

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO AND MOTIVATION FOR THE RESEARCH

The work performance of the employees involved in the credit control function in the finance division of a bank has a crucial influence on the profitability of the bank. The asset most often financed by a bank is the motor vehicle. Typical clients of a finance bank spend up to 20% of their monthly income on vehicle payments. A client with an account in arrears may be able to recover one payment, but owing to the size of the payment, the chances are usually very good that further arrears will lead to the cancellation of the finance agreement and repossession of the vehicle.

Repossessed vehicles are sold at an auction and the proceeds are used to settle the clients' accounts. There is, however, often a shortfall between the amount owing on an account and the proceeds from the auction sale. This shortfall is influenced by the condition of the vehicle and the demand for the specific type of vehicle with a second-hand status. The shortfall on the account has to be retrieved from the client by legal action, which is often a futile procedure because clients are not very willing to carry on paying for vehicles that are no longer in their possession. Expensive legal action adds to the bank's cost structure and, furthermore, if unsuccessful legal action leads to the shortfall being written off as bad debt, there is a direct negative impact on the profitability of the bank.

Bad debt is first and foremost prevented by means of a thorough credit scoring of a client who applies for financing, but the ability of the credit controller to

collect the amounts in arrears on accounts in time to save the account, also contributes considerably to the prevention of bad debt. What makes successful debt collecting so difficult, however, is that the responsible credit controller must not only have the disciplinary approach to contact the client and get him/her to pay his/her account, but also the ability to do this in such a way that the client will retain a positive regard for the bank in view of the long-term nature of the finance relationship. The typical finance contract spans over 54 months and the credit controller should therefore aim to keep the relationship with the client on a positive, collaborative level.

The question is: How can job applicants be selected to ensure that they will become successful credit controllers? One of the aspects considered during the selection procedure is personality. Although numerous research studies have been done on the relationship between personality and work performance (see chapter 2), no record of research on the relationship between personality and the work performance of credit controllers could be found. The need therefore existed to determine whether such a relationship exists and, if so, whether important personality characteristics could be identified which could be used as a basis for the selection of applicants for credit controller positions.

A guideline for the important personality characteristics of a credit controller had to be obtained by means of scientifically based research. Personality characteristics are best determined by means of psychometric assessment whereas trends in the effect of a personality profile on the work performance of a sample of people can best be determined by means of a statistical analysis of the results of the psychometric assessment and the work performance of the sample. Furthermore, the Employment Equity Act, No 55 (1998) prescribes that selection be based on competencies that are measurable and fair. This underlines the need for scientific research (Caroux & Moerdyk, 1997).

1.2 PROBLEM STATEMENT

Some of the client complaints received at Bankfin, the finance division of Absa, relate to the aggressive way in which clients have been treated during the debt collection procedure (H. Anderson, personal communication, 2 August 2000). It can be expected that these clients are not only complaining to the bank, but are also sharing their dismay with others, thereby negatively influencing the bank's image as a service organisation. On the other hand, credit controllers who approach the client with more lenience, struggle to keep the arrears on the accounts in their portfolio under control (H. Anderson, personal communication, 2 August 2000). This results in bad debt.

A bank cannot afford to settle for a payoff between a negative image and bad debt being written off because both have a negative impact on profit. It is therefore important to define the good performance of credit controllers both in terms of percentage arrears and number of customer complaints.

It was hypothesised that personality traits that predict good performance in respect of credit controlling could be identified by means of scientific research of the relationship between personality and work performance.

1.2.1 General research question

Is there a relationship between the personality traits of credit controllers and their work performance in a bank?

1.2.2 Specific research question

What are the measurable personality traits that can be used to predict good performance results for a credit controller in a bank?

1.3 AIMS

1.3.1 General aim

The general aim was to determine whether there is a relationship between the personality traits of credit controllers and their work performance in a bank.

1.3.2 Specific aim

The specific aim was to determine the personality traits that can be used to predict good performance of an individual who applies for a position in credit control in a bank.

1.4 THE PARADIGM PERSPECTIVE

The research was conducted within the discipline of industrial psychology with specific reference to the sub-discipline of personnel psychology. Dimensional theories of personality were utilised as basis. Meyer, Moore and Viljoen (1988) point out that the dimensional personality theories are based on the viewpoint that a person has various traits and behaviours that can be described in terms of dimensions of personality.

The philosophical paradigm within which the research was conducted is logical positivism (<http://www/utm.edu/research/iep/l/logpos.htm>), according to which there are only two sources of knowledge: logical reasoning and empirical experience. 'Positive' knowledge is arrived at by means of scientific exploration and the objective collection of facts summarised by means of a process of

induction (http://www.sar.bolton.ac.uk/lt/lecture2/logical_positivism.htm).

Empirical methods that allow for measurement and comparison of constructs were used. The methodology included the nomothetic method and induction. Meyer et al. (1988) refer to the nomothetic method as the description of psychological processes by making inferences about general principles that apply to all people, without considering individual differences. The inductive method is on in which generalisations are made from specific deductions to general principles (Meyer et al., 1998).

The psychometric approach was used for the research. According to Saville, Cramp and Henley (1995) theory of personality rooted in the psychometric tradition relies on a statistical derivation of personality profiles.

Systems theory was used to integrate aspects of personality and performance in the organisation. Bateman and Zeithaml (1990) describe organisational systems theory as a general scientific approach in which an organisation is seen as a set of interdependent elements with the generic structure of input, process, output, and environment.

1.5 RESEARCH DESIGN

1.5.1 Research variables

Mouton and Marais (1994) refer to the independent variable as the antecedent phenomenon in the cause-effect relationship, whereas the dependent variable is seen as the consequent phenomenon. The independent variable for the current research is the personality profile, whereas the dependent variable is work performance.

Owing to the multiple influences in the organisational system that may have an impact on the work performance of credit controllers, it was important to

recognise that there were extraneous variables that needed to be taken into account in the research. Christensen (1994, p. 213) defines an extraneous variable as “any variable other than the independent variable that influences the dependent variable”. The crucial extraneous variables were identified as part of the research so that their effects on the dependent variable could be determined by statistical means.

1.5.2 Type of research

The research report entails both an exploratory literature review (theoretical basis to facilitate an understanding of the problem and the research) and a quantitative empirical study that investigated the relationship between the independent variable (personality) and the dependent variable (work performance) (Christensen, 1994). Hypotheses were tested by means of a measurement of the variables and a statistical analysis of the results.

1.5.3 Unit of analysis

Although both the independent and the dependent variable were measured per individual, the unit of analysis that applied was the sample (for investigating the relationships between relevant variables for the total sample).

1.5.4 Ensuring reliability and validity

According to Mouton and Marais (1994, p. 79) the main consideration in the process of data collection is that of reliability which is defined as “the requirement that the application of a valid measuring instrument to different groups under different sets of circumstances should lead to the same observations”. Mouton and Marais (1994) point out that the reliability of the observations or data is influenced by four variables: the researcher, the

participants, the measuring instrument, and the research context. All four variables are considered carefully (see section 3.4.1) to maximise reliability and validity.

1.6 RESEARCH METHOD

The research was conceptualised following an explorative literature review. Operationalisation of the variables included

- gathering of personality data by means of standardised measuring instruments;
- gathering of performance data and data with regard to extraneous variables by means of internal company data sources; and
- processing of data by means of statistical analysis.

The hypotheses were as follows:

H₀: There is no significant relationship between the personally traits of credit controllers and their performance results.

H₁: There is a significant relationship between the personality traits of credit controllers and their performance results.

H₂: Specific personality traits can be identified that will predict good and poor performance in credit control.

Results are reported and interpreted.

1.7 OVERVIEW OF CHAPTERS

Chapter two covers a literature review, starting with an historical perspective of the concept of personality, followed by a definition of personality and a discussion of personality theories. Dimensional theories of personality, within which this study has been scoped, are discussed in detail. The concept of work performance is defined and work performance is conceptualised within the organisational system. Previous research on the relationship between personality and work performance is finally discussed.

Chapter three consists of a discussion of the research design: the planning and the operationalisation of the variables.

The results of the empirical study are reported in chapter four.

In chapter five the results are interpreted, conclusions are drawn and recommendations made based on the findings of the empirical research. Limitations of this study are also discussed.

1.8 CHAPTER SUMMARY

Chapter one consisted of an introduction, including motivation for the research, the problem statement, aims of the research and a summary of the design and method of the research.

CHAPTER 2

THE RELATIONSHIP BETWEEN PERSONALITY AND WORK PERFORMANCE: A LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this literature review is to conceptualise the research by:

- (1) defining the concept of personality (the independent variable) and exploring personality theory and research to gain a better understanding of trait theory and the psychometric approach for the measurement of personality;
- (2) defining the concept of work performance (the dependent variable) and exploring work performance theory and research;
- (3) integrating the concepts, using a systemic view of organisations to explore the relationship between personality and work performance; and
- (4) gaining an overview of previous research on the relationship between personality on work performance by means of an explorative literature review.

2.2 HISTORICAL PERSPECTIVE OF THE CONCEPT OF PERSONALITY

The exploration of personality theory starts with an historical perspective to explore the origins and development of the field.

The first recorded studies of personality can be found in Greek philosophy:

- (1) According to Corsini and Marsella (1983) Pythagoras (582 B.C. - 507 B.C.) expressed what was seen as supernatural views of human nature: his major contribution to psychology was the idea that man is different from all other forms of nature because of man's ability to reason.
- (2) Hippocrates (460 B.C. - 377 B.C.) posited that there are four basic temperaments caused by excesses of certain body fluids: Melancholic (caused by an excess of black bile), Sanguine or optimistic (caused by an excess of blood), Choleric or angry (caused by an excess of yellow bile), and Apathetic (caused by an excess of phlegm) (Corsini & Marsella, 1983; Saville, Cramp & Henley, 1995).

According to Meyer ET AL.(1988) psychology had a philosophical rather than a scientific status between 400 B.C. and 1600. They record that Plato and Aristotle described principles of human behaviour in terms of the structure and functions of the psyche, after which St Augustine and Thomas of Aquinas integrated these philosophies with Christianity, with the result that psychology (including the study of the concept of personality) in these early years was a part of philosophy in support of religion. Corsini and Marsella (1983) point out that the church's view increasingly became that human beings were vile temples of evil and corruption. This view was challenged in the Renaissance period, roughly between 1200 and 1600. This was a period, as described by Corsini and Marsella (1983, p. 17) "...of the celebration of life – a return to views of human nature which valued human individuality. Optimism replaced pessimism, life replaced death, hope replaced fear, and rationality replaced blind faith".

Psychology became a philosophy in support of natural sciences between 1600 and 1879 when the fall of church authority led to a knowledge explosion (Meyer

et al., 1988). According to Meyer et al. (1988) Empiricism and Rationalism attempted to find definitions for the nature of man. Empiricism departed from the viewpoint that observation through the senses was the only source of real knowledge and Francis Bacon's emphasis on empirical observation made an important contribution to include psychology as part of the natural sciences (Meyer et al., 1988). Rationalism, in contrast, recognised that there are both a physical world that can be objectively observed, and a world in the mind that consists of non-material, non-observable processes that are characterised by man's ability to reason and that have led to the development of the human sciences (Meyer et al., 1988). René Descartes, the father of Rationalism, laid down principles for psychology as an introspective, subjective human science. John Locke (1632-1704) supported Descartes with his view that man is born with a blank mind and subsequently acquires ideas by means of experience via the five senses, and also by means of reflection or rational thought (Corsini & Marsella, 1983). Two psychological paradigms therefore developed: psychology as part of the natural sciences, and psychology as part of the human sciences.

