THE PREDICTIVE VALIDITY OF THE BIG FIVE CONSTRUCTS ON JOB
PERFORMANCE: A META-ANALYSIS

by

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DECLARATION OF ORIGINAL AUTHORSHIP

I, Ninette Mari van Aarde, declare that this dissertation titled, "The predictive validity of the big five constructs on job performance: A meta-analysis", which I hereby submit in the fulfilment of the requirements for the degree MCom Industrial Psychology in the faculty of Economic and Management Science at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

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ETHICS STATEMENT

The author, whose name appears on the title page of this dissertation, has obtained, for the research described in this work, the applicable research ethics approval. The author declares that he/she has observed the ethical standards required in terms of the University of Pretoria's Code of ethics for researchers and the Policy guidelines for responsible research.

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ABSTRACT

THE PREDICTIVE VALIDITY OF THE BIG FIVE CONSTRUCTS ON JOB PERFORMANCE: A META-ANALYSIS

Organisations want to employ people who will perform well and contribute to the bottom line. Research over a number of years has been dedicated to finding and validating predictors of job performance. Although General Mental Ability has been proven to be one of the best predictors of job performance across different jobs it is not the only predictor. The study of personality as a predictor of job performance has a long history and individual studies have yielded varying results, however, the use of cumulative research has demonstrated consistent results over various jobs, industries and countries. When a measure adds to the prediction of a criterion above what can be predicted by other sources of data the measure can be said to have incremental validity (Hunsley & Meyer, 2003). Studies prove that personality contributes to the incremental validity of predicting performance. In addition to cognitive ability, Conscientiousness and Emotional Stability significantly increase the incremental validity of predicting performance. This study investigated the predictive validity of the Big Five on Performance in a South African context by means of a meta-analysis. The study was based on quantitative research and made use of secondary data. Stratified purposive sampling was used to gather studies that met the criteria of the study. Based on the inclusion criteria, 34 studies were included in the analysis with a combined sample size of N=7100. The results corroborate international findings concerning the predictive validly of personality for performance. Although the number of studies available was small the relationships that were found are comparable to those reported in international research and demonstrated that each of the Big Five Factors correlated with the criterion to some extent. The criterion was categorised into performance categories, where the predictors of Technical Performance are Conscientiousness (.20) and Emotional Stability (.13). Conscientiousness (.25) and Extraversion (-.19) are the best predictors of Academic Performance. Organisational Citizenship Behaviour yielded positive relationships with all five factors with Openness to Experience (.36), Emotional Stability (.30),

Agreeableness (.25) and Extraversion (.24) being the best predictors. Conscientiousness (.32) and Emotional Stability (.30) were shown to be valuable in predicting Avoiding Counterproductive Work Behaviour. Overall Performance is influenced most by Emotional Stability (.21), Extraversion (.16) and Openness (.16). This is the first meta-analysis exploring the predictive validity of the Big Five on Performance in South Africa.

Key words: Big Five, Five Factor Model (FFM), Personality, Performance, Meta-Analysis, Agreeableness, Conscientiousness, Emotional Stability, Extraversion, Openness to Experience, South Africa, Predictive Validity

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CHAPTER 1- INTRODUCTION TO THE STUDY

This chapter discusses the background and significance of the study. It summarises the problem this research was designed to address. This study aims to provide organisations and recruiters with valuable information regarding the validity of the use of personality to predict job performance in the South African context.

1.1 BACKGROUND

Human capital plays a vital role in the competitive advantage of a company and when it is managed successfully it is extremely hard to imitate (Mello, 2010). The basis of personnel selection involves selecting the candidates who are most likely to perform well on the job (Viswesvaran & Ones, 2000). The most important characteristic of any employee selection method is its predictive validity - in other words its ability to predict future job performance and job related learning (Schmidt & Hunter, 1998). Job performance refers to the things employees do, how they act and what they achieve and this in turn relates to and contributes to organisational objectives (Viswesvaran & Ones, 2000). Job performance is a multi-dimensional construct that includes how well an employee accomplishes their responsibilities, the initiative they take and the creativity they utilise when solving problems (Boshoff & Arnolds, 1995). When selecting from existing employees the key focus is on matching an applicant's attributes to the requirements of the vacant job (Tsai, Chen, & Chen, 2012).

Researchers have attempted to determine predictors of job performance. Although it is widely accepted that cognitive ability is a valid predictor of job performance (Tett, Jackson, & Rothstein, 1991) it is not the only predictor of job performance (Cascio & Aguinis, 2008). Whether or not intellectual capital is of critical importance in determining organisational success depends on the competence and commitment of employees (Tsai et al., 2012). Studies have shown that personality, in particular the Big Five personality factors, predicts job performance across settings and occupations (Barrick & Mount, 2005; Goldberg, 1993).

Various meta-analyses have been conducted worldwide to examine the relationship between personality and job performance. These studies have consistently found that several of the Big Five personality dimensions are related to job performance (Barrick & Mount, 1991; Hough, Eaton, Dunnette, Kamp, & McCloy, 1990; Salgado, 1997). However, thus far no meta-analytic studies concerning the predictive validity of personality for job performance have been published in South Africa. This raises questions in relation to whether the findings concerning personality as a predictor of job performance can be generalised to the South African context.

1.2   PROBLEM STATEMENT

This study made use of a meta-analysis to investigate the predictive validity of the Big Five personality constructs for job performance in the South African context. Employing talented employees can lead to a continuous competitive advantage for organisations (Carless, 2009). The importance of recruiting talented employees means that recruitment is crucial for business continuity and success. Employees are critical to the success of the organisation and therefore recruitment has become a core function in organisations (Walker et al., 2013).

The higher the predictive validity of the hiring methods used the greater the observable effect on employee performance, which can be measured through factors such as increased output, increased value of output, and increased enhancement of job related skills (Schmidt & Hunter, 1998). Research indicates that when recruiting a person with no previous experience, general metal ability (GMA) has the greatest influence on future learning and performance. However, GMA is not the only predictor of success and other measures contribute to the overall predictive validity of the selection process (Schmidt & Hunter, 1998). Personality variables can be used to determine whether an individual will fit with an organisation (Day & Silverman, 1989). As much as cognitive ability may significantly impact job performance, this might also hold true for personality (Day & Silverman, 1989). Managers consider personality to be almost as important a variable as GMA when making recruitment decisions (Dunn, Mount, Barrick, & Ones, 1995). The use of personality measures in employment decision making has become popular due to the measures' good criterion-related validity for predicting job performance (Tsai et

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al., 2012). Personnel selection research has confirmed that personality, in particular the Five Factor Model, is an important predictor of performance behaviours at work (Rodrigues & Rebelo, 2013). Personality contributes to the prediction of job performance, over what can be predicted by cognitive measures alone (Day & Silverman, 1989).

The validity of a recruitment method is directly related to its practical value, which relates to the effects of the hiring method on the organisation (Schmidt & Hunter, 1998). Research investigating the ability of personnel selection methods to predict performance and learning has been around since the early 1900s. This body of research has yielded varying results and suggests that the validity of a selection procedure is mostly dependent on the situation or setting in which it is used (Schmidt & Hunter, 1998). The relationship between personality and job performance has been a topic of interest and investigation in personnel psychology for many years. However, studies investigating the predictive validity of personality have produced varied results (Sitser, van der Linden, & Born, 2013). Statistical advances and the development and use of meta-analytic procedures suggest that the actual variability in validity is small to none, making it possible to select the most valid selection methods (Schmidt & Hunter, 1998).

The development and adoption of the Five Factor Model or Big Five Model of personality has proven that personality has value as a predictor (Sitser et al., 2013). Researchers using the Big Five Model have constantly found that personality predicts job performance in different jobs with employees with various skills (Sitser et al., 2013). Personality appears to be related to individual attitudes and behaviour as well as team and organisational functioning (Judge, Rodell, Klinger, Simon, & Crawford, 2013).

Many assessments currently used in South Africa have been adopted and adapted from assessments developed in other countries and this raises questions concerning the cross-cultural fairness of applying these assessments in a South African context (Foxcroft, Paterson, Le Roux, & Herbst, 2004). Language fairness is a critical concern in the use of assessments in South Africa. According to Nell (1994, as cited

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in Foxcroft et al., 2004) language is one of the most important moderator variables influencing test performance in South Africa, which is a multilingual country.

Allik and McCrae (2004, p. 23) explained the complexity of the South African environment as follows: "the primacy of human groups over geophysical locations is illustrated by the fact that Black and White South Africans have very different personality profiles, despite living in the same country for many generations". The structural equivalence of personality inventories is weak across ethnic groups, while personality inventories have low reliability in indigenous African groups (Meiring, Van de Vijver, Rothmann, & Barrick, 2005). Taylor and De Bruin (2005) set out to develop a culturally valid measure of the FFM (Basic Traits Inventory) in South Africa by considering the local context, and found similar factor structures and reliabilities of the five factors of their measure across groups. Nel et al. (2012, p. 919) concluded that "this work suggests that personality inventories based on trait models such as the FFM can yield comparable scores across cultural groups in South Africa".

As part of a project referred to as the South African Personality Inventory (SAPI) project Nel et al. (2012) investigated the inherent personality structure in South Africa's eleven official languages and identified a nine-cluster model of personality. A study by Fetvadjiev, Meiring, van de Vijver, Nel and Hill (2015) found that a 6-dimensional structure (comprising a positive and a negative Social-Relational factor, Neuroticism, Extraversion, Conscientiousness, and Openness) was equivalent across groups and could be replicated.

According to Barrick and Mount (2005) personality as a predictor of job performance is valuable because it explains behaviour at work. These authors argued that studies using the Big Five personality constructs have shown that personality predicts job performance across outcomes that organisations value. However, this result has only been found in pockets in South Africa and has not yet been generalised to the South African population as no meta-analytic review has been conducted. This study therefore aimed to investigate the predictive validity of the Big Five personality construct for job performance in a South African context by means of a meta-

analysis. Should the findings of this study be similar to those obtained in other countries then the results could be generalised to South Africa.

1.3 PURPOSE STATEMENT

The main purpose of this study was to investigate the predictive validity of personality, in particular the Big Five personality constructs (Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism), in relation to job performance in the South African context. The study made use of a meta-analytic approach.

1.4 RESEARCH OBJECTIVES

The study was based on the following research objectives:

- To determine the predictive validity of the Big Five for several domains of performance in the South African context by means of a meta-analysis study;
- To determine what the correlation is between each of the Big Five and several performance domains; and
- To determine which of the Big Five personality constructs predict job performance most optimally.

1.5 SIGNIFICANCE OF THIS STUDY

South African organisations, like their international counterparts, are desperately trying to attract talent and appoint talented people who could provide organisations with a competitive advantage to advance in the market (Beechler & Woodwa, 2009). Predicting the job performance of potential talent is a key element in appointing talent. However, there are currently no large scale studies relating to the validity of personality as a predictor of job performance in the South African context. There is a need to address this gap.

Although international meta-analytic studies have shown a correlation between some of the Big Five personality constructs and job performance these findings cannot be generalised to South Africa (Anderson & Viswesvaran 1998; Barrick & Mount, 1991, 2002, 2005; Barrick, Mount, & Judge, 2001; Campbell, Castaneda, & Pulos, 2010;

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Griffin & Beryl, 2004; Hough, 1992; Hough et al., 1990; Mount, Barrick, & Stewart, 1998; Ones, Mount, Barrick, & Hunter, 1994; Robertson & Kinder, 1993; Salgado, 1997, 1998, 2002; Tett, Jackson, Rothstein, & Reddon, 1994; Varela, Boccaccini, Scogin, Stump, & Caputo, 2004; Vinchur, Schippmann, Switzer, & Roth, 1998). There is thus a need to determine whether personality can predict job performance in the South African context.

1.6 DELIMITATIONS AND ASSUMPTIONS

1.6.1. Delimitations

The study had several delimitations related to the context, constructs and theoretical perspectives of the study. Firstly, it was limited to the South African context. As such, the study did not consider studies which focussed their sampling on international citizens. Instead, the study drew exclusively on studies that were conducted in the South African context.

Secondly, the study focused on job performance and acknowledges that organisations use different means of measuring job performance and this may impact the perception of good and poor performers.

Finally, the study relied exclusively on data collected for previous studies. Thus the study relied on data already collected by other researchers and is subjected to the limitations of those studies.

1.6.2. Assumptions

An assumption is "a condition that is taken for granted, without which the research project would be pointless" (Leedy & Ormrod, 2005, pg. 5). This study was based on several assumptions.

Firstly, it was assumed that this study would deliver similar results to the studies conducted in other contexts as it was assumed that personality holds some predictive power in terms of performance. Secondly, it was assumed that the studies used in the meta-analysis are valid and reliable and that their reports and findings

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are valid and reliable. The third assumption was that the data used in the meta-analysis would include sufficient information to test the hypothesis and deliver reliable and sufficient results that can be generalised to the larger population. The fourth assumption was that job performance consists of various aspects and any of these aspects were included in the study. The final assumption was that personality constructs can be statistically converted to the Five Factor Model even if the assessments used do not explicitly measure personality in terms of the Big Five constructs.

1.7   DEFINITION OF KEY TERMS

This study made use of a number of key concepts, namely Big Five Constructs, Effect size, Meta-analysis, Predictive Validity as well as Job performance. The manner in which these key terms are defined for the purpose of this study is discussed below.

Big Five Constructs: The Five-Factor Model (FFM) represents the human trait structure (Roccas, Sagiv, Schwartz, & Knafo, 2002). The five personality factors are usually labelled as follows: Agreeableness refers to characteristics such as being warm and accommodating; Conscientiousness refers to characteristics like organised, hardworking, and reliable; Emotional Stability (opposite of neuroticism) refers to avoiding negative emotional experiences and experiencing stability in emotions; Extraversion relates to characteristics of decisiveness and sociability; and Openness to Experience describes the degree of an individual's creativity, curiosity and appetite for change (Côté & Miners, 2006).

Effect size: The measure of the strength of the relationship between two variables, such as personality and job performance in a statistical population (Kelley & Preacher, 2012).

Meta-analysis: The analysis of analyses; a meta-analysis is the statistical analysis of a collection of analysis results from various individual studies with the purpose of integrating the results and findings (Glass, 1976).

Predictive validity: To accurately predict future performance on a variable (Guion, 2009).

Job performance: The extent to which an employee assists the organisation in reaching its goals (Motowidlo, Borman, & Schmidt, 1997).

Table 1: Abbreviations used in this document

Abbreviation	Meaning
FFM	Five Factor Model
GMA	General Mental Ability
SIOPSA	Society for Industrial and Organisational Psychology of South Africa
PAI	People Assessment in Industry
OCB	Organisational Citizenship Behaviour
CWB	Counter productive Work Behaviour
16PF	Sixteen Personality Factor Questionnaire

1.8   RESEARCH DESIGN AND METHODOLOGY

This study followed a quantitative research method. Quantitative research is a systematic and objective process making use of numerical data from a sample to generalise the finding to a larger group or population (Maree, 2010). Quantitative analysis can be described as the "numerical representation and manipulation of observations for the purpose of describing and explaining the phenomena that those observations reflect" (Babbie, 2008, p.443). The main purpose of quantitative research is to test a theory by investigating the relationship between variables (Creswell, 2009), for example investigating the relationship between personality and job performance.

1.8.1 Meta-analysis as a form of quantitative research

This study made use of a meta-analysis approach, which can be described as the analysis of analyses. A meta-analysis is thus the statistical analysis of a collection of results from various individual studies, with the purpose of integrating the results and findings (Glass, 1976). In simple terms when using a meta-analysis approach the researcher gathers and analyses quantitative data from other studies that

investigated the topic in question. Validity generalisation is the use of meta-analytic techniques to explore the generalisability of the correlation between employment test scores (such as personality) and the outcome variables (such as job performance) (Banks & McDaniel, 2014). The appropriateness of this choice of research method is supported by previous studies that made use of quantitative research methods to investigate the predictive validity of personality for job performance (Dunn et al., 1995; Ones et al., 1994; Tett et al., 1991).

1.8.2 Sampling and data collection

A meta-analysis makes use of data from various studies and this study therefore used previous studies as its database. The data collected was in the form of studies, including research papers, theses, and articles. The studies were obtained by searching computer databases in South Africa for studies in the period from 1985 – 2015. In addition to database searches, the specific journals targeted were the *South African Journal of Industrial Psychology, South African Journal of Psychology* and *South African Journal of Human Resource Management*. Studies were also obtained by requesting validity studies of personality instruments from distributors of psychological materials in South Africa as well as by searching the databases of all major universities in South Africa.

Viable studies identified were transcribed and coded on data templates for the meta-analysis. The data extracted from the studies included sample size, sample characteristics, anonymity of data, purpose for which data was collected, industry in which the study was conducted, job of sampled persons, names of personality scales, reliability of the personality scales, reliability of performance indices, range restrictions, standard deviation, mean, type of performance, performance measure, reliabilities and effect size of the relationship between personality scales and job performance. The personality scales were classified into the FFM using a statistical taxonomy approach as described in Hough and Ones (2001). The data was analysed using the psychometric meta-analysis approach described by Hunter and Schmidt (2004).

1.9 RESEARCH ETHICS

This study involved the review of previous studies and as such no participants were involved. Ethical considerations relating to human participants therefore bear no relevance. The research did however adhere to and consider the following ethical considerations:

Copyright: The ideas, concepts and findings of these studies are that of the researcher, where information generated by others is used it is appropriately referenced.

Plagiarism: In research you may not use another person's words; when reporting on research findings or presenting information the researcher ensured that information was referenced properly and not copied. Published articles as well as master and doctoral studies can be used without consent as they are in the public domain. In cases where the test publisher or supplier provided studies, consent was obtained from these entities.

Researcher's objectivity, honesty and integrity: The data was moderated by an expert to ensure accuracy and objectivity.

Accuracy of data and results: All data and results are accurately and truthfully represented in this paper. The researcher did not manipulate the data or results in any way.

1.10 DOCUMENT OVERVIEW

This dissertation has five main parts. The next section presents the literature on personality, the Big Five Model, and job performance. The section also reviews meta-analyses and criterion research. In the following section the research design and methods are described. The results are considered in a separate section. Finally, the document concludes with a section focusing on conclusions, recommendations and limitations for the study.

Chapter 1: Introduction to the study

This chapter provides an overview of the research being presented in this paper. It elaborates on the purpose of the research, the problem it aimed to address, the

specific research objectives, the significance of the study as well as the delimitations and assumptions identified. The chapter concludes with the key terms used in the research, the research design and methodology used and an overview of the layout of the chapters in this paper.

Chapter 2: Literature Review

The purpose of this chapter is to summarise relevant literature and research. The main focus areas are the Big Five factors of personality, job performance, criterion factors and meta-analysis. The chapter starts by introducing the concept of selection and the importance of predicting job performance, followed by discussions of personality, job performance and meta-analysis.

Chapter 3: Research Methodology

This chapter describes the research design and methodology used in this study. It describes the methods used to gather and analyse the data as well as the corrections applied in the analysis.

Chapter 4: Research Results

This chapter presents the results of the study.

Chapter 5: Conclusions, limitations and recommendations

This closing chapter focusses on the conclusions of the study based on the results. It also presents the limitations of the study and offers recommendations for future research.

1.11 CHAPTER SUMMARY

This chapter introduced the study by providing crucial information concerning the direction and reasoning of the study. The research objectives and methodology were identified and the structure of the paper was explained. Chapter 2 presents the literature relating to the research concepts. It summarises crucial findings of previous research and explains the concepts involved in the research.

CHAPTER 2 - LITERATURE REVIEW

This chapter presents an overview of literature relating to the research topic. It provides information concerning research investigating the validity of personality as a predictor of job performance and probes into the knowledge base of related subjects. This literature review consists of (i) background information crucial to the study; (ii) the concept of personality; (iii) an explanation of the Big Five Model of personality; (iv) the concept of job performance; (v) personality as a predictor of job performance; (vi) an explanation of meta-analysis; and (vii) the role and use of meta-analysis in investigating the topic.

2.1 BACKGROUND

The world is becoming increasingly globalised and companies therefore need to do a lot more to retain their customers and keep all their investors and shareholders happy (Mello, 2010). Twenty-first century organisations are required to think and perform globally and they must therefore ensure that they employ staff who can adapt to and thrive in these fast changing conditions (Cascio & Aguinis, 2008). It is becoming increasingly important to attract and retain talented employees as these employees hold a competitive advantage for organisations (Carless, 2009). Many organisations rely on skilled, personable employees to ensure client satisfaction; but it is not an easy task to identify, recruit and retain these employees (Bateson, Writz, Burke, & Vaughan, 2013).

The new generation of employees is referred to as talent; talent is expected to deliver ground breaking products in a fast paced global setting. Talent is responsible for ensuring that the organisation is a step ahead of its competitors; in the new world of work speed is the key objective (Cascio & Aguinis, 2008). Companies are looking for people who will initiate growth within that company, people who will mean the difference between loss and profit, and people who actively contribute to the company's competitive advantage. It is these people who are referred to as talent (Mellahi & Collings, 2010; Tarique & Schuler, 2010;). Talent management starts with finding the right candidates (Risavy & Hausdorf, 2011). Hiring the wrong people can have a negative impact on an organisation in terms of production, return on

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investment and recruiting costs. Selection is therefore important for human resource practitioners and organisations (Risavy & Hausdorf, 2011).

The sole purpose of organisations is to produce products and services and turn these products and services into economic utility that serves society (Theron, 2014). In order to achieve this, organisations must rely on the performance of their employees (Theron, 2014). Many companies are experiencing the major issue of high staff turnover, which has a severe impact on business and leads to additional expenses, loss of revenue and has a negative impact on staff moral (Kalugina & Shvydun, 2014). There are several reasons for high employee turnover, including errors in employee selection, job dissatisfaction and poor management. The single best way to reduce employee turnover is to recruit and appoint the right people (Kalugina & Shvydun, 2014). In addition, appointing the right people leads to substantial savings and increased productivity associated with high performers (Risavy & Hausdorf, 2011).

Making accurate recruitment decisions is therefore becoming increasingly important. Gatewood and Field (1994, p. 3) explained that selection is "…the process of collecting and evaluating information about an individual in order to extend an offer of employment". According to Guion and Gottier (1965, p. 8) selection is "choosing from a number of available participants, a smaller number to be hired for a given job".

According to Avis, Kudisch and Fortunato (2002) personnel selection involves the prediction of employees' future behaviour. These authors agued that the prediction of overall job performance is of particular interest to organisations because effective employee performance leads to various organisational outcomes. A multi-hurdle approach incorporates various aspects such as a background check, psychological tests and an oral interview (Sanders, 2007). This process is used to eliminate candidates rather than identify the best candidates, and is thus termed 'weeding-out'.

The current staffing model essentially consists of identifying the job, identifying competencies assumed to predict performance, developing measurements to assess

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the performance of applicants, ranking applicants based on their standing and selecting those with the best score for the job (Cascio & Aguinis, 2008). This staffing model is illustrated in Figure 1 below. The recruitment process has been improved over the years through the use of technology which simplifies the process of posting vacancies and resumes, listing jobs and viewing possible candidates (Kalugina & Shvydun, 2014). Many companies have a standard recruitment process that consists of reviewing résumés, telephonic or face to face interviews with promising candidates and testing to determine best fit (Bateson et al., 2013). This approach is time consuming and, given recent evidence of the value in the predictive validity of psychometric assessments, organisations may benefit from using psychometric screening upfront (Bateson et al. 2013). The primary purpose of assessments in the selection process is to screen applicants based on inferences about future performance (Banks & McDaniel, 2014).

Figure 1: Recruitment and selection model
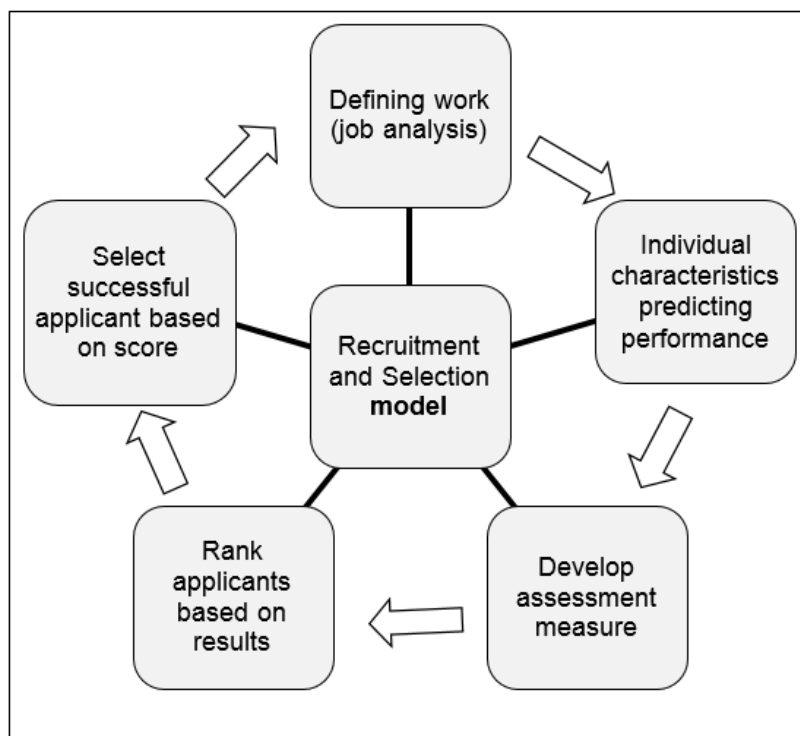
Adapted from "Staffing Twenty-first-century Organizations" by W.F Cascio & H. Aguinis, 2008, *The Academy of Management Annuls,* 2(1), p.140.

