Validation of the Prospect Screener for the selection of entry-level service industry employees in the South African context

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PREFACE

This study, undertaken in partial fulfilment of the degree Master of Arts in Research Psychology, will be presented in three chapters. Chapter 1 consists of a comprehensive literature overview of relevant international and national research illustrating an existing gap in the literature which indicates the need for a study such as the one presented here. Chapter 2 consists of an article which will be submitted for publication, and Chapter 3 concludes this study with a critical reflection.

This dissertation will be submitted to the South African Journal of Psychology (SAJP) to be considered for publication. The journal acts as a forum for scholars, practitioners, policy makers, educators, and advocates who wish to stay up-to-date with the latest research in psychology. The SAJP typically publishes contributions from all fields of psychology. It emphasises empirical research, but also accepts theoretical and methodological papers, review articles, etc. Priority is given to articles relevant to Africa. The journal was selected for publication because this study focuses on the psychometric properties (reliability and validity) and effectiveness of an assessment that is to be used in the South African job selection context. The results of this research may be used to inform the fields of personnel psychology and psychometrics on the appropriateness of the use of this test for job selection.

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ABSTRACT

Organisations can save money and make better hiring decisions by using short psychometric tests as the first screening step, since such tests effectively screen out the least suitable candidates, leaving a smaller pool to partake in the costlier aspects of the process. The Prospect Screener is a South African screening tool that addresses this need by providing a preliminary screening of basic verbal ability, numerical ability, detail-orientation, and some aspects of personality. The aim of this study was to evaluate the effectiveness of the Prospect Screener in selecting entry-level service industry employees in South Africa by investigating its psychometric properties. A sample of 371 South African entry-level employees working in the service industry was assessed using the Prospect Screener, the Basic Traits Inventory, the Verbatim, and the Numeratum. In the reliability analysis, all of these assessments demonstrated satisfactory to good internal consistency, with the exception of two scales on the Prospect Screener. With regard to the Prospect Screener, in the convergent validity analysis, construct validity was demonstrated in that its scales correlated statistically significantly with other scales that measure the same construct. In the differential validity analysis, it was found that the Prospect Screener overall score effectively distinguishes between high and low performance on the other four tests on a statistical level. Post-hoc analyses revealed that the greatest differences were between the Good Prospect group and the other two groups. There was no statistically significant difference between the scores of the Screened Out group and the Prospect group, which poses a potential area of improvement for the Prospect Screener. Confirmatory factor analysis confirmed the current theoretical model that is used in the Prospect Screener and showed that the model presented satisfactory fit, offering evidence for its structural validity. The regression analysis delivered results that were in line with the research hypotheses, with the Words scale predicting scores on the Verbatim, the Numbers scale predicting scores on the Numeratum, and the Emotional Stability and Dependability scales predicting scores on the Neuroticism and Conscientiousness scales, respectively. Overall, the present study supports

the validity and reliability of the Prospect Screener and, therefore, confirms its effectiveness for use in job selection in the South African service industry.

Keywords: *job selection; numerical ability; personality; psychometry; screening; verbal ability*