After 1879 the study of psychology continued in both the natural sciences and the human sciences paradigms. According to Meyer et al. (1998) Wilhelm Wundt and the Structuralism movement defined psychology as the analytical study of the human mind, using introspection as experimental method. Meyer et al. (1988) point out that Wundt's work was severely criticised, but is considered important because of the following:

- (a) It led to functionalism (emphasis on observable psychological processes), which in turn led to behaviourism, an approach that made a huge contribution to the development of psychology within the natural sciences paradigm.
- (b) Gestalt psychology developed as a reaction against structuralism, leading to the further development of psychology in the human sciences

paradigm. According to Meyer et al. (1988) Brentano led the opposition to structuralism by developing a descriptive method of studying psychological phenomena, called the phenomenological method. The intention of phenomenology is to understand rather than to explain.

Meyer et al. (1988) group more recent thinking in psychology into four categories: depth psychological theories, dimensional theories, behaviouristic theories and humanistic theories. These are discussed further in section 2.4.

Today there is a vast number of theories of personality and, as pointed out by Corsini and Marsella (1983, p. 21), no theory is right or wrong: "...different theories of personality offer us the opportunity to view certain aspects of human behaviour through the glasses of their promulgators."

The field of industrial-organisational psychology, which is mainly concerned with human behaviour and personality in the workplace, has developed largely since the beginning of the twentieth century (McCormick & Ilgen, 1985). According to McCormick and Ilgen (1985) the most rapid advancements in industrial psychology came when major problems needed to be solved, for example the problem of the unacceptably high incidence of airplane accidents in World War II due to "human error" which led to the development of standardised evaluation techniques. A more recent problem that needed to be solved specifically in South Africa, relates to the Employment Equity Act No. 55 (1998) that prohibits any psychological testing unless the instrument used has been proved to be scientifically valid and reliable, fairly applied to all employees, and not biased against any employee or group (Bendix, 2000). This has led to psychometric tests losing favour in South African organisations during the 1990s, followed by a cross-cultural review of many psychometric tests and the development of several new tests regarded as fair and unbiased (Nel, Gerber, van Dyk, Haasbroek, Schultz, Sono & Werner, 2001).

2.3 DEFINITION OF PERSONALITY

Meyer et al. (1988) define personality as the continuously emerging, but at the same time relatively stable organisation of physical, psychological and spiritual characteristics of the individual that determines his or her behaviour in interaction with the environment. Gouws, Louw, Meyer and Plug (1982) offer a very similar, but broader definition that personality is the integrated and dynamic organisation of an individual's psychic, moral, social, and physical characteristics as manifested in interaction with the environment and in particular with other people.

Gregory (1996) shies away from a definition of personality, but offers two fundamental features instead: First, each individual is consistent to some extent, manifesting traits and patterns of behaviour that arise repeatedly. Second, each individual is distinctive from others to some extent. Avery and Baker (1990) agree with Gregory's two fundamental features in their definition that refers to individual differences that are stable over time.

Maddi (1996, p. 8) offers a comprehensive definition: "Personality is a stable set of tendencies and characteristics that determine those commonalities and differences in people's psychological behaviour (thoughts, feelings, and actions) that have continuity in time and that may not be easily understood as the sole result of the social and biological pressures of the moment." Maddi (1996) then explains that *tendencies* are the processes that give direction to thoughts, feelings and actions, whereas *characteristics* are static personality structures that influence the way in which the world is interpreted. Saville, Cramp and Henley (1995) offer a definition that corresponds with the one of Maddi (1996) in terms of personality encompassing thoughts, feelings and actions. Saville et al. (1995, p. 6) define personality as "a person's typical or preferred way of behaving,

thinking and feeling.” The measuring instrument of personality in the current study, the Occupational Personality Questionnaire (OPQ), is based on the definition of Saville et al. (1995). Also see section 2.6.2 for a detailed discussion of the OPQ.

2.4 PERSONALITY THEORY

Meyer et al. (1988) describe personality theory as the result of a conscious, deliberate attempt to develop a logical, coherent system for the description, explanation and/or prediction of human behaviour. According to Meyer et al. (1988) a personality theory has as point of departure a model that can guide the exploration of individual differences in personality. Gouws et al. (1982) see personality theory as a system that can serve as a comprehensive framework for the explanation and description of human behaviour and experience.

Many different personality theories have been developed to describe, explain and predict human behaviour in different situations. Avery and Baker (1990) point out that psychologists do not all agree that any one theory is the best to explain behaviour. More recent personality theories can be grouped into four broad categories:

- (1) *Depth psychological theories* are based on the premise that a set of unconscious forces within the individual determines behaviour (Meyer et al., 1988). Freud (1946) proposes that most of our mental activity is unconscious and that much of our behaviour is influenced by conflicts between the id, ego and superego (three separate but interacting processes), which stem from childhood experiences of which we are mostly unaware. Jung (1971) was of the opinion that individuals strive to develop their fullest potential and that they are not especially driven by events from their childhood. Jung (1971) combined two main personality

- types, extraverts and introverts, with four psychological functions in personality (thinking, feeling, sensing and intuiting) to arrive at eight broad personality types.
- (2) *Behaviouristic theories* explain behaviour as a result of learning and environmental influences (Meyer et al., 1988). These theories vary from learning based on biological needs like Hull's stimulus-response theory (Meyer et al., 1988) to learning based on imitation like Thorndike's connectionism (Thorndike, 1968). Skinner (1993) took the radical view that it is unnecessary to refer to personality at all, because behaviour can be understood in terms of the situation a person is in, and the person's past history of rewards and punishments in similar situations.
 - (3) *Dimensional theories* all start with the premise that each individual has a unique set of traits and they suggest dimensions of descriptions, from constitutional typologists like Sheldon who use physical properties (Meyer et al., 1988) to factor analysts like Cattell (1984) who combine psychological and statistical methods to discover dimensional patterns of traits. The present study is based on the dimensional theories and therefore these theories are to be explored in more detail in section 2.5 to conceptualise the present study.
 - (4) *Humanistic theories* are very diverse and include two branches of theory: existentialism and phenomenology (Meyer et al., 1988). Examples of existentialist theories are Allport's holistic theory, which suggests that man is an open system whose behaviour is determined by his environment, his needs, his past and his future plans (Allport, 1955). Secondly, Frankl (1984) considers man as a being that has the freedom to take responsibility.

Phenomenologists like Rogers (1989) suggest that man can only be understood if his subjective experience is known because people see themselves in terms of a "self" and an "ideal self" and the wider the gap between these two entities, the more internal conflict an individual experiences.

According to Meyer et al. (1988) the humanistic theories share a common view of man as a responsible, developing being with free choice about self-actualisation. Meyer et al. (1988) suggest that the plea of humanists is that the psychologically healthy person should be the norm used to measure the level of functioning of man, and not the neurotic or psychotic person.

2.5 DIMENSIONAL THEORIES OF PERSONALITY

Dimensional theories of personality all aim at describing the structure of personality by differentiating it in terms of stable dimensions. Dimensional theories of personality can further be divided into the *constitutional approach*, *Murray's needs theory* and *the factor-analytical approach* (Meyer et al., 1988).

2.5.1 The constitutional approach

The constitutional approach is very old, starting with Hippocrates and his description of personality based on excesses of body fluids (see section 2.2). The most influential constitutional approach came from Sheldon (Corsini & Marsella, 1983; Meyer et al., 1988) who theorised that personality is genetically determined. Sheldon (as cited by Meyer et al., 1988) researched the relationship between body structure and personality and found correlations between body structure and personality as recorded in Table 2.1 below. The reported

correlation coefficients indicate a strong positive relationship between body structure and personality.

TABLE 2.1: SHELDON'S MORPHOGENOTYPES (Meyer et al., 1988)

MORPHOLOGY	PERSONALITY	CORRELATION COEFFICIENT
<i>Endomorphy</i> : round, soft, small skeleton and muscles, big abdomen	<i>Viscerotonia</i> : indolent, sociable, loving food, needing attention.	0,79
<i>Mesomorphy</i> : athletic, big skeleton, muscular, hard	<i>Somatotonia</i> : adventurous, aggressive, dominant	0,82
<i>Ectomorphy</i> : slender, big brain and central nervous system	<i>Cerebrotonia</i> : reserved, self-conscious	0,83

2.5.2 Murray's needs theory

Murray (1938) proposed a systemic approach to the study of personality, recognising the influence of genetics and unconscious and social influences on behaviour. Murray (1938) does not see behaviour as an automatic result of interaction between personality and situation and he recognises the influence of the individual's needs in setting goals, making choices, and planning his life.

Murray and his associates developed several instruments to gather information for research, of which the best known is the Edwards Personal Preference

Schedule that measures 15 of the individual needs that Murray identified (Meyer et al., 1988).

2.5.3 The factor-analytical approach and personality trait theory

The factor-analytical approach led to the personality trait theories of which the work of Cattell is the best known (Meyer et al., 1988). The present study is based on trait theory and the instrument used to measure personality traits is one of the Occupational Personality Questionnaires (OPQ).

According to Meyer et al. (1988) the factor-analytical approach is based on the assumption that anything can be discovered by collecting enough measurements and analysing these measurements (data) with the aid of a statistical method, factor analysis. Inter-correlations between the measurements are calculated, making it possible to subdivide a large number of variables into smaller groupings (factors) that are related. Meyer et al. (1988) suggest that, owing to the fact that personality traits show little change over years, they have a high predictive value.

Personality trait theory forms the basis of the psychometric approach to personality analysis. Saville et al. (1995) contrast the psychometric approach, which relies on statistical derivation of personality profiles to the psychoanalytic approach, which is based heavily on clinical interpretation. According to Saville et al. (1995) the psychometric tradition can be divided into theories identifying types and theories identifying traits.

Whereas Saville et al. (1995) define the construct 'trait' as anything that can be measured to show differences between individual people, Kerlinger (1986, p. 452) defines the construct as "a characteristic of an individual revealed through recurring behaviors [sic] in different situations". Kerlinger (1986)

therefore limits the definition to behaviour and uses the example of *compulsivity*, which may be seen in an individual's neatness, punctuality, the need for structure and order, and the dislike of irregularities.

In the psychometric tradition, theories are subjected to extensive research and they are usually the basis of psychometric instruments or tests. According to Gregory (1996) the psychometric approach rests on the assumption that tests can measure individual differences in the characteristics of people. The test provides the examiner with an estimate of the amount/extent of a characteristic or trait possessed by an individual (Gregory, 1996). Kerlinger (1986) points out that the individual characteristics that can be measured include intelligence, aptitude, achievement, personality, attitude and values.