The dilemma organisations are faced with is that they would like to appoint a person who will perform in the position, but actual job performance information is not available at the time of selection and performance levels will only become apparent once applicants have been appointed (Myburgh & Theron, 2014). In order to select the most suitable candidates certain information is measured such as knowledge, skills and abilities to perform well on important aspects of the job. The best alternative to random decision making is to predict expected performance through limited information (Myburgh & Theron, 2014). The Society for Industrial and Organisational Psychology of South Africa (SIOPSA) in association with People Assessment in Industry (PAI) have published a code of practice for psychological and other similar assessment in the workplace (SIOPSA & PAI, 2005). This code stipulates:

> The purpose of psychological and other similar assessment is to learn about another person in order to inform others of how they function now or to predict how they are likely to perform or function in the future. Broadly defined, occupational assessments are psychological instruments and similar procedures developed and used by professionals in organisations for the purposes of making inferences about people in the workplace. (SIOPSA & PAI, 2005, p. 4)

The core purpose of an employment test is to determine future job performance (Le, Oh, Shaffer, & Schmidt, 2007). The most important part of any personnel assessment is the ability to predict future job performance (predictive ability) (Schmidt & Hunter, 1998). With the emergence of employment tests aiming to predict job performance, variation in the results of studies led researcher to conclude that a) employment tests were organisation specific, thus they had predictive value in one organisation but not another, and b) employment tests were job specific, thus they may predict performance for one job but not another job in the same organisation (Le et al., 2007). These conclusions largely limited the generalisability of the use of employment tests and it became generally accepted that organisations had to conduct separate prediction studies for all the jobs in that organisation (Le et al. 2007). In the late 1970s this assumption was brought into question based on the

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argument that the sample sizes of the studies that led to this conclusion were not large enough to yield reliable results. This realisation inspired Schmidt and Hunter to develop analytic methods now commonly referred to as meta-analysis. These methods allow researchers to correct for most major imperfections in previous studies, thus providing more accurate estimates of predictive power (Le et al., 2007).

Using recruitment methods with high predictive validity leads to substantial increases in employee performance (Schmidt & Hunter, 1998). Psychometric testing is an essential part of the best practices for selection as it is demonstrably relevant, objective and fair. Ability and personality tests are frequently used psychological tests (Carless, 2009).

Early meta-analytic studies indicated that general mental ability (GMA) is a predictor of job performance and training performance across all settings and for both majority and minority groups (Le et al., 2007). Personality testing is more frequently used in the recruitment process, although recruiters might not completely understand the benefit this practice adds (Risavy & Hausdorf, 2011; Rothstein & Goffin, 2006). The value of incremental validity is not only in adding a measure but also in the correlation between the two measures (Schmidt & Hunter, 1998). Adding an integrity measure to a GMA test in selection results in an incremental validity increase of 27% whilst adding a Conscientiousness test increases incremental validity by 18%, therefore the combination of GMA and either of these tests increases the predictive power of an assessment battery (Schmidt & Hunter, 1998). Research shows that personality assessments account for notable incremental validity over and above what is accounted for by biographical data (Witt, Burke, Barrick & Mount, 2003). Evidence shows that managers perceive cognitive ability and conscientiousness to be the most important attributes relating to the hirability of prospective employees (Dunn et al., 1995).

In summary this study used a meta-analysis to investigate the predictive validity of personality measures, specifically the Big Five Model of personality, for job performance in the South Africa context. The importance of selecting the right people for the right job is evident in the search for talent and organisations' need to gain and

maintain a competitive advantage. Although it is generally accepted that GMA predicts job performance, international studies have suggested that personality is a valuable predictor that increases the incremental validity of the prediction of job performance. The aim of this study was to evaluate the value of personality as a predictor of job performance in South Africa.

2.2 PERSONALITY

2.2.1 Introduction

Everybody has a personality and aspects of this personality determine an individual's success, happiness and fulfilment throughout the lifespan. Personality is one of the most important assets of any individual (Schultz & Schultz, 2005). The study of personality became formalised and systematised in the late 1930s in American psychology (Schultz & Schultz, 2005). Personality is complex and diverse and therefore it is difficult to compile one coherent theoretical framework for personality (Ryckman, 2008). The validity of personality measures for recruitment and selection purposes has been extensively researched in various countries over a number of years (Barrick & Mount, 1991). The overall conclusion has been that personality has low predictive validity in terms of job performance (Barrick & Mount, 1991). Over the last 20 years, large scale meta-analyses have demonstrated that personality does influence several constructs in organisations. Studies have focused on investigating the validity of these findings (Ones, Viswesvaran, & Dilchert, 2005). Personality is a multi-dimensional concept; there are many definitions and many scales have been developed to measure personality variables (Hough & Ones, 2001). The following section introduces the concept of personality and provides insight concerning the development and value of this concept.

2.2.2 Defining personality

Personality theory investigates the differences between people. The concept of personality has a long history and numerous philosophers and writers, including Plato, Aristotle, Descartes and Machiavelli, have explored human personality (Ellis, Abrams, & Abrams, 2009). Plato reasoned that the soul is the seat of personality and consists of three forces guiding human behaviour, namely, reason, emotion and

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appetite. He believed that reason keeps emotion and appetite in check (Ellis et al., 2009). Aristotle argued that the seat of personality is in the psyche, which consists of biological processes that direct human behaviour. In contrast, Descartes held that personality is the result of the interaction of divine and primal forces. Machiavelli believed that people are selfish, greedy, ungrateful and vengeful. According to him people are driven by two primary forces: first, a combination of assertiveness, fearlessness and self-confidence; and, second, luck (Ellis et al., 2009). Personality psychology explains individual characteristics, the way people think, feel and behave and the psychological mechanisms that influence these factors (Funder, 2001).

The word personality comes from the Latin word persona, which refers to a theatrical mask worn by Roman actors in Greek dramas with the aim of projecting a role or a false self (Feist & Feist, 2008; Schultz & Schultz, 2005). Based on this derivation personality refers to our external and visible characteristics (Schultz & Schultz, 2005). Psychologists do not agree on a single definition of personality (Burger, 2011). Feist and Feist (2008, p.4) integrated many views of the definition of personality as follows:

> Personality is a pattern of relatively permanent and unique characteristics that give both consistency and individuality to a person's behaviour. Traits contribute to individual differences in behaviour, consistency of behaviour over time, and stability of behaviour across situations. Traits may be unique, common to some group, or shared by an entire species, but their pattern is different to each individual. Thus each person, though like others in some ways, has a unique personality. Characteristics are unique qualities of an individual that include some attributes as temperament, physique and intelligence.

Burger (2011, p. 4) defined personality as "consistent behaviour patterns and intrapersonal process originating within the individual". Personality is "the unique, relatively enduring internal and external aspects of a person's character that influence behaviour in different situations" (Schultz & Schultz, 2005, p. 10). Human behaviour is influenced by many factors including biological factors, environmental

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stimuli, interpersonal factors, cultural and social factors and psychological and spiritual factors amongst others (Grieve, van Deventer, & Mojapelo-Batka, 2006).

Personality involves characteristics and patterns of thoughts, feelings and behaviours that consistently emerge over time and across situations (Conner-Smith & Flachsbart, 2007). It refers to the psychological characteristics of an individual, as well as the emotional, mental and spiritual ways in which a person consistently differs from other people (McMartin, 1995). Gordon Allport (1961, p. 28, as cited in McMartin, 1995) proposed the following definition: "Personality is the dynamic organisation within the individual of those psychophysical systems that determine his or her characteristic behaviour and thought". McMartin (1995) concluded that personality is an individual's internal psychological structure and is not necessarily the same as the manner in which he or she may appear to other people at any specific time.

Personality is not only one thing, but a spectrum of individual characteristics that consistently differentiate people from one another in terms of how they think, feel and act (Ones et al., 2005). Ones et al., (2005, p. 390) explained that "personality traits are enduring dispositions and tendencies of individuals to behave in certain ways". There is therefore more to personality than meets the eye; personality is not only about behavioural characteristics but also involves an individual's thoughts and feelings. Personality psychology is aimed at providing an integrative framework for understanding the whole person (McAdams & Pals, 2006). Personality involves the ways in which people differ in terms of how they think, behave and process information (Ellis et al., 2009).

Hogan (1991) observed that personality is generally used to refer to underlying structures, dynamics, processes and predispositions that result in behavioural actions. Personality theories are a way of describing, explaining and predicting human behaviour in order to understand personality (Burger, 2011; Grieve et al., 2006). "Investigators generally agree that personality is the dynamic and organized set of characteristics possessed by a person that uniquely influences his or her cognitions, motivations, and behaviours in various situations (Ryckman, 2008, p. 4).

All approaches to personality can be divided into two categories, namely idiographic and nomothetic. Idiographic theories focus on the uniqueness of the individual while the nomothetic approach stresses that uniqueness exists only as a combination of quantifiable traits (Ellis et al., 2009). Ellis et al. (2009) summarised the major schools of personality theory and their founders and this summary is reproduced in Table 2 below.

Table 2: Major Schools of Personality Psychology

School	Founders	Essential Premises
Psychoanalytic	Sigmund Freud	Self-regulating and independent unconscious processes make up the essence of personality. They operate though mental structures and are in continual conflict.
Neo-psychoanalytic	Alfred Adler, Carl Jung, Karen Horney	Conscious individual, social, and interpersonal factors are powerful forces in shaping personality.
Humanistic	Albert Ellis, Carl Rodgers, Abraham Maslow	People are basically good and strive toward maximum personal development or self-actualisation.
Behavioural	John Watson, B. F. Skinner	Personality is the observable result of reinforcement.
Genetic/Biological	William Sheldon, Edmund O. Wilson, Hans Eysenck	Genes, hormones, and neurochemicals in the brain regulate the greater portion of human personality.
Trait	Raymond Cattell, Hans Eysenck	Differences amongst people can be reduced to a limited number of distinct behavioural styles or traits.
Cognitive/REBT	Albert Bandura, Ulric Neisser, Albert Ellis	Personality results from the interplay of learned and innate styles of thinking.

Reproduced from "Personality Theories: Critical Perspectives" by A. Ellis, M. Abrams and L. Abrams, (2009), Thousand Oaks, CA: Sage, p. 15.

This study primarily relies on the trait and factor theory, in particular the Big Five Model, and as such the literature review focuses exclusively on this theory. The interested reader is referred to Ellis et al. (2009) for a discussion of the other schools of personality theory.

2.2.3 Trait and factor theory

Trait theory makes use of characteristics to describe personality or, in other words, trait theory uses descriptors to label the relatively stable features of personality (Burger, 2011). Trait psychologists make use of a large range of behaviours that can be represented along a continuum. They argue that any person falls somewhere along such a continuum. They further argue that if a large group were to be measured and their scores plotted on the continuum one would find that the scores are normally distributed (Burger, 2011). "A trait is a dimension of personality used to categorise people according to the degree to which they manifest a particular characteristic" (Burger, 2011, p. 150).

According to McAdams (1995) there are two ways in which to describe personality. The first way involves observation through various means while the second way involves organising observations and measurements into a meaningful system or framework. Different theorists have proposed different organising structures and it was Allport (1939) who proposed organising using traits (McAdams, 1995). Allport's theory holds that there are three main structures of personality, namely, cardinal, central and secondary traits (Feist & Feist, 2008; Grieve et al., 2006; McAdams, 1995). Cattell (1957) distinguished between surface traits and source traits and further described source traits as consisting of ability, temperament and dynamic traits (Feist & Feist, 2008; Grieve et al., 2006; McAdams, 1995). In the 1980s and 1990s broad personality definitions were established with the emergence of consensus concerning the five-factor model of personality (McAdams, 1995). McAdams (1995, p. 371) stated that "a person cannot be known without knowing traits, but knowing traits in not enough".

McAdams (1995) provided reasons why trait theory has proven to be a powerful mode of personality description. Traits are based on careful observation and reflect real differences in behaviour and personality and are therefore more than linguistic conveniences. Many traits remain stable overtime and therefore traits show longitudinal consistency. Traits predict behaviour fairly well, individual differences in traits account for a substantial amount of variance in collected behaviours. Trait effects are just as strong as situational effects, thus situational variables do not

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account for more variance in behaviour than trait effects. The Five Factor Model of personality seems to be a comprehensive and consensual description of the trait domain.

The trait approach relies on two assumptions: first, personality characteristics are stable over time; and, second, personality characteristics are stable across situations (Burger, 2011). Trait theorists focus on predicting behaviour based on the strength of a preference for a certain trait with the aim of identifying differences between the behaviour of people with a high preference and the behaviour of people with a low preference. Cattell (1943) defined a trait as the mental elements of personality, suggesting that traits are relatively permanent reaction tendencies that are the basic structural units of the personality (Schultz & Schultz, 2005). Cattell (1943) developed the theory of surface traits, which are the visible aspects of personality. He found that some of the surface traits appeared to be clustered in groups and represented underlying personality characteristics called source traits. According to Cattell traits are relatively permanent and broad reaction tendencies and serve as building blocks of personality (Ryckman, 2008). Cattell then used factor analysis to identify common factors related to personality (Schultz & Schultz, 2005).

Cattell developed a list of 16 source traits that provide a description of a person's personality. In 1949 the first version of the Sixteen Personality Factor Questionnaire (16PF) designed to measure these traits was published (Burger, 2011; Grieve et al., 2006). The sixteen factors are: Warmth, Reasoning Ability, Emotional Stability, Dominance, Liveliness, Rule Consciousness, Social Boldness, Sensitivity, Vigilance, Abstractedness, Privateness, Apprehension, Openness to Change, Self-reliance, Perfectionism, and Tension (Ryckman, 2008). Hans Eysenck (1982) claimed that only three major factors can be determined through a factor analytic approach. He referred to these factors as Extraversion or Introversion, Neuroticism or Stability and Psychoticism or Superego (Feist & Feist, 2008) and suggested that these factors are most useful for describing personality (Ryckman, 2008). According to Feist and Feist (2008) most researchers agree that five dominant traits continually present themselves in factor analytic studies, thus resulting in a model referred to as five-factor theory or the Big Five. This study focuses primarily on trait theory, in particular

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the Five Factor Model of personality or the Big Five of personality. A detailed discussion of the Big Five Model is provided later in this section.

Basing their research on the foundation developed by Cattell and Eysenck, Robert McCrae and Paul Costa used factor analysis to identify five so called robust Big Five factors (Schultz & Schultz, 2005). These factors are discussed in the next section. Trait theory is not without its problems, and trait theories and the Big Five theory have been labelled as superficial, reductionist and imperialistic (McAdams, 1995). It has been argued that traits are labels that do not explain anything. According to Goldberg (1981) the English language contains five clusters of trait-related terms and these terms describe the personality characteristics most prominent in interpersonal human interaction, especially when describing a person (McAdams, 1995). Trait theory does not allow for conditional patterns, thus in some situations a person might behave in one way but in another situation behave in a different way (McAdams, 1995). When one gets to know a person better it is common to seek for non-comparative and highly conditional information, information unique to a person, information which is contextualised. Traits cannot provide this information as they are by definition comparative and non-conditional (McAdams, 1995).

2.2.4 Summary

Personality traits are stable characters and predispositions of individuals to behave in certain ways (Ones et al., 2005). Many theories of personality exist and it is important to acknowledge that no one theory encompass the domain of personality completely (Ryckman, 2008). Each theory explains some aspects of the domain of personality to a certain extent. In recent years the Five Factor Model of personality has emerged and has become generally accepted as a model of personality (Ones et al., 2005). From Freud to the Big Five it is clear that personality is a large domain in which many theories emerge and develop. Each of these theories has its own reasoning and limitations. The Big Five is the foundation of this study and is discussed in depth in the next section.

2.3 THE BIG FIVE

2.3.1 Introduction

In the past 20 years the widely accepted Five-Factor Model of personality (FFM) has emerged and has served as a flagship for the influence and application of personality psychology in various areas (De Fruyt & Salgado, 2003). Most of the taxonomic efforts involved in personality research have focused on psycholexical variables such as those contained in the Five Factor Model (Hough & Ones, 2001). The Big Five framework is a hierarchical model of personality traits that contains five broad factors: Agreeableness, Conscientiousness, Emotional Stability, Extraversion and Openness to Experience. The Big Five framework proposes that personality can be classified into five broad, empirically derived domains (Gosling, Rentfrow, & Swann, 2003).

2.3.2 The development of the Big Five Model

The Big Five Model is good basis for organising diverse measures of temperament and personality (Conner-Smith & Flachsbart, 2007). The Big Five organises broad individual differences into five categories that were created through the use of factor analysis (McAdams & Pals, 2006). This is not the only trait model of personality, there are also two factor, three factor, four factor and sixteen factor models of personality (Ellis et al., 2009).

Over several decades countless personality characteristics have been clustered into meaningful related groups and these related clusters are hierarchically organised. Research has resulted in the development of the Five Factor Model of personality, which contains the Big Five factors of Agreeableness, Conscientiousness, Emotional Stability, Extraversion and Openness to Experience (Ones et al., 2005). These factors were identified through lexical studies and through joint factor analyses of personality instruments assessing the Five Factor Model (Ones et al., 2005). Using the lexical approach researchers conducted factor analyses of personality related words sampled from a dictionary to identify factors that many regard as the fundamental structure of personality, now referred to as the Five Factor Model (Hough & Oswald, 2005). Researchers attempting to describe the basic dimensions

of personality have reported consistent findings in factor analytic studies (Burger, 2011).

Data from different personality inventories and thousands of test takers confirms that personality is hierarchically organised. This means that individual responses to test items and test items clustered together are indicators of specific attributes known as personality sub-dimensions or facets. Facets that share a psychological meaning contribute to personality factors (Ones et al., 2005). The Big Five personality factors correlate with one another and are not statistically independent (Ones et al., 2005). The manner in which the Big Five organises personality traits appears to be universal (Funder, 2001), although there has been some opposition to this claim.

2.3.3 Developing a taxonomy

In a review of the history of the taxonomy of personality John, Angeleitner and Ostendorf (1988) explained that a taxonomy is a systematic framework typically used for differentiating, ordering and naming types and groups within a specific field. The development of a personality taxonomy such as the taxonomy described by McDougall (1932) therefore entails the grouping and ordering of personality characteristics into larger descriptors or factors, thus allowing researchers to study specified classes instead of individual instances. John et al (1988) explained that personality attributes are abstract concepts that cannot be seen or observed directly. This means that the existence of personality attributes is also inferred based on observable behaviour, and this means that the existence of some attributes has been debated. This makes the task of developing a widely accepted personality taxonomy difficult.

Developing a taxonomy poses various challenges, many of which were identified by John, Goldberg and Angeleitner (1984). First, researchers must specify the phenomena to be covered by the taxonomy and this implies defining personality. There are different definitions of personality and researchers therefore need to specify what should be classified before embarking on any classification attempt. They further need to specify which instances will be considered relevant. The researcher must also decide on the scope or inclusiveness of the classification, so

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what is in and what is out. Next the researcher must decide what procedures will be used to collect data and what data is relevant, how to analyse the data, the structure of the data and the approach (inductive or deductive). The final issue concerns the evaluation of the taxonomy and relates to how the proposed taxonomy is to be evaluated and compared to alternative taxonomies. This also involves deciding how a taxonomy may be able to change once it has been established for a period of time.

One of the primary goals of personality psychology is determine the structure of personality characteristics. However, it is important that attempts to ascertain that structure are based on samples representative of the universe of those characteristics (Ashton & Lee, 2001). According to Ashton and Lee (2001) the lexical hypothesis is the only recognised method of obtaining such samples. According to this hypothesis the most significant personality traits are encoded as a single term in natural languages. The lexical hypothesis emerged in 1884 when Galton (as cited in Hough and Ones, 2001) proposed that personality traits are descriptors people use to describe one another and which are defined in dictionaries. Language provides an extensive set of terms for describing differences among people (John et al., 1984).

Major factor analytical derived lexical models include the work of Cattell (1943), who attempted to summarise the catalogue of words compiled by Allport and Odbert by adding and eliminating various words from the catalogue (Hough & Ones, 2001). This attempt resulted in Cattell's development of the Sixteen Factor Personality Questionnaire, which measures fifteen personality factors and one cognitive factor (Hough & Ones, 2001). Fiske (1949) derived a Five Factor Model of personality, with factors labelled Social Adaptability, Emotional Control, Conformity, Inquiring Intellect, and Confident Self-Expression. Tupes and Christal (1992) have been credited with identifying the Five Factor Model in the form in which it is currently used. The development of the FFM is illustrated in Table 3.

Table 3: The Five robust dimensions of personality

Author	I	II	III	IV	V
Fiske (1949)	Social adaptability	Conformity	Will to achieve	Emotional control	Inquiring intellect
Eysenck (1970)	Extraversion	Psychoticism	Psychoticism	Neuroticism	
Tupes & Christal (1961)	Surgency	Agreeableness	Dependability	Emotionality	Culture
Norman (1963)	Surgency	Agreeableness	Conscientiousness	Emotional	Culture
Borgatta (1964)	Assertiveness	Likeability	Talk interest	Emotionality	Intelligence
Cattell (1957)	Exvia	Cortertia	Superego strength	Anxiety	intelligence
Guilford (1975)	Social activity	Paranoid disposition	Thinking introversion	Emotional stability	
Digman (1988)	Extraversion	Friendly compliance	Will to achieve	Neuroticism	Intellect
Hogan (1986)	Sociability & Ambition	Likeability	Prudence	Adjustment	Intellectance
Costa & McCrae (1985)	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Peabody & Goldberg (1989)	Power	Love	Work	Affect	Intellect
Buss & Plomin (1984)	Activity	Sociability	Impulsivity	Emotionality	
Tellegen (1985)	Positive emotionality		Constraint	Negative emotionality	
Lorr (1986)	Interpersonal involvement	Level of socialisation	Self-control	Emotional stability	Independence

Adopted from "Personality Structure: Emergence of the Five-Factor Model", by J.M. Digman (1990) *Annual Review Psychology,* 42, p. 423.

Ashton and Lee (2001) found that the Big Five Factors of personality repeatedly emerged in ten independent lexical studies, implying that the Big Five Factors are a reflection of the structure of personality representative of the traits encompassed in those factors. Block (1995) summarised praise for the Big Five when it was first developed, with these initial supporters claiming that the five factors are both necessary and reasonably satisfactory for describing personality at a global level. The five-factor approach provides a collective descriptive framework for the assessment of individuals (Block, 1995). The Five Factor Model of personality is often called the Big Five and provides an understanding of the structure of personality (Block 1995). "The Five Factor Model represents a structure of traits, developed and elaborated over the last five decades" (Rothmann & Coetzer, 2003, p. 68). The five-factor model (FFM) is considered the leading approach for representing personality as it describes most personality traits (Roccas et al., 2002).

Côté and Miners (2006) described the five personality factors as follows; Agreeableness refers to characteristics such as being warm and accommodating; Conscientiousness refers to characteristics like organised, hardworking, and reliable; Emotional Stability (opposite of neuroticism) refers to avoiding negative emotional experiences and experiencing stability in emotions; Extraversion relates to characteristics of decisiveness and sociability; and Openness to Experience describes the degree of an individual's creativity, curiosity and appetite for change. Some of these dimensions are also sometimes referred to using different labels, for example Openness to Experience is sometimes referred to as Intellect while Emotional Stability is sometimes referred to as Neuroticism (the opposite pole of the construct's continuum). However, despite these labelling differences the contents of these five dimensions overlaps across many different conceptualisations of personality (Dilchert, Van Rooy, & Viswesvaran, 2006). These broad dimensions or domains subsume a large number of other more distinct and specific characteristics. In this way the Big Five provide a useful categorisation of broad dimensions encompassing individual differences in people (Larson, 2002).

Tett, Steele and Beauregard (2003, p. 336) explained the benefits of a general taxonomy of personality, like the FFM, as well as more specific models.

> General taxonomies "can contribute to scientific investigation by (a) organising otherwise disparate constructs into meaningful clusters, (b) offering simple conceptual systems that are easy to work with (and easy to sell to users), and (c) providing a framework for evaluating structural (e.g., factorial) validity of a set of measures. Greater specificity, on the other hand, has the advantages of (a) improving person-job fit through use of more points of comparison, (b) articulating better the causes, effects, and measurement of important constructs, and (c) allowing more powerful analysis of construct validity through finer articulation of the nomological net".

The Five Factor Model is not without critique. Burger (2011) summarised some of the criticism and limitations of the Big Five Model. The first criticism is that the model might not accurately encase the complexities of human personality. Burger (2011) countered this criticism by contending that researchers have investigated the Big Five Model among people who speak other languages and have found that there appears to be a universal pattern for describing personality. The second concern raised by Burger (2011) is that there is disagreement regarding the structure of the Five Factor Model as some analytic studies have yielded findings that do not fit the existing structure. In addition, factor structures are not always similar across studies. Some of these factors that do not always fit well with the existing structure are Religiousness, Youthfulness, Frugality, Humour and Cunning (Burger, 2011). Thirdly, the Big Five Model did not originate from a theory, but rather from the results of analyses and as such the results can be explained by various factors. This criticism is based on the argument that because the hypothesis followed the results, there is no evidence to explain why these five factors emerged (Burger, 2011).

Hough (1997 as cited in Hough & Oswald, 2005, p.383) provided comprehensive criticism of the Five Factor Model by stating "a comparison of meta-analytic research

summarising the criterion-related validity of personality constructs of different taxonomic models reveals the Five-factor model obscures important predictor-criterion relationships". However, Hough and Oswald (2005) countered this argument by suggesting that if facets are carefully chosen to be relevant to a specific selection situation this will lead to higher criterion-related validities.

Block (1995) also raised concerns which McCrae (2010) summarised by naming three contentions. The concerns are as follows: Firstly, the methods used to determine and verify the FFM structure are inadequate; secondly, the FFM does not cover all of the important individual differences; and, finally, the FFM does not sufficiently represent the dynamic processes involved in creating and influencing behaviour and experience. The first contention relates to the first concern and suggests that this concern is outdated as the FFM has proven itself in the years since the publication of Block's article (McCrae, 2010). Although the FFM first emerged as the result of analyses of English-language trait descriptors administered to highly educated people, the FFM has since been replicated in various languages, using different instruments and in broadly representative samples (McCrae, 2010). In relation to the concern regarding of the model's ability to sufficiently represent individual differences, McCrae (2010) argued that the FFM is not and will never be an exhaustive directory of individual differences. The FFM does not claim to be an exhaustive taxonomy of individual differences, but instead is simply a taxonomy of dispositions or personality traits (McCrae, 2010). Finally, in relation to the third concern, McCrae (2010) supported the position that the FFM is atheoretical and is therefore a static and descriptive model of trait structure. Table 4 and Table 5 below provide descriptions of the Big Five Factors.