OPSOMMING

Organisasies kan geld spaar en beter aanstellingsbesluite neem deur kort psigometriese toetse as die eerste siftingstap te gebruik, aangesien sulke toetse die mins geskikte kandidate effektief uitsif en ‘n kleiner poel oorlaat om aan die duurder aspekte van die proses deel te neem. Die Prospect Screener is ‘n Suid-Afrikaanse siftingsinstrument wat hierdie behoefte aanspreek deur ‘n preliminêre sifting van basiese verbale vermoë, numeriese vermoë, detail-oriëntering en sekere aspekte van persoonlikheid te verskaf. Die doel van hierdie studie was om te evalueer hoe effektief die Prospect Screener intreevlak-werknemers in die diensbedryf in Suid Afrika keur deur ondersoek in te stel na die psigometriese eienskappe van die Prospect Screener. ‘n Steekproef van 371 Suid-Afrikaanse intreevlak-werknemers in die diensbedryf is getoets deur die Prospect Screener, die Basic Traits Inventory, die Verbatim en die Numeratum te gebruik. In die betroubaarheidsanalise het al die toetse bevredigende tot goeie interne konsekwentheid getoon, behalwe vir twee van die Prospect Screener se skale. Met betrekking tot die Prospect Screener is konstrukgeldigheid in die geldigheidsanalise getoon deurdat die skale van die toets statisties betekenisvol gekorreleer het met ander skale wat dieselfde konstruk meet. In die differensiële geldigheidsanalise is daar gevind dat die Prospect Screener se algehele telling op ‘n statistiese vlak effektief tussen hoë en lae prestasie op die ander toetse onderskei. Post hoc analise het onthul dat die grootste verskille tussen die Good Prospect groep en die ander twee groepe was. Daar was geen statisties betekenisvolle verskille tussen die tellings van die Screened Out groep en die Prospect groep nie, wat moontlik ‘n ontwikkelingsarea vir die Prospect Screener inhou. Bevestigende faktorontleding het die huidige teoretiese model bevestig wat in die Prospect Screener gebruik word, wat bewyse bied vir die strukturele geldigheid van die toets. Die regressie-analise het resultate gelewer wat in lyn is met die navorsingshipoteses, met die Words skaal wat tellings op die Verbatim voorspel, die Numbers skaal wat tellings op die Numeratum voorspel, en die Emotional Stability en Dependability skale wat tellings op die Neuroticism en

Conscientiousness skale, onderskeidelik, voorspel. In die geheel ondersteun die huidige studie die geldigheid en betroubaarheid van die Prospect Screener en bevestig dit daarom die effektiwiteit van die Prospect Screener vir gebruik in werkskeuring in die Suid-Afrikaanse diensbedryf.
Sleutelterme: *werkskeuring; numeriese vermoë; persoonlikheid; psigometrie; sifting; verbale vermoë*

PERMISSION TO SUBMIT ARTICLE FOR EXAMINATION

The student, Elcke du Plessis, opted to write an article with the support of her study leader. I hereby grant permission that she may submit this article for examination purposes in partial fulfilment of the requirements for the degree Master of Arts in Research Psychology.

Dr. Nicola Taylor

DECLARATION OF RESEARCHER

I, Elcke du Plessis, hereby declare that this dissertation titled **Validation of the Prospect Screener for the selection of entry-level service industry employees in the South African context** is my own effort in cooperation with my study leader Dr Nicola Taylor and my assistant study leader Mrs. Cheryl Petersen. I also declare that this study has been informed by existing literature and that all sources used have been referenced and acknowledged.

As the primary researcher of this study, I was responsible for the project management and dissemination of this dissertation. I analysed the data myself under the supervision of Dr Taylor.

Furthermore, I declare that this dissertation was edited and proofread by a registered language editor as prescribed and submitted to Turnitin. A satisfactory report was received to confirm that no plagiarism had been committed.

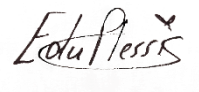
_____

Elcke du Plessis

DECLARATION BY LANGUAGE EDITOR

This is to testify that the Master's dissertation titled **Validation of the Prospect Screener for the selection of entry-level service industry employees in the South African context** has been language edited to the best of the language practitioner's knowledge and ability.

The language practitioner, Elcke du Plessis, is registered at the South African Translators' Institute (SATI) with membership number 1003382, and thereby fully qualified and authorised to provide said services.



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Elcke du Plessis

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CHAPTER 1
LITERATURE REVIEW

Chapter Overview

In this section, a literature overview will be given of the concepts and processes that are relevant to the topic of the present study. This overview serves as a preface and orientation to Section 2, which is an article containing the method and results of the present study. The literature overview will introduce the reader to the broader context of job selection and then move on to discuss the job selection process. After the reader has been familiarised with the topic, the validity of selection methods will be discussed. The challenges of psychological assessment in South Africa will then be discussed. Thereafter, two variables that are important to consider in selection, namely cognitive ability and personality, will be introduced. This will be followed by a detailed description of the specific cognitive and personality assessments that are relevant to this topic, including a short summary of previous research conducted on these assessments. Finally, screening in job selection will briefly be discussed, as well as the screening tool that is being used in this study, namely the Prospect Screener.