Gregory (1996, p. 33) defines the concept 'test' as "a standardised procedure for sampling behavior [sic] and describing it with categories or scores". He explains the definition as follows:

- (1) *Standardised procedure:* The procedure to administer the test should be uniform from one examiner to another and from one setting to another. Standardised directions for the administration of a test as indicated in the instructional manual in respect of that test serves that purpose.
- (2) *Behaviour sample:* A psychological test is a limited sample of behaviour that permits the examiner to predict other behaviours.
- (3) *Scores or categories:* A psychological test should permit the derivation of scores or categories that allows for summing up performance in numbers or classifications.

- (4) *Norms and standards:* Norms refer to a summary of test results for a large group of subjects that allows for comparison of individual results. Individuals need to be compared in relation to the correct standard: a standardisation sample must be representative of the population for whom the test is intended.
- (5) *Prediction of non-test behaviour:* The ability of a test to predict non-test behaviour is confirmed by validation research once a test is released.

According to Goldberg (1990) trait conceptions of personality have been enormously popular throughout the history of psychological testing because personality traits are embedded in everyday language - if one person is described as sociable and another as shy, we are using trait names to describe consistencies within individuals and also differences between them.

2.6 PERSONALITY TESTS/QUESTIONNAIRES BASED ON FACTOR ANALYSIS AND TRAIT THEORY

In this section, Cattell's Sixteen Personality Factors (16PF) questionnaires and the Occupational Personality Questionnaires (OPQ) are discussed and compared, leading to motivation for the selection of the OPQ3.2i as instrument to measure the independent variable.

2.6.1 Cattell's Sixteen Personality Factors (16PF) Questionnaire

2.6.1.1 Cattell's factor-analytical trait theory

Cattell (1905 – 1998), initially a chemist by profession, became intrigued by the world of psychology after the First World War. The thinking at the time was dominated by the psychoanalytic approach, which does not lend itself to

scientific evaluation. Cattell was very critical of the work of Freud and other psychoanalysts and he saw a gap in the field of psychology in respect of which he wished to make a contribution. Cattell's conviction in science formed the basis of his theory that the domains of personality and motivation could be identified and defined by means of scientific method. Spearman's development of the logic of factor analysis and Fisher's development of the analysis of variance led Cattell to see the potential of applying these methods to the study of human behaviour. (Cattell, 1944; <http://www.stthomasu.ca>).

The essence of Cattell's factor-analytical trait theory (Cattell, 1984) is, firstly, that personality is both a product of genetic maturation and learning and, secondly, that in order to study personality learning (or therapeutic change), one has to measure attributes of personality at different moments in time so that these measurements can be compared. Cattell had the belief that the solution of social, economic and moral problems of society lies in effective research leading to the understanding of behaviour (<http://www.stthomasu.ca>).

Cattell produced many tests/questionnaires during his life, but he is best known for his development of the 16 Personality Factors (16PF) questionnaire (Cattell, 1984).

2.6.1.2 The Sixteen Personality Factors (16PF) questionnaire

Cattell wanted to develop a manageable set of terminology to describe personality, starting with a list of 4500 English words compiled by Allport and Odbert, all describing aspects of personality (Meyer et al., 1988). According to Meyer et al. (1988) Cattell processed the initial list of words as follows:

- (1) Cattell deleted all synonyms on the list, thereby narrowing down the list to 171 words.

- (2) The life record data (L-data) of a sample of adults in several experiments were evaluated in terms of the 171 personality traits, inter-correlations were factor-analysed, and eventually 15 L-data factors that were the basis of most behaviour, were identified.
- (3) The next step was to determine whether the same source traits found with L-data, would also surface with questionnaire data (Q-data). A total of 1800 questionnaire items were developed and large samples of adults and children were subjected to these. Several studies and a number of years later Cattell came up with 23 source traits, including four factors that were only found in adults, as well as four factors found in the Q-data that did not surface in the L-data.
- (4) The third phase of Cattell's research entailed objective test data (T-data), eventually ending up with 16 source traits (15 plus intelligence) and a number of second order factors calculated from scores in respect of the source traits.

According to Cattell, Eber, and Tatsuoka (1985) the 16 source traits are measured on continuums between opposites. See Table 2.2 below.

TABLE 2.2: THE PRIMARY SOURCE TRAITS COVERED BY THE 16PF

FACTOR	LOW SCORE DESCRIPTION	HIGH SCORE DESCRIPTION
A	<i>Reserved</i> , detached, critical, cool, impersonal.	<i>Warm-hearted</i> , outgoing, participating interested in people, easy-going.

FACTOR	LOW SCORE DESCRIPTION	HIGH SCORE DESCRIPTION
B	<i>Less intelligent</i> , concrete-thinking.	<i>More intelligent</i> , abstract thinking, bright.
C	<i>Affected by feelings</i> , emotionally less stable, easily upset, changeable	<i>Emotionally stable</i> , mature, faces reality, calm, patient
E	<i>Humble</i> , mild, accommodating, easily led, conforming.	<i>Assertive</i> , aggressive, authoritative, competitive, stubborn.
F	<i>Sober</i> , prudent, serious, taciturn.	<i>Happy-go-lucky</i> , impulsively lively, enthusiastic, heedless.
G	<i>Expedient</i> , disregards rules, feels few obligations.	<i>Conscientious</i> , persevering, proper, moralistic, rule-bound.
H	<i>Shy</i> , restrained, threat-sensitive, timid.	<i>Venturesome</i> , socially bold, uninhibited, spontaneous.
I	<i>Tough-minded</i> , self-reliant, realistic, no-nonsense.	<i>Tender-minded</i> , intuitive, unrealistic, sensitive.
L	<i>Trusting</i> , adaptable, free of jealousy, easy to get on with.	<i>Suspicious</i> , self-opinionated, hard to fool, sceptical, questioning.
M	<i>Practical</i> , careful, conventional, regulated by external realities.	<i>Imaginative</i> , careless of practical matters, unconventional, absent-minded.
N	<i>Forthright</i> , natural, genuine, unpretentious.	<i>Shrewd</i> , calculating, socially alert, insightful.
O	<i>Unperturbed</i> , self-assured, confident, secure, self-satisfied.	<i>Apprehensive</i> , self-reproaching, worrying, troubled.

FACTOR	LOW SCORE DESCRIPTION	HIGH SCORE DESCRIPTION
Q1	<i>Conservative</i> , respecting established ideas, tolerant of traditional difficulties.	<i>Experimenting</i> , liberal, analytical, likes innovation.
Q2	<i>Group oriented</i> , a joiner and a sound follower.	<i>Self-sufficient</i> , prefers own decisions, resourceful.
Q3	<i>Undisciplined self-conflict</i> , careless of protocol, follows own urges.	<i>Controlled</i> , socially precise, following self-image, compulsive.
Q4	<i>Relaxed</i> , tranquil, torpid, unfrustrated [sic].	<i>Tense</i> , frustrated, driven, restless, overwrought.

Secondary source traits measured by the 16PF include extraversion, anxiety, sensitivity, independence, discretion, subjectivity, fluid intelligence, and superego strength (Cattell et al., 1985).

Meyer et al. (1988) point out that Cattell's work is unique because of his vast database, the identification of measurable traits that are continuous over the lifespan of a person, the determination of specific environmental and genetic contributions for each personality source trait, and the relevance of his work for normal daily life. The latest available version of the 16PF is the fifth edition questionnaire (<http://www.16pfworld.com/keyinfo.html>).

2.6.1.3 Psychometric properties of the 16PF

a. Reliability

According to Saville et al. (1995, section 6, p. 2) "the reliability of a test or questionnaire is concerned with errors of measurement within both the test itself and also its administration and scoring."

Reliability can be determined in terms of internal consistency, test-retest reliability, and parallel form reliability. Many versions of the 16PF have been developed over the years and the reliability of each new version has varied, but has always been satisfactory. A few summarised examples will be given.

The 16PF is objectively scored, using either a computer or a mask so that the concept reliability coefficient is potentially 1,0 (Cattell et al., 1985).

Cattell (as cited by Marais, 1970) reports internal consistency reliability coefficients of between 0,71 and 0,93 based on the split half method. The average internal consistency of the 16PF fifth edition questionnaire is reported as 0,76 (<http://www.16pfworld.com/keyinfo.html>).

Prinsloo (1992) reports test-retest reliabilities of between 0,15 and 0,71 for Form E. This means that the reliabilities vary between extremely low for some traits to outstanding for other traits. The test-retest reliabilities of the 16PF fifth edition questionnaire is outstanding at an average of 0,80 for a two-week interval and 0,70 for a two-month interval (<http://www.16pfworld.com/keyinfo.html>).

b. Validity

The Standards for Educational and Psychological Testing (as cited by Gregory, 1996, p. 107) define validity as follows: "A test is valid to the extent that inferences made from it are appropriate, meaningful, and useful." A variety of approaches are used to determine the validity of a test, including face validity, content validity, criterion-related validity, and construct validity.

The traits of the 16PF are calculated by factor analysis and not on the basis of meaning, therefore face validity is not relevant (Maas, 1989). Cattell et al. (1985) report two different forms of validity: direct concept validity and indirect or circumstantial concept validity.

According to Cattell et al. (1985) direct concept validity provides the answer to the question whether the scale really measures the source trait it sets out to measure. Cattell et al. (1985) report direct concept validity coefficients between 0,77 and 0,96 as calculated by computer-synthesis.

According to Cattell et al. (1985, p. 38) indirect or circumstantial concept validity provides the answer to the question, "How well do the correlations of this test with a representative sample of concrete natural criteria agree with those which the conceptual criterion itself is expected to have with these relevant variables?" Cattell et al. (1985) report circumstantial concept validity coefficients between 0,63 and 0,96.

2.6.1.4 Culture fairness of the 16PF

Since the inception of the Employment Equity Act No. 55 (1998), adverse impact has become a prominent concern the South African context. According to SHL

(2000a, p. 15), "adverse impact refers to the impact of the results of assessment instruments on personnel decisions involving the different designated groups referred to in the Employment Equity Act." Mauer (2000) points out how, in the earlier drafts of the Bill that eventually became the Employment Equity Act, psychological testing was completely forbidden. According to Mauer (2000) it was only after a good deal of lobbying and debate that this stance was changed so that psychometric tests are now allowed under very specific conditions with a magnitude of fines that can be imposed for transgression of those conditions. Section 8 of the Employment Equity Act (1998) deals very specifically with this issue in stating that psychological testing or assessment is prohibited unless the instrument used has been scientifically shown to be valid and reliable, the instrument can be applied fairly to all employees and it is not biased against any employee or group.

The question of whether a psychometric test is culturally fair, has therefore become very important in the South African context.

Bain (2002) cites the following studies that used the 16PF in the South African, multicultural context:

- (1) Van Eeden and Prinsloo evaluated the 16PF results of 637 applicants at Absa. The African languages subgroup scored above average on the motivation distortion scale and statistically significant differences were found on 10 of the 16 factors. Van Eeden and Prinsloo concluded that the results do not warrant separate norms, but cultural trends should be considered when interpreting results.
- (2) Abrahams compared the 16PF results of 983 students from the Black, White, Coloured and Indian culture groups. Statistically significant differences between races were found in the case of 10 of the 16 factors.

The reliabilities in terms of race were unsatisfactory with 14 factors below 0,5 and five factors below 0,3. Abrahams concluded that race has a great influence on the manner in which items are dealt with and should not be ignored.