Table 4: Short description of the Big Five Factors

Factor	Description
Agreeableness / Likability	Courteous, Helpful, Trusting, Cooperative, Sympathetic, Friendly, Good-natured, Tolerant, Forgiving
Conscientiousness	Dependable, Hardworking, Efficient, Organised, Thorough, Responsible, Persevering, Achievement-striving, Planful

Emotional Stability / Neuroticism	Even-tempered, Self-confident, Calm, Resilient, Tolerant of stress, Well-adjusted (terms associated with emotional stability)
Extraversion / Surgency	Sociable, Gregarious, Assertive, Adventurous, Ambitious, Reward-seeking, Talkative
Openness to Experience / Intellect / Culture	Perceptive, Imaginative, Cultured, Curious, Creative, Broad-minded, Intelligent

Adapted from "The Big Five personality dimensions and job performance: A meta-analysis" by M.R. Barrick and M.K. Mount, 1991, *Personnel Psychology,* 44 and "A contrarian view of the Five-Factor Approach to personality description" by Block, 1995, Psychological Bullitin, 117(2).

Table 5: Detailed description of the Big Five Factors

Factor	Description
Agreeableness / Likability	An agreeable person is fundamentally altruistic, sympathetic to others and eager to help them, and in return believes that others will be equally helpful. The disagreeable/antagonistic person is egocentric, sceptical of others' intentions, and competitive rather than co-operative.
Conscientiousness	The conscientious person is purposeful, strong-willed and determined. Conscientiousness is manifested in achievement orientation (hardworking and persistent), dependability (responsible and careful) and orderliness (planful and organised). On the negative side, high Conscientiousness may lead to annoying fastidiousness, compulsive neatness or workaholic behaviour.
Emotional Stability	Emotional Stability indicates the extent to which people are calm, steady under pressure, and less likely to experience negative emotional states, including anxiety, depression, and anger.
Extraversion	Extraverts are energetic and optimistic. Introverts are reserved rather than unfriendly, independent rather than followers, even-paced rather than sluggish. Extraversion is characterised by positive feelings and experiences and is therefore seen as a positive affect.
Openness to Experience / Intellect / culture	Includes active imagination, aesthetic sensitivity, attentiveness to inner feelings, a preference for variety, intellectual curiosity and independence of judgement. People scoring low on Openness tend to be conventional in behaviour and conservative in outlook. People scoring high on Openness tend to be unconventional, willing to question authority and prepared to entertain new ethical, social and political ideas.

Adapted from "The Big Five personality dimensions and job performance" by S. Rothmann and E.P. Coetzer, 2003, *SA Journal of Industrial Psychology, 29(1),* p. 69.

2.3.4 Agreeableness

Agreeableness contrasts traits such as compassion, trust, and friendliness with traits such as unfriendliness, self-centredness, and suspicion (Goldberg, 1993). Agreeableness refers to traits such as self-sacrifice, kindness, acceptance, flexibility, generosity, compassion, and consideration (Digman, 1990). Agreeableness proved to be important as a dimension of personality due to its close connection with communion, defined as the desire to contribute to something bigger than self (Graziano, Habashi, Sheese, & Tobin, 2007).

Agreeableness has proved valuable to job performance in cases where joint action and collaboration are required (Mount et al., 1998). Persons high on Agreeableness tend to deal with conflict in a cooperative manner and strive for a common understanding, attempting to maintain social affiliations (Witt et al., 2002). More than any of the other four factors Agreeableness is concerned with interpersonal relationships and has consistently been correlated with conflict resolution (Field, Tobin, & Reese-Weber, 2014).

People high on Agreeableness are more willing to help others despite the risk of negative outcomes (Graziano et al., 2007). Agreeableness, Conscientiousness and Emotional stability seem to be the best predictors of counterproductive behaviour (Jensen & Patel, 2011). Agreeableness and Conscientiousness were found to relate to organisational citizenship behaviour (Ilies, Fulmer, Spitzmuller, & Johnson, 2009). Witt et al. (2002) found that employees with high Conscientiousness and high Agreeableness received higher performance ratings than those individuals with high Conscientiousness and low Agreeableness. These results were confirmed by Chowdhury and Amin (2006), who found that high Agreeableness and Conscientiousness had a significant relationship with academic performance in economics.

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Persons high on Agreeableness are more likely to be willing to sacrifice their self-interested in favour of others, handle conflict better and work well in groups (Caprara, Alessandri, & Eisenberg, 2012). Agreeableness is also associated with high work satisfaction and lower risk of burnout (Törnroos et al., 2013).

2.3.5 Conscientiousness

Conscientiousness is concerned with being responsible, diligent, methodical and adhering to rules (Roberts, Jackson, Fayard, Edmonds, & Meints, 2009). Employees with high Conscientiousness tend to plan well and be organised, detailed, orderly, hardworking, reliable, systematic and focussed. They are therefore more likely than employees low on Conscientiousness to perform tasks in a thorough and correct manner, to take initiative and work within the rules and remain focussed on work tasks (Witt et al. 2002).

Individuals low on Conscientiousness may hold beliefs that they do not care about adhering to proper workplace norms, which is likely to cause counterproductive behaviour (Jensen & Patel, 2011). Persons high on Conscientiousness are more likely to recover from negative emotions (Javaras et al. 2012). Conscientiousness has proved to be a reliable predictor of achievement in high school and college students (Noftle & Robins, 2007). It is also a good predictor of leadership (Judge, Bono, Ilies, & Gerhardt, 2002), work outcomes and job performance (Dudley, Orvis, Lebieck, & Cortina, 2006).

2.3.6 Extraversion

Extraversion involves the tendency to be sociable, assertive, active, and to experience positive affects, such as energy and enthusiasm (Judge et al., 2002). Extraversion is related to good communication, due to its links with sociability and gregariousness (Macht, Nembhard, Kim, & Rothrock, 2014).

Extraverts are more likely than introverts to be energetic and take proactive steps to ensure success (Elliot, McGregor, & Gable, 1999). When dealing with stress extraverts tend to use positive thinking strategies (McCrae & Costa, 1986). In

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training settings persons with high Extraversion possess higher self-efficacy than those who with low Extraversion (Esfandagheh, Harris, & Oreyzi, 2012).

2.3.7 Emotional Stability / Neuroticism

Emotional Stability reflects the degree to which people are composed and calm under pressure. Individuals with high levels of Emotional Stability are less likely to experience negative emotions (Rothmann & Coetzer, 2003).

Persons with high levels of Neuroticism are more likely to be unsatisfied at work, experience burnout, and fall sick due to physical ill health (Törnroos et al., 2013). Neuroticism negatively correlates with leadership (Judge et al. 2002), while optimism is related to low Neuroticism (Sharpe, Martin, & Roth, 2011). Neuroticism is negatively associated with academic achievement (Komarraju et al., 2011). Individuals high on Neuroticism are likely to spend resources in dwelling on their internal emotional states rather than in addressing occupational demands (Connor-Smith & Flachsbart, 2007).

2.3.8 Openness to Experience

Openness to experience is often referred to simply as Openness. This factor has been much debated with theorists questioning its definition as well as whether it actually exists (Connelly, Ones, Oleksandr, & Chernyshenko, 2014). Openness is associated with words like intelligent, competent and wisdom while the conceptualisation of Intellect encompasses expressions of curiosity, creativeness and independence (Connelly et al., 2014). McCrae (1987) explained that Openness to Experience includes intellectual curiosity, aesthetic sensitivity, liberal values and emotional differentiation. Other studies have moved away from descriptors relating to abilities or intelligence and instead place emphasis on the culture aspects related to being artistic, reflective and creative (Connelly et al., 2014). People who score high on Openness to Experience may be less rigid in their ideas, open to consider other opinions and less likely to reject conflict (Homan et al., 2008).

Openness to experience was found to be a common characteristic of creative individuals (McCrae, 1987). This finding was supported in a study conducted by George and Zhou (2001) who found that Openness was useful in the study of creativity and innovation. Their findings indicated that people high on Openness to experience tend to display more creativity in their work when conditions allow for creativity. Political Conservatism also correlates negatively with Openness (Jost, Glaser, Kruglanski, & Sulloway, 2003) as does prejudice (Ekehammar & Akrami, 2003). These findings suggest that Openness to Experience plays an important role in shaping political and cultural attitudes.

A study by Homan et al. (2008) emphasised the importance of Openness in diverse teams as it was found that Openness is positively related to the performance of diverse teams, especially if teams or individuals are faced with a task which requires an open mind. Openness has a significant influence on the success of training and education (Barrick et al., 2001; Salgado & Tauriz, 2012).

2.3.9 Conclusion

Although it is possible to criticise the Big Five Model it still remains a useful model for organising personality scales into constructs (Barrick & Mount, 1991). It has proven itself useful and serves an organising and summarising function for the field of personality psychology (Hough & Ones, 2001). Most researchers agree that the FFM is useful in describing human personality (Ellis, Abrams, & Abrams, 2009). This study focuses particularly on the relationship of the Big Five with performance in South Africa and aimed to validate the findings of international studies. The FFM has been used in many studies and has been used as a predictor in various international studies of personality and performance. Job performance is a considered a central construct in Industrial and Organisational Psychology (Viswesvaran & Ones, 2000) and is discussed in detail in the next section.

2.4 JOB PERFORMANCE

2.4.1 Introduction

Individual job performance is at the core of all performance and powers the entire economy. It can be said that without individual performance, team performance, unit performance, organisational performance and economic performance do not exist (Campbell & Wiernik, 2015). Measuring job performance is one of the most significant challenges faced by managers and researchers (Murphy, 2008). Significant questions exist regarding defining and measuring job performance (Murphy, 2008). Although manager ratings represent one of the most common methods of measuring performance these ratings do not carry the respect of practitioners and researchers as they are often seen as unreliable (Murphy, 2008).

There are two theoretical approaches relating to the nature of performance. The first defines the achievement results of predetermined activity, while the second sees performance as the accumulation of behaviours that an employee controls in a certain context (Tutu & Constanti, 2012). Performance is multidimensional and this study investigated the relationship between the Big Five and the following performance dimensions: overall performance, task performance, academic performance, organisational citizenship behaviours and counterproductive behaviours. The section below explores these domains of performance in detail.

2.4.2 Defining Job Performance

This section details the evolution of the definition of job performance and follows a chronological order in terms of the evolving definition. Ree and Earles (1992) claimed that job performance consists of several components, which are the skills, knowledge, and expertise required in the position, and the application of these components to the achievement of organisational goals. They further argued that individual motivation, physical strength, personality, and other non-intellectual components also determine job performance.

Job performance can also be defined as the degree to which an individual assists the organisation in reaching its objectives (Motowidlo, Borman, & Schmitt, 1997 as cited in Côté & Miners, 2006). Hurtz and Donovan (2000) defined job performance by categorising it into task performance, job dedication, and interpersonal facilitation. Rothman and Coetzer (2003, p. 68) defined job performance as "a multi-dimensional construct which indicates how well employees perform their tasks, the initiative they take and the resourcefulness they show in solving problems. Furthermore, it indicates the extent to which they complete tasks, the way they utilise their available resources and the time and energy they spend on their tasks". Situational factors such as the characteristics of the job, environment and co-workers and dispositional factors such as personality factors, needs, attitudes and preferences could have an influence on job performance (Rothmann & Coetzer, 2003). Job performance is further influenced by ability, motivation, self-regard, character and the interaction between these constructs (Rothmann & Coetzer, 2003).

Côté and Miners (2006) agreed with these definitions and explained that job performance has several dimensions, namely task performance and Organisational Citizenship Behaviour (OCB). Task performance relates to the core functional duties that are formally recognised as part of a job, and OCB relates to activities that contribute to the achievement of the objectives of an organisation but that are not necessarily formally recognised as part of a job, such as helping co-workers with their duties (Côté & Miners, 2006).

Ng and Feldman (2008) included ten dimensions of job performance in their meta-analysis study of the relationship between age and job performance. These ten dimensions are core task performance, creativity, performance in training programs, organisational citizenship behaviour, safety performance, general counterproductive work behaviours, workplace aggression, on-the- job substance use, tardiness, and absenteeism. They later identified four categories of behaviour that contribute to or detract from employee performance. These categories are core task performance, citizen behaviour, creativity and innovative behaviour and counterproductive work behaviour (CWB) (Ng & Feldman, 2013).

Myburgh and Theron (2014) preferred a board definition of performance and argued that job performance includes behaviours and outcomes. "It is the nomological network of structural relations existing between an interrelated set of latent behaviours performance dimensions (abstract representations of bundles of related observable behaviour) and interrelated set of outcome variables valued by the organisation, and contribute to organisational goals" (Myburgh & Theron, 2014, p. 30).

In the 1980s an Army Selection and Classification project, named Project A, systematically selected a sample of entry level jobs and developed over one hundred separate performance indicators for each job. Performance data was then collected on two units of 10000 enlisted personnel at three points in time. This allowed for extensive application of confirmatory factor analysis to test substantive models of the latent structure of performance (Campbell & Wiernik, 2015). The results of this analysis resulted in a consensus that individual job performance is the things people do that contribute to organisational goals (Campbell & Wiernik, 2015). This definition does not require that a set of performance actions be limited by the term 'job' nor that they remain 'static' over time. It should therefore be noted that a job description is not directly link to performance objectives, rather the organisational goals are linked to performance objectives (Campbell, 2012).

The determinates of performance include things like individual trait variables (cognitive abilities, personality, physical characteristics, ability, and stable motivational states), state variables (relevant knowledge and skill, attitudes and flexible motivational states) and situational characteristics (reward structures, managerial and peer leadership) as well as the interaction between these factors (Campbell & Wiernik, 2015). Performance is what directly facilitates achieving an organisation's goals (Campbell & Wiernik, 2015).

These different views of job performance all acknowledge that performance consist of various components and is therefore multidimensional. There is a consensus that

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performance is influenced by various factors, some dispositional and others relating to skill, knowledge, expertise and environmental factors. From these definitions it can be concluded that core aspects of performance include task performance, Organisational Citizenship Behaviour, Counterproductive Work Behaviour (CWB) and creativity or initiative. Finally performance is the things people do which directly facilities achieving organisational goals. This study defined performance as consisting of overall performance, task performance, OCB and CWB.

2.4.3 Models of job performance

Since the 1980s there have been several attempts to specify the dimensionality of performance resulting in models or approaches attempting to identify the latent structure of performance (Campbell, 2012). These models focus on the actions required by an occupation, job, position or role and are known as performance models (Campbell, 2012). This section will chronologically detail several performance models, in specific, higher-order generic non-managerial performance factors (task performance, organisational citizenship behaviour and counterproductive behaviour) and first-order generic non-managerial performance factors.

2.4.3.1 *Higher-order generic non managerial performance factors*

Three broad dimensions of performance have been identified that can generally be applied across jobs as stand-a-lone performance dimensions (Viswesvaran & Ones, 2000). These dimensions are task performance, organisational citizenship behaviour and counterproductive behaviour (Viswesvaran & Ones, 2000).

Task performance

According to Borman and Motowidlo (1997, p. 99) core task performance relates to "the effectiveness with which job incumbents perform activities that contribute to the organization's technical core". Task performance involves two sets of behaviour. The first set of behaviour involves activities that produce items from resources, while the second set involves activities that services (Borman & Motowidlo, 1997). Thus, task

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performance behaviours involve either completing the technical processes of an organisation or maintaining and servicing the organisation's technical requirements (Motowidlo & Van Scotter, 1994).

Organisational Citizenship Behaviour

Organisational Citizenship Behaviour (OCB) is defined as individual behaviour that is discretionary or extra over and above role responsibilities, is not directly or explicitly recognised by the formal reward system, and is behaviour that in the aggregate promotes the effectiveness of the organisation (Organ, 1988). Citizenship behaviour is defined as behaviours that contribute to organisational effectiveness by supporting the social and culture capital of the organisation, rather than by contributing directly to the goods and services provided by the organisation (Borman, Brantley, & Hanson, 2014). Organ (1998) identified the following six first-order factors loading on the second-order OCB factor: sportsmanship; altruism; civic virtue; courtesy; cheerleading; and conscientiousness. In his 1998 review of OCB Organ revised the definition of OCB claiming that these behaviours not necessarily should be extra over role responsibilities and not to be directly rewarded.

Borman and Motowidlo (1993) proposed a performance factor, termed contextual performance, which closely resembles organisational citizenship behaviour and is contrasted to task performance. Contextual performance behaviours primarily support the broader organisational, social, and psychological environment (Borman & Motowidlo, 1993). Borman and Motowidlo (1993) identified the following five categories of contextual performance:

- Volunteering to carry out task activities that are not formally part of the job;
- Persisting with extra enthusiasm when necessary to complete own task activities successfully;
- Helping and cooperating with others;
- Following organisational rules and procedures even when it is personally inconvenient; and
- Endorsing, supporting, and defending organisational objectives.

Counter Productive Behaviour

Behaviours that have a negative value for organisational effectiveness have been theorised to constitute distinct dimensions of job performance (Viswesvaran & Ones, 2000). Organisational deviant behaviour is intentional behaviour that violates significant organisational norms and results in risking the wellbeing of an organisation and its members (Robinson & Bennett, 1995, as cited in Viswesvaran & Ones, 2000).

Four categories of counterproductive behaviour are identified in terms of these two criteria, namely (Viswesvaran & Ones, 2000):

- Property deviance (serious deviance directed at the organisation);
- Production deviance (minor deviance directed at the organisation);
- Personal aggression (serious deviance directed at other individuals); and
- Political deviance (minor deviance directed at other individuals).

Sackett and DeVore (2001) defined counterproductive behaviours as any deliberate behaviour on the part of an employee viewed by the organisation as contrary to its legitimate interest. They further argued that counterproductive behaviour at work can be categorised into three groups: deviant behaviour such as theft, drugs and alcohol use; absenteeism, in other words absence or lateness; and, third, unsafe behaviour like accidents and injuries.

2.4.3.2   First-order Generic Non-Managerial performance factors

"Generic work behaviour is defined as behaviour that contributes to the performance of virtually any job independent of technical job roles" (Hunt, 1996, p. 51). These factors are observable things people do that are related to outcomes produced on a specified job function.

Bernardin and Beatty (1984)

Bernardin and Beatty (1984) defined performance as the outcomes achieved on a specific function in a set period of time. Although a person's job performance

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depends on a combination of ability, motivation and situational constraints it is measured in terms of certain outcomes. Bernardin and Russell (1998, p. 243) identified six dimensions of performance, namely:

Quality: The degree to which the process or result of carrying out an activity approaches perfection, in terms of either conforming to some ideal way of performing the activity or fulfilling the activity's intended purpose.

Quantity: The amount produced, expressed in such terms as dollar value, number of units, or number of completed activity cycles.

Timeliness: The degree to which an activity is completed, or a result produced, at the earliest time desirable from the standpoints of both coordinating with the outputs of others and maximising the time available for other activities.

Cost-effectiveness: The degree to which the use of the organisation's resources (e.g., human, monetary, technological, material) is maximised in the sense of getting the highest gain or reduction in loss from each unit or instance of use of a resource.

Need for supervision: The degree to which a performer can carry out a job function without either having to request supervisory assistance or requiring supervisory intervention to prevent an adverse outcome.

Interpersonal impact: The degree to which a performer promotes feelings of self-esteem, goodwill, and cooperativeness among co-workers and subordinates.

They emphasized that the relationship between these dimensions needs to be understood. For example, a work activity performed in sufficient quantity and quality

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but insufficient time might not have value for the organisation (Viswesvaran & Ones, 2000). This definition of performance is in contrast with the definition developed by Campbell (1990) who argued that performance should be defined as behaviour rather than outcomes (Viswesvaran & Ones, 2000).

Campbell (1990)

According to this definition performance refers to observable things people do that are relevant for the goals of the organisation (Campbell, McHenry, & Wise, 1990). These behaviours constitute performance and can be scaled in terms of the level of performance they represent (Campbell et al., 1990). Project A was a classification project where the latent performance structure of 275 entry-level jobs in the United States Army was classified. Project A resulted in the identification of the following five factors:

- Core technical proficiency;
- General soldiering proficiency;
- Effort and leadership;
- Personal discipline; and
- Physical fitness and military bearing.

Campbell (1990) proposed eight dimensions of job performance with each dimension describing a speciﬁable content domain of goal-relevant actions. Table 6 provides a summary of Campbell's (2012) performance dimensions.

Table 6: Campbell's dimensions of Job Performance

Performance Component	Description
1. Job-specific technical performance	The core substantive or technical tasks which are central to an individual's job.
2. Non-job-specific technical task proficiency	Task not specific to the individual's particular job.
3.Written and Oral Communication task proficiency	Making formal oral or written presentations.
4. Demonstrating effort	Effort day by day and frequency and willingness to work longer hours.

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5. Maintaining personal discipline (Counter productive work behaviour)	Avoiding negative behaviour.
6.Faciliating peer and team performance	Supporting peers/team, helps them and teaches them.
7. Supervision / leadership	Influencing the performance of subordinates through interpersonal interaction and influence.
8. Management / administration	Includes the major elements in management that are distinct from supervision.

Adapted from "Behaviour, performance and effectiveness in the 21st century" by J.P. Campbell, 2012, in *The Oxford handbook of organisational psychology,* pp.159-195.

The importance of these dimensions differs across different occupational groups and no higher-order general performance factor loads on the foregoing eight performance factors (Campbell, 1990). However, Campbell (1990) regarded the proposed model as hierarchical in as far as lower-order factors load on each of the proposed eight dimensions.

In a study modelling job performance in a population of entry level jobs Campbell et al. (1990) found two general factors of performance. The first factor is composed of components of a particular job, thus job specific behaviours. The second factor includes components that are defined and measured in the same way in every job (Campbell et al., 1990).

Murphy (1990)

According to Murphy (1990) job performance consists of the following four factors:

- Downtime behaviours;
- Task performance;
- Interpersonal performance; and
- Destructive behaviours.

He described task performance as role prescribed activities, while downtime behaviours refer to lateness, tardiness, absences or any time away from performing job. Interpersonal performance refers to helping others, teamwork and prosocial

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behaviours and, finally, destructive behaviours refer to lack of compliance with rules of the organisation (Viswesvaran & Ones, 2000).

Borman and Motowidlo (1993, 1997)

Borman and Motowidlo (1997) proposed a performance model consisting of two general factors, namely core technical performance and contextual performance. Task performance is described as: "the effectiveness with which job incumbents perform activities that contribute to the organisation's technical core either directly by implementing a part of its technological process, or indirectly by providing it with needed materials or services" (Borman & Motowidlo, 1997, p. 99). Contextual performance is defined as: "activities that contribute to organisational effectiveness in ways that shape the organisational, social, and psychological context and serves as the catalyst for task activities and processes" (Borman & Motowidlo, 1997, p. 100).

Organisational citizenship behaviour (OCB) refers to performance behaviours that are relevant to the organisation's goals but which are not required by the actual job description (Organ, 1998). Confirmatory factor analyses provided evidence for the distinction between task and citizenship performance (Johnson, 2003). Supervisors tend to ascribe the same importance to contextual and task performance when making judgements about overall performance (Borman & Motowidlo, 1997).

The five sub-factors of contextual performance are also intended to incorporate performance factors associated with OCB (Campbell, 2012). Podsakoff, MacKenzie, Paine, & Bachrach (2000) (2000) identified seven dimensions that represent OCB on an individual scale, namely: helping behaviour; sportsmanship; organisational loyalty; organisational compliance; individual initiative; civic virtue; and self-development. Brief and Motowidlo (1986, as cited in Campbell, 2012) introduced pro-social behaviour, which is defined as Performance behaviour directed toward individuals, groups and organisations with whom the individual interacts and which is intended to promote the welfare of the individual, group or organisation to which it is directed. Prosocial behaviour is typically manifested in activities such as providing

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service or products to consumers, helping customers with personal matters, suggesting organisational improvements and staying with the organisation during tough times (Campbell, 2012). Pro-social organisational behaviour (POB) is similar to OCB and refers to behaviour that is intended to uphold and promote the interests of individuals or groups irrespective of whether it promotes the interests of the organisation. The difference between OCB and POB is that POB can be role-prescribed or extra-role behaviour, while OCB refers to extra-role behaviours (Borman & Motowidlo, 1997).

Hunt (1996)

Hunt (1996) created a model of generic work behaviour applicable to entry-level positions especially related to the service industry. He identified nine dimensions of job performance that are not dependent on job-specific knowledge, These dimensions are illustrated in Table 7.

Table 7: Hunt's dimensions of Job Performance

Performance dimension	Description
Adherence to confrontational rules	Employee's willingness to follow rules that might result in a confrontation between employee and customer.
Industriousness	Constant effort and attention towards work while on the job.
Thoroughness	The quality of work.
Schedule flexibility	Employee's willingness to change their schedule to accommodate demands at work.
Attendance	Employee's presence at work when scheduled to work and punctuality.
Off-task behaviour	Use of company time to engage in non-job activities.
Unruliness	Minor deviant tendencies as well as abrasive and inflammatory attitude towards co-workers, supervisors and work itself.
Theft	The taking of money or company property or helping others steal property.
Drug misuse	Inappropriate use of drugs and alcohol.

Adapted from "Perspective on models of job performance" by C. Viswesvaran and D.S. Ones, 2000, *International journal of selection and assessment,* 8 (4), p.219.

A fundamental assumption of the Hunt model is that the nine dimensions of performance are interrelated. This suggests the presence of higher-order factors. Hunt (1996) proposed five higher-order factors to account for the correlations observed between the nine dimensions of performance. These higher-order factors are shown in the hierarchical latent performance structure depicted in Figure 2.