The researchers will then state the anticipated contribution of the study as well as their hypotheses with regard to the results. The aims and objectives of the study will be listed and, lastly, the literature overview will be concluded with a final argument that integrates the most important concepts covered and bridges the overview section to Section 2, the article.

Introduction

For organisations to perform at globally competitive levels, they need to select and retain the best employees (Marimuthu, 2017). The objective of the selection process is to identify and hire the right people by matching their individual characteristics (e.g., ability and experience) with the requirements of the job (DeRue & Morgeson, 2007; Kristof-Brown, Zimmerman, & Johnson, 2005). Not having the right people for the job can incur great costs in terms of time and money and could lead to poor service and unfair distribution of workload in companies (Joubert, 2003).

It could also cost organisations effort and resources to reinvest in selection and employee training (Okusolubo, Grobler, & Joubert, 2016). Moreover, failing to get a proper match between the individual and the job causes both employee performance and satisfaction to suffer (Schenk, 2013). As Grobler, Warnich, Carrell, Elbert, and Hatfield (2010, p. 178) stated: "without a high-quality labour force, an organisation is destined to have mediocre performance." Organisations are therefore obligated to ensure that their selection practices allow for the selection of people who will be able to perform the required tasks and contribute effectively to the organisation (Nzama, de Beer, & Visser, 2008).

Most organisations have certain recruitment and selection processes in place that assist them in filling positions, and selection is the process of choosing from a pool of applicants those individuals that are best suited for the available positions (Grobler et al., 2010). When selecting individuals for positions, Swanepoel, Erasmus, van Wyk, and Schenk (2014) indicate that individual differences between applicants, the requirements of the job, and the organisation's internal and external environments are taken into account. Opoku et al. (2013) further expand on this definition by adding that organisations use specific instruments to choose these individuals in terms of management goals as well as legal requirements. Such instruments may include job applications (created by the company itself, gathering whatever information they deem necessary for the position), interviews (i.e., meeting with applicants and asking them questions relevant to the job role), assessment centres (which could include interviews, tasks, and psychometric assessment), and reference checks (i.e., communicating with previous employers whom applicants have chosen as their referees; Hellriegel et al., 2012). Other techniques used during this preliminary screening phase of selection include checking résumés to determine a candidate's suitability for a position as well as checking for prior training, job experience, and biographical blanks (Gatewood, Feild, & Barrick, 2015).

The Job Selection Process

The specific job selection techniques and strategies employed may be unique for each organisation, but most organisations follow a similar overarching process. Job applicants will go through several stages during which they can be rejected at any time. Schenk (2013) described the typical process that organisations usually follow and three stages of this process are shown in Figure 1 below.