Bain (2002) also reviewed the organisational use of the 16PF and found that several large organisations in South Africa have abandoned the instrument on the basis of cultural fairness.

2.6.2 The Occupational Personality Questionnaire (OPQ)

2.6.2.1 The OPQ model of personality

Saville et al. (1995) propose that personality is concerned with three key domains:

- (1) The Relating Domain is characterised by such traits as assertiveness, outgoingness and empathy;
- (2) The Thinking Domain covers traits like conservatism, abstract thinking and detail consciousness.
- (3) The Feeling Domain includes traits like anxiety, tough-mindedness, and optimism.

Saville et al. (1995) point out that there may be a fourth area, the Energy Domain, characterised by traits like active, competitive and decisive, which impinges upon the three other domains.

The OPQ model of personality is illustrated in Figure 2.1 below.

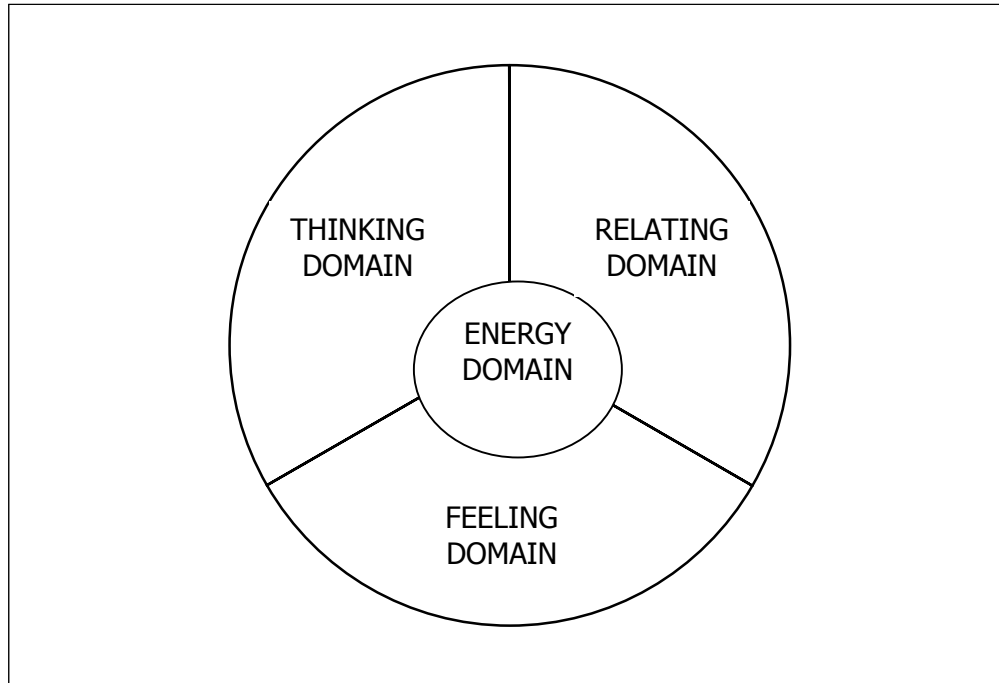


Figure 2.1: The OPQ Model of Personality (Saville et al., 1995, p.14)

2.6.2.2 *The OPQ questionnaires*

The development of the OPQ was based on an exhaustive literature survey, repertory grid analysis and critical incident techniques to develop initial models of personality put to extensive trials and progressively refined (Saville et al., 1995). According to Saville et al. (1995) the Occupational Personality Questionnaire (OPQ) departed from the following basis:

- (1) The questionnaire was not based on a specific personality theory, but rather on an eclectic approach using personality traits proposed by other scientists including Eysenck and Cattell.

(2) New scales, based on assessment centre criteria, management competencies and appraisal documentation, were proposed.

The proposed traits were then subjected to trials and factor analytic methods, leading to a number of technically sound instruments (Saville et al., 1995).

The guiding criteria for the development of the OPQ as listed by Saville et al. (1995) focus strongly on user-friendliness for the work environment, therefore this is clearly an instrument intended for industrial psychological purposes.

One of the intended uses of the OPQ was to assist in the selection interview. According to Saville et al. (1995) the applicant's profile can be used to structure the interview, with the emphasis on those attributes identified from job analysis as being most relevant to the job.

The measurement of the independent variable (personality) in the present study is used to determine the attributes most relevant to the position of credit controller.

The latest version of the OPQ, the OPQ32, is available both in ipsative and normative formats. According to SHL (2000b) the ipsative version forces the respondent to choose between options that measure aspects of personality, which is a helpful approach in measuring relative preferences and avoiding social desirability in selection situations. On the other hand SHL suggests that the normative version allows the respondent to indicate his or her choice on a scale from strongly agree to strongly disagree, making the approach appropriate for use in a range of applications including training, development and counselling. Also see section 2.6.2.5 for a discussion of concerns raised in literature about the use of ipsative scales for interpersonal comparison.

Table 2.3 below provides short descriptions of attributes measured by the OPQ32i as supplied on the Expert Report printout of the computerised reporting module of the OPQ32i:

TABLE 2.3: OPQ32i ATTRIBUTES

DOMAIN	ATTRIBUTE	DEFINITION OF HIGH SCORE	DEFINITION OF LOW SCORE
RELATION- SHIPS WITH PEOPLE	PERSUASIVE (RP1)	Rarely pressures others to change their views, dislikes selling, less comfortable using negotiation	Enjoys selling, comfortable using negotiation, likes to change other people's view
	CONTROLLING (RP2)	Happy to let others take charge, dislikes telling people what to do, unlikely to take the lead	Likes to be in charge, takes the lead, tells others what to do, takes control
	OUTSPOKEN (RP3)	Holds back from criticising others, may not express own views, unprepared to put forward own opinions	Freely expresses opinions, makes disagreement clear, prepared to criticise others
	INDEPENDENT- MINDED (RP4)	Accepts majority decisions, prepared to follow the consensus	Prefers to follow own approach, prepared to disregard majority decisions
	OUTGOING (RP5)	Quiet and reserved in groups, dislikes being centre of attention	Lively and animated in groups, talkative, enjoys attention
	AFFILIATIVE (RP6)	Comfortable spending time away from people, values time spent alone, seldom misses the company of others	Enjoys others' company, likes to be around people, can miss the company of others
	SOCIALLY CONFIDENT (RP7)	Feels more comfortable in less formal situations, can feel	At ease in formal situations, feels comfortable when first

awkward when first meeting
people

meeting people

DOMAIN	ATTRIBUTE	DEFINITION OF HIGH SCORE	DEFINITION OF LOW SCORE
RELATION- SHIPS WITH PEOPLE (continued)	MODEST (RP8)	Makes strengths and achievements known, talks about personal success	Dislikes discussing achievements, keeps quiet about personal success
	DEMOCRATIC (RP9)	Prepared to make decisions without consultation, prefers to make decisions alone	Consults widely, involves others in decision-making, less likely to make decisions alone
	CARING (RP10)	Selective with sympathy and support, remains detached from others' personal problems	Sympathetic and considerate towards others, helpful and supportive, gets involved in others' problems
THINKING STYLE	DATA RATIONAL (TS1)	Prefers dealing with opinions and feelings rather than facts and figures, likely to avoid using statistics	Likes working with numbers, enjoys analysing statistical information, bases decisions on facts and figures
	EVALUATIVE (TS2)	Does not focus on potential limitations, dislikes critically analysing information, rarely looks for errors or mistakes	Critically evaluates information, looks for potential limitations, focuses upon errors
	BEHAVIOURAL (TS3)	Does not question the reasons for people's behaviour, tends not to analyse people	Likes to understand motives and behaviour, enjoys analysing people
	CONVENTIONAL (TS4)	Favours changes to work methods, prefers new approaches, less conventional	Prefers well-established methods, favours a more conventional approach

DOMAIN	ATTRIBUTE	DEFINITION OF HIGH SCORE	DEFINITION OF LOW SCORE
THINKING STYLE (continued)	CONCEPTUAL (TS5)	Prefers to deal with practical rather than theoretical issues, dislikes dealing with abstract concepts	Interested in theories, enjoys discussing abstract concepts
	INNOVATIVE (TS6)	More likely to build on than generate ideas, less inclined to be creative and inventive	Generates new ideas, enjoys being creative, thinks of original solutions
	VARIETY SEEKING (TS7)	Prefers routine, is prepared to do repetitive work, does not seek variety	Prefers variety, tries out new things, likes changes to regular routine, can become bored by repetitive work
	ADAPTABLE (TS8)	Behaves consistently across situations, unlikely to behave differently with different people	Changes behaviour to suit the situation, adapts approach to different people
	FORWARD THINKING (TS9)	More likely to focus upon immediate than long-term issues, less likely to take a strategic perspective	Takes a long-term view, sets goals for the future, more likely to take a strategic perspective
	DETAIL CONSCIOUS (TS10)	Unlikely to become preoccupied with detail, less organised and systematic, dislikes tasks involving detail	Focuses on detail, likes to be methodical, organised and systematic, may become preoccupied with detail
	CONSCIENTIOUS (TS11)	Sees deadlines as flexible, prepared to leave some tasks unfinished	Focuses on getting things finished, persists until the job is done

DOMAIN	ATTRIBUTE	DEFINITION OF HIGH SCORE	DEFINITION OF LOW SCORE
THINKING STYLE (continued)	RULE FOLLOWING (TS12)	Not restricted by rules and procedures, prepared to break rules, tends to dislike bureaucracy	Follows rules and regulations, prefers clear guidelines, finds it difficult to break rules
FEELINGS AND EMOTIONS	RELAXED (FE1)	Tends to feel tense, finds it difficult to relax, can find it hard to unwind after work	Finds it easy to relax, rarely feels tense, generally calm and untroubled
	WORRYING (FE2)	Feels calm before important occasions, less affected by key events, free from worry	Feels nervous before important occasions, worries about things going wrong
	TOUGH MINDED (FE3)	Sensitive, easily hurt by criticism, upset by unfair comments or insults	Not easily offended, can ignore insults, may be insensitive to personal criticism
	OPTIMISTIC (FE4)	Concerned about the future, expects things to go wrong, focuses on negative aspects of a situation	Expects things will turn out well, looks to the positive aspects of a situation, has an optimistic view of the future
	TRUSTING (FE5)	Wary of others' intentions, finds it difficult to trust others, unlikely to be fooled by people	Trusts people, sees others as reliable and honest, believes what others say
	EMOTIONALLY CONTROLLED (FE6)	Openly expresses feelings, finds it difficult to conceal feelings, displays emotions clearly	Can conceal feelings from others, rarely displays emotion

DOMAIN	ATTRIBUTE	DEFINITION OF HIGH SCORE	DEFINITION OF LOW SCORE
FEELINGS AND EMOTIONS (continued)	VIGOROUS (FE7)	Likes to take things at a steady pace, dislikes excessive work demands	Thrives on activity, likes to keep busy, enjoys having a lot to do
	COMPETITIVE (FE8)	Dislikes competing with others, feels that taking part is more important than winning	Has a need to win, enjoys competitive activities, dislikes losing
	ACHIEVING (FE9)	Sees career progression as less important, looks for achievable rather than highly ambitious targets	Ambitious and career-centred, likes to work to demanding goals and targets
	DECISIVE (FE10)	Tends to be cautious when making decisions, likes to take time to reach conclusions	Makes fast decisions, reaches conclusions quickly, less cautious

2.6.2.3 Psychometric properties of the OPQ32i

a. Reliability

SHL (1999, section 10, p. 2) defines internal consistency reliability as “a measure of the consistency with which a set of questionnaire items are answered”. SHL found the internal consistencies of the OPQ32i to range from 0,67 to 0,88 with a median of 0,81 for the standardisation sample of 807 subjects. This internal consistency reliability is very satisfactory.