Figure 2: Hierarchical latent performance structure adopted from Hunt (1996, p.75).
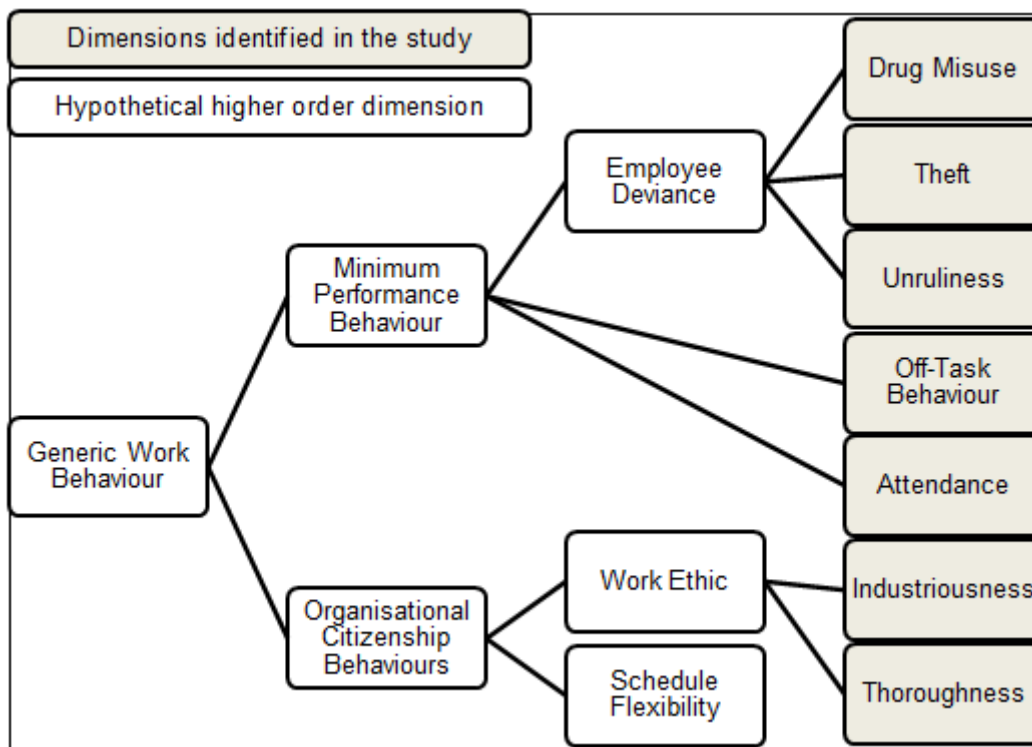
Hunt (1996) decided that this initial model excluded four performance factors that literature suggest are important, namely teamwork, problem solving, safety and personal appearance. Teamwork is defined as the way employees work together in the workplace to reach and achieve a common organisational goal. Problem solving describes the ability of an employee to utilise information in order to solve or adapt to problems in the workplace. This dimension of safety includes the components of accidents, being a safety conscious employee and protecting the organisation.

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Personal appearance is when the employee's appearance deviates from societal norms (Hunt, 1996).

Welbourne, Johnson and Erez (1998)

Welbourne, Johnson and Erez (1998) argued that employees have to play numerous organisationally prominent roles while at work beyond that of jobholder. They identified the following five roles: Job role; Organisational role; Career role; Team role and Innovator role (Welbourne et al., 1998).

- Job role - Represents employee performance related to assigned tasks to contribute towards organisational goals.
- Organisational role - Is behaviour that influences the overall organisational success in terms of the organisational citizenship behaviour it produces.
- The career role - There is a joint responsibility between employee and employer in terms of career planning.
- Team role - Many performance models include teamwork as a vital component.
- The innovator role - Employees need to behave in innovative ways, not only applying their creative skills to their specific jobs.

Welbourne et al. (1998) argued that the roles mentioned in this model relate to dimensions of job performance that are typically neglected by the other traditional performance appraisal measures.

Viswesvaran and Ones (2000)

Viswesvaran and Ones (2000) identified the following ten dimensions of job performance: overall job performance, job performance or productivity, effort, job knowledge, interpersonal competence, administrative competence, quality, communication competence, leadership, and compliance with rules (Viswesvaran & Ones, 2000). Viswesvaran, Schmidt and Ones' (2005) definitions of these factors are presented in Table 8 below.

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Table 8: Definition of Job Performance Ratings Adopted from Viswesvaran, Schmidt and Ones (2005).

Dimension rated	Definition
Interpersonal competence	Ratings of ability to work well with others which includes cooperation and customer relations.
Administrative competence	Ratings of proficiency in handling the coordination among different roles in an organisation.
Quality	Ratings of statements referring to the quality of tasks completed.
Productivity	Ratings of the quantity of work produced.
Effort	Ratings of amount of work expended in striving to do a good job.
Job knowledge	Ratings of the individual's on-job knowledge, keeping up to date, as well as nominations of who knows the job best and nominations of who keeps up to date.
Leadership	Ratings of ability to inspire, to elicit high performance from others, to motivate others.
Compliance/acceptance of authority	Ratings on general perspective about rules and regulations.
Communication competence	Ratings of skill in gathering and transmitting information (both in oral and written format).

Viswesvaran and Ones (2000) found positive correlations across the different dimensions of job performance. These positive correlations suggest the existence of a general factor across the different dimensions of job performance (Viswesvaran & Ones, 2000; Viswesvaran et al., 2005).

Bartram (2005)

The Great Eight model has emerged from factor analyses and multidimensional scaling analyses of self-ratings and manager ratings of job performance. The Great Eight model is a criterion-centric model that can be used to explore the validity of various potential predictors of workplace performance (Bartram, 2005).

The framework distinguishes between 112 component competencies of related workplace behaviour at the finest level of detail and is not differentiated further. These components are the foundation of the development of competency models (Bartram, 2005). Components can be combined to form competencies and the combined competencies can form competency models. Bartram (2005) developed a hierarchical competency model where the 112 components were aggregated under twenty second-order competency factors and these in turn were collapsed into eight third-order competency factors (Myburgh & Theron, 2014).

Table 9 provides definitions of the factors and summarizes a range of hypotheses relating to the probable relationships between high level factors in the predictor domain and the Great Eight competencies (Bartram, 2005).

Table 9: Barman's Big Eight Competency Model

Competency Domain Title	Competency Domain Definition
Leading and deciding	Takes control and exercises leadership.
Supporting and Co-operation	Supports others and shows respect and positive regard for them in social situations.
Interacting and Presenting	Communicates and networks effectively.
Analysing and interpreting	Shows evidence of clear analytical thinking.
Creating and conceptualising	Works well in situations requiring openness to new ideas and experiences.
Organising and Executing	Plans ahead and works in a systematic and organised way.

| Adapting and Coping | Adapts and responds well to change. |
| Enterprising and Performing | Focuses on results and achieving personal work objectives. |

Adopted from The great eight competencies: A criterion-centric approach to validation by D. Bartram (2005) *Journal of applied psychology*, (90) 6, p.1187.

Myburgh and Theron (2014)

Myburgh and Theron (2014) proposed a model of individual non-managerial performance. They summarised latent performance dimensions of various researchers (presented in Table 10 below) and proposed a model by grouping behavioural performance dimensions as listed in column one.

Table 10: Brief Summaries of Performance Dimensions

Performance Dimension number and name	Behavioural performance Dimension	Models listing Dimension
1 Effort	Effort Demonstrating Effort (OCB) Industriousness (OCB)	Viswesvaran (Viswesvaran & Ones, 2000) Campbell (1990) Hunt (1996)
2 Job Knowledge	Job Knowledge	Viswesvaran (Viswesvaran & Ones, 2000)
3 Interpersonal Performance	Interpersonal Competence Interpersonal Performance Team Role Supporting and Cooperating Facilitating Peer and Team performance (OCB) Interpersonal impact	Viswesvaran (Viswesvaran & Ones, 2000) Murphy (1990) Welbourne, Johnson and Erez (1998) Bartram (2005) Campbell (1990) Bernardin and Beatty (1984)
4 Management and Administration	Administration Competence Management / Administration Organising and Executing	Viswesvaran (Viswesvaran & Ones, 2000) Campbell (1990) Bartram (2005) Schepers (2003)

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		Managerial ability	
5	Communication	Communication Competence Written and Oral Communication Interacting and Presenting	Viswesvaran (Viswesvaran & Ones, 2000) Campbell (1990) Bartram (2005)
6	Leadership	Leadership Supervision Leading and deciding	Viswesvaran (Viswesvaran & Ones, 2000) Campbell (1990) Bartram (2005)
7	Counter Productive Work Behaviour	Compliance with Rules Maintaining Personal Discipline Adherence to Confrontational; Rules Destructive Behaviours Attendance (CPB) Downtime Behaviour Unruliness (CPB) Theft (CPB) Drug Misuse (CPB) Off-Task Behaviour	Viswesvaran (Viswesvaran & Ones, 2000) Campbell (1990) Hunt (1996) Murphy (1990) Hunt (1996) Murphy (1990) Hunt (1996) Hunt (1996) Hunt (1996) Borman and Motowidlo (1993)
8	Organisational Citizenship Behaviour	Organisational Role Contextual Performance	Welbourne, Johnson and Erez (1998) Borman and Motowidlo (1993)
9	Task Performance	Task Performance Task Performance Task Orientation (quality and quantity) Job Role Job specific task proficiency Non-job specific task proficiency Productivity Enterprising and Performing Quality of Work Thoroughness	Borman and Motowidlo (1993) Murphy (1990) Schepers (2003) Welbourne, Johnson and Erez (1998) Campbell (1990) Campbell (1990) Viswesvaran (Viswesvaran & Ones, 2000) Bartram (2005) Viswesvaran (Viswesvaran & Ones, 2000) Hunt (1996)
10	Innovating	Creative thinking Innovator role Creating and conceptualising	Schepers (2003) Welbourne, Johnson and Erez (1998) Bartram (2005)
11	Career growth	Career role Enterprising and	Welbourne, Johnson and Erez (1998)

		performance	Bartram (2005)
12	Problem-solving and analysing	Analysing and interpreting Analytical ability	Bartram (2005) Schepers (2003)
13	Adapting	Adapting and coping Schedule flexibility	Bartram (2005) Hunt (1996)

Adopted from "The development and evaluation of a generic individual non-managerial performance measure" by D. Myburgh and C. Theron, 2014, *Management Dynamics*, 23(1), p.33.

Myburgh and Theron (2014) proposed a fourteen dimension performance model (see Table 11). This is intended to be a comprehensive model that combines elements of previous models.

Table 11: Myburgh and Theron's (2014) fourteen performance dimensions

Dimension	First-order Dimension Name	First-order Dimension Definition
1	Task performance	The extent to which the employee effectively performs activities that contribute to the organisation's technical core, performs the foundational, substantive or technical tasks that are essential for a specific job effectively, successfully completes role activities prescribed in the job description and achieves personal work objectives. Core task productivity is defined as the quantity or volume of work produced and describes the ratio inputs in relation to the outcomes achieved.
2	Effort	The extent to which the employee devotes constant attention towards his work, uses resources like time and care spend in order to be effective on the job, shows willingness to keep working under detrimental conditions and spends the extra effort required for the task.
3	Adaptability	The extent to which the employee adapts and responds effectively in situations where change is inevitable, manages pressure effectively and copes well with setbacks, shows willingness to change his/her schedule in order to accommodate demands at work.

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4	Innovating	The extent to which the employee displays creativity, not only in his/her individual job but also on behalf of the whole organisation, shows openness to new ideas and experiences, handles novel situations and problems with innovation and creativity, thinks broadly and strategically. Supports and drives organisational change.
5	Leadership potential	The extent to which the employee empowers others, brings out extra performance in other employees, supports peers, helps them with challenges they face, motivates and inspires other employees, models appropriate behaviour, initiates action, provides direction and takes responsibility.
6	Communication	The extent to which the employee communicates well in writing and orally, networks effectively, successfully persuades and influences others, relates to others in a confident and relaxed manner.
7	Interpersonal relations	The extent to which the employee relates well with others, interacts on a social level with colleagues and gets along with other employees
8	Management	The extent to which the employee plans ahead and works in a systematic and organised way, follows directions and procedures, articulates goals for the unit, organises people and resources, monitors progress, helps to solve problems and to overcome crises, effectively coordinates different work roles.
9	Analysing and problem-solving	The extent to which the employee applies analytical thinking in the job situation, identifies the core issues in complex situations and problems, learns and utilises new technology, resolving problems in a logical and systematic way, behaves intelligently, making decisions by deducing the appropriate option from available information.
10	Counterproductive work behaviour	The extent to which the employee displays behaviour that threatens the wellbeing of an organisation, shows unwillingness to comply with organisational rules, interprets organisational expectations incorrectly, fails to maintain personal discipline, is absent from work, not punctual, steals, misuses drugs, displays confrontational attitudes towards co-workers, supervisors, and work itself, his/her behaviour hinders the accomplishment of organisational goals.
11	Organisational citizenship behaviour	The extent to which the employee displays voluntary behaviour contributing towards the overall effectiveness of the organisation, volunteers to carry out task activities that are not formally part of his/her

		job description, follows organisational rules and procedures, endorses, supports, and defends organisational objectives, shows willingness to go the extra mile, voluntary helps colleagues with work, shows willingness to tolerate inconveniences and impositions of work without complaining, is actively constructively involved in organisational affairs.
12	Self-development	The extent to which the employee takes responsibility for his/her own career development, works on the development of job relevant competency potential and competencies, seeks opportunities for self-development and career advancement.

Adopted from "The development and evaluation of a generic individual non-managerial performance measure" by D. Myburgh and C. Theron, 2014, *Management Dynamics*, 23(1), p. 48.

Table 11 clearly illustrates that job performance consists of various dimensions. These dimensions should be considered when examining job performance as a construct. As this study focused on individual performance models of leadership and management performance are not discussed.

2.4.4 Conclusion

Job performance is a fundamental construct in organisational and industrial psychology (Viswesvaran & Ones, 2000). Most of the efforts of managers and human resource consultants are aimed at improving individual employee performance (Viswesvaran & Ones, 2007). Personnel selection is aimed at selecting employees, from a group of candidates, who will perform better on the job (Viswesvaran & Ones, 2000). Job performance has been difficult to understand in a systematic manner and the measurement of performance occurs in organisations and is not controlled by researchers (Poropat, 2002). Job performance models have been developed to specify the content domain of job performance as well as to clarify the relationships among individual differences variables such as personality and organisational characteristics (Viswesvaran & Ones, 2007).

The use of a job analysis makes it possible to determine the outlines of what should be included when an individual's job performance is assessed. These aspects of job performance may include performance on tasks, communication, leadership, and avoiding counterproductive behaviours (Viswesvaran & Ones, 2007). Researchers have created models of job performance to manage the complexity of job performance (Poropat, 2002).

Although there is a general job performance factor that underlies the different measures of job performance this does not preclude or diminish the importance of individual dimensions or facets of job performance (Viswesvaran & Ones, 2007). In many cases job performance is measured by supervisory ratings or using organisational production records and these measures are usually not comparable (Ones et al., 1993). Supervisors take various factors into consideration when rating an employee, such as OCB and output (Ones et al., 1993). Ones et al. (1993) found that production ratings are a more reliable measure of job performance than supervisor ratings. Salgado, Moscoso and Lado (2003) supported this by stating that, in comparison to other measures, supervisor ratings are less reliable largely due to subjectivity.

One of personnel selection's key functions is to select those individuals, from a pool of applicants, who are likely to perform better on the job (Viswesvaran & Ones, 2000). There has been an increase in the use of non-cognitive predictors for selection; much of this has been focused on the Big Five personality factors (van Iddekinge, Putka & Campbell, 2011). This study investigated the predictive validity of the Big Five in relation to job performance. Performance is multi-dimensional, and in this study the focus was on the performance dimensions of overall performance, task performance, organisational citizenship behaviour and counterproductive work behaviour.

2.5 PERSONALITY AS A PREDICTOR OF JOB PERFORMANCE

2.5.1 Introduction

The use of psychological tests to predict performance dates back to the First World War (Ree & Earles, 1992). The field of test development has seen much advancement since this time with the increased use of predictors of performance (Cascio & Aguinis, 2008). Individual differences, including personality traits, are important and powerful in explaining human behaviour in the workplace (Dilchert et al., 2006).

The measures used to predict performance are diverse and assess information collected directly from job applicants and information collected indirectly from other sources such as references from past employers. Some assessments are used in the beginning of the recruitment process to act as a screening method; these can range from curriculum vitae screening to reference checks and drug tests (Cascio & Aguinis, 2008). After the initial screening phase successful candidates are often required to complete a pencil and paper based assessment (this could also be an online assessment) measuring general metal ability and personality traits. These assessments are usually followed by an interview (Cascio & Aguinis, 2008). Evidence suggests that personality tests can account for significant incremental validity (Witt, Burke, Barrick, & Mount, 2002).

2.5.2 Personality as predictor of job performance

The validity of the relationship between the Big Five and job performance is strengthened as every Big Five trait is related to job performance (Barrick, Mitchell, & Stewart, 2003). The Big Five seem to be valid and reliable across racial or ethnic groups while the use of cognitive ability tests is known to result in significant majority–minority differences (Barrick & Mount, 2005).

Although each of the Big Five factors has some influence on job performance, various studies have found that Conscientiousness may be the best predictor of job performance (Barrick & Mount, 1991; Barrick et al., 2001; Hurtz & Donovan, 2000;

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Salgado, 1997). Barrick and Mount (1991) found that Conscientiousness is a valid predictor of job performance across occupations and performance criteria. Ones et al. (1994) explained the significance of using the Big Five Model of personality by stating that the Big Five provides a framework for summarising validities within constructs, which allows knowledge to be accumulated in a meaningful way.

Barrick and Mount (2005) found that Extraversion, Agreeableness, and Openness to Experience are valid predictors of performance for specific occupations or for some criteria. Campbell et al. (2010) conducted a meta-analysis to determine whether personality plays a role in the successful training of pilots. They found that Neuroticism, Extroversion and anxiety had the greatest validity in predicting training outcomes. The construct of customer service orientation is strongly connected to three of the Big Five dimensions of personality, namely Agreeableness, Emotional stability, and Conscientiousness (Ones & Dilchert, 2005). Hurtz and Donovan (2000) revaluated the meta-analytic studies conducted by various researchers (Barrick & Mount, 1991; Mount & Barrick, 1995; Salgado, 1997; Tett et al., 1991) and found that Conscientiousness has the highest validity of the Big Five dimensions for the prediction of overall job performance.

According to Barrick, Parks and Mount (2005) Conscientiousness shows the strongest and most consistent correlations with performance across all jobs and settings, while Emotional Stability relates to overall performance across many jobs. This indicates that these traits can be considered generally generalisable predictors because they are relevant in almost all jobs. Research has shifted from investigating whether a relationship between personality and job performance exists to the investigation of the moderating or mediating effects that explain how personality influences job performance (Barrick et al., 2005).

Hurtz and Donovan (2000, p. 876) stated that "we do interpret our findings as indicating a pattern of theoretically meaningful relations between the broad personality dimensions and job performance that should be explored in future research, perhaps using facet scales of the Big Five dimensions". Hurtz and

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Donovan (2000) concluded that the Conscientiousness seems to have the strongest relation to overall job performance. Emotional Stability showed a stable influence on performance while Agreeableness has proven to be important in jobs that require interpersonal interactions. Finally, Extraversion appears to influence sales and managerial jobs, while Openness to Experience seems to influence performance in customer service jobs (Hurtz & Donovan, 2000).

2.5.3 Conclusion

Meta-analysis studies have consistently shown that certain personality constructs are valid predictors of job performance (Moy & Lam 2004). The broad Big Five traits are well suited to predict job performance (Judge et al., 2013). The next section will explore the use of meta-analysis as a research method and the use of this method to investigate the relationship between personality and performance.

2.6 META-ANALYSIS

2.6.1 Introduction

This study made use of a meta-analytic approach to investigate the predictive validity of the Big Five factors for job performance in the South African context. This section therefore provides insight into the meta-analysis as a research approach. It defines meta-analysis, explores the use of this technique in studies and discusses the advantages and criticism of the approach and the methods of meta-analysis.

It is known that a single study is not able to provide a solution for any major issue (Hunter, Schmidt, & Jackson, 1982). Research findings indicted that the same employment test could yield differing validity estimates relating to job performance even when computed for the same job in similar settings (Banks & McDaniel, 2014). Various studies have produced contradicting results and if the field is to advance these conflicting results need to be clarified. Meta-analysis allows researchers to combine numerical results from studies, thereby allowing them to accurately estimate descriptive statistics and explain the inconsistent findings in research (Rosenthal & DiMatteo, 2001). This research approach allows researchers to reach

conclusions with more accuracy and more credibility than can be achieved by a single study (Rosenthal & Dimatteo, 2001). Meta-analysis provides clarity regarding inconsistencies in research findings by providing unmistakeable answers to questions that have traditionally been raised by conflicting research outcomes (Le et al., 2007).

2.6.2 Defining Meta-Analysis

There are several definition and explanations of meta-analysis. Glass (1976), who first coined the concept, explained that meta-analysis is the analysis of analyses. It is the statistical analysis of the results of individual studies investigating a related topic in order to integrate the results and findings of those studies (Glass, 1976). DeNeve (1999) supported this definition by stating that a meta-analysis makes use of statistical methods to combine the literature addressing a topic and can provide insight into contradictions that exists among studies. Additionally, Glass, McGaw and Smith (1981) explained that meta-analysis is the statistical analysis of the summary of findings of many empirical studies. They added that meta-analysis makes use of statistical methods to organise and extract information from large amounts of data that may be incomprehensible by other means.

2.6.3 The use of meta-analysis

Meta-analysis is a method used by scientists to summarise volumes of information and identify coherent patterns within the various subjects. The practice of meta-analysis was first introduced to summarise a body of literature (Shercliffe, Stahl, & Tuttle, 2009). Meta-analysis is a "methodology for systematically examining a body of research, carefully formulating hypotheses, conducting an exhaustive search and establishing inclusion/exclusion criteria for articles, recording and statistically synthesising and combining data and effect sizes from these studies, searching for moderator and mediator variables to explain effects of interest, and reporting results" (Rosenthal & Dimatteo, 2001, p. 62).

A primary analysis is an analysis of original data while secondary analysis is the reanalysis of data in order to answer the original or new research questions by

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means of better or new statistical techniques (Glass et al., 1981). The results and conclusions generated using this method largely depended on the judgment and personal style of the author and in many cases the sample size, effect size and research design (Shercliffe et al., 2009). According to Glass et al. (1981) it is important to note the methodological weaknesses in the original studies and to examine their relationship to the findings. There are two major approaches to meta-analysis: first, psychometric meta-analysis (Hunter & Schmidt, 1990); and, second, meta-analysis in the tradition of Hedge and Olkin (1985, as cited in Banks & McDaniel, 2014). These approaches both acknowledge that correlations and other effect sizes may vary between studies due to sampling error. However, psychometric meta-analysis also explicitly considers other statistical artefacts (Banks & McDaniel, 2012).

2.6.4 Advantages of meta-analysis

Meta-analysis holds various advantages. These advantages include the ability to explore more information than what is possible in a single primary study, allowing researchers to obtain a cumulative view of a field of study and not relying on a single study as it makes use of the data of several studies concerning the topic under investigation (Rosenthal & Dimatteo, 2001). Meta-analysis aims to locate published and unpublished studies on a specific topic because when only published data is included this may cause bias in the results (Crombie & Davies, 2009). Another advantage comes in the form of statistical significance. Statistical significance is influenced by the size of the sample and because meta-analysis makes use of multiple studies it combines the samples of those studies and therefore makes use of a larger sample. Larger samples are able to yield more significant findings, thus the findings of a meta-analysis hold more powerful evidence of effect than one single study (Rosenthal & Dimatteo, 2001). Significant effects can be identified with a higher level of accuracy, due to a larger number of studies (sample size) involved in the meta-analysis (Crombie & Davies, 2009).

In many cases data collection is a difficult and frustrating task yielding small sample sizes that hardly ever produce significant results. However, these studies can be

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included in a meta-analysis to contribute to a significant finding. Meta-analysis therefore strengthens the belief that no research should be wasted and researchers should write up any results even when the findings are not significant (Rosenthal & Dimatteo, 2001).

When conducting a meta-analysis it is crucial to have a focused hypothesis concerning the significance of the findings as the results of the meta-analysis may possibly have colossal effects on the field being researched. Researchers making use of this method therefore need to be attentive and precise in the questions they ask. By examining the moderating variables the researcher can expand theory development and increase the richness of empirical work (Rosenthal & Dimatteo, 2001).

The methods of meta-analyses are generally explained in detail. All decisions and steps taken during the procedure are recorded and this verifies the validity of the analysis to the readers (Crombie & Davies, 2009).

2.6.5 Criticism of meta-analysis

Despite the clear advantages of meta-analysis the approach also has several criticisms. Every meta-analytic study is subject to the biases of the studies included in the analysis. The meta-analysis itself is also biased due to its own inclusion and exclusion criteria as well as the searching strategies used to find studies. Regardless of the search strategies used not every article will be identified. Although all the data on the topic should be included this is rarely possible as some data is not published and searches do not cover everything. Limitations thus apply to the sampling of data (Glass et al., 1981; Rosenthal & Dimatteo, 2001). Another criticism can simply be referred to as 'garbage in garbage out', which means that including studies with corrupt research methods (whether in data collection, analysis or reporting) in turn produces corrupt findings (Glass et al., 1981; Rosenthal & Dimatteo, 2001).

A further concern with meta-analysis relates to combining effect sizes in an incorrect manner; effect sizes dependant on each other have to be combined differently from

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effect sizes independent of each other. The meta-analytic technique systematically assesses individual effects without viewing the bigger picture and this might be a risk. In order to counter this risk it is acknowledged that a multifactorial model is necessary. The final criticism lies in comparing studies that used different techniques and research methodologies and combining data collected and analysed in different ways, thus leading to the combining of apples and oranges. It is important for the meta-analyst to take these differences into account and treat them as moderating factors (Glass et al., 1981; Rosenthal & Dimatteo, 2001).

Glass et al. (1981) responded to these criticisms by stating that comparing the same studies with each other will yield the same findings. There is seldom more than 0.1 standard deviation difference between average effects for high-validity and low-validity experiments. The same amount of bias exists in selection of studies by date as by publication. The first step in reviewing and integrating research literature is to identify the literature (Glass et al., 1981). A good starting point involves searching the bibliographies of studies on the topic and thoroughly describing the methods used to find studies (Glass et al., 1981). According to Shercliffe et al. (2009) some common problems experienced when conducting a meta-analysis include the absence of methodological information, incomplete and inconsistent sampling procedures and failure to attend to validity issues.