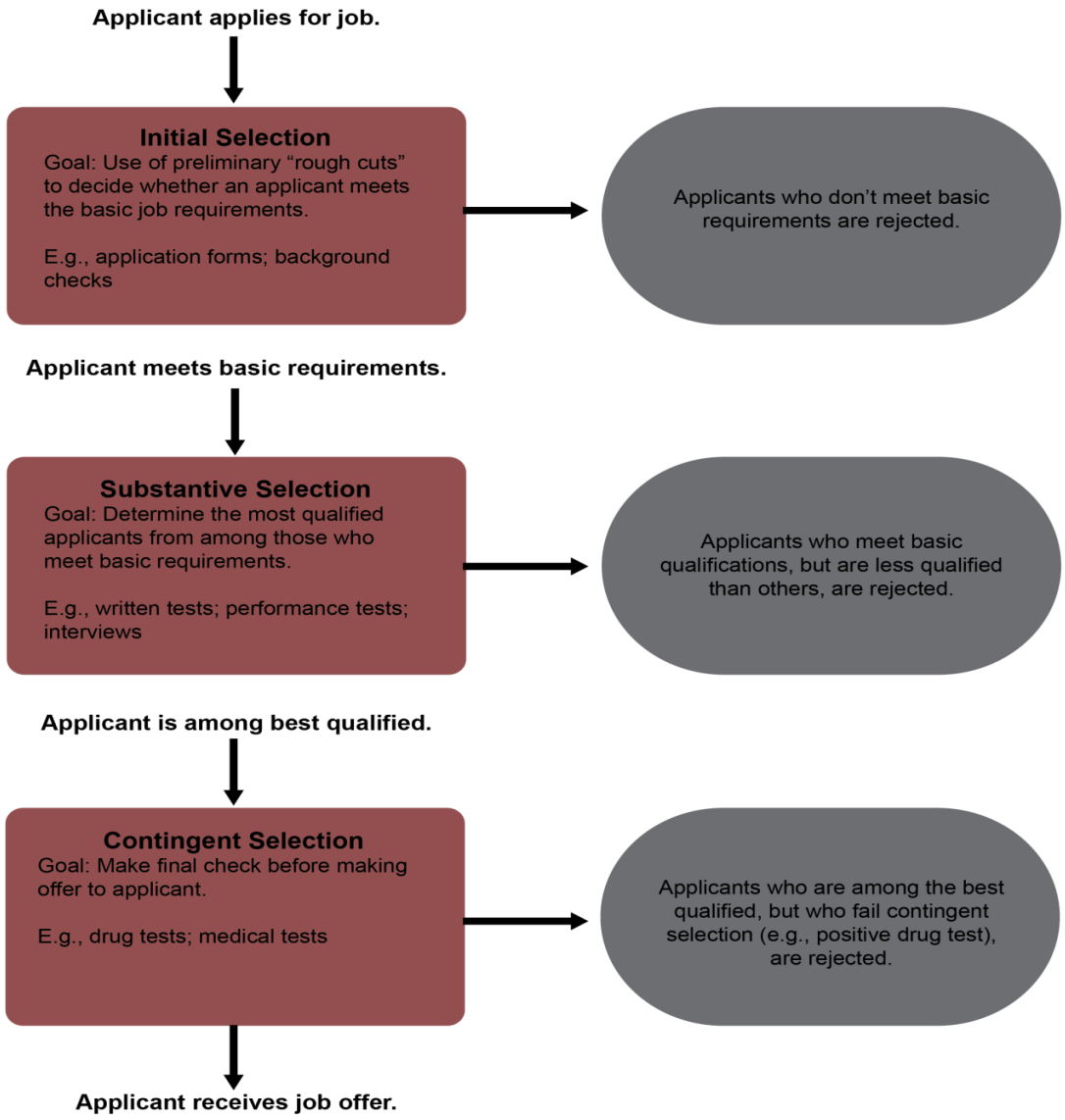

Figure 1.1. Model of selection process in organisations (adapted from Schenk, 2013).

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Stage 1: Initial Selection

During this stage, the initial selection devices such as application forms and background checks are submitted to decide whether applicants meet the basic requirements of a job. Applicants who do not meet these requirements are rejected. This stage can also be referred to as "rough cuts" (Schenk, 2013, p. 647) or screening.

Application forms. Looking at the information provided on an application form can be a good initial screen. The person responsible for making the hiring decision can easily see whether the applicant has the appropriate education, qualifications, and experience. However, this information will not be a useful predictor of job performance (Schenk, 2013), as it does not provide a comprehensive picture of the applicant's skills, abilities, and personality.

Background checks. For employers to know how an applicant fared in past jobs, background checks are conducted (Schenk, 2013). One form of background check is speaking to former employers of the applicant; another is obtaining letters of recommendation. Unfortunately, both of these methods are not as useful as they could be, because in the first instance, former employers are sometimes reluctant to provide detailed references and in the second instance, applicants select referees who will write positive things about them, resulting in almost all letters of recommendation being positive. Another check that is also conducted is credit histories and criminal record, to rule out any potentially criminal or fraudulent behaviour.

Stage 2: Substantive Selection

Once applicants have passed the first stage, substantive selection methods are applied to determine the most qualified applicants amongst those who have met the basic requirements. These may include employment tests, performance-simulation tests, and interviews (Schenk, 2013).