SHL (1999, section 10, p. 1) defines test-retest reliability as “the result of administering the same questionnaire on two separate occasions to the same

people and correlating the results.” There is no measurement available for test-retest reliability of the OPQ32i.

SHL (1999, section 10, p. 1) defines parallel or alternate form reliability as “the agreement between two parallel forms of the questionnaire”. Although two versions of the OPQ32i are not available, the OPQ32n attempts to measure the same constructs, but uses a normative instead of a forced choice format. SHL provides correlations between the two versions, based on a sample of 154 undergraduates from higher education institutions throughout England. Both the tests were completed in the same test session and the correlations range from 0,45 to 0,79 with a median of 0,66. This shows a reasonably strong relationship between the scores on the two versions.

b. Validity

According to SHL (1999, section 11, p. 1) *face validity* is “the degree to which a test or questionnaire appears to have relevance for a particular job to the untrained eye.” SHL have found all the OPQ32 questionnaires to have good face validity for occupational use because questions have been constructed so that both candidates and their managers can clearly see the relevance of the questions to the workplace.

SHL (1999, section 11, p. 2) define *content validity* as “the similarity between the content of the questionnaire scale and the domain it is designed to measure”. According to SHL an inductive approach was used in the development of the OPQ questionnaires: job analytic techniques were used to understand and define the domains to be measured, leading to high content validity.

According to SHL (1999, section 11, p. 2) *criterion-related validity* "in occupational terms is the relationship between a score on a questionnaire and a measure of performance in the job". This is of particular importance for the present study in which the instrument will be used to identify personality traits that could be used for future recruitment purposes.

Robertson and Kinder (as cited by SHL, 1999) did a meta-analysis of 21 validity studies with 15 different job types ranging from telephone sales agents through system analysts and senior managers, with a total sample size of $n=1999$. Criterion-related validity of 0,6 is reported. Although some of the 21 studies in the Robertson and Kinder meta-analysis used the OPQ Concept Model questionnaire rather than OPQ32 instruments, there is a strong relationship between the two instrument types with 25 of the OPQ32 scales showing correlations of 0,7 to 0,8 with Concept scales. The remaining OPQ32 scales are either new or substantial re-workings of the other scales with correlations of between 0,4 and 0,6 with the original Concept scales. The OPQ32 scales include the OPQ32n based on a normative scale and the OPQ32i based on an ipsative scale. Correlations between these two scales range between 0,45 and 0,79 (SHL, 1999). SHL (1999) concludes (section 12, p. 16) that, "this study provides a strong evidence favouring the OPQ scales' efficacy as predictors of job competence".

SHL (1999) points out that *construct validity*, or the extent to which a scale measures a hypothetical construct is the most basic form of validity, but at the same time the most abstract. According to SHL many forms of evidence are required to conclude that an instrument has construct validity, therefore the focus of such an investigation should be on convergent evidence (relationships occurring where expected) and divergent evidence (absence of relationships where not expected). SHL reports the results of inter-correlation patterns of

scales within the questionnaire, factor structures and correlations with other instruments, some of which are:

- (1) Inter-correlations of the OPQ32i scales for the general population ($n = 807$) vary between $-0,36$ and $0,58$ with 82 % falling between $-0,1$ and $0,1$. This suggests a generally high degree of independence for the scales.
- (2) Investigation of the relationship between the OPQ Concept Model and the 16PF5 ($n = 243$, sample of undergraduates in England) found most of the 16PF scales to be adequately explained by the Concept Model of the OPQ (most correlations exceed $0,3$). The only exceptions are the Reasoning scale of the 16PF, which is a measure of intelligence rather than personality, and the Vigilance scale. Although this study was with the OPQ Concept Model, there is a strong relationship between the OPQ Concept Model and the OPQ32 with 25 of the OPQ32 scales showing correlations of $0,7$ to $0,8$ with Concept scales.
- (3) A factor analysis was performed based on OPQ32n scale inter-correlations for the general population group ($n = 2028$). Five factors (in accordance with the Big 5 model of personality) were extracted explaining 48 % of the total variance in the data set: extraversion, agreeableness, neuroticism, openness to experience, and conscientiousness. Although the OPQ32n scale was used for this study and not the OPQ32i, correlations between these scales range between $0,45$ and $0,79$ (SHL, 1999).
- (4) Investigation of the relationship between the OPQ Concept 5.2 questionnaire and the NEO Personality Inventory Revised (NEO PI-R) produced the results listed in Table 2.4:

TABLE 2.4: CORRELATIONS OF OPQ CONCEPT 5.2 AND NEO PI-R BIG 5 (n = 197)

NEO Big 5 scale	Highest OPQ Concept correlations
Neuroticism	Relaxed (-0,83); Worrying (0,69); Optimistic (-0,64); Tough Minded (-0,63)
Extraversion	Social confidence (0,66); Controlling (0,61); Persuasive (0,60)
Openness to experience	Conceptual (0,58); Behavioural (0,50); Innovative (0,42); Change oriented (0,41)
Agreeableness	Caring (0,61); Competitive (-0,56); Modest (0,43); Democratic (0,40)
Conscientiousness	Detail conscious (0,76); Forward planning (0,73); Conscientious (0,73); Achieving (0,45)

When these results were compared with the factor structure of the OPQ32 model referred to in the previous paragraph, in most cases the OPQ32 scales which load most strongly onto the NEO PI-R Big 5 scales showed the same factors, lending support to the construct validity of the questionnaire.

2.6.2.4 Culture fairness of the OPQ32i

According to SHL (www.shl.co.za) the development of the OPQ32 was an international effort with more than 20 countries, including South Africa, participating in designing and testing items and scales to ensure that the different cultures and languages are taken into consideration. Developmental study D004 (www.shl.co.za), designed to determine the mean difference

between ethnic and gender groups in the South African context, evaluated a sample of 613 employees of whom 78,63 percent were Black (all race groups classified as Black according to the Employment Equity Act) and 21,37 percent were White. SHL concluded that no significant differences were found between the different ethnic groups and therefore SHL suggests that the OPQ32 scales, including the OPQ32n and the OPQ32i, could be used with confidence in the South African context.

2.6.2.5 Possible limitations of ipsative data as supplied by the OPQ32i

Johnson, Wood and Blinkhorn (1988) suggest that the use of ipsative personality tests to compare individuals with each other is startling because failure to take account of the mathematical properties of ipsative measures leads users to treat them as if they are normative measures. Chan (2003) and Macmann and Barnett (1999) support this notion, pointing out that with ipsative measurements there is a scale for every individual within which variations of behaviour occur – two persons having an identical set of ipsative responses could in fact be very different in the amount they possess of a personality trait. Interpretations of ipsative scores are more “person relative” than “population relative” (Macmann & Barnett, 1999). Chan (2003) therefore suggests that ipsative scores should only be used for intra-individual comparisons.

SHL (2000b) maintains that the ipsative version forces the respondent to choose between options that measure aspects of personality, which is a helpful approach in measuring relative preferences. On the other hand SHL suggests that the normative version allows the respondent to indicate his or her choice on a scale from strongly agree to strongly disagree, making the approach appropriate for use in a range of applications including training, development and counselling.

2.6.3 Comparison of Cattell's Sixteen Personality Factors questionnaires (16PF) and SHL's Occupational Personality Questionnaires (OPQ)

Both the 16PF questionnaires and the OPQ questionnaires are classified by the Professional Board of Psychology of the Health Professions Council of South Africa as being psychological tests subject to the control of the Board (http://www.hpcsa.co.za/Professional_Boards/Psychology/Forms/F207.pdf).

Both the 16PF and the OPQ3.2i have adequate reported psychometric properties (see section 2.6.1.3 and 2.6.2.3). Saville and Munro (1986) conducted a comparative study involving 230 individuals. They found that the OPQ Factor version is considerably more effective in measuring the 16PF reliable variance than the 16PF is in measuring the OPQ Factor, because some of the OPQ Factor scales are not well represented in the 16PF. The OPQ questionnaires therefore seem to be more comprehensive than the 16PF questionnaires.

SHL (1999) investigated the relationship between the OPQ32n and the OPQ Factor based on a sample of 603 respondents from the general population. For each factor scale there were correlating OPQ32n scales that reached at least 0,30. In turn, the correlations between the OPQ32n and the OPQ32i scales range between 0,45 and 0,79 (SHL, 1999).

The 16PF was for a long time the preferred instrument for personality assessment in many organisations, including Absa. Since the publication of the

Employment Equity Act No. 55 (1998), a number of large organisations have abandoned the 16PF because of its suspect culture fairness (see section 2.6.1.4).

Swinburne (1986) conducted a study of the application of personality questionnaires as a source of learning through self-knowledge in management education. It was found that OPQ questionnaires are preferred more often, whereas the 16PF questionnaires' acceptance related to the level of the skill of the trainer.

Despite the limitation of ipsative scales in research that generalises to a population as discussed in section 2.6.2.5, the OPQ32i was selected as the instrument to measure the independent variable (personality) because firstly, it is the test used for personality profiling in Absa, the organisation that hosted the study. Secondly, the reported psychometric properties and culture fairness are adequate.

2.7 DEFINITION OF THE CONCEPT OF WORK PERFORMANCE

The focus in most of the literature about organisational management is on the performance management process and not on defining the concept of work performance. Dessler (1983) suggests that work performance is a measure of how well an employee meets the standards that are required on a specific job. Ivancevich and Matteson (1996) describe work performance as the quality and quantity of human output necessary to meet work goals agreed upon between employees and their managers. It is therefore clear that performance can only be evaluated as good or bad if a standard of performance has been agreed upon between employees and their managers.

Lewis, Goodman and Fandt (1998) point out that the measurement of performance can be relatively simple when the performance criteria are

quantitative and can be objectively measured. However, sometimes performance criteria are more qualitative in nature and do not easily lend themselves to absolute units of measure. In such cases, according to Lewis et al. (1998), a subjective assessment to determine whether a standard is being met, will be required. Such a subjective performance measure would not be suitable for the kind of study that was intended here because of the need for standardisation of measures to ensure the reliability and validity of the study. It was therefore important that the measurement of performance in the current study be objective and quantitative.

Bateman and Zeithaml (1990) see work performance as being dependent on two factors:

- (1) The opportunity to achieve performance (knowledge, understanding, opportunity to participate, access to resources); and
- (2) The incentive to achieve performance (linking of rewards to objectives).

Ivancevich and Matteson (1996) conceptualise work performance as a function three variables:

- (a) The capacity to perform (knowledge and skills);
- (b) The willingness to perform (motivation); and
- (c) The opportunity to perform (workload, tools, climate).

See Figure 2.2 below.