A researcher should consider these issues when choosing his or her studies, especially because they may influence the validity of the meta-analysis. Murphy (2000, as cited in Rothstein & Goffin, 2006) summarised issues to keep in mind when making inferences from meta-analysis. These issues are "(a) the quality of the data base and the quality of the primary studies it contains; (b) whether the studies included in the meta-analysis are representative of the population of potential applications of the predictor; (c) whether a particular test being considered for use is a member of the population of instruments examined in the meta-analysis; and (d) whether the situation intended for use is similar to the situations sampled in the meta-analysis" (Rothstein & Goffin, 2006, p.157).

2.6.6 Methodology of meta-analysis

In order to conduct a meta-analysis enough studies must be in existence. Once a topic has been identified all the information has to be gathered. This may involve searching various data bases, approaching various academic institutions and searching for unpublished articles. The goal of meta-analysis is to provide an accurate, unbiased, quantitative description of the findings contained in the research on a particular topic (Glass et al., 1981). The next step involves classifying and coding research studies. The purpose of this step is to relate the properties of the studies to the study findings (Glass et al., 1981). The studies have to be coded; this involves sifting through studies to find articles with all the relevant information relating to the sample (Shercliffe et al., 2009).

Rosenthal and Dimatteo (2001, p. 69) identified the following six basic steps in a meta-analysis:

Step one: Define the independent and dependant variables of interest

Step two: Collect the studies in a systematic way, attempting to find all the research available. Read each article's method and results very carefully, assessing how independent and dependant variables were operationalised and measured. Hope the researchers reported the sample size, and if they have not, scour the articles for the information necessary to calculate it.

Step three: Examine the variability among the obtained effect sizes informally with graphs and charts. Most approaches to meta-analysis operationalise heterogeneity as a chi-square test of significance. It must be kept in mind, however, that the significance of this chi-square test depends upon the sample size and can yield highly significant results even when there is little variation in the effect sizes; the standard deviation is a straightforward measure of the variability in effects sizes that is not dependent upon sample sizes. Variability among effect sizes points to the likelihood that a

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moderator variable might account for the variability in the effect sizes, and the possibilities should be explored.

Step four: Combine the effects using several measures of their central tendency, i.e. medians and both weighted and unweighted means. When several approached to central tendency yield different results, the reasons for such differences need to be explored.

Step five: Examine the significant level of the indices of central tendency. It is almost always useful to employ confidence intervals around the unweighted mean effect size based on a random effects mode (using studies as unit of analysis) and it is sometimes useful to employ confidence intervals around the weighted mean effect size based on a fixed effects model. The latter fixed effects model employs subjects nested within studies as the units of analysis, and yields a more powerful test of an overall null hypothesis, a null that is probably always false in any case. The disadvantage of the fixed effect model is that it does not permit generalisation to studies other than those already in the sample. The random effects approach, though less powerful, does permit generalisation to studies not yet in the sample, and if only one approach were to be used it would be the one we prefer. A new statistical procedure called the counternull value of the effect size is often helpful in meta-analytic work as well as in the analysis of individual studies. The counternull gives that value of the effect size that is greater than the one obtained and has exactly the same probability level as does the null value.

Step 6: Using an examination of the binominal effect size display evaluate the importance of the effect size obtained.

The validity and reliability of the studies included in a meta-analytic review has an impact on the validity and reliability of the meta-analytic review and the results of that review (Glass et al., 1981).

2.6.7 Conclusion

"Meta-analysis provides for the statistical integration of empirical studies of a common phenomenon. The findings of all studies must be expressed on some common scale for this integration to be feasible. The findings are dependent variables in the statistical analysis. The independent variables in the analysis are the substantive and methodological characteristics of the studies" (Glass et al., 1981, p. 93).

Meta-analysis has become the major form of literature review in areas such as psychology, education, and medicine (Cortina, 2003) and has changed the way researchers understand, analyse and interpret research findings. Meta-analysis enables researchers to provide more conclusive answers to problems faced by organisations and this makes research more relevant and understandable to its users (Le et al., 2007). Many international studies of personality and performance have been based on a meta-analytic approach and these studies have proven that personality, particularly the Big Five traits, holds predictive power in relation to performance. The following section explores the findings of some of these studies.

2.7 META-ANALYTIC REVIEWS OF PERSONALITY AND PERFORMANCE

2.7.1 Introduction

Over the last few decades findings reported in meta-analytic reviews have clearly shown that personality influences behaviours and outcomes (Ones et al., 2005). The use of meta-analysis makes it possible to detect broad patterns of relations between personality variables and organisational behaviours (Ones et al., 2005).

2.7.2 Meta-analytic studies of personality and performance

Personality and performance has been a topic of interest over many years and has been the topic of several meta-analytic studies, the results of which are summarised in Table 12 and Table 13 below (Anderson & Viswesvaran, 1998; Barrick et al., 2001; Barrick & Mount, 1991; Barrick, Mount & Stewart, 1998; Hough et al., 1990; Hough, 1992; Robertson & Kinder, 1993; Salgado, 1997, 1998, 2002; Vinchur et al.,

1998). Similar to single sample studies these meta-analytic reviews found that of the Big Five factors Conscientiousness is the strongest predictor of performance while Neuroticism is negatively related to performance (Barrick & Mount, 1991; Hurtz & Donovan, 2000; Salado, 1997, 1998, 2002; Tett, Jackson & Rothstein, 1991).

Hough and colleagues (1990) conducted a meta-analytic review and found that Conscientiousness is strongly related to training performance (0.33 and 0.11), while the other factors have weak relationships to training performance (ranging from 0.08 to 0.16). A meta-analytic study by Barrick and Mount (1991) focused on the predictive validity of the Big Five in relation to three performance criterion types, namely job proficiency (performance ratings and productivity), training proficiency (training performance) and personnel data (tenure, salary and job movement). This study found that Conscientiousness (0.22) remains the strongest predictor of performance across the criterion, Extraversion (0.13) may be a predictor of training performance while Emotional Stability (opposite of Neuroticism) and Agreeableness show a weak relation to the criterion. Openness to experience (0.04) shows an overall low relationship, but does hold predictive value for training proficiency with a moderate relationship (0.25).

Tett, Jackson and Rothstein (1991) found that Agreeableness (0.326) and Openness (0.272) were the strongest predictors of performance followed by Conscientiousness (0.179), Extraversion (0.155) and Neuroticism (-0.223). These results differ from results reported in previous studies in that Agreeableness is the strongest predictor, although Agreeableness does show some predictive value in other studies. A study investigating the relationship between personality and job performance constructs found that Conscientiousness (0.19; named achievement) is the strongest predictor, followed by Emotional stability (0.11; named adjustment). The other factors show low predictive power ranging from 0.07 to 0.01 (Hough, 1992).

A later study by Vinchur et al., (1998) investigating the predictive validity of personality for sales performance found that Conscientiousness (0.17) and Extraversion (0.12) hold the most significant relation to sales performance while

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Agreeableness (-0.02) and Emotional stability (-0.07) have negative relationships with sales performance. Salgado (1997, 1998) conducted two meta-analytic studies that yielded similar findings and indicated that Conscientiousness (0.10 and 0.13), Extraversion (0.05 and 0.10) and Emotional stability (0.09 and 015) have the highest correlations with job performance.

Barrick et al. (1998) investigated personality and job performance in jobs involving interpersonal interaction and found that Conscientiousness (0.26), Agreeableness (0.21) and Emotional Stability (0.18) are related to performance in this context. Ten years after their first meta-analysis Barrick and Mount partnered with Judge to review the progress of personality and performance (Barrick et al., 2001). In this meta-analytic review the authors quantified the results of 15 meta-analytic reviews. Their findings reinforced the findings of previous studies and indicated that conscientiousness (0.27) is related to performance. Extraversion (0.13) and Agreeableness (0.13) seem to have some relation to performance, while Openness to experience (0.03) and Emotional stability (0.09) have very weak relationships with performance (Barrick et al., 2001). It should also be noted that the review of the relationships between personality and training performance yielded slightly different results with Conscientiousness (0.27), Extraversion (0.28) and Openness to experience (0.33) showing the most significant relationships.

Table 12: Meta-analytic studies of personality and performance

Authors	Reported statistics	Openness	Conscientious-ness	Extraversion	Agreeable-ness	Emotional Stability
Barrick & Mount (1991)	p-value	0,04	0,22	0,13	0,07	0.08
Hough (1992)	Mean r	0,01	0.19 and 0.07	0,05	0,02	0,11
Salgado (1997)	r	0,04	0,1	0,05	0,01	0,09
Salgado (1998)	True r	0,06	0,13	0,1	0,01	0,15
Vinchur et al., (1998)	r	0,03	0,17	0,12	-0,02	0.07
Mount et al., (1998)	True	0,17	0,26	0,14	0,21	.18
Hurtz & Donovan (2000)	True score	0,06	0,24	0,09	0,12	0,15
Barrick et al., (2001)	p-value	0.03	0.27	0.13	0.13	0.09
Salgado & Tauriz (2012)	p-value	0,14	0,24	0,09	0,06	0,11

A meta-analytic review conducted by Hurtz and Donovan (2000) explored personality and job performance and training performance and confirmed that Conscientiousness (0.24) has predictive value with regards to job performance. It also found that Emotional stability (0.15) and Agreeableness (0.12) have predictive value for job performance. Training performance has a strong relationship with Agreeableness (0.21), Openness to experience (0.14) and Extraversion (0.14) while training performance has low correlations for Emotional stability (0.09) and Conscientiousness (0.03). These findings regarding training performance are similar to the findings reported by Barrick et al. (2001), who found that the highest correlation is with Openness to experience (0.21), followed by Conscientiousness (0.19). However, the Barrick et al. (2001) study reported negative correlations between training performance and Extraversion (-0.03) and Agreeableness (-0.08). In a study investigating the relationship between personality and performance Salgado and Tauriz (2012) found that Conscientiousness strongly relates to job performance (0.24). They further found that job performance is related to Openness (0.14) and Emotional stability (0.11).

Trapmann, Hell, Hirn and Schuler (2007) found that Conscientiousness (0.216) has a strong relationship with training performance, which is also related to Openness to experience (0.083) and Agreeableness (0.041). A meta-analytic review of the relationship between personality and organisational citizenship behaviour yielded results similar to that of performance studies in that Conscientiousness (0.14) is closely related to OCB, followed by Openness to experience (0.11), Agreeableness (0.11) and Emotional stability (0.10). The lowest reported correlation was the correlation between organisational citizenship behaviour and Extraversion (0.07) (Chiaburu, Oh, Berry, Li, & Gardner, 2011). Notably, across the Five Factors organisational citizenship behaviour yields higher correlations than performance studies.

Table 13: Meta-analytic studies of personality and training performance

Authors	Reported statistics	Openness	Conscientious-ness	Extraversion	Agreeable-ness	Emotional Stability
Hough et al. (1990)	Mean r	0,14	0,33 and 0,11	0,08	0,1	0,16
Hurtz & Donovan (2000)	True score	0,14	0,03	0,14	0,21	0,09
Barrick et al., (2001)	p-value	0.33	0.27	0.28	0.11	0.10
Trapmann et al., (2007)	Mean r	0,083	0,216	0,011	0,041	0.044
Chiaburu et al., (2011)	Mean r	0,11	0,14	0,07	0,11	0,1
Salgado & Tauriz (2012)	p-value	0,21	0,19	-0,03	-0,08	0,05

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2.7.3 Conclusion

Although initially yielding differencing results meta-analysis has proved its worth and has become increasingly popular. These meta-analytic studies consistently indicate that, of the Big Five factors of personality, Conscientiousness is related to performance with most studies yielding fair correlations between performance and Conscientiousness. Results over the past two decades suggest that Openness to experience is a stronger predictor of training performance than of job performance. Agreeableness features as a predictor for both work and training performance, however this finding is not consistent in all studies. Most studies report on Emotional stability rather than Neuroticism implying an attempt to avoid the negative connotations associated with Neuroticism and a preference for the term emotional stability. Emotional stability, although not the strongest predictor, does contribute to the incremental validity of personality as a predictor of job performance.

2.8 CHAPTER SUMMARY

The aim of Chapter 2 was to review key literature relevant to this study. In particular, the chapter aimed to define and describe key concepts in this study and to investigate the validity of personality as a predictor of job performance in the international arena.

The world of work is changing and in a demanding economy organisations need the best people to remain viable and competitive. The world of work is influenced by increases in innovation and advances in technology. Organisations therefore need talented people to gain a competitive advantage. Businesses therefore require human resources professionals and industrial and organisational psychologists to source and select people who will contribute to and have a positive impact on organisational profitability. In other words, organisations are looking for employees who will perform well.

In order to select the right person for a specific job industrial psychologists attempt to predict future performance based on the information they have at hand and through psychological testing. The two most popular psychological assessments are cognitive ability and personality. Although GMA has proved to be a valuable

predictor of job performance, the concept of incremental validity holds that adding a measure will increase the confidence of the prediction. Personality contributes to the incremental validity of predicting job performance.

Personality is a multi-dimensional concept and many theories exist attempting to explain, define and dissect personality. No theory of personality replaces other theories or completely explains the domain of personality. Although initially criticised the FFM has become an accepted framework for describing personality based on trait theory. Job performance consists of many dimension, various facets contribute to an overall description of good performance. Performance is crucial to economic output and the purpose of businesses, which is to make a profit.

The predictive validity of personality for job performance has been studied over a period of time and has produced varied results. Meta-analyses allow researchers to compare and analyse results of many studies and provide greater statistical significance. Previous meta-analytic studies proved that personality, particular the Big Five, has predictive validity for job performance. This study investigated the predictive validity of personality for job performance in the South African context by making use of a meta-analysis.

CHAPTER 3 - RESEARCH DESIGN AND METHODOLOGY

3.1   INTRODUCTION

This chapter outlines the research design of the study. It also describes the sampling technique and provides details of the sample and data collection. It describes the statistical analysis procedure used.

3.2   RESEARCH DESIGN

The use of validated employee selection and promotion procedures is crucial to organisational effectiveness and required by the Employment Equity Act (no. 55 of 1998) of South Africa. Various international authors have investigated the predictive validity of personality for job performance (Barrick et al., 2001; Barrick & Mount, 1991, 2002, 2005; Dunn et al., 1995; Hurtz & Donovan, 2000; Ones et al., 1994; Mount et al., 1998; Salgado & Táuriz, 2014). While there is some moderation of predictive validities across cultural contexts and occupational types, results of studies around the world have been remarkably consistent. Personality traits have been found to be important predictors of job performance in the United States (Barrick & Mount, 1991), in Europe (Salgado, 1997, 1998), and in East Asia (Oh, 2009). This study extends cumulative personality research to the South African context and highlights the African contribution.

This study sought to establish the existence of a relationship between the variables and does not aim to understand the relationship or the causes of the relationship and therefore a quantitative research strategy was deemed to be the most appropriate strategy of inquiry. Quantitative research is a systematic and objective process making use of numerical data from a sample to generalise the findings to a larger group or population (Maree, 2010). Creswell (2009) explained that quantitative research involves a process of collecting and analysing data, interpreting and writing the results of a study. Quantitative research involves examining the relationship between variables to explore a theory (Creswell, 2009), for example, testing the existence of a relationship between personality and job performance. Quantitative research has two types of designs, experimental and non-experimental.

Experimental designs are aimed at answering a specific (cause-and-effect) research question, while non-experimental designs are used in descriptive studies (Maree, 2010). This study made use of a non-experimental quantitative research design. To conduct quantitative research it is necessary to collect and analyse numerical data in a systematic and objective way (Maree, 2010).

Quantitative analysis can be described as the "numerical representation and manipulation of observations for the purpose of describing and explaining the phenomena that those observations reflect" (Babbie, 2008, p. 443). Quantitative research thus utilises numerical data to test and describe phenomena and relationships between variables, such as the possible relationship between personality and job performance.

3.2.1 Meta-analysis as a form of quantitative research

The foundation of science is the accumulation of knowledge from the results of many studies (Hunter et al., 1982). Meta-analysis involves the statistical analysis of a collection of analysis results from various individual quantitative studies with the purpose of integrating the results and findings (Glass, 1976). In simple terms, when using a meta-analysis approach the researcher gathers and analyses quantitative data from other studies that investigated the topic in question. This choice of research method for this particular study is supported by the existence of previous studies that made used of quantitative research methods to investigate the predictive validity of personality in relation to job performance (Dunn et al., 1995; Ones et al., 1994). The technique of meta-analysis was initially introduced to summarise a body of literature and can be used to summarise volumes of information and identify rational patterns within the various subjects (Shercliffe et al., 2009).

The advantage of a meta-analysis lies in the fact that a body of literature can be analysed to investigate a shared phenomenon or field. By making use of a meta-analysis the researcher is able to combine various studies' data and therefore have a larger and more significant sample size with which to work. The results obtained are therefore more likely to be significant and generalisable. Meta-analysis is a form of statistical analysis that allows researchers to understand the variation of results.

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Meta-analysis separates true variation from sampling error variation, therefore presenting a more accurate picture of the knowledge in a particular field than what would be possible with a simple narrative review.

Hunter and Schmidt (2004) proposed the following steps in conducting a meta-analysis: first, search for and gather studies; second, extract and code information from the studies; and, finally, apply meta-analysis to the information extracted. These steps are the basis of the approach followed by this study.

Meta-analyses report findings in effect sizes; an effect size can be explained as the significance measure of observed differences (Neill, 2006). Effect size estimates provide an indication of relation strength (the magnitude) and are almost always necessary to report in primary studies (Bosco, Aguinis, Singh, Field, & Pierce, 2015). Effect size information is important to the scientific process as it informs the study design, statistical analysis and the assessment of scientific progress. In addition, an effect size also has practical significance (Bosco et al. 2015). In meta-analyses the effect size provides information regarding the amount of change that is apparent across all the studies included in the meta-analysis. There are different effect sizes and these effect sizes fall into two types, namely standardised mean difference and correlation. Not all studies have the same effect sizes and therefore the effect sizes of the studies included in the meta-analysis have to be converted into either one of these effect sizes in order for them to be comparable (Neill, 2006). Hemphill (2003) established the following empirical benchmarks for effect sizes in psychological research: $|r| = 0.1$ (small), 0.2 (medium) and 0.3 (large).

3.2.2 A classification of the study's overall research design

The following bullet points describe the broad research design of the study:

- Empirical research – This study can be classified as an empirical study as the researcher made use of data to test a theory while making use of the scientific method.
- Basic research or applied research – The research can be used in two ways, basic research determining how personality influences work behaviour and

applied research determining if the measure (Big Five) predicts performance in a certain context.

- Evaluative research – According to Trochim (2006) evaluation is the systematic assessment of the worth or merit of some object. This study aimed to evaluate the worth of the Big Five personality measures as predictors of job performance. The study made use of summative evaluative research in the form of a meta-analysis.

- Cross sectional – The study made use of data that was collected at a certain point in time; although each study was conducted at a different time none of the included studies involved the collection of data over multiple points in time. The data included in this study was therefore cross sectional in nature.

- Secondary data – Secondary data is data collected in another study that is then reanalysed to answer the same or new research questions, usually with different statistical techniques (McArt & McDougal, 1985, as cited in Coyer & Gallo, 2005). The data utilised for the analysis was collected from other studies investigating the same topic.

- Numeric (quantitative) data – Quantitative data refers to numerical data, the numerical data from various studies was used to compile the data set.

3.3   SAMPLING

A sample is a portion of the population chosen for the study (Maree, 2010). Stratified purposive sampling was used in this study and studies (data) were selected on preselected criteria relevant to the research questions. The target population of the study is employees, prospective employees and students (individuals) in the South African business sector. These individuals were assessed by means of a personality measure (Big Five constructs) and performance data (supervisor ratings, academic performance). The data was all collected in South Africa. Given that the study is a meta-analysis and makes use of secondary data, studies that met these specific criteria were selected as the data.

3.4   DATA COLLECTION

A meta-analysis makes use of the data of various studies and this data becomes the database of the meta-analysis. Thus, in the case of meta-analysis, data collection

involves identifying studies that investigated the same or similar phenomena and gaining access to that quantitative data.

3.4.1 Search strategy

The first set of studies were obtained by searching computer databases in South Africa for studies conducted in the period from 1985 to 2015 using any combination of the following search terms: personality, Agreeableness, Conscientiousness, Emotional stability, Neuroticism, Extraversion, Openness to experience, personnel, performance, job performance and selection. The databases searched were Sabinet, African Digital Repository, Scielo South Africa, EbscoHost, *South African Journal of Industrial Psychology, South African Journal of Psychology* and *South African Journal of Human Resource Management*. The second set of studies were obtained by requesting validity studies of personality instruments from distributors of psychological materials in South Africa. The third set of studies was obtained by asking all major universities in South Africa for studies/theses both published and unpublished concerning or relating to the topic as well as by accessing and searching the university online research websites.

3.4.2 Inclusion criteria

In order to ensure the statistical validity of the meta-analytic results, several inclusion criteria for studies were established. These criteria mirror those used by previous meta-analyses of the Big Five personality traits and job performance (Barrick & Mount, 1991; Salgado, 1997).

The first inclusion criterion was that studies should have been conducted in the South African context. Second, a self-report measure of personality traits should have been use as a predictor measure; in addition, personality measures were required to either assess the Big Five traits or be able to be conceptually mapped to the Big Five. The third criterion was that studies should include some measure of performance (e.g., task performance, organisational citizenship, training outcome). Fourthly, studies had to either report a sample size and the correlation between a personality trait and performance or report enough information to compute a correlation and its corresponding sampling error variance. Lastly, to ensure no

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inflation in the meta-analytic results, studies reporting only significant results using studies of laboratory performance or using designs that enhance variation (i.e., extreme contrasted groups designs) were excluded.

3.4.3 The Sample

The original data search yielded 37 possible studies. However, it was found that some of these studies did not meet all the inclusion criteria and had to be excluded. Some of the common issues included only reporting significant results and not reporting directly on performance but on related issues such as 20 viable studies were identified through the search. The data of an unpublished study by Rothmann, Meiring, van der Walt and Barrick (2002) on the same topic was included to supplement the data used in this meta-analysis. A total of 34 studies were included in the meta-analysis.

Table 14 provides a comprehensive list of the studies included in the meta-analysis. All studies were conducted in South Africa on a South African sample. The details provided include the industries and job titles of the participants involved in the studies. Various industries are represented in the sample, however banking and insurance seem to be particularly well represented.

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Table 14: Studies included in the meta-analysis

Authors	Title	Publisher	Year	Industry	Specific Job
Blignaut, L	Personality as a predictor of performance for Customer Service Centre agents in the Banking in industry	UNISA	2011	Banking	Customer service Call centre
Byers, M.P.C.	The role of personality traits in determining Brand Ambassador Performance in the Alcoholic Beverage Industry	University of Pretoria	2006	Beverage	Brand ambassador
Coetzee, O.	The relationship between personality variables and job performance of credit controllers in a bank	UNISA	2003	Banking	Credit Controller
de Bruin, K., de Bruin, G.P., Dercksen, S., & Cilliers-Hartslief, M.	Predictive validity of general intelligence and Big Five measures or adult basic education and training outcomes	SA Journal of Psychology	2005	Domestic Service	
Dijkman, J.	Intelligence, motivation and personality as predictors of training performance in the South African Army Armour corps	University of Stellenbosch	2009	Military	Troop
Farrington, S.M.	Does personality matter for small business success?	SA Journal of Economic and Management Science	2012	Service and retail	
Fertig, S.	The incremental validity of a situational judgement test relative to personality and cognitive ability to predict managerial performance	University of Stellenbosch	2009	Banking	Managers
Geldenhuys, A., Visser,D., & Crafford, A.	Personality characteristics as predictors of career success of provincial traffic officers	Journal of Industrial Psychology	2001	Government traffic	Traffic controllers
Hillowitz, K.	A study of Fund Administrators' job performance in a financial intuition	University of Cape Town	2003	Insurance	Fund Administrator
Le Grange, L. & Roodt, G	Personality and cognitive ability as predictors of job performance of insurance sales people	Journal of Industrial Psychology	2001	Insurance	Broker
Muller, E.	The Big Five Model of personality and academic achievement at university	University of Johannesburg	2010	University	Student
Muller, R.	The validity of the OPQ in the prediction of work success	University of Pretoria	2002	Banking	Managers
Nagdee, S.	The relationship between a selection battery and the academic performance of students on an MBA programme	University of Pretoria	2011	University	Student
Nicholls, M., Viviers, A.M., & Visser, D.	Validation of a test battery for the selection of call centre operators in a communications company	South African Journal of Psychology	2006	Communications	Call centre consultant
Nzama, L., de Beer, M., & Visser, D.	Predicting job performance through selection interview ratings and psychological assessment	South African Journal of Industrial Psychology	2008	Retail	Management

Rothmann, S., & Coetzer, E.P.	The Big Five personality dimensions and job performance	South African Journal of Industrial Psychology	2003	Pharmaceutical	Pharmacists and non-pharmacists
SHL V030	Validation study	SHL	2002	Insurance	Broker consultants
SHL V034	Validation study	SHL	2002	University	MBA Student
Sutherland, R., de Bruin, G.P., & Crous, F.	The relation between Conscientiousness, empowerment and performance	South African Journal of Human Resource Management	2007	Banking	Service engineer
Levy, J.	Personality and demographic correlates of effective retail sales manager	University of Pretoria	2012	Car dealership	Sales manager
Alves, V.	Discriminating the performance of salespeople on the basis of behaviour, values and personality using the style analysis instrument, the personal interests and values instrument and the Myers-Briggs type indicator	University of the Witwatersrand	1997	Mobile communications	Sales consultant
Strauss, C.M.	The Five Factor Model of personality and locus of control as predictors of managers' performance	University of the Witwatersrand	1999	Banking	Junior manager
van Zyl, P.	Predictors of scholastic achievement: IQ, self-concept, time concept, and background characteristics	South African journal of education	1999		Students
Nell, T.L.	The composition of a personality profile for the selection of prison guards.	University of Port Elizabeth	2002	Correctional Services	Prison Warden
Esterhuizen, E.	The validation of a selection battery for security guards in the gold industry.	Potchefstroom University for Christian Higher Education	1997	Mining	Security officer
Nel, J.J.	The influence of career phase on the relationship between personality and absenteeism	UNISA	1986	Various	
van Vuuren, S.M.	The relationship between certain personality characteristics and job satisfaction of ministers of religion.		1990	Religion	Minister of Religion
Geldenhuys, A.	Vocationally orientated education and training in the 21st Century : substratum for an effective public sector in South Africa	IMFO: Official Journal of the Institute of Municipal Finance Officers	2001	Education	MBA Student

Note. In addition to data collection procedures, studies from a conference paper presented in 2002 were included in this analysis. The researchers of the conference paper did not report the studies; however the data of the studies were available and included for analysis. By contacting the authors the references of eight studies were obtained, however the researcher of this study could not obtain the original references of six studies which was included in the analysis.