Employment tests. Employment tests or psychometric tests can provide employers with a wide range of information about who they are and what their abilities, strengths, and weaknesses are. Typically used tests include cognitive ability tests, personality tests, interest inventories, and integrity tests. Managers have recognised that valid tests are helpful in predicting successful job

performance (Maltby, 2009). Intelligence tests are especially good at predicting performance in tasks that require use of complex cognition (Schmidt, Shaffer, & Oh, 2008). In terms of personality, the traits that have been found to best predict job performance are positive self-concept and conscientiousness (Salgado et al., 2003) seeing that positive people are persistent and have a 'can-do' attitude and conscientious people can usually be depended upon and are motivated.

Performance-simulation tests. This type of test is used to determine whether an applicant will be able to do specific job tasks successfully by having them perform similar tasks to those they would be required to do in the job. Three popular performance-simulation tests are work sample tests, assessment centres, and situational judgment tests. *Work sample tests* include simulations of some of the work that applicants would have to perform if they got appointed. Each sample of work is matched with a specific element of job performance which allows employers to measure applicants' abilities, knowledge, and skills in a more valid way than aptitude or personality tests alone (Roth, Bobko, & McFarland, 2005). *Assessment centres* use a more comprehensive set of performance-simulation tests and are usually designed to assess an applicant's managerial potential. Current employees in such managerial positions evaluate the applicants while they navigate through several exercises that simulate problematic situations that could occur in the job (Schettler, 2002; Woodruffe, 2000). This approach could, however, become very costly. To avoid spending a lot of money on job simulations, some organisations are starting to use *situational judgment tests* which entail asking applicants what they would do in a variety of hypothetical job situations, and then comparing their answers to the answers of well-performing employees (Lievens, Peeters, & Schollaert, 2008).

Interviews. The interview remains one of the most common selection devices around the globe (Posthuma, Moregeson, & Campion, 2002; Schmidt, Oh, & Shaffer, 2016; Wilk & Capelli, 2003). South African research has shown that interviews and application forms are the selection methods that are most often used, while psychological assessments and assessment centres also emerged as popular methods (Louw, 2013). However, employers and selection personnel are

advised to refrain from relying solely on interviews for selection, because there is evidence that impression management (e.g., self-promotion) has a significant impact on the preferences of interviewers (Swider, Barrick, Harris, & Stoverink, 2011). Concomitantly, poor interview performance also renders a candidate likely to be rejected regardless of test scores, experience, or letters of recommendation. Unstructured interviews, which are commonly used in organisations, have thus been found to be ineffective selection devices when used on their own (Ziegler, Dietl, Danay, Vogel, & Bühner, 2011), although they do tend to add incremental validity over general mental ability in the selection process (Schmidt et al., 2016). The unstructured nature of the interview allows interviewers to favour candidates who share the same attitudes, focus on negative information, and even become influenced by the order in which candidates are interviewed (Barrick, Swider, & Stewart, 2010). The data gathered through interviews are, therefore, typically biased and it has been found that these data are only modestly associated with job performance (Ziegler et al., 2011).

Stage 3: Contingent Selection

Once applicants have passed the substantive selection stage, the employer is ready to hire them, but hiring is contingent on one final check. This check may comprise drug testing as it is known that alcohol and drug abuse are major contributory factors to accidents in the workplace as well as absenteeism globally (Schenk, 2013) and in South Africa (Ponge, 2013). Another final check could be medical testing, which is typically enforced if the job includes certain minimum medical requirements.