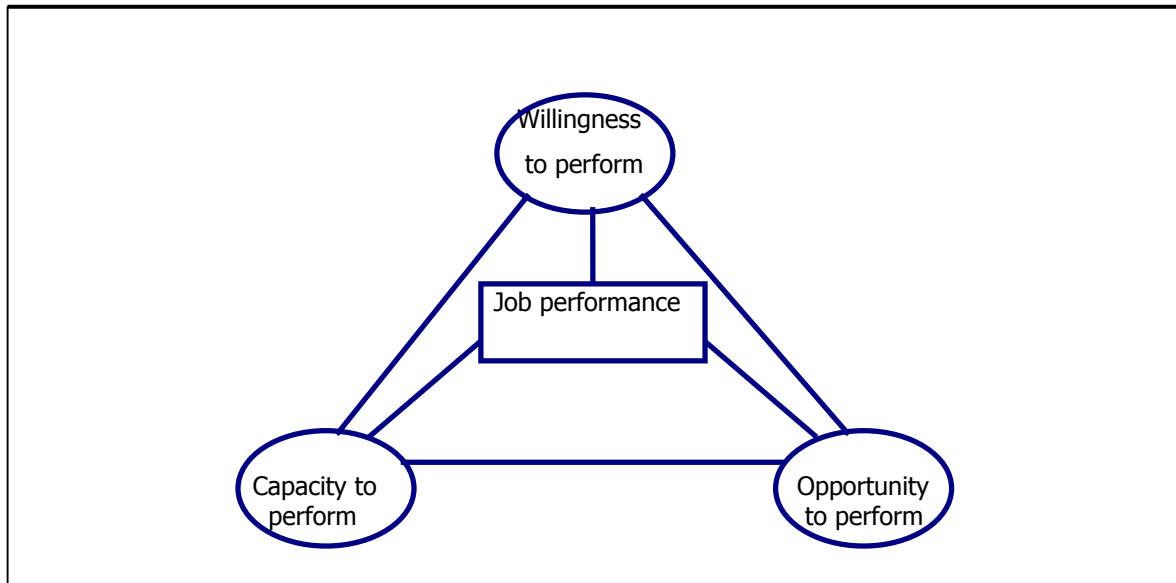


Figure 2.2: Determinants of job performance (Ivancevich & Matteson, 1996, p. 156)

As the opportunity to perform is determined by variables external to the individual, the systems approach is required to understand work performance better.

2.8 INTEGRATION OF CONCEPTS: WORK PERFORMANCE IN THE ORGANISATIONAL SYSTEM

Systems theory is useful to integrate the concepts 'personality' and 'work performance' in the organisation. Bateman and Zeithaml (1990) offer a simple description of organisational systems theory as a general scientific approach in

which an organisation is seen as a set of interdependent elements with the generic structure of input, process, output, and environment. Bateman and Zeithaml (1990) distinguish between closed systems (no emphasis on interdependence with the external environment) and open systems (the organisation is seen as interdependent with its external environment). The nature of the interdependence between organisations and their environment is highlighted as follows by Lewis et al. (1998): Organisations import resources from the external environment, these resources are then processed and exported to the environment in the form of products and services.

An important input into the system is employees' characteristics like personality, knowledge, aptitude and experience that will have an effect on work performance. Other influences on work performance indicated by Figure 2.3 are management, the processes of the organisation, the tools available to do the work, and the external work environment.

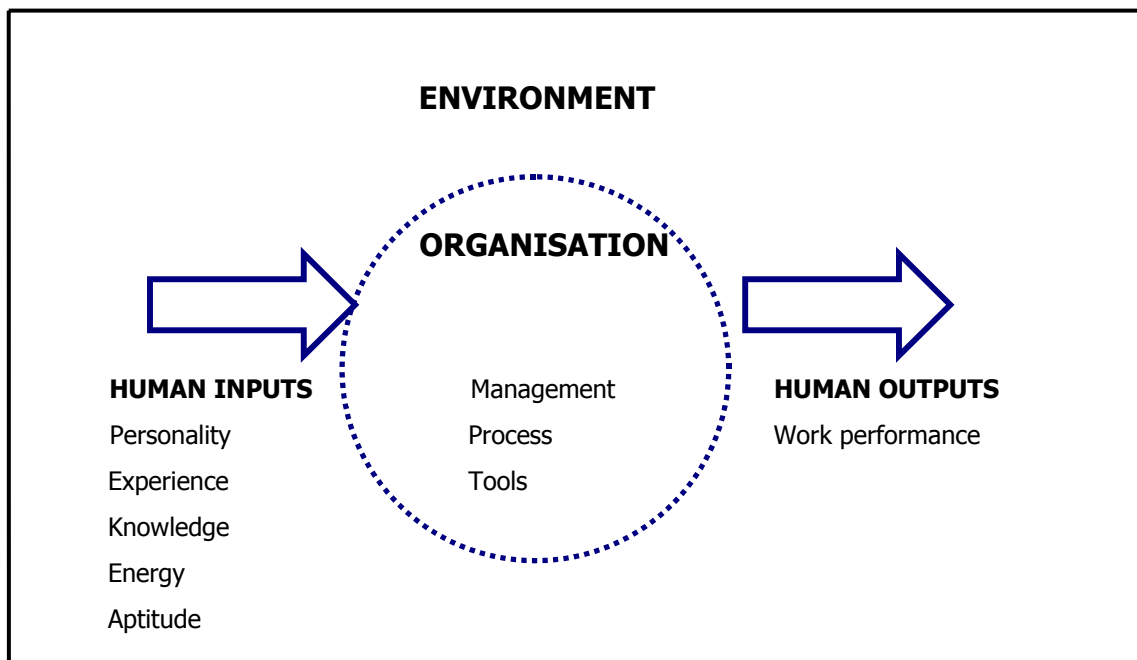


Figure 2.3: The organisation as an open system

According to Lewis et al. (1998) the systems perspective stresses the multiple influences on any part of the system, which make it impossible to focus entirely on any one influence as it impacts on a specific outcome. This is demonstrated in both Figure 2.2 and Figure 2.3.

At the same time the organisation is an open system influenced by its environment (Lewis et al., 1998), for example the economy. The multitude of influences on work performance in the organisational system has important implications for research design in terms of investigating extraneous variables that may have an effect on the dependent variable (work performance).

In summary, the literature review points out that personality is one of the inputs into the organisational system, which has an effect on the eventual work performance as the output of the organisational system. As both personality and the performance are measurable, it should be possible to investigate whether it is possible to predict performance based on personality profile.

2.9 PREVIOUS RESEARCH ON THE RELATIONSHIP BETWEEN PERSONALITY AND WORK PERFORMANCE

Kierstead (1998) points out that prior to the 1980's, it was generally assumed that the link between personality and work performance was by far not as important as the link between cognitive ability and work performance. According to Kierstead (1998) the greatest single advance in personality research has been the emergence and acceptance of the Five Factor model of personality, which led to intensification of research examining the link between personality and job performance.

Barrick and Mount (1991) conducted a meta-analysis of 117 studies involving in total 23 994 subjects to establish whether work performance in general and not for a specific type of work, is predictable based on the measurement of the "Big

Five" personality traits. The five personality traits are extraversion, agreeableness, conscientiousness, emotional stability and openness to experience and the performance criteria Barrick and Mount used are job proficiency, training proficiency, and personnel data. Barrick and Mount found that one dimension of personality, conscientiousness, showed consistent relations with the three performance criteria for all the occupational groups. For the other four personality dimensions the correlations varied by occupational group and performance criterion.

Research studies that investigated personality profiles that would predict work performance in a specific kind of work have been encouraging. SHL (www.shl.co.za) conducted a number of South African studies to validate the Occupational Personality Questionnaire as instrument to predict work performance, including the following:

- (1) Study number V001 tested the relationship between the personality profile and work performance (measured by 12 performance criteria) of 69 branch managers in a financial institution. Significant relationships were identified between the OPQ CM5.2 scales and all of the performance criteria with correlations between 0,23 and 0,53. SHL therefore concluded that the OPQ CM5.2 could reliably be used in the selection of branch managers in a financial institution to predict future work performance.
- (2) Study number V007 tested the relationship between the personality profile and work performance of 72 public sector middle managers. Significant relationships (r between 0.28 and 0.57, $p = 0,05$) were identified between OPQ CM4.2 scores and Inventory of Management (IMC) scores. It was concluded that the OPQ could reliably be used in the selection of public sector middle managers to predict future work performance based on

correlation coefficients of between-test validity where the OPQ CM4.2 and the IMC was used.

- (3) Study number V015 tested the effect of the personality profile on the work performance of 35 call centre operators. Although the result may have been influenced by the very small sample, there were a few coefficients of higher than 0,20 and it was concluded that the OPQ CM4.2 could reliably be used in the selection of call centre operators to predict future work performance.
- (4) Study number V019 tested the effectiveness of using a battery of predictors consisting of the South African Wechsler Adult Intelligence Scale (SA WAIS), the Career Path Appreciation (CPA), the OPQ32i, the Minnesota Multiphasic Personality Inventory (MMPI) and the 16Pfi to select (predict job performance of) supervisors for a large food production company. The sample consisted of 79 supervisors from the company in question. The conclusion was that the tests included in the battery are good predictors of job performance because the stepwise multiple regression analyses indicated that the SA WAIS contributes 30 %, the CPA contributes 3 %, the OPQ32i contributes 30 %, the 16Pfi contributes 21 % and the MMPI contributes 18 % to the prediction of work performance in the given context.

SHL (www.shl.co.za) has also conducted tests with other personality questionnaires. The Customer Contact Styles Questionnaire (CCSQ) was used to test the relationship between the personality profile and work performance measured by the Customer Contact Competency Index (CCCI). The sample consisted of 172 trainee brokers. The results showed significant correlations between certain personality traits and work performance (correlations between 0,24 and 0,35 with p values between 0,01 and 0,05). It was concluded that

personality could be used as a predictor of the work performance of trainee brokers.

SHL (www.shl.co.za) used the OPQ32i to test the relationship between personality and work performance of 162 call centre operatives in a large national bank in the United Kingdom. Eight of the dimensions of the OPQ32i were shown to have a significant relationship with work performance at the 0,05 level of significance.

Saville, Sik, Nyfield and Hackston (1996) conducted two validation studies of the Concept Model of the OPQ, separated by four years. A total of 710 senior and middle managers from various organisations and industries participated. The results confirmed that the OPQ consistently predicts job success across different organisations and over time (combined correlation $r = 0,4$).

Chatman, Caldwell and O'Reilly (1999) did a longitudinal study of the job offers and early job success of 83 MBA students selected on the basis of an ideal managerial personality template. They found that the students whose personalities matched the template proved to be more successful in their careers than did those who fitted the managerial template less well. The personality template could therefore be used as a predictor of work success or performance.

Barnard (1987) researched the relationship between personality and work performance in general of 60 men in a variety of careers and found significant differences between seven of the sixteen personality factors, as measured by the 16PF, of high and low performing groups. The results of Barnard's (1987) study are summarised in Table 2.4 below. The significance level was established at $p < 0,05$ and only significant results are shown.