3.4.4 Data preparation

The researcher captured data from the original studies on an Excel spreadsheet, which served as the data sheet for the meta-analysis. The information captured (although not all information was available for each study) included name of coder, authors, year, publisher, publication type, region, country, laboratory or field, sample type, mean age, sample demographics, sample size, industry, specific job, predictor description, trait, facet, predictor inventory, predictor scale, rating score, purpose of data collection, predictor reliability details, criterion description, broad criterion, criterion cluster, exact criterion reported, rated by whom, why was the data collected, predictive or concurrent, when was it collected, criterion reliability details and the relationship between the predictor and criterion.

Not all personality measures report the Big Five. Studies reporting other personality constructs were converted to the Big Five for the purposes of this study. Over a number of years researchers have provided guidance regarding how a specific personality measure relates to the Big Five. These criteria were used to convert the personality measures used in the data of this study to the Big Five. The researcher coded each facet of each personality measure to reflect the corresponding Big Five Factor. Table 15 details the sources used to convert the personality measures to the Big Five.

For studies reporting criterion correlations for multiple facet scales within a Big Five domain, composite correlations were computed using the intercorrelation matrix provided by the study. If the study did not report a full intercorrelation matrix, facet scale intercorrelations were obtained from the personality test manual.

Table 15: Personality Measures related to the Big Five

Personality Measure	Reference
15 Factor Questionnaire	15 FQ + Technical Manual - Global Factors
16 Personality Factor Questionnaire	16 PF Technical Manual – Global Factors
Big Five Inventory	Reports Big Five Factors
Basic Traits Inventory	Reports Big Five Factors
Customer Contact Style Questionnaire	Salgado & Táuriz (2014)

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Five Factor Nonverbal Personality Questionnaire	Reports Big Five Factors
NEO Five Factor Inventory	Reports Big Five Factors
NEO Personality Inventory – Revised	Reports Big Five Factors
Occupational Personality Questionnaire	Bartram (2013)
Ten Item Personality Inventory	Reports Big Five Factors

The criterion related to performance data reflected various categories based on the details reported by the studies (data), which was in turn based on the performance measures used in these studies. Given the varied categories there was a need to code the criterion as performance categories based on job performance research. Table 16 provides a description of each of the performance categories used in this meta-analysis. Several studies reported multiple measures of the same performance construct. Composite correlations between personality scales and these performance measures were computed using intercorrelations reported in the studies. If studies did not report intercorrelations between performance measures, composites were computed using performance dimension correlations reported by Viswesvaran (1993), Viswesvaran et al., (1996) or Viswesvaran et al. (2005). For Muller (2010) estimates for intercorrelations between course grades were taken from Bacon and Bean (2006). Intercorrelations for the performance facet scales from Rothmann and Coeztee (2003) were taken from Bothma and Schepers (1997). For Levy (2012), correlations between objective sales performance and customer satisfaction were taken from Ahearne, Mathieu and Rapp (2005).

Table 16: Description of criterion categories

Criterion	Description
Overall performance	Comprehensive, summative, or global ratings of undifferentiated job performance, also encompasses composites of multiple components of performance if a study reports several dimensions of performance.
Technical Performance	Performance of tasks relating to the core functions of the job.
Academic performance	Performance relating to academics or training.
*Organisational Citizenship Behaviour	Helping - Helping co-workers with their functions, participating in team activities and taking initiative. Self-

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| | Development - Activities involved in furthering or developing the self. |
| Counter Productive Behaviour | Behaviours relating to deviant behaviour, breaking rules and not living the company values. |

Note: Self-development and Helping are elements of OCB, due to the small number of studies in these two categories they were analysed together and are reported as OCB. Leadership had only one study and therefore was excluded.

3.5 DATA ANALYSIS / META-ANALYTIC PROCEDURES

The data analysis technique used was based on the psychometric meta-analysis approach developed by Schmidt and Hunter (2004). The strength of this meta-analytic approach is that it allows one "to determine how much of the variance in findings across studies is due to sampling error, measurement artifacts, and other artifacts, and to adjust for the effects of these artifacts, yielding an estimate of the true population variability of study outcomes" (Hunter & Schmidt, 2004, pg. *xxx*). Thus, this technique corrects meta-analytic correlations for artifactual biases associated with sampling error and attenuation due to measurement error and restriction of range.

3.5.1 Artifact corrections

Statistical artifacts are imperfections in studies; these imperfections cause errors in study results which are termed artifactual errors as they result from the features of the study and are not properties of nature (Hunter & Schmidt, 2004). Table 17 lists study artifacts that alter the value of the outcomes measured by studies.

Table 17: Study artifacts that alter the value of outcome measures

Type of Error	Impact of error on results
Sampling error	Study validity will vary randomly from the population value because of sampling error.
Error of measurement in the dependent variable	Study validity will be systematically lower than true validity to the extent that job performance is measured with random error.
Error of measurement in the independent variable	Study validity for a test will systematically understate the validity of the ability measured because the test is not perfectly reliable.

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Dichotomization of a continuous dependent variable	Turnover, the length of time that a worker stays with the organisation, is often dichotomized into "more than . . ." or "less than . . ." where . . . is some arbitrarily chosen interval such as one year or six months.
Dichotomization of a continuous independent variable	Interviewers are often told to dichotomize their perceptions into "acceptable" versus "reject".
Range variation in the independent variable	Study validity will be systematically lower than true validity to the extent that hiring policy causes incumbents to have a lower variation in the predictor than is true of applicants.
Attrition artifacts: Range variation in the dependent variable	Study validity will be systematically lower than true validity to the extent that there is systematic attrition in workers on performance, as when good workers are promoted out of the population or when poor workers are fired for poor performance.
Deviation from perfect construct validity in the independent variable	Study validity will vary if the factor structure of the test differs from the usual structure of tests for the same trait.
Deviation from perfect construct validity in the dependent variable	Study validity will differ from true validity if the criterion is deficient or contaminated.
Reporting or transcriptional error	Reported study validities differ from actual study validities due to a variety of reporting problems: inaccuracy in coding data, computational errors, errors in reading computer output, typographical errors by secretaries or by printers. Note: These errors can be very large in magnitude.
Variance due to extraneous factors that affect the relationship	Study validity will be systematically lower than true validity if incumbents differ in job experience at the time their performance is measured (because job experience affects job performance).

Adapted from "Methods of meta-analysis: Correcting error and bias in research findings" by J.E. Hunter and F.L. Schmidt, 2004, Thousand Oaks, CA, Sage, p. 35.

All measurements must contend with unreliability; no measure is free of measurement error (Viswesvaran, Ones, Schmidt, Le, & Oh, 2015). The reporting of statistical artifacts (i.e., reliability of the personality and performance measures,

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range restriction of the personality measures) was inconsistent across studies. Given this inconsistency and the presence of unreliability in all studies, the artifact distribution method was used to correct for these biases. Hunter and Schmidt (2004, p. 165) indicated that the artifact distribution method should be used in cases where artifact information is sparsely available:

> "first, the studies are used to compile information on four distributions: the distribution of the observed correlations, the distribution of the reliability of the independent variable, the distribution of the reliability of the dependent variable, and the distribution of range departure of the independent variable. That is, there are then four means and four variances compiled from the set of studies, using each study to provide whatever information it has. Second, the distribution of correlations is corrected for sampling error. Third, the distribution corrected for sampling error is then corrected for error of measurement, range variation, and perhaps other artifacts. This fully corrected distribution is the final result of the meta-analysis (unless the data are analysed by subsets to test for moderator variables)".

In some cases, the artifact distributions obtained from the studies in the present analysis were sparse. They were therefore supplemented by more robust artifact distributions from previously published meta-analyses.

3.5.2 Correcting for Measurement Error in the Predictor

Attenuation due to measurement error in the personality predictors was corrected using values reported in the studies included in the current meta-analyses. For studies using composite correlations of multiple facet scales, Mosier reliability coefficients were computed as estimates of the composite scale reliability. Artifact distribution values for Big Five measures in the present studies are presented in Table 18.

Table 18: Artifact distributions for correcting for unreliability in the predictor from the studies included in the meta-analysis

Construct	K	$\bar{r}_{xx}$	$SD_{\bar{r}_{xx}}$	$\overline{\sqrt{r_{xx}}}$	$SD\overline{\sqrt{r_{xx}}}$
Agreeableness	9	.79	.12	.89	.07
Conscientiousness	10	.83	.10	.91	.05
Emotional Stability	9	.82	.11	.90	.07
Extraversion	9	.84	.08	.91	.04
Openness	9	.82	.08	.90	.05

These artefact distributions are very similar to those in the comprehensive reliability distributions reported by Davies (2014) for normative personality scales and by Salgado and Táuriz (2014) for ipsative and quasi-ipsative personality scales. These distributions are shown for comparison in Table 19.

Table 19: Reliability artefact distributions reported by Salgado and Táuriz (2014) and Davies (2014)

Construct	K	$\bar{r}_{xx}$	$SD_{\bar{r}_{xx}}$	$\overline{\sqrt{r_{xx}}}$	$SD\overline{\sqrt{r_{xx}}}$
Ipsative Scales (Salgado & Táuriz, 2014)					
Agreeableness	8	.80	.08		
Conscientiousness	11	.72	.12		
Emotional Stability	10	.73	.09		
Extraversion	6	.75	.13		
Openness	4	.81	.12		
Normative Scales (Davies, 2014)					
Agreeableness	161	.77	.07	.88	.04
Conscientiousness	205	.80	.07	.89	.04
Emotional Stability	220	.82	.07	.90	.04
Extraversion	199	.81	.06	.90	.04
Openness	150	.75	.08	.87	.05

It is important to note that results for both true score correlations (correcting for range restriction and measurement error in the criterion and predictor) and operational validity (correcting only for range restriction and measurement error in the criterion) are reported. In personnel selection settings it is impossible to assess

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applicants' true scores and therefore decisions must be made based on the imperfectly measured observed scores. As a result, the operational validity results provide the best estimate of the predictive utility of personality scales in South African organisations. The true score correlations provide the best estimate of the actual effects of personality traits and should be the focus of developing theories of job performance (Viswesvaran et al., 2015).

3.5.3 Correcting for Measurement Error in the Criterion

A variety of different performance measures were used. These included supervisor ratings, customer ratings, training scores, and objective performance measures. Following the recommendations of Wilmot, Wiernik, and Kostal (2014), the reliabilities of these performance measures were estimated using a combination of information reported in the individual studies and meta-analytic estimates. For supervisor ratings, Mosier composite reliabilities of interrater reliabilities were computed using intercorrelations reported in the studies (where available) and the reliabilities and intercorrelations reported by Viswesvaran (1993), Viswesvaran et al. (1996) and Viswesvaran et al. (2005). The reliability values reported by Viswesvaran et al. (1996), which were used as input to many criterion composite reliabilities, are reported in Table 20. Reliabilities for the objective performance measures used by Coetzee (2003), de Bruin et al., (2005), Farrington (2012), and SHL (2002a, 2002b) were estimated as Cronbach's alphas computed from in-study intercorrelation matrices. Reliability for the objective performance measure used by Muller (2010) was estimated as a Cronbach's alpha based on course grade intercorrelations reported in the course grade reliability estimation study reported by Bacon and Bean (2006). For Nagdee (2011) the reliability of GPA was estimated using the meta-analytic value provided by Kuncel, Hezlett and Ones (2001).

Table 20: Correcting for unreliability in Criterion

Dimension	n	k	Mwt	SDwt	Munwt	SDunwt	Msq wt	SDsq wt	Msqu nwt	SDsq unwt	80% CI	SDres	80% Credibility
Overall job performance	14,650	40	.52	.0950	.68	.1469	.72	.0605	.82	.0924	.50-.54	.0870	.41-.63
Productivity	2,015	19	.57	.1540	.57	.1769	.75	.1079	.75	.1236	.52-.62	.1392	.39-.75
Quality	1,225	10	.63	.1191	.65	.1406	.79	.0756	.80	.0885	.58-.68	.1058	.49-.77
Leadership	2,171	20	.53	.0928	.55	.1124	.73	.0598	.74	.0742	.50-.56	.0617	.45-.61
Communication competence	1,563	9	.45	.1282	.43	.1824	.66	.1071	.64	.1568	.40-.50	.1129	.31-.59
Administrative competence	1,120	9	.58	.1040	.59	.1674	.76	.0659	.76	.1056	.54-.62	.0851	.47-.69
Effort	2,714	24	.55	.1250	.56	.1601	.74	.0858	.74	.1113	.52-.58	.1062	.41-.69
Interpersonal competence	3,006	31	.47	.1664	.53	.1983	.68	.1332	.70	.1711	.43-.51	.1461	.28-.66
Job Knowledge	14,072	20	.53	.0508	.56	.1976	.73	.0392	.73	.2356	.52-.54	.0429	.48-.58
Compliance with or acceptance of authority	905	8	.56	.1276	.60	.1295	.74	.1548	.77	.0900	.50-.62	.1099	.42-.70

Adopted from Comparative Analysis of the reliability of job performance ratings by C. Viswesvaran, D.S. Ones and F.L. Schmidt, 1996, *Journal of applied psychology,* 81(5), p.562.

3.5.4 Correcting for Range Restriction

All personality criterion validities were computed on samples of employees. Such samples are likely to have less variation in personality scores than job applicant pools as a result of personnel selection procedures. As a result observed validity correlations are artificially biased toward zero. An estimate of the amount of variability lost through selection is needed to correct for this bias. Ideally, these estimates (u values; referring to the ratio of the restricted to unrestricted group standard deviations) would be computed by comparing job applicant samples to the study incumbent samples. Unfortunately, no studies in the current meta-analysis provided sufficient information concerning applicant samples to compute u values. Accordingly, following the procedures used by Salgado and Táuriz (2014), u values were computed by comparing the standard deviations in the study samples to the values reported in the personality test manuals. This approach is not generally problematic, as national population samples (which are typically reported in test manuals) are generally only slightly more variable than applicant pools, resulting in negligibly different corrections. Unfortunately, South African norm data was not available for most of the inventories used in the current studies. As a result u values were estimated using available norms (usually for the US or UK). This is potentially problematic, as countries differ meaningfully in their personality distributions (Kostal, Wiernik, Ones, & Hazucha, 2014). Indeed, the distributions of u values computed in this manner (shown in Table 21) showed substantially less range restriction than has been observed in previous meta-analyses of the Big Five and job performance (cf. Salgado, 2003, 2014). Accordingly, analyses were also conducted correcting for range restriction using the distributions for normative and ipsative Big Five scales reported by Salgado (2003) and Salgado and Táuriz (2014), respectively. For these analyses, a range restriction artifact distribution as a weighted average of the distributions reported in the two aforementioned studies was computed, weighted by the number of studies in the meta-analysis using normative versus ipsative personality scales. The average computed distributions are reported in Table 21.

Table 21: Distributions of *u* Values Used to Correct for Range Restriction

	Number of artifact values	Mean artifact value	SD of artifact values	Mean	SD
	Current Study			*Salgado 2014*	
Agreeableness	12	,90	,15	,90	,14
Conscientiousness	12	,85	,22	,88	.17
Emotional Stability	12	,93	,18	,87	,16
Extraversion	12	,89	,21	,90	,14
Openness	13	,86	,16	,92	,13

Note: The u values computed for de Bruin et al. (2006) were extremely high, especially for Emotional Stability (u=1.77), and the test norms were computed on a small sample (N=340), as such these u values were excluded from the distribution.

3.5.5 Methods for Artifact Correction

All analyses corrected for attenuation due to measurement error in both variables and indirect range restriction in the personality predictor. For the analyses using range restriction estimates based on the studies included in the current analyses, the nonlinear interactive meta-analysis method was used (Schmidt & Hunter, 2014). For studies using range restriction distributions based on Salgado (2003, 2014), the interactive model could not be applied (as it requires individual artefact values), therefore the Taylor Series Approximation method described by Hunter, Schmidt, and Le (2006) was used.

3.5.6 Analysing the data

The data was analysed using the Open Psychometric Meta-Analysis software package (Wiernik, 2015). The data was entered separately onto several Excel Spreadsheets. The first sheet consisted of the correlations (R) and the corresponding sample sizes (N) of the primary studies. The second sheet consisted of the distribution of reliability coefficients of the independent variable (reliability values and frequencies or mean r_{xx} and its SD). The third sheet consisted of the distribution of reliability coefficients of the dependent variable (reliability values and frequencies or mean r_{yy} and its SD). And the fourth data file consisted of the distribution of range restriction (*u* values and their frequencies or mean *u* and its SD). Based on the data entered, the program runs the analysis and produces the

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total sample size (N), number of correlations (k), Mean uncorrected r, Observed SDr, Mean corrected ρ, SD of ρ and the credibility and confidence intervals. Mean Uncorrected r is the mean correlation before any corrections have been applied for artefacts, Observed SDr is the standard deviation of observed correlations, Mean Corrected ρ is the average relationship between criterion and predictor after corrections have been applied, SDρ is the residual variation in mean ρ after corrections have been applied, 90% Conf. Int. (ρ) which indicates the estimate precision of ρ and 80% Cred. Int. (ρ) which indicates the true variation in validities across settings. The results are indicted for both true score and validity generalisation/operational validity.

The predictor construct is causally related to the criterion construct, this relationship is referred to

> "as the true score validity and represents the relationship between the predictor and the criterion constructs in the absence of the distorting influences of various statistical artifacts such as sampling error, range restriction, or unreliability. It is a hypothetical correlation that can best be estimated using methods of psychometric meta-analysis" (Viswesvaran et al., 2015, p. 508).

The correlation between predictor measure(s) and criterion construct(s) is the crucial inference that is sought in validating assessments for selection.

> "This relationship describes the extent to which inferences drawn from predictor measures enable prediction of criterion constructs and is known as operational validity. Operational validity can be estimated by correcting the observed validity for unreliability in the criterion and any potential range restriction but not for unreliability in the predictor" (Viswesvaran et al., 2015, p. 508).

3.6   SUMMARY

This chapter described the research approach and methods utilised in this study. The study is quantitative in nature and takes the form of a meta-analysis. Although the study did not involve participants the sample consisted of studies and the data of those studies. The meta-analytic procedures based on Hunter and Schmidt (2004)

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were used to prepare and analyse the data and described in this section. The next section will detail the results produced by this analysis.

CHAPTER 4: RESULTS

4.1. INTRODUCTION

This chapter represents the findings of the meta-analyses of the Big Five and various performance dimensions. The results of the Big Five and Technical Performance, Academic Performance, Organisational Citizenship Behaviour, Avoiding Counter Productive Behaviour and Overall Performance will be presented respectively. As explained in chapter 3 the range restriction corrections which was based on the studies data is subject to international personality norms and countries differ meaningfully in their personality distributions (Kostal, Wiernik, Ones, & Hazucha, 2014). As such this section will focus on the results yielded from the analysis conducted using range restrictions reported by Salgado (2003) and Salgado and Táuriz (2014), respectively. Across criteria, only the results for Emotional Stability showed substantial differences (due to very small estimates of range restriction from the international-norms based u values). The results tables from the analysis using range restriction calculated with data from the studies will follow the results tables reporting the results using the Salgado (2003) Salgado and Táuriz (2014) range restrictions.

4.2. RESULTS
4.2.1 Technical Performance

Technical performance refers to the performance of tasks that relate to the core functions of a job. The results from the analysis of the relationship between the Big Five and technical performance using range restriction by Salgado (2003, 2014) are displayed in Table 22, while the results using range restriction from the data are displayed in Table 23. The analysis included 10 to 12 studies (k), yielding a combined sample size (N) of 1453 to 1955. Conscientiousness showed a moderate relationship (.20) with technical performance; this relationship is consistent across settings. However, it should be noted that results may vary should more studies be included in the analysis (80% CV [.20, .20]; CI 90% [.09, .35]). It can therefore be concluded that Conscientiousness has moderate predictive power in relation to technical performance. Emotional Stability also has a small positive relationship with

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technical performance (.13). Although this relationship is consistent across settings the results indicate that the relationship may vary should more studies be included in the analysis (80% CV [.13, .13]; CI 90% [.09, .35]). Based on the credibility and confidence intervals, it is likely that the relationship will remain small and positive in nature. Consequently, Emotional Stability has a positive relationship with technical performance. Agreeableness (-.01), Extraversion (.10) and Openness to Experience (.00) showed no to negligible relationships with technical performance. Overall, the results for the Big Five predicting technical performance are very consistent with meta-analyses in other international contexts (cf. Salgado, 2003). The variances in these relationships indicate the possible need to determine a moderator as results differ across settings. A moderator is a cause of variance not accounted for in the corrections applied in the analysis. In this study, moderators may include the source of performance ratings, the industry where the sample was drawn from or the gender or age of participants. The performance data in this study largely consisted of supervisor ratings. Research indicates that supervisor ratings can be unreliable, therefore this may account for some of the variance (Salgado et al., 2003).

Table 22: The Big Five Factors' relationships with Technical Performance using Salgado (2003, 2014) to correct for Range Restriction

Big Five Factor	Type of Correlation	N	k	Mr	Obs SDr	Mρ	SDρ	90% Conf. Int.		80% Cred. Int.	
								Lower	Upper	Lower	Upper
Agreeableness	True score correlations	1955	12	-,01	,13	-,01	,17	-.12	.10	-.23	.20
	Validity generalization	1955	12	-,01	,13	-,01	,15	-.11	.09	-.20	.18
Conscientiousness	True score correlations	1453	10	,15	,14	,22	,00	.09	.35	.22	.22
	Validity generalization	1453	10	,15	,14	,20	,00	.09	.32	.20	.20
Emotional Stability	True score correlations	1559	10	,09	,12	,14	,00	.03	.25	.14	.14
	Validity generalization	1559	10	,09	,12	,13	,00	.03	.23	.13	.13
Extraversion	True score correlations	1955	12	,07	,16	,10	,17	-.03	.22	-.12	.31
	Validity generalization	1955	12	,07	,16	,09	,15	-.03	.20	-.11	.29
Openness	True score correlations	1955	12	,00	,11	,00	,10	-.08	.08	-.13	.13
	Validity generalization	1955	12	,00	,11	,00	,09	-.07	.07	-.12	.12

Note. N = Sample size; k = the number of independent effect sizes included in each analysis; Mr = mean uncorrected correlation; Obs SDr = observed standard deviation of uncorrected correlations; Mρ = mean corrected correlation (corrected for unreliability in the predictor and criterion); SDρ = standard deviation of ρ; 90% Conf. Int. = 90% confidence interval for Mρ; 80% Cred. Int. = 80% Credibility interval for Mρ.

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Table 23: The Big Five Factors' relationships with Technical Performance using *u* Values from sample to correct for Range Restriction

Big Five Factor	Type of Correlation	N	k	Mr	Obs SDr	Mρ	SDρ	90% Conf. Int.		80% Cred. Int.	
								Lower	Upper	Lower	Upper
Agreeableness	True score correlations	1955	12	-,01	,13	-,01	,15	-.11	.09	-.21	.18
	Validity generalization	1955	12	-,01	,13	-,01	,13	-.10	.08	-.18	.16
Conscientiousness	True score correlations	1453	10	,15	,14	,23	,16	.10	.36	.02	.43
	Validity generalization	1453	10	,15	,14	,21	,15	.09	.33	.02	.39
Emotional Stability	True score correlations	1559	10	,09	,12	,12	,11	.03	.22	-.03	.27
	Validity generalization	1559	10	,09	,12	,11	,10	.03	.20	-.02	.24
Extraversion	True score correlations	1955	12	,07	,16	,09	,20	-.03	.22	-.17	.36
	Validity generalization	1955	12	,07	,16	,09	,19	-.03	.20	-.15	.33
Openness	True score correlations	1955	12	,00	,11	,00	,11	-.09	.09	-.14	.14
	Validity generalization	1955	12	,00	,11	,00	,10	-.08	.08	-.13	.12

Note. N = Sample size; k = the number of independent effect sizes included in each analysis; Mr = mean uncorrected correlation; Obs SDr = observed standard deviation of uncorrected correlations; Mρ = mean corrected correlation (corrected for unreliability in the predictor and criterion); SDρ = standard deviation of ρ; 90% Conf. Int. = 90% confidence interval for Mρ; 80% Cred. Int. = 80% Credibility interval for Mρ.

4.2.2 **Academic Performance**

Academic performance is performance relating to university settings or training. The results from the analysis of the relationship between the Big Five and academic performance using range restriction by Salgado (2003, 2014) are displayed in Table 24, while the results using range restriction from the data are displayed in Table 25. The analysis included 4 to 5 studies (*k*) and has a combined sample size (*N*) of 1877 to 2297. An analysis of the relationship between the Big Five and academic performance indicated that all five factors influence academic performance. Conscientiousness (.25) has a moderate positive relationship with academic performance. Considering the variance in the sample (80% CV [.25, .25]; CI 90% [.17, .34]) it can be concluded that Conscientiousness contributes positively to academic performance. Extraversion (-.19), had a moderate negative relationship with academic performance. Agreeableness (-.07) and Openness (-.06) had negligible relations with academic performance.. The variance in these relationships can largely be explained by the relatively small number of studies included in the meta-analysis and the need for more studies. However, considering that this correlation varies from slight negative to moderately negative, it can therefore be concluded that these factors have a negative relationship with academic performance. Although Emotional Stability showed a slight positive relationship with academic performance (.07) the variance in this relationship (80% CV [-.03, .17]; CI 90% [-.07, 21]) suggests that results may vary from a slight negative relationship to a small positive relationship. Based on this variance there is a need to determine moderators in the relationship; however, the small sample size (five studies) does not allow for this.

