360	-.0646	-.1378**	-.0800*	-.0731*	.0880*	.1080**	.1289**	.0627	.0463
Sign.	.321	.075	.000	.027	.044	.015	.003	.000	.084	.201
Factor Q1	-.0688	.0518	.1570**	.1494**	.1502*	-.0896**	-.1683**	-.2098	.0212	-.0711*
Sign.	.058	.153	.000	.000	.000	.013	.000	.000	.559	.050
Factor Q2	.0583	-.0221	-.0331	-.0576	-.1729**	.1969**	-.0859*	.0460	.1255**	-.0045
Sign.	.108	.542	.362	.112	.000	.000	.018	.205	.001	.901
Factor Q3	-.0622	.0895*	.2094**	.1837**	.0083	-.1792**	-.1256**	-.0817*	-.0644	-.0491
Sign.	.086	.013	.000	.000	.820	.000	.001	.024	.067	.176
Factor Q4	.0351	-.0615	-.1557**	-.1117**	-.0853*	.1514**	.0507	.0829*	.0667	.0630
Sign.	.333	.090	.000	.002	.019	.000	.162	.022	.066	.082

** Correlation is significant at the 0.01 level (2-tailed) * Correlation is significant at the 0.05 level (2-tailed)