TABLE 2.5: *t*-TEST RESULTS FOR EQUALITY OF MEANS OF HIGH AND LOW PERFORMING GROUPS ON 16PF TRAITS (n=60)

Factor	Description	<i>P</i>
B	Less intelligent <i>versus</i> More intelligent	0,0005
E	Humble <i>versus</i> Assertive	0,0256
G	Expedient <i>versus</i> Conscientious	0,0034
M	Practical <i>versus</i> Imaginative	0,0360
Q1	Conservative <i>versus</i> Experimenting	0,0074
Q2	Group-dependent <i>versus</i> Self-sufficient	0,0098
Q3	Casual <i>versus</i> Controlled	0,0476

Doman (2000) researched the relationship between the personality and work performance of 74 supervisors and found significant differences between six first order factors and one second order factor as measured by the 16PF, of high and low performing individuals. Doman's (2000) results of high performing individuals are summarised in Table 2.5 below.

TABLE 2.6: RELATIONSHIP BETWEEN PERSONALITY AND THE WORK PERFORMANCE OF SUPERVISORS (n = 74)

Factor	Location of score	Description	Pearson correlation coefficient <i>r</i>	Level of significance <i>p</i>
B	High	More intelligent	$r=0,37$	$p<0,05$
C	High	Emotionally stable	$r=0,39$	$p<0,05$

L	Low	Trusting	$r=-0,29$	$p<0,01$
O	Low	Placid	$r=-0,34$	$p<0,05$
Q4	Low	Relaxed	$r=-0,28$	$p<0,01$
QII	Low	Non-anxious	$r=-0,42$	$p<0,05$

Published research studies have found that there is a relationship between personality and work performance. No research could be found in the specific discipline of credit control within the banking industry.

2.10 CHAPTER SUMMARY

Chapter two covered a literature review, starting with an historical perspective of the concept of personality, followed by a definition of personality and a discussion of personality theories. Dimensional theories of personality, within which this study has been scoped, were discussed in detail. Two instrument groups, the Sixteen Personality Factors (16PF) questionnaires and the Occupational Personality Questionnaires (OPQ), were compared and motivation provided for the choice of instrument to measure the independent variable (personality).

The concept of work performance (the dependent variable) was defined and work performance was conceptualised within the organisational system.

Previous research on the relationship between personality and work performance was explored. Most published research studies have found that there is a significant relationship between personality and work performance although no research could be found in the specific discipline of credit control within the banking industry.

CHAPTER 3

RESEARCH DESIGN

3.1 INTRODUCTION

In this chapter the operationalisation of the research within the context of Bankfin, the finance division of Absa, will be described, after which the actual process followed to conduct the research, will be explained.

3.2 POPULATION AND SAMPLE

The population for the present study was the total credit control staff complement at Bankfin who worked alone on the same portfolio for the three consecutive months during which the performance data was obtained. The population consisted of 155 credit controllers. Christensen (1994) points out that the power of the statistical test increases with the number of subjects in the sample. Kretjcie and Morgan (as cited by Christensen, 1994) suggest that for a population of this size, the sample size should be approximately 125. Christensen (1994) acknowledges, however, that increasing sample size goes hand in hand with increasing cost in terms of both time and money. The researcher attempted to balance these competing elements.

The subjects were full-time employees of Absa who participated in the research during working hours. Moreover, they were distributed throughout South Africa with as few as one debt collector in some small towns. Sampling was therefore not done at random, but rather on the basis of convenience. The planned sample size was 126 and the realised sample size was 89. See section 4.2.1

where a comparison of the salient features of the population and the sample are shown in Table 4.1.

3.3 MEASURING INSTRUMENTS

3.3.1 Measurement of the independent variable

The independent variable for the current research is personality profile, which is measurable by means of psychometric testing. The OPQ32i is the instrument that was chosen both on account of the quality of the instrument (see sections 2.6.2.3, 2.6.2.4 and 2.6.3) and for the practical reason that it is one of the psychometric instruments currently used in Absa for selection and development purposes. Some of the subjects in the sample had already been tested which not only made the data gathering process easier, but the test results of the subjects who were tested as part of the research, could be made available to Absa for further developmental use.

All job incumbents were selected for the position by means of psychometric testing and there may therefore be restriction of range on some of the personality traits. Lachenicht (2002) explains that restriction of range occurs when variables have unrepresentatively small variances. Information for all applicants to the position of credit controller was not available and therefore the restriction of range could not be investigated.

3.3.2 Measurement of the dependent variable

The dependent variable for the current research is work performance, which in the area of credit control in Bankfin (the finance division of Absa) is measured in terms of three sub-measures: percentage of delinquent accounts, percentage of accounts in arrears for more than two months, and customer complaints. The

three sub-measures are then aggregated to achieve a total performance evaluation.

3.3.2.1 Percentage of delinquent accounts

Delinquent accounts are those accounts that have fallen into arrears for more than thirty days or one payment. The online credit management system of Bankfin is used monthly to calculate the number of delinquent accounts as a percentage of the total number of accounts in each portfolio. The higher the percentage of delinquent accounts, the lower the performance of the credit controller. According to C. Cronjé (personal conversation, 20 March 2002) this sub-measure carries a weight of 33,3 percent of total performance and it includes the accounts that are in arrears for two or more months (see section 3.3.2.2), but the latter category is a separate sub-measure as well because of its importance to the total performance of a credit controller.

3.3.2.2 Percentage of accounts in arrears for two months or more

The online credit management system of Bankfin is used monthly to calculate the number of accounts that are two payments or more in arrears as a percentage of the total number of accounts in each portfolio. The higher the percentage of accounts in arrears for two months or more, the lower the performance of the credit controller. According to C. Cronjé (personal conversation, 20 March 2002) this category carries a weight of 50 percent of total performance and it is also included in the measurement of the percentage of delinquent accounts, see comments under section 3.3.2.1.

3.3.2.3 Number of customer complaints

Customer complaints are recorded at the customer satisfaction hotline. In cases of unprofessional conduct, the description of the complaint refers to the name of the staff member involved. The higher the number of customer complaints, the lower the performance of the credit controller. According to C. Cronjé (personal conversation, 20 March 2002) this category carries a weight of 16,7 percent of total performance.

3.3.2.4 Total performance

Odd percentages are used for the weighting of the three sub-measures because a 60-point scale is used in Bankfin and that has been converted to a percentage scale.

In view of the fact that the sub-measures "Percentage of delinquent accounts" and "Percentage of accounts that have been in arrears for two months or more" are expressed in percentages, the "customer complaints" sub-measure has also been converted into percentage based on the number of complaints per individual compared with the highest number of complaints for any individual during this particular three month period. This procedure was chosen because the performance of a credit controller with no customer complaints represents the best possible performance in this category, whereas the credit controller with the most customer complaints represents the worst possible performance in this sub-measure (100% on a negative rating) for the given three-month period.

The conversion of customer complaints into percentages allows for aggregation of the three sub-measures after application of the appropriate weighting. Since all three the performance sub-measures are expressed in terms of a reversed

scale (the higher the percentage, the lower the performance), the same interpretation applies to total performance.

The measurement of the dependent variable was evaluated statistically and the results are reported in section 4.1.2.

3.3.3 Identification of extraneous variables

Owing to the multiple influences in any organisational system that could have an effect on work performance, it was important to recognise that there were extraneous variables that needed to be taken into account in the research. The crucial extraneous variables were identified by means of a focus group of people in the credit control discipline of Bankfin. The nominal group technique was used. Bateman and Zeithaml (1990) describe this technique as a process with the following steps:

- (1) Individuals sit at a table and write down their ideas about the problem.
- (2) The ideas are presented on a round-robin basis by the attendees until all the ideas have been adequately clarified and evaluated.
- (3) The decision is determined by a written, silent vote.

3.4 RESEARCH PROCEDURE

3.4.1 Methods to ensure reliability and validity

Mouton and Marais (1994) point out that the reliability of the observations or data is influenced by four variables: the researcher, the participants, the research context, and the measuring instruments. Cohen (1988) also includes

the representativeness and size of the sample as influencers of the reliability of the observations. These additional elements were discussed in section 3.2.

3.4.1.1 The researcher and the participants

The researcher acted in accordance with the ethical principles prescribed by The Psychological Society of South Africa (1996). The researcher works for the organisation and has a positive image due to longstanding value adding service. The purpose and benefits of the research project were thoroughly communicated to both management with whom the research was contracted, and the employees who were chosen as part of the sample. The researcher made a commitment to the participants that the results of the research would only be used for future recruitment purposes. Permission was obtained from the employees to make the psychometric test results available to Absa for further developmental use. The general manager of Bankfin (responsible for credit and risk) made a commitment in writing that no employee would be negatively influenced as a result of the findings and that, if a significant relationship was found between personality variables and performance, this would only be utilised for future recruitment purposes.

3.4.1.2 The context

Crucial extraneous variables were determined and measured (see section 3.4.3.5) so that the relationship of those variables and performance could be taken into consideration when the relationship between personality and performance was investigated.

3.4.1.3 *The instruments*

The measuring instruments used for measurement of the dependent variable (performance) are standardised across the whole credit control population: the percentage of delinquent accounts and the percentage of accounts in arrears for two months and more are determined monthly on a computerised basis, and client complaints are captured as they occur, identifying the employee involved in the record of the complaint (J van der Merwe, personal communication, 7 May 2001).

The performance records in respect of the three months were obtained to allow for any *ad hoc* influences such as illness or leave. Only those subjects who worked alone on the same portfolio for the three consecutive months during which the performance data was obtained, were included in the population.

The psychometric properties of the instrument (OPQ32i) used for the measurement of the independent variable (personality profile) were discussed in chapter two, section 2.6.2.3. The instrument is considered culture fair by SHL (www.shl.co.za) as discussed in chapter two, section 2.6.2.4. The suitability of the instrument is further enhanced by the following guiding criteria set for the development of the OPQ (Saville et al., 1995):

- (1) It was designed specifically for the world of work and therefore items relating to religion or sexual identity/orientation have been avoided.
- (2) Clinical or obscure psychological constructs have been avoided to make it more applicable and user-friendly for the work environment.
- (3) It is comprehensive in terms of the personality scales measured.

- (4) Apart from industrial/organisational psychologists, it is available for use by appropriately trained human resource practitioners.
- (5) It is based on sound psychometric principles, so the professional standard is above reproach.

3.4.2 Evaluation of feasibility

The Psychological Society of South Africa (PSYSSA) (1998) suggests that researchers involved in criterion-related validity studies should determine whether the study is feasible by considering four aspects of the study: stability of the job used in the study, quality of the criterion, representativeness of the sample, and statistical power.

3.4.2.1 Stability of the job

The job of credit controller in Bankfin has existed in the same format for at least ten years and the same measures of performance have been in existence for at least six years (C. Cronjé, personal communication, 12 April 2003).

3.4.2.2 Evaluation of the criterion

According to PSYSSA (1998) the criterion measure should be relevant, reliable, uncontaminated and unbiased. The complicated measure used for performance in this study was evaluated statistically and the results are reported in chapter four.

3.4.2.3 Representativeness of the sample

PSYSSA (1998) cautions that there are influences such as restriction of range in the predictor and the criterion that may distort the estimate obtained from the sample. The representativeness of the sample was evaluated and is reported in section 3.2, Table 3.1. Due to the fact that information for all applicants to the position of credit controller was not available, the restriction of range involved in this study could not be evaluated.