Table 24: The Big Five Factors' relationships with Academic Performance using Salgado (2003, 2014) to correct for Range Restriction

Big Five Factor	Type of Correlation	N	k	Mr	Obs SDr	Mρ	SDρ	90% Conf. Int.		80% Cred. Int.	
								Lower	Upper	Lower	Upper
Agreeableness	True score correlations	1877	4	-,05	,03	-,08	,00	-.14	.01	-.08	-.08
	Validity generalization	1877	4	-,05	,03	-,07	,00	-.12	.01	-.07	-.07
Conscientiousness	True score correlations	1877	4	,18	,05	,28	,00	.18	.37	.28	.28
	Validity generalization	1877	4	,18	,05	,25	,00	.17	.34	.25	.25
Emotional Stability	True score correlations	2297	5	,05	,10	,08	,09	-.08	.24	-.04	.19
	Validity generalization	2297	5	,05	,10	,07	,08	-.07	.21	-.03	.17
Extraversion	True score correlations	2297	5	-,14	,21	-,21	,11	-.50	.08	-.35	-.07
	Validity generalization	2297	5	-,14	,21	-,19	,10	-.45	.08	-.32	-.07
Openness	True score correlations	1877	4	-,04	,04	-,06	,00	-.13	.01	-.06	-.06
	Validity generalization	1877	4	-,04	,04	-,06	,00	-.12	.01	-.06	-.06

Note. N = Sample size; k = the number of independent effect sizes included in each analysis; Mr = mean uncorrected correlation; Obs SDr = observed standard deviation of uncorrected correlations; Mρ = mean corrected correlation (corrected for unreliability in the predictor and criterion); SDρ = standard deviation of ρ; 90% Conf. Int. = 90% confidence interval for Mρ; 80% Cred. Int. = 80% Credibility interval for Mρ.

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Table 25: The Big Five Factors' relationships with Academic Performance using *u* Values from sample to correct for Range Restriction

Big Five Factor	Type of Correlation	N	k	Mr	Obs SDr	Mρ	SDρ	90% Conf. Int.		80% Cred. Int.	
								Lower	Upper	Lower	Upper
Agreeableness	True score correlations	1877	4	-,05	,03	-,07	,00	-.13	.01	-.07	-.07
	Validity generalization	1877	4	-,05	,03	-,06	,00	-.11	.01	-.06	-.06
Conscientiousness	True score correlations	1877	4	,18	,05	,29	,00	.19	.38	.29	.29
	Validity generalization	1877	4	,18	,05	,26	,00	.17	.35	.26	.26
Emotional Stability	True score correlations	2297	5	,05	,10	,07	,12	-.07	.20	-.09	.22
	Validity generalization	2297	5	,05	,10	,06	,11	-.06	.18	-.08	.20
Extraversion	True score correlations	2297	5	-,14	,21	-,20	,28	-.49	.08	-.56	-.15
	Validity generalization	2297	5	-,14	,21	-,19	,26	-.45	.08	-.51	-.14
Openness	True score correlations	1877	4	-,04	,04	-,06	,00	-.13	.01	-.06	-.06
	Validity generalization	1877	4	-,04	,04	-,06	,00	-.12	.01	-.06	-.06

Note. N = Sample size; k = the number of independent effect sizes included in each analysis; Mr = mean uncorrected correlation; Obs SDr = observed standard deviation of uncorrected correlations; Mρ = mean corrected correlation (corrected for unreliability in the predictor and criterion); SDρ = standard deviation of ρ; 90% Conf. Int. = 90% confidence interval for Mρ; 80% Cred. Int. = 80% Credibility interval for Mρ.

4.2.3 <u>Organisational Citizenship Behaviour</u>

Organisational Citizenship Behaviour refers to behaviours contributing to organisational effectiveness by completing supporting activities that do not directly relate to task performance. The analysis included 2 studies (k) and has a combined sample size (N) of 248. The results from the analysis of the relationship between the Big Five and organisational citizenship behaviour using range restriction by Salgado (2003, 2014) are displayed in Table 26, while the results using range restriction from the data are displayed in Table 27. Analysing the relationship between the Big Five and organisational citizenship behaviour (OCB) showed that all of the factors have moderate to large positive relationships with the criterion (Openness to Experience .36, Emotional Stability .30, Agreeableness .25, Extraversion .24 and Conscientiousness .11). Considering that only two studies were included in this analysis, the mean relationships are subject to large amounts of sampling error variance. Results indicate that if more studies are analysed the relationships of each of the Big Five and OCB may vary from a slight positive to a strong positive relationship. To draw conclusive and confident results, more studies are required to comprehensively research the relationship between the Big Five and OCB.

Table 26: The Big Five Factors' relationships with Organisational Citizenship Behaviour using Salgado (2003, 2014) to correct for Range Restriction

Big Five Factor	Type of Correlation	N	k	Mr	Obs SDr	Mρ	SDρ	90% Conf. Int.		80% Cred. Int.	
								Lower	Upper	Lower	Upper
Agreeableness	True score correlations	248	2	,13	,02	,28	,00	.14	.42	.28	.28
	Validity generalization	248	2	,13	,02	,25	,00	.13	.37	.25	.25
Conscientiousness	True score correlations	248	2	,07	,00	,13	,00	.09	.16	.13	.13
	Validity generalization	248	2	,07	,00	,11	,00	.08	.15	.11	.11
Emotional Stability	True score correlations	248	2	,16	,03	,33	,00	.01	.61	.33	.33
	Validity generalization	248	2	,16	,03	,30	,00	.01	.55	.30	.30
Extraversion	True score correlations	248	2	,14	,01	,26	,00	.16	.36	.26	.26
	Validity generalization	248	2	,14	,01	,24	,00	.15	.33	.24	.24
Openness	True score correlations	248	2	,22	,03	,40	,00	.16	.62	.40	.40
	Validity generalization	248	2	,22	,03	,36	,00	.14	.56	.36	.36

Note. N = Sample size; k = the number of independent effect sizes included in each analysis; Mr = mean uncorrected correlation; Obs SDr = observed standard deviation of uncorrected correlations; Mρ = mean corrected correlation (corrected for unreliability in the predictor and criterion); SDρ = standard deviation of ρ; 90% Conf. Int. = 90% confidence interval for Mρ; 80% Cred. Int. = 80% Credibility interval for Mρ.

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Table 27: The Big Five Factors' relationships with Organisational Citizenship Behaviour using *u* Values from sample to correct for Range Restriction

Big Five Factor	Type of Correlation	N	k	Mr	Obs SDr	Mρ	SDρ	90% Conf. Int.		80% Cred. Int.	
								Lower	Upper	Lower	Upper
Agreeableness	True score correlations	248	2	,13	,02	,24	,00	.12	.36	.24	.24
	Validity generalization	248	2	,13	,02	,22	,00	.11	.32	.22	.22
Conscientiousness	True score correlations	248	2	,07	,00	,14	,00	.10	.18	.14	.14
	Validity generalization	248	2	,07	,00	,12	,00	.09	.16	.12	.12
Emotional Stability	True score correlations	248	2	,16	,03	,27	,00	.01	.52	.27	.27
	Validity generalization	248	2	,16	,03	,24	,00	.01	.47	.24	.24
Extraversion	True score correlations	248	2	,14	,01	,25	,00	.16	.34	.25	.25
	Validity generalization	248	2	,14	,01	,23	,00	.14	.31	.23	.23
Openness	True score correlations	248	2	,22	,03	,40	,00	.15	.62	.40	.40
	Validity generalization	248	2	,22	,03	,36	,00	.14	.56	.36	.36

Note. N = Sample size; k = the number of independent effect sizes included in each analysis; Mr = mean uncorrected correlation; Obs SDr = observed standard deviation of uncorrected correlations; Mρ = mean corrected correlation (corrected for unreliability in the predictor and criterion); SDρ = standard deviation of ρ; 90% Conf. Int. = 90% confidence interval for Mρ; 80% Cred. Int. = 80% Credibility interval for Mρ.

4.2.4 <u>Avoiding Counterproductive Behaviour</u>

Counterproductive behaviour refers to behaviours that have a negative value for organisational effectiveness. The analysis included 2 studies (k) and has a combined sample size (N) of 248. The results from the analysis of the relationship between the Big Five and avoiding counterproductive behaviour using range restriction by Salgado (2003, 2014) are displayed in Table 28, while the results using range restriction from the data are displayed in Table 29. The analysis of the relationship between the Big Five and avoiding counterproductive work behaviours (CWB) included two studies, therefore it should be noted that the results are subject to variance. More studies are required to investigate the relationship between the Big Five and avoiding CWB, in order to reach conclusive and generalisable results. The results of the analysis of this study indicate that Conscientiousness (.32) and Emotional Stability (.30) are the strongest predictors of avoiding CWB. Extraversion (-.11) has a small negative influence on avoiding CWB, while Openness to Experience (.07) and Agreeableness (.00) have no or negligible relationships with avoiding CWB.

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Table 28: The Big Five Factors' relationships with Avoiding Counter Productive Behaviour using Salgado (2003, 2014) to correct for Range Restriction

Big Five Factor	Type of Correlation	N	k	Mr	Obs SDr	Mρ	SDρ	90% Conf. Int.		80% Cred. Int.	
								Lower	Upper	Lower	Upper
Agreeableness	True score correlations	248	2	,00	,11	,00	,13	-.88	.88	-.17	.17
	Validity generalization	248	2	,00	,11	,00	,12	-.77	.77	-.15	.15
Conscientiousness	True score correlations	248	2	,18	,13	,35	,00	-.70	1.00	.35	.35
	Validity generalization	248	2	,18	,13	,32	,00	-.63	1.00	.32	.32
Emotional Stability	True score correlations	248	2	,16	,08	,33	,00	-.39	.88	.33	.33
	Validity generalization	248	2	,16	,08	,30	,00	-.35	.79	.30	.30
Extraversion	True score correlations	248	2	-,06	,04	-,12	,00	-.40	.18	-.12	-.12
	Validity generalization	248	2	-,06	,04	-,11	,00	-.37	.16	-.11	-.11
Openness	True score correlations	248	2	,04	,16	,07	,25	-1.00	1.00	-.24	.39
	Validity generalization	248	2	,04	,16	,07	,22	-.97	1.00	-.22	.35

Note. N = Sample size; k = the number of independent effect sizes included in each analysis; Mr = mean uncorrected correlation; Obs SDr = observed standard deviation of uncorrected correlations; Mρ = mean corrected correlation (corrected for unreliability in the predictor and criterion); SDρ = standard deviation of ρ; 90% Conf. Int. = 90% confidence interval for Mρ; 80% Cred. Int. = 80% Credibility interval for Mρ.

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Table 29: The Big Five Factors' relationships with Avoiding Counter Productive Behaviour using *u* Values from sample to correct for Range Restriction

Big Five Factor	Type of Correlation	N	k	Mr	Obs SDr	Mρ	SDρ	90% Conf. Int.		80% Cred. Int.	
								Lower	Upper	Lower	Upper
Agreeableness	True score correlations	248	2	,00	,11	,00	,11	-.82	.82	-.14	.14
	Validity generalization	248	2	,00	,11	,00	,10	-.73	.73	-.13	.13
Conscientiousness	True score correlations	248	2	,18	,13	,34	,08	-.68	1.00	.23	.45
	Validity generalization	248	2	,18	,13	,31	,08	-.62	1.00	.21	.41
Emotional Stability	True score correlations	248	2	,16	,08	,27	,00	-.32	.81	.27	.27
	Validity generalization	248	2	,16	,08	,24	,00	-.29	.73	.24	.24
Extraversion	True score correlations	248	2	-,06	,04	-,11	,00	-.39	.17	-.11	-.11
	Validity generalization	248	2	-,06	,04	-,10	,00	-.35	.15	-.10	-.10
Openness	True score correlations	248	2	,04	,16	,07	,26	-1.00	1.00	-.26	.41
	Validity generalization	248	2	,04	,16	,07	,24	-.96	1.00	-.24	.37

Note. N = Sample size; k = the number of independent effect sizes included in each analysis; Mr = mean uncorrected correlation; Obs SDr = observed standard deviation of uncorrected correlations; Mρ = mean corrected correlation (corrected for unreliability in the predictor and criterion); SDρ = standard deviation of ρ; 90% Conf. Int. = 90% confidence interval for Mρ; 80% Cred. Int. = 80% Credibility interval for Mρ.

4.2.5 Overall Performance

Overall Performance refers to global ratings of undifferentiated job performance. The analysis included 10 to 11 studies (*k*) with a combined sample size (*N*) of 2212 to 2420. The results from the analysis of the relationship between the Big Five and Overall Performance using range restriction by Salgado (2003, 2014) are displayed in Table 30, while the results using range restriction from the data are displayed in Table 31. Emotional Stability has a moderate positive relationship (.21) with overall performance, if more studies are collected for analysis the relationship may vary. However, the results suggest that the relationship will remain at least a small positive relationship (80% CV [.21, .21]; CI 90% [.12, .29]). Similar to Emotional Stability, Extraversion (.16) has a small positive relationship with overall performance. Although this relationship appears to be stable across settings the inclusion of more studies in the analysis may cause the relationship to vary, but it is likely to remain a small to moderate positive relationship (80% CV [.16, .16]; CI 90% [.10, 21]). Openness to Experience (.16) has a small positive relationship with overall performance, results indicate that there is variance between studies and therefore this relationship is not stable across settings. In addition, should more studies be collected the relationship may vary from none to a large positive relationship (80% CV [.04, .29]; CI 90% [.01, 32]). Conscientiousness had on average a small relationship (.07) with overall performance. Although the relationship is stable across settings the results indicate that should more studies be collected the relationship may vary, but remain small (80% CV [.07, 07]; CI 90% [.00, .14]). It can be concluded that Conscientiousness has a small positive relationship with overall performance. This result is in contrast to previous meta-analyses and the results for Technical Performance in the current study. It can be understood by examining the content of the Overall Performance criteria used in the included studies. All of the studies were managerial ratings of performance which were collected in order to make administrative decisions (e.g., promotions, termination). In these contexts, a wide variety of factors influence ratings besides employee performance, such as raters' liking of the employees and employee need. As a result, such ratings lack construct validity and are of questionable value for validation research (Campbell and Wiernik, 2015).   While all the other factors had a positive relationship,

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Agreeableness shows no relationship with overall performance. The results indicate that there is variance between studies and therefore it is not stable across settings. In addition, should more studies be collected, the relationship may vary from a small negative to a small positive relationship (80% CV [.-.14, .15]; CI 90% [-.09, .10]).

Table 30: The Big Five Factors' relationships with Overall Performance using Salgado (2003, 2014) to correct for Range Restriction

Big Five Factor	Type of Correlation	N	k	Mr	Obs SDr	Mρ	SDρ	90% Conf. Int.		80% Cred. Int.	
								Lower	Upper	Lower	Upper
Agreeableness	True score correlations	2212	10	,00	,09	,00	,13	-.10	.11	-.16	.17
	Validity generalization	2212	10	,00	,09	,00	,11	-.09	.10	-.14	.15
Conscientiousness	True score correlations	2313	11	,04	,08	,08	,00	.00	.16	.08	.08
	Validity generalization	2313	11	,04	,08	,07	,00	.00	.14	.07	.07
Emotional Stability	True score correlations	2420	11	,12	,09	,23	,00	.14	.33	.23	.23
	Validity generalization	2420	11	,12	,09	,21	,00	.12	.29	.21	.21
Extraversion	True score correlations	2420	11	,10	,06	,17	,00	.11	.23	.17	.17
	Validity generalization	2420	11	,10	,06	,16	,00	.10	.21	.16	.16
Openness	True score correlations	2212	10	,11	,17	,18	,11	.01	.35	.04	.32
	Validity generalization	2212	10	,11	,17	,16	,10	.01	.32	.04	29

Note. N = Sample size; k = the number of independent effect sizes included in each analysis; Mr = mean uncorrected correlation; Obs SDr = observed standard deviation of uncorrected correlations; Mρ = mean corrected correlation (corrected for unreliability in the predictor and criterion); SDρ = standard deviation of ρ; 90% Conf. Int. = 90% confidence interval for Mρ; 80% Cred. Int. = 80% Credibility interval for Mρ.

Table 31: The Big Five Factors' relationships with Overall Performance using _u_ Values from sample to correct for Range Restriction

Big Five Factor	Type of Correlation	N	k	Mr	Obs SDr	Mρ	SDρ	90% Conf. Int.		80% Cred. Int.	
								Lower	Upper	Lower	Upper
Agreeableness	True score correlations	2212	10	,00	,09	,00	,11	-.09	.10	-.14	.15
	Validity generalization	2212	10	,00	,09	,00	,10	-.08	.09	-.12	.13
Conscientiousness	True score correlations	2313	11	,04	,08	,08	,06	.00	.16	.00	.16
	Validity generalization	2313	11	,04	,08	,07	,06	.00	.14	.00	.15
Emotional Stability	True score correlations	2420	11	,12	,09	,19	,08	.11	.27	.09	.30
	Validity generalization	2420	11	,12	,09	,17	,07	.10	.24	.08	.27
Extraversion	True score correlations	2420	11	,10	,06	,17	,00	.11	.23	.17	.17
	Validity generalization	2420	11	,10	,06	,15	,00	.10	.21	.15	.15
Openness	True score correlations	2212	10	,11	,17	,18	,27	.01	.35	-.16	.52
	Validity generalization	2212	10	,11	,17	,16	,24	.01	.33	-.15	47

Note. N = Sample size; k = the number of independent effect sizes included in each analysis; Mr = mean uncorrected correlation; Obs SDr = observed standard deviation of uncorrected correlations; Mρ = mean corrected correlation (corrected for unreliability in the predictor and criterion); SDρ = standard deviation of ρ; 90% Conf. Int. = 90% confidence interval for Mρ; 80% Cred. Int. = 80% Credibility interval for Mρ.

4.3. CONCLUSION

This chapter described the results regarding the relationships between the Big Five personality factors and each of the performance dimensions under investigation. The analysis was based on range restriction corrections provided by Salgado (2003, 2014) since the u values calculated based on the data available for the samples did not adequately report range restriction values. The u values calculated from the sample computed using data from personality measure manuals, which in most cases reported international norms; these u values suggested unrealistically less range restriction on Emotional Stability than had been observed in previous meta-analyses. The results indicated that the Big Five personality factors are related to each of the performance dimensions. The analysis revealed small to moderate relationships with the performance dimensions and the relationships are comparable with other personality research. The confidence and credibility intervals in most cases indicate a relative stable relationship between the predictor and criterion. Emotional Stability and Conscientiousness are both consistently important predictors of performance across criteria. The implications of these results as well as limitations of the study and recommendations for future research will be explored in the next section.

CHAPTER 5 – DISCUSSION, LIMITATIONS AND RECOMMENDATIONS

5.1   INTRODUCTION

The purpose of this study was to determine and examine the predictive validity of the Big Five in relation to job performance in South Africa. This was accomplished by conducting a meta-analytic review of research examining the relationship between personality and performance in the South African setting. This analysis examined the relationship between personality, specifically the Big Five factors, and technical performance, academic performance, organisational citizenship behaviour, avoiding counter productive behaviour and overall performance. The analysis included 34 studies and had a combined sample size of 7100. This chapter will discuss the results presented in Chapter 4 in accordance with the research objectives of the study and international research. Furthermore it will present the implications of the findings, limitations of the study and will conclude with recommendations for future research.

The study posed the following research objectives:

1.   To determine the predictive validity of the Big Five personality constructs for several domains of job performance in the South African context by means of a meta-analytic study.

2.   To determine what the correlation is between each of the Big Five variables and several job performance domains.

3.   To determine which of the Big Five personality constructs predict job performance most optimally.

The results will be discussed in light of these research objectives and compared with international literature.

5.2 DISCUSSION OF RESULTS IN RELATION TO RESEARCH OBJECTIVES

5.2.1 Research objective one: To determine the predictive validity of the Big Five in relation to several domains of job performance in the South African context by means of a meta-analytic study

In order to investigate this research objective the study took the form of a meta-analysis examining the relationship between the Big Five personality factors and various job performance domains in a South African setting. Results relieved that the Big Five has predictive power in relation to technical performance, academic performance, organisational citizenship behaviour (OCB), avoiding counter productive work (CWB) behaviour and overall performance. In particular **Agreeableness** has a positive influence on OCB (.25) and a slight negative influence on academic performance (-.07), while **Conscientiousness** has proven to be significant in predicting performance with a positive relationship with technical performance (.20), academic performance (.25), OCB (.11), avoiding CWB (.32) and overall performance (.07). Similarly, **Emotional Stability** has proven its predictive power with positive relationships with technical performance (.13), academic performance (.07), OCB (.30), avoiding CWB (.30) and overall performance (.21). **Extraversion** influences academic performance (-.19) and avoiding CWB (-.11) negatively but has a positive influence on OCB (.24) and overall performance (.16). Finally, **Openness to Experience** has a slight negative impact on academic performance (-.06), but has a positive influence on OCB (.36) and overall performance (.16).

In the next section these findings will be discussed in more detail and will be compared with international research in terms of findings and significance.

5.2.2 Research objective two: To determine what the correlation is between each of the Big Five personality constructs and several job performance domains

Agreeableness - Individuals high on Agreeableness tend to be trusting, helpful towards others, forgiving, soft hearted, and compassionate (Costa & McCrae, 1992).

Research on the topic

Previous research suggests that no correlation exists between Agreeableness and overall job performance (Barrick & Mount, 1991). Given that most jobs have a social component, the average relationship of Agreeableness to performance is surprisingly low (Barrick et al., 2001). Several studies have found small positive relationships between overall performance and Agreeableness ranging between .01 and .08 (Barrick & Mount, 1991; Hough, 1992; Hurtz & Donovan, 2000; Salgado, 1998, 2003).

Research shows mixed results regarding the relationship between academic performance and Agreeableness, indicating both a positive (Gray & Watson, 2002) and negative (Hurtz & Donovan, 2000; Poropat, 2009; Rothstein et al. 1994) relationship. It is theorised that the traits associated with Agreeableness (trust, altruism, tender-mindedness, etc.) are not typically associated with academic success (Furnham, Nuygards, & Chamorro-Premuzic, 2013). It is possible that Agreeableness is correlated with academic success, as agreeable individuals tend to be good at giving, asking for and receiving help from both peers and teachers (Furnham et al., 2013).

Agreeableness was found to predict performance for team-orientated jobs (.27). This finding is in line with research by Barrick et al. (2001), who found that Agreeableness predicts teamwork (.34) and can predict success in specific occupations. Agreeable individuals seem to strive towards communion, which may contribute to increased performance in team settings (Barrick, Steward, & Piotrowski, 2002). Characteristics related to agreeableness, like eagerness to cooperate and conflict avoidance (McCrae & Costa, 1990) may cause people high on Agreeableness to struggle in competitive environments and this may diminish the positive effect of Agreeableness on performance (Furnham et al., 2013). Agreeableness is identified as a strong predictor of Organisational Citizenship Behaviour (Ilies et al., 2009; Ones & Viswesvaran, 2001; Organ & Ryan, 1995). A meta-analytic review by Chiaburu et al.

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(2011) reported a positive relationship (.14) between these factors. Ilies, Scott, and Judge (2006) found that individuals high in Agreeableness engage in citizenship behaviour as they attempt to meet their altruistic needs by engaging in these behaviours.

In terms of counter productive work behaviours Agreeableness has negative correlations with both individual (-.49) and organisational deviance (-.32) (Berry, Ones, & Sackett, 2007). Another study confirmed that Agreeableness is negatively related to CWB (-.38) (Sackett, Berry, Wiemann, & Laczo, 2006). Research confirms a negative relationship between Agreeableness and CWB (Bolton, Becker, & Barber, 2010; O'Neill, Lewis, & Carswell, 2011). This suggests that persons with high levels of Agreeableness are not likely to engage in these behaviours

Current study

Results from the current study are mostly comparable with previous research concerning the relationship between Agreeableness and performance. Earlier research has shown that Agreeableness has no significant relationship with technical performance or overall performance. The current study yielded a relationship of -.01 for technical performance and .00 for overall performance, which supports the findings of previous research. Analysis of academic performance and Agreeableness produced mixed results in previous studies, while the current study yielded a small negative correlation (-.07) similar to that reported by Rothstein et al. (1994), Poropat (2009) and Hurtz and Donovan (2000).

The results of this study are consistent with previous research concerning the relationship between OCB and Agreeableness. Past research indicated the existence of a positive relationship between Agreeableness and OCB as well as team related tasks, concurring with the results of the current study (.25). In terms of CWB previous research indicated that Agreeableness is a predictor of avoiding CWB, yielding negative correlations with deviant behaviour. However, this study found no relationship (.00) between Agreeableness and avoiding CWB. This finding differs from what is indicated by previous research, and may be due to the fact that only two studies were included in this analysis. One study (N=89) reported on

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"adhere and live the values", which was measured by supervisors, while the other (N=79) considered absenteeism. Mount, Ilies and Johnson (2006) found that job satisfaction plays a moderating role in the Agreeableness – avoiding CWB relationship and it is therefore likely that other factors such as job satisfaction are at play. It is recommended that more data is included to analyse the true relationship between the Big Five and avoiding CWB.

Conclusion

Agreeable individuals who are generally helpful, compassionate and forgiving tend to establish and maintain healthy and rewarding relationships with their co-workers, colleagues and place of business (O'Conner & Paunonen, 2007). Qualities such as kindness, likeability, and thoughtfulness, which are associated with Agreeableness, tend to lead to successful relationships with co-workers (McCrae & Costa, 1991; Organ & Lingl, 1995). These good relationships in turn encourage Agreeable individuals to remain within the organisation (Colquitt, LePine, & Wesson, 2009). Agreeableness predicts performance in interpersonally-oriented jobs (Hurtz & Donovan, 2000) and is a predictor of helping others (Organ & Ryan, 1995). Agreeableness enables performance in contexts that require strong social skills, as well as in dealing with unfriendly or irritated people (Barrick et al., 2002). Agreeableness might be a hindrance in competitive environments (Furnham et al., 2013). It is likely that Agreeableness supports academic performance, because agreeable individuals tend to be good at giving, asking for and receiving help both from their peers and their teachers (Furnham et al., 2013). Individuals who possess traits associated with Agreeableness (friendly, cooperative, compassionate, kind, affectionate, and sympathetic) may struggle to engage in CWB, while they are likely to flourish performing actions associated with OCB. Employees high on Agreeableness strive to be of value to the group and the organisation, therefore they are more likely to help the group and to engage in other OCBs (Phipps, Prieto, & Deis, 2015).