3.4.2.4 Statistical power

According to PSYSSA (1998, p. 11) "statistical power refers to the probability of detecting a relationship between the predictor and the criterion in a sample if such a relationship exists in the population". PSYSSA (1998) suggests that suitable tables should be consulted to establish sample sizes and that a minimum statistical power of 0,80 should be used as a basis to determine sample sizes. Wiesen and Schlenger (1998) offer suitable tables to establish the correct sample size and they confirm that, the bigger the sample, the higher the statistical power of the test will be. Sample size in this study, however, has been limited by practical considerations (see section 3.4.3.3).

Cohen (1988) explains that the power of a statistical test depends on the significance criterion, the reliability of the sample results, and the effect size or degree to which the phenomenon exists.

a. The significance criterion

The probability standard chosen for this study is the 0,05 significance level.

b. Reliability of the study

Cohen (1988) points out that in practice the reliability of sample results is necessarily an estimated value, since the population value is generally unknown. Measures that were taken to ensure the reliability of the study are discussed in section 3.4.1.

c. Effect size

Effect sizes are reported in chapter four. According to Prentice and Miller (1992) there is a growing realisation that conventional statistical significance testing (SST) procedures are inadequate in portraying the importance of statistical effect and that effect size is at least as informative. The 1994 publication manual of the American Psychological Association (APA) recognises that p -values are not acceptable measures of effect size magnitudes and encourages authors to report effect sizes (Thomson, 1999). Henson and Smith (2000) point out that, although effect size is not often reported or interpreted by researchers, the APA has again clearly stated in a task force report in 1999 that researchers should always report effect size measures.

An effect size that is too small to be picked up by the significance test, but big enough to not be considered trivial, will indicate the risk of a type II error, which is defined by Aron and Aron (1997, p. 128) as “the error you would make in not rejecting the null hypothesis when in fact the reality is that the null hypothesis is false”. Henson and Smith (2000, p. 286) supports this view with their statement “SSTs only answer the question: Assuming the null hypothesis is true, what is the likelihood of obtaining my results? SSTs don’t answer the question: Given my results, what is the likelihood that the null hypothesis is true in the population?”

Another problems with SSTs as pointed out by Henson and Smith (2000) is the use of the term 'statistical significance' which is misleading if the general meaning of the term 'significant', which is 'important', is considered.

In the light of the above, effect sizes are reported in chapter four.

According to Prentice and Miller (1992) the measure of effect size in correlation studies is the correlation coefficient (r). They list the following benefits of effect size measures:

- (1) They indicate the degree to which a phenomenon is present on a continuous scale with zero indicating that the phenomenon is absent.
- (2) There are conventions available for what values constitute a small, medium, or a large effect.
- (3) They provide an indication of the practical significance of an effect, which significance tests do not.
- (4) They can be used to compare the results of two or more studies.
- (5) They can be used to guide decisions about how many subjects are needed in a study.

Cohen's (1992) interpretation of effect size in the case of correlations is that it is small (difficult to observe with the naked eye, but not trivial) if r is approximately 0,10, it is medium (visible to the naked eye) if r is in the region of 0,30, and it is large (same distance above medium as small is below medium) if r is in the region of 0,50.

3.4.3 Data collection

The data was collected in the following steps:

3.4.3.1 Contracting the client

The content of the planned research was shared with the top management of Bankfin to obtain their commitment and consent. The general manager of credit and risk of Bankfin was assisted with regard to a written communication to the credit control departments nationally to gain their commitment and to give them the assurance that no employee would be negatively influenced by the findings of the research. It was specifically stated that if specific personality traits could be identified on the strength of the research findings, it would only be utilised for future recruitment purposes.

3.4.3.2 Personality data

The necessary data in respect of the independent variable (personality) was obtained as follows: First, the human evaluation centre at Absa was visited to obtain the results of the OPQ32i tests already available. These tests were conducted from April 2000 when the OPQ32i version of the OPQ was implemented in Absa and the results were therefore between one month and eighteen months old. In view of the fact that the adult personality is seen as relatively stable (Gerber, Nel & van Dyk, 1993; Gregory, 1994; Maddi, 1996; Meyer et al., 1988), the results were accepted as recent enough to be valid.

In the case of those employees in respect of whom OPQ32i results were not already available, psychometric tests were conducted on location by the researcher in Gauteng, Mpumalanga, Limpopo and North West Province. Owing to the geographical spread of Bankfin, the researcher obtained the help of field

workers (Absa people management consultants who are qualified to use psychometric tests) to do the tests in the Western Cape, Eastern Cape and KwaZulu-Natal. In view of the costs that would have had to be incurred to test the limited number of credit controllers in the Northern Cape and Free State on account of the geographical distribution of these credit controllers, no further testing was done in these provinces.

3.4.3.3 Convenience sample

Owing to the geographical spread of the branches of Bankfin throughout South Africa, sampling needed to be done on the basis of convenience. The population of N=155 consisted of the total credit control staff complement at Bankfin who worked alone on the same portfolio for the three consecutive months during which the relevant performance data was obtained.

The planned sample included, firstly, all those employees in respect of whom OPQ32i results were already available. Secondly, it included all those employees who worked in teams larger than two per branch and in branches that were not too far into rural areas, so that the cost could be justified.

The planned sample was 126 because 39 employees were working alone in isolated rural branches, making data collection in these cases very time-consuming and costly. The realised sample is described in Table 3.1.

TABLE 3.1: DESCRIPTION OF THE REALISED SAMPLE

Number of subjects	Status	Percentage of population
89	Participated	57,4 %
39	Too far and isolated to justify the cost	25,2 %
15	On leave or out on business at the time when the branch concerned was visited	9,7 %
9	Had resigned or had been transferred between the time that the population was determined and the time that the tests were conducted.	5,8 %
3	Refused to participate	1,9 %
155	TOTAL	100 %

3.4.3.4 Performance data

The dependent variable (performance) was measured by retrieving the percentage of delinquent accounts and the percentage of accounts that were in arrears for two months or more for each portfolio from the online credit management system in respect of three consecutive months. Only those credit controllers who worked alone on the same portfolio for the three months under consideration were included in the population of 155 from which the sample was taken.

The data needed about customer complaints received during the same three months was obtained from Bankfin's customer satisfaction action line department.

The biographical data needed to assist in the identification of the subjects on both the online credit management system and the customer complaint records, was obtained from Absa's mainframe computer and by means of direct contact with the Bankfin branches concerned.

3.4.3.5 Focus group to identify extraneous variables

A focus group consisting of six representatives of interest groups in the credit control department of Bankfin (Gauteng North) was used to identify possible crucial extraneous variables that may have an effect on the performance of individuals. The nominal group technique was used for this purpose (see section 3.3.3). Five extraneous variables were identified and they were quantified as shown in Table 3.2 below.

TABLE 3.2: EXTRANEOUS VARIABLES

Extraneous variable	Quantified as
Geographical location of work area	Rural/Urban
Gender of credit controller	Male/Female
Race of credit controller	White/Black (definitions correspond with Employment Equity Act [1998] definitions)
Size of credit controller's portfolio	Number of accounts in the portfolio
Quality of credit controller's portfolio	Average behaviour score of the arrears accounts in the portfolio as calculated by the online credit management system

3.5 DATA ANALYSIS

The data analysis was done using descriptive statistics, correlations and multiple regression analyses.

3.5.1 Descriptive statistics

Descriptive statistics of the sample, the extraneous variables, the independent variable (personality) and the dependent variable (performance) were obtained to gain insight into their nature. These statistics include minimum and maximum scores, means, standard deviations and frequency distributions.

The results of the descriptive statistics are reported in chapter four.

3.5.2 Correlations

According to Keller and Warrack (2000) the coefficient of correlation (also called the *Pearson correlation coefficient*) is the statistic used to determine the strength of linear association between two variables. The coefficient of correlation (denoted r) will always lie between -1 and $+1$ and Keller and Warrack (2000) offer the following interpretation guide:

- (1) If r is close to $+1$, it indicates a very strong positive relationship between two variables. Graphically this will present a straight line sloping upward from left to right.
- (2) If r is close to -1 , it indicates a very strong negative relationship between two variables. Graphically this will present a straight line sloping downward from left to right.

- (3) If r is close to zero, it indicates that no straight-line relationship exists between the two variables.

In the event of an extraneous variable that has a statistically significant effect on the dependent variable, correlation can be investigated by controlling for the significant extraneous variable (holding it constant). The use of a *partial correlation coefficient* accomplishes this (Aron & Aron, 1997).

According to Prentice and Miller (1992) there is a growing realisation that conventional significance testing procedures are inadequate in portraying the importance of statistical effect and that effect size is at least as informative (see section 3.4.2.4.c). Cohen's (1992) interpretation of effect size in the case of correlations is as follows:

- (1) It is small (difficult to observe with the naked eye, but not trivial) if r is approximately 0,10.
- (2) It is medium (visible to the naked eye) if r is in the region of 0,30.
- (3) It is large (same distance above medium as small is below medium) if r is in the region of 0,50.

The following correlations were done in this study:

- (a) Inter-correlations of the sub-measures of performance with each other.
- (b) Inter-correlations of extraneous variables with each other and with the performance variable.

- (c) Correlations of personality variables with the performance variable as well as partial correlations of personality variables with the performance variable where the significant extraneous variables are first partialled out in turn and then at the same time.

The results of the correlations are reported in chapter four.

3.5.3 Multiple regression analyses

The correlation studies were done to investigate the importance of each of the personality variables to predict performance on their own. However, the current question is to determine how important personality dimensions are when they are used together to predict performance. In a case where the nature of multiple co-linearity of independent variables (in this case including extraneous variables) is unknown (or unrevealed by a simple correlation matrix), Keller and Warrack (2000) suggest that the stepwise regression procedure should be used.

According to Hair, Anderson, Tatham and Black (1995) stepwise regression is a procedure that iteratively adds and deletes one independent variable at a time, based on the incremental explanatory power they can add to the regression model. Independent variables are added as long as their partial correlation coefficients are statistically significant. Independent variables may also be dropped if their predictive power drops to a non-significant level as other variables are added. Eventually, only those independent variables that make a statistically significant contribution to predicting the dependent variable are included in the model.

The following regression analyses were done:

- (1) Multiple regression analysis with personality variables as predictors and performance as the dependent variable.
- (2) Multiple regression analyses with personality variables and significant extraneous variables in turn as predictors and performance as the dependent variable.
- (3) Multiple regression analysis with personality variables and significant extraneous variables together as predictors and performance as the dependent variable.

The results of the multiple regression analyses are reported in chapter four.

3.5.3 Reporting of results

In chapter four the results are reported in table format for ease of interpretation and then discussed. The results are finally summarised, interpreted and used to identify limitations and make recommendations (see chapter five).

3.6 CHAPTER SUMMARY

Chapter three consisted of a discussion of the research design. The population and sample were compared with each other and the measuring instruments for the independent variable (personality) and the dependent variable (work performance) were discussed. Extraneous variables were identified and the methods that were put in place to ensure reliability and validity were discussed. Evaluation of the feasibility of the study was discussed. The procedure followed to collect the data, the various statistical tests done to analyse the data, and how the data is reported, were also discussed.