Conscientiousness - Individuals high on Conscientiousness typically exhibit traits of self-control and are able to plan, organise, work strategically towards goals and carry out tasks (Barrick & Mount, 1998; Costa & McCrae, 1992). Conscientious individuals

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tend to be reliable, hardworking, determined, self-disciplined and achieving (Costa & McCrae, 1992). Individuals low on Conscientiousness tend to be careless, irresponsible, low achievement striving and impulsive. It has been suggested that Conscientiousness and general performance are related through motivation (Sackett, Gruys, & Ellingson, 1998).

Research on the topic

Previous research has consistently found that Conscientiousness predicts performance across settings and jobs (Barrick & Mount, 1991; Salgado, 1997). Research findings suggest that Conscientiousness is the personality dimension that correlates the strongest, of all personality dimensions, with overall job performance across occupations (Barrick et al., 2001; Hurtz & Donovan, 2000; Mount & Barrick, 1995; Ones & Viswesvaran, 1996; Salgado, 1997; Vinchur et al., 1998).

Conscientiousness has consistently been associated with academic performance (Busato, Prins, Elshout, & Hamaker, 2000; Costa & McCrae, 1992; De Raad, 1996; De Raad & Schouwenburg, 1996; Goff & Ackerman, 1992; Hurtz & Donovan, 2000; Kling, 2001). Meta-analytic studies support the finding that Conscientiousness is a predictor of academic performance (Noftle & Robins, 2007; O'Connor & Paunonen, 2007; Poropat, 2009). Conscientiousness has been described as achieving with an emphasis on goal-setting and has subsequently been related to motivation, which is important in performance of any job (Chamorro-Premuzic & Furnham, 2003). Conscientiousness was found to be the most important correlate and predictor of academic performance (Chamorro-Premuzic & Furnham, 2003).

Conscientiousness emerged as a strong predictor of organisational citizenship behaviour (Ilies et al., 2009; Chien, 2004; Ones & Viswesvaran, 2001; Organ & Ryan, 1995; Organ & Lingl, 1995). A meta-analytic review by Chiaburu et al. (2011) supported these findings, reporting a positive relationship (.18) between these factors.

Conscientiousness has negative correlations with both individual (-.23) and organisational deviance (-.42) aspects of counterproductive work behaviour (Berry et

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al., 2007). This was confirmed by another study yielding a strong negative relationship (-.52) between Conscientiousness and CWB (Sackett et al., 2006). Additional research also confirms a negative relationship between Conscientiousness and CWB (LePine, LePine & Jackson, 2004; O'Neill et al., 2011;), suggesting that persons high on Conscientiousness are not likely to engage in these behaviours.

Current study

Results from the current study are mostly comparable with previous research concerning the relationship between Conscientiousness and job performance. Prior research found Conscientiousness to generally be a predictor of performance across settings and jobs. Conscientiousness correlates positively with technical performance, academic performance, OCB, avoiding CWB and overall performance. This study found positive relationships between Conscientiousness and technical performance (.20), academic performance (.23), OCB (.11), avoiding CWB (.32) and overall performance (.07). This indicates that the results of this study are comparable to previous research and that Conscientiousness has predictive power over several domains of performance, not only internationally, but also in the South African context. While the validity for Overall Performance was small, this can be understood to be an artefact of the administrative performance measures used—the results for specific performance dimensions are concordant with previous results.

Conclusion

Conscientious individuals are typically capable of planning, organising, working strategically towards goals, and carrying out tasks (Barrick & Mount, 1998; Costa & McCrae, 1992). It would appear that the ability to plan, organise and remain task focused allows conscientious individuals to perform well in most jobs and academic settings (Barrick et al., 2002). Conscientiousness motivates individuals to act in a certain way to achieve certain goals (Phipps et al., 2015). King, George, and Hebl (2005) argued that Conscientiousness may be an important predictor of workplace behaviours, allowing individuals the focus to produce targeted behaviours (organisational goals). Occupations requiring attention to detail require behaviours that are consistent with the trait of Conscientiousness. Conscientious employees in

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this kind of work environment should be more likely to demonstrate valued behaviours and ultimately better job performance than individuals low on Conscientiousness (Judge & Zapata, 2015). Conscientious individuals tend to be reliable, hardworking, determined, self-disciplined and achieving (Costa & McCrae, 1992), which can be associated with OCB. Individuals low on Conscientiousness tend to be careless, irresponsible, low achievement striving and impulsive, which may be associated with CWB.

It may be concluded that individuals high on Conscientiousness are likely to perform well in virtually all jobs and contribute to tasks that are outside of their role, but of value of the organisation. Conscientiousness has consistently been found to be the best personality predictor of performance (Barrick et al., 2002).

Emotional Stability - Individuals who score high on the Emotional Stability factor tend to be secure and calm, and therefore more likely to control their impulses and cope with stress (Costa & McCrae, 1992).

Research on the topic

Emotional Stability has a consistent relationship with job performance, mostly indicated as a relatively small, positive correlation (Barrick et al., 2001; Hurtz & Donovan, 2000). In the European context Salgado (1997) found that Emotional Stability is a valid predictor of all types of job performance, measured across occupations.

It has been found that individuals high on Emotional Stability (or low on Neuroticism) tend to score higher on ability tests, possibly because they tend to be less influenced by anxiety (Furnham & Mitchell, 1991; Zeidner, 1995; Zeidner & Matthews, 2000) and they are found to perform better in university classes (Cattell & Kline, 1977; Lathey, 1991; Sanchez-Marin, Rejano-Infante, & Rodriguez- Troyano, 2001). Neuroticism was found to negatively correlate with academic achievement (Chamorro-Premuzic & Furnham, 2003). This may be explained by the significant

association found between Neuroticism and increased test anxiety (Chamorro-Premuzic, Furnham, Christopher, Garwood & Martin, 2008).

Although Emotional Stability was related to all types of performance, Barrick et al. (2001) found that it correlated most strongly with teamwork (.22). Emotional Stability has a slight positive relationship with helping behaviour or OCB (.06) (Organ & Ryan, 1995). A meta-analytic study investigating the relationship between the Big Five and OCB supported these findings, reporting a positive relationship between Emotional Stability and OCB (Chiaburu et al., 2011; Ones & Viswesvaran, 2001). In relation to counter productive work behaviours Emotional Stability has negative correlations with both individual (-.24) and organisational deviance (-.23) (Berry et al., 2007) and a strong negative relationship (-.39) to a combined CWB factor (Sackett et al., 2006). Bolton et al. (2010) and O'Neill et al. (2011) confirmed the negative relationship between these factors, suggesting that persons high on Emotional Stability are not likely to engage in these behaviours.

Current study

Results from the current study are mostly comparable with previous research concerning the relationship between Emotional Stability and performance. Earlier research showed that Emotional Stability has relatively small, positive correlations with technical and overall performance across settings. The current study confirmed these relationships with correlations of .13 and .21 respectively. The relationship between Emotional Stability and academic performance produced a positive relationship in past research, which is comparable with the current study which produced a small positive relationship (.07).

Research on OCB and avoiding CWB research generally yielded positive correlations with Emotional Stability. Research suggests that a small positive relationship exists between OCB and Emotional Stability, while a moderately strong positive relationship emerged between teamwork and Emotional Stability. Emotional stability is significantly related to supervisor ratings of OCB (Small & Diefendorff, 2006).

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The current study produced a moderately strong positive (.30) relationship with OCB. This relationship might be exaggerated, as only two studies were included in the analysis. Similar to the results of prior research, this study showed a moderately strong positive (.30) correlation between Emotional Stability and avoiding CWB.

Conclusion

Individuals with high levels of Emotional Stability tend to be in control of their impulses, are seemingly calm and even-tempered, and are better able to deal with stress. Their ability to deal well with stress likely equips them to respond appropriately in difficult social situations and assists in coping with environments that require interaction with unpleasant or angry individuals (Barrick et al., 2002). Individuals with high levels of Neuroticism may be less happy, influencing their ability to perform well (Colquitt et al., 2009). The insecurity associated with Neuroticism can lead to dissatisfaction with one's job (Judge, Heller & Mount, 2002). Emotional Stability positively influences academic performance, as individuals with this trait are likely to be less influenced by anxiety. Being in control of impulses and being even-tempered, individuals with high levels of Emotional Stability are likely to assist and help others, engaging in OCB and avoiding CWB. Individuals who can maintain their composure, even under demanding or hectic circumstances, are likely to have less anxiety and more levelheadedness, enabling them to go beyond the expectations of their roles, therefore engaging in OCB (Phipps et al., 2015). Well-adjusted, secure individuals (high on Emotional Stability) are likely less inclined to worry, and it is likely that their rationality would enable them to have the presence of mind to behave in a manner that would be of benefit to the organisation (Phipps et al., 2015).

Extraversion - Extraversion refers to the quantity and intensity of energy directed outwards into the social world (Costa & McCrae, 1992). Individuals who have high levels of Extraversion tend to be sociable, active, talkative, person-oriented, optimistic, fun, loving, and affectionate.

Research on the topic

Previous research yielded mixed results concerning the relationship between Extraversion and performance. Salgado (1997) found that Extraversion positively

correlates with performance in supervisory, police, and sales-related positions. The relationship with sales performance was confirmed using a meta-analysis that found that Extraversion is a solid predictor of sales performance (Vinchur et al., 1998). However, Barrick et al. (2001) found no significant relationship between Extraversion and overall performance, although Extraversion does predict managerial performance (.21) and teamwork (.16). Hurtz and Donovan (2000) found a small positive relationship between overall performance and Extraversion. Various studies found a small positive relationship between Extraversion and overall performance (Barrick & Mount, 1991; Hough, 1992; Hurtz & Donovan, 2000; Salgado, 1998, 2003).

Extraversion has a negative relationship with several knowledge tests (Rolfhus & Ackerman, 1999), likely because introverts might spend more time studying while extraverts might spend more time socialising (Chamorro-Premuzic & Furnham, 2003). Although earlier research produced mixed results investigating the relationship between Extraversion and academic performance (Chamorro-Premuzic & Furnham, 2003), Sanchez-Marin et al. (2001) found that extraverts tended to fail their courses more frequently than introverts, possibly due to their sociability, distractibility and impulsiveness. Extraversion was reasonably strongly negatively correlated with academic success (Furnham et al., 2013; Poropat, 2009).

Ryan and Organ (1995) found Extraversion to be a valid predictor of OCB (.15). These findings were supported by Chiaburu et al. (2011), who reported a small positive relationship (.09). Elanain (2007) found that Extraversion was positively related to several organisational citizenship behaviours. A study conducted in a secondary school indicated that extroverts engage in more OCB than their counterparts (van Emmerik & Euwema, 2007). In relation to counter productive work behaviours, Extraversion has a negligible positive correlation with individual deviance (.02) and a small negative correlation with organisational deviance (-.09) (Berry et al., 2007). Similarly, a small negative relationship (-.13) with a general CWB factor is indicated (Sackett et al., 2006), suggesting that Extraversion is not a likely predictor of deviant behaviour.

Current study

Results from the current study are mostly comparable with previous research concerning the relationship between Extraversion and performance. Previous research produced mixed results when investigating the relationships between technical and overall performance and Extraversion. However, various studies reported a small positive relationship between Extraversion and overall performance. This may suggest that this relationship is diverse across positions. The current study reflects the results of several other studies indicating the presence of small positive relationships between Extraversion and technical performance (.09) and overall performance (.16).

When considering research on Extraversion and academic performance it is notable that although early results varied, subsequent research has consistently found that Extraversion is negatively related to academic performance. The current study mirrors this finding by indicating the presence of a small negative relationship (-.19). OCB has been positively linked to Extraversion, with research indicating a small positive relationship between these factors. Similarly, this study produced a moderate positive relationship (.24) between Extraversion and OCB. Extraversion has been shown to be a predictor of avoiding CWB, with a small positive relationship (.09). In contrast to these findings, the current study found a small negative relationship (-.11) between these factors. This difference can possibly be due to only two studies being included in the analysis. One study (N=89) reported on "adhere and live the values" which was measured by supervisors, while the other (N=79) considered absenteeism. Barrick and Mount (1991) explains that the core of Extraversion is to place the self in the centre of attention, to stand out amongst peers. Extraversion fuels a need to be dominant, ambitious and socially lively. These attributes could possibly fuel behaviours of theft, favouritism, and absence from work in order to satisfy the need to get ahead or be social. However, it is recommended that more data is included to analyse the true relationship between the Big Five and avoiding CWB.

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Conclusion

Extraverted individuals tend to be sociable, talkative, fun, optimistic, people-orientated and affectionate. These traits enable extraverts to perform well in jobs where they can make use of their strong social skills. As a result, extraverts should perform especially well in occupational contexts that require strong social skills (Barrick et al., 2002). Their social skills may equip extraverts to perform better than introverts when in competitive groups (Bentea & Anghelache, 2012). Extraverts should be particularly capable of handling problems requiring social interaction (Tett & Burnett, 2003), such as dealing with unpleasant or angry people (Barrick et al., 2002). Extraverted people are predicted to have cognitive motivations consistent with striving for status, which is related to sales performance and may result in behaviour enabling job performance (Barrick et al., 2002). Extraverts tend to perform worse than introverts in academic settings, possibly due to their sociability, distractibility and impulsiveness.

Extroverts show energy and enthusiasm and tend to be more socially comfortable than introverts and, from a theoretical perspective, this would suggest that they should be more prone to engage in organisational citizenship behaviours (Phipps et al., 2015). Given that extraverted people are person-orientated, social, loving and affectionate they are likely to be naturally inclined to engage in organisational citizenship behaviours such as helping co-workers, assisting with duties outside of their role and engaging in activities to benefit the organisation.

Openness to Experience - Individuals high on Openness to Experience tend to be creative, imaginative, and curious to experience new things. They likely have positive attitudes towards their own ideas and experiences in life (Costa & McCrae, 1992).

Research on the topic

Previous research has produced varied results when investigating the relationship between Openness to Experience and job performance. Barrick et al. (2001) found no significant relationship between Openness and overall performance. Other studies found a weak positive relationship between Openness (.11) and overall performance (Barrick & Mount, 1991; Hough, 1992; Hurtz & Donovan, 2000;

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Salgado, 1997, 2003). Salgado (1997) found that Openness was significantly related to police and skilled labour performance.

Openness was positively correlated to training proficiency (Barrick & Mount, 1991; Hurtz & Donovan, 2000). Furnham et al. (2013, p. 977) summarised the findings regarding Openness as follows:

> "Openness was typically positively associated with Academic Performance (e.g. Duff et al. 2004). This relationship is usually understood in terms of ability such that measures of Openness typically correlate positively with intelligence measures (Ackerman & Heggestad 1997), which in turn has been positively correlated with scholastic success (Busato et al., 2000)".

The research on Openness as a predictor of OCB has produced diverse results. Organ et al. (2006) found no visible relationship between these factors, while several researchers found Openness to be a small predictor of OCB (Elanain, 2007; Hurtz & Donovan, 2000; van Emmerik & Euwema, 2007). A meta-analysis conducted by Chiaburu et al. (2011) found a small positive relationship (.14) and concluded that Openness has not been adequately connected to OCB as a predictor. In relation to counter productive work behaviours Openness has small negative correlations with both individual (-.09) and organisational deviance (-.04) (Berry et al., 2007). Similarly, it has a small negative relationship (-.08) with a general CWB factor (Sackett et al., 2006) suggesting that Openness is not a strong predictor of deviant behaviour.

Current study

The results of the current study concerning the relationship between Openness to Experience and performance are mostly comparable with that of previous research.

In terms of past research it is notable that although Barrick et al. (2001) found no significant relationship between Openness and overall performance, several other studies found a positive relationship between Openness (.11) and overall performance. This study found no relationship between technical performance and openness. This inconsistency may be because the sample in this study did not

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include jobs that allowed for a great deal of variety, autonomy and creativity. In terms of Openness and overall performance the findings of this study are in line with previous research, indicating a small positive relationship (.16).

In terms of the relationship between academic performance and Openness previous research has indicated positive relationships between these factors, however the current study yielded a small negative relationship (-.06). This discrepancy could possibly be attributed to the nature of academic achievement in South Africa. Persons with high levels of Openness will likely flourish in academic settings where they can use creative problem solving and imaginative original thinking (De Fruyt & Mervielde, 1996). However, the academic environment requires students to understand, memorise and recall information. These requirements do not reflect the natural strengths associated with Openness. Previous research on the relationship between Openness and OCB produced diverse results, with some studies finding no relationship and other studies reporting a small positive relationship. The current study found a moderately strong positive relationship between these factors. However, this correlation may be exaggerated since only two studies were included in the analysis. In relation to counter productive work behaviours, research suggests that Openness has small positive correlations with avoiding CWB. This is in line with the results of the current study which indicated a small positive relationship (.07) between Openness and avoiding CWB.

Conclusion

Openness to Experience refers to a person's intellectual curiosity and preference for variety and new things. People high on this factor tend to be creative, imaginative, and curious to experience new things (McCrae & Costa, 1997).

Individuals high on this factor may enjoy exploring new things and may not be resistant to change. They are likely to excel in occupations that require creativity and innovation (e.g., King et al., 1996; McCrae, 1987; Raja & Johns, 2010). Open individuals will perform well in occupations requiring independence, as well as in occupations with strong demands for innovation (Barrick et al., 2002). Individuals who display the qualities associated with Openness may enjoy learning and this may

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positively impact their academic achievement. However, their creative and imaginative nature may sometimes be a disadvantage in academic settings. This may be the case when individuals are required to recall and replicate curricular content rather than produce original and innovative responses or engage in creative problem solving (De Fruyt & Mervielde, 1996).

The imaginative, creative, and curious nature of individuals possessing high levels of Openness to Experience leads to better working relationships, which supports OCB. It is plausible that these individuals are more willing to work together with others to achieve something new (Phipps et al., 2015).

5.2.3 Research objective three: To determine which of the Big Five personality constructs predict job performance most optimally

In attempting to determine which of the Big Five personality factors determines job performance most optimally it should be noted that performance is a multi-dimensional concept and therefore each domain needs to be considered separately. Although the correlations reported in this study are not significant they are mostly comparable with other research findings. The correlations, which are summarised in Table 32, should be viewed in conjunction with the credibility and confidence intervals (presented in Chapter 4) in order to understand the validity and generalisability of the results.

Based on the results presented in Table 32, it is clear that the best predictors of technical performance are Conscientiousness (.20) and Emotional Stability (.13). Conscientiousness (.25) and Extraversion (-.19) have the greatest influence on academic performance. Although OCB yielded positive relationships with all five factors, Openness to Experience (.36), Emotional Stability (.30), Agreeableness (.25) and Extraversion (.24) best predict OCB. When predicting avoiding CWB, Conscientiousness (.32) and Emotional Stability (.30) have been proven to be valuable. Overall performance is influenced most by Emotional Stability (.21), Extraversion (.16) and Openness (.16).

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Contrary to previous research findings Conscientiousness was not a strong predictor of overall performance. This is possibly because performance is not unidimensional and should not be used in the singular (Campbell & Wiernik, 2015). Instead, performance consists of all the individual actions that support or undermine the organisational goals to varying degrees (Campbell & Wiernik, 2015). Early research may have included various dimensions of task related performance in overall performance and might have been predicting technical performance rather than overall performance. This study investigated various dimensions of job performance and viewed overall performance as being the summative ratings of undifferentiated performance that encompasses composites of multiple components of performance.

From this summary it is clear that Conscientiousness and Emotional Stability have predictive power over several performance dimensions. These two factors can therefore be considered to be the Big Five personality dimensions that best predict job performance in the South African context.

Table 32: Summary of correlations between Big Five and peformance dimensions

	Agreeableness		Conscientiousness		Emotional Stability		Extraversion		Openness to Experience	
	Mρ	SDρ	Mρ	SDρ	Mρ	SDρ	Mρ	SDρ	Mρ	SDρ
Technical Performance	-,01	,15	,20	,00	,13	,00	.09	,15	,00	,09
Academic Performance	-,07	,00	,25	,00	,07	,08	-,19	,10	-,06	,00
OCB	,25	,00	,11	,00	,30	,00	,24	,00	,36	,00
CWB	,00	,12	,32	,00	,30	,00	-,11	,00	,07	,22
Overall Performance	,00	,11	,07	,00	,21	,00	,16	,00	,16	,10

Note. Mρ = mean corrected correlation (corrected for unreliability in the predictor and criterion); SDρ = standard deviation of ρ;

5.3 IMPLICATIONS FOR PRACTICE

This study has several implications for researchers and practitioners. The meta-analytic evidence confirms that the Big Five has a place in predicting job performance in South Africa as all factors contributed to various performance dimensions. The Big Five therefore contributes to the incremental validity of other selection measures such as cognitive ability and integrity.

Human resource practitioners, industrial psychologists and managers should consider using personality as a predictor when making decisions regarding selection, career development, coaching, succession planning and development interventions. This suggests that they should consider using personality measures and the results of these measures when making decisions.

The meta-analytic evidence presented in this study shows that Conscientiousness and Emotional Stability are predictors of job performance generalised across criteria, samples and occupations. The other three personality dimensions were predictors for certain criteria. These results are comparable with international findings and indicate that Conscientiousness and Emotional Stability have significant predictive power and should be considered in decision-making related to performance.

Furthermore, given that the findings of this research are comparable with the findings of international research this suggests that the conclusion and assumptions drawn from international research can be applied in the South African setting.

The Big Five has proven to be a valuable framework for predicting performance in various settings and across criteria, as all the factors were correlated with some or all of the criteria.

5.4   LIMITATIONS

This study is not without limitations and it is important to note the following limitations of the study. These limitations influence the results of the study and the application of these results.

The first limitation relates to the fact that the sample was reliant on research conducted in South Africa. Some of the studies identified could not be used as statistics were not adequately reported. Attempts to source the results were unsuccessful and, as such, not all the studies on the research topic could be utilised.

A further limitation is that some studies in the sample did not adequately report statistical artifacts, as such corrections for range restrictions could not be made on the data from the sample. Further to this, most studies did not adequately describe their samples and therefore no inferences could be made in terms of racial, age, language or gender differences.

Although international and South African guidelines concerning the reporting of validation studies are available many researchers do not use these guidelines when reporting their statistical findings. This is evident from the lack of statistical reporting in the sample used in this study. It can be argued that researchers are not adequately trained to report on the minimum requirements of validation research and therefore fail to report adequately.

Most of the performance ratings included in the study were supervisor ratings. There are several concerns regarding the objectivity and accuracy of such ratings as a performance measure. The reliability of supervisor ratings has been questioned and researchers have found that production ratings are a much more reliable measure of job performance (Ones et al., 1993). In comparison to other measures, supervisor ratings are less reliable largely due to subjectivity (Salgado et al., 2003).

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There was very little research available that focused on organisational citizenship behaviours and counterproductive work behaviours. Only two studies were included in the analysis and therefore the results are not generalisable and have a high degree of variance.

A criticism of meta-analyses is that they tend to overestimate validity relationships because they are derived from published sources with significant effects. In many cases studies that failed to find significant or positive effects remain unpublished and are therefore not included in meta-analyses. As such meta-analyses 'oversample' larger effects when including mostly published studies, this is known as the 'file drawer' problem (Harms & Crede, 2010). Although this study included many published studies in an attempt to avoid this problem, it could be argued that published studies may be significant or in support of findings.

Finally, most performance measures included in the analysis were normative measures (single stimuli). A recent meta-analytic study showed that

> "the results of the reliability estimates indicated that FC measures do not inflate or deflate reliability coefficients. Therefore, as a whole, quasi-ipsative Forced Choice measures can be seen as useful tools for making academic and personnel decisions, and they can be seen as a robust alternative to Single Stimuli (e.g., Likert, yes/no, true/false) inventories because they are more resistant to faking" (Salgado & Táuriz, pg. 14, 2014).

Therefore, results using quasi-ipsative measures would be likely to produce more reliable results.

5.5   RECOMMENDATIONS AND CONCLUSIONS

5.5.1 Recommendations

Based on the findings and limitations of this study the following recommendations for future research as well as business practices are made.

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Researchers need to responsibly report results and ensure that statistical procedures and results are reported comprehensively. This includes reporting all results, not only significant findings and providing details concerning the sample of the study. In cases where space to report these statistical results is a concern alternatives, such as including an addendum or making information available electronically, should be considered.

Researcher, practitioners and test publishers need to be educated about the requirements and use of validity research and need to adhere to the requirements and use of validity research. The concern of responsible statistical reporting is not only in term of meta-analytic research, but also in terms of the Employment Equity Act (no. 55 of 1998), which requires that psychological assessments should be fair, valid and reliable. This requirement does not only refer to internal validity, but also predictive validity.

Performance in a work role is a complex phenomenon and this makes assessment difficult (Campbell & Wiernik, 2015). Research should focus its efforts on finding workable performance models, which can be applied across settings and occupations, to measure performance in an objective manner.

Organisations should consider using various sources of information to rate an employee. These sources of information may include sourcing ratings from different people or having two people rate an employee.

More research in needed in South African on the relationship between personality and organisational citizenship behaviour and counterproductive work behaviour. International research suggests that the Big Five is a valid predictor of these performance dimensions (Organ et al., 2006) and therefore there is a need to explore the predictive validity of personality in relation to OCB and CWB.

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A second-order meta-analysis of international research should be conducted to validate and expand on the findings of this study.

More meta-analytic studies in the field of Industrial Psychology are required in South Africa to accumulate results and create better reliability and generalisability in findings.

5.5.2 Conclusions

This meta-analysis showed that the Big Five is a valid predictor of several performance domains in the South African context. The results of this study echo international findings which indicate that Conscientiousness and Emotional Stability have predictive power over several performance domains and across various settings and occupations. The other three personality factors show predictive validity for some of the performance domains investigated in this study. The Big Five contributes to the incremental validity of other measures used for selection such as cognitive ability and integrity. The Big Five should be considered by practitioners when making decision relating to performance, as it has been proven to be a valid predictor of performance.

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