Validity of Selection Methods

It is important to note that the most important factors underlying the impact of selection techniques on employee turnover are procedural fairness in selection processes, consistency, objectivity, and confidentiality. In terms of the practical value of job selection methods to an organisation, its most essential property is predictive validity; that is, how well it predicts job performance (Schmidt et al., 2016). Although some of the abovementioned selection instruments

and techniques (such as interviews, résumés, and reference-checking) have been found useful in selection, they are not characterised as being objective, reliable, valid, and standardised for all selection contexts (Muchinsky, Kriek, & Schreuder, 2005). Using selection practices that have not been validated is not deemed beneficial to organisations, since the value derived from these processes cannot be known, and both the monetary and non-monetary costs of unsuccessful selection are high (Nzama et al., 2008). Another study has found that the cost-benefit of a selection process is determined by the validity of the process, the value of good performance, the costs of the selection procedures, and the tenure of employment (Cooper et al., as cited in Okusoluba et al., 2016). In addition, using biased selection process could lead organisations to hire unsuitable people for the job, also called 'false positives', or may result in a failure to hire applicants who would have succeeded in the job, also called 'false negatives' (Warnich et al., 2011).

However, one selection method known as psychometric or employment testing can serve as a solution to this problem. An employment test is "an objective and standardised measure of a sample of behaviour that is used to gauge a person's knowledge, skills, abilities and other characteristics" (Sherman, Bohlander, & Snell, 1998, p. 202). Similarly, a psychometric test is a "sample of behaviour gathered under standardised conditions with clearly defined rules for scoring the sample, with a view to describing current behaviour or to predicting future behaviour" (Moerdyk, 2009, p. 270). Using selection methods with increased predictive validity such as valid psychometric assessments leads directly to significant increases in employee job performance (Schmidt et al., 2016). Due to extensive research conducted in the area of test development since the origin of psychological assessment in the late 1800s, both the use and value of psychometric testing have grown globally (Whiston, 2000).

Psychological Assessment in the South African Context

In South Africa, there have historically been advocates for and against the use of psychological assessment to assist in job selection (Nzama et al., 2008). However, despite continuous debates in the academic literature (Foxcroft, 2011), psychological assessments are still

widely used in South African organisations (Donald, Thatcher, & Milner, 2014). In addition, the promulgation of the Labour Relations Act (LRA; 1995) and the Employment Equity Act (EEA; 1998) contributed to a major growth spurt in the use of psychological assessment, as these new regulations forced organisations to ensure and prove that their employment practices are fair, i.e., that they must have specific, objective criteria against which job applicants are measured and that any tests used must be valid, reliable, and fair.

These regulations impact directly on recruitment practices, selection criteria, employment testing, diversity management, and affirmative action measures (Schenk, 2013). It obligates employers to become aware of and eradicate unfair discrimination in the workplace, and to refine their policies and practices accordingly. The EEA, therefore, protects candidates against unfair discrimination as well as unfair psychometric testing (Schenk, 2013).

Personnel selection in South Africa, particularly, with its strict non-discriminatory standards and regulations can be difficult and complex, and the standards of regulatory compliance and objectivity can be difficult to meet by the people who make hiring decisions. Schenk (2013) recommends using a combination of selection methods as it may assist the employer in selecting the most appropriate applicant for a position.

In a comparison of global and South African trends (Schenk, 2013), it was shown that South Africa continues to rank comparatively low in annual global competitiveness surveys, especially with regard to human resource management. South Africa was ranked 52nd out of 60 countries in the IMD Global Business School's world competitiveness rankings and 53rd out of 148 countries in the World Economic Forum's (WEF) global competitiveness report (Maswanganyi, 2014). A particularly important finding was that one of the highest contributory factors to these low rankings is South Africa's hiring and firing practices. This implies that there is a great need for improvement in this regard, and research exploring potential solutions to the problem is indispensable. The WEF report reaffirmed this by stating that South Africa will have

to make the labour market more efficient if it wants to address its high unemployment rate of 27.7 % (Statistics South Africa, 2017).

With regard to the organisational transformation mandate of current-day South Africa, psychological assessment instruments can play an essential role (Donald et al., 2014). Transformation here refers specifically to organisational redress for previously disadvantaged groups and not to organisational transformation in general. Psychometric tests serve as a gate-keeper when used in an organisational context and can be a vital factor in determining access to employment opportunities. Several studies have noted the importance of appropriate assessment for social redress (Rothmann & Cilliers, 2007; Snelgar & Potgieter, 2003; Stead, 2002; Taylor, 2013; Theron, 2007). Sehlapelo and Terre Blanche (1996) stated the following:

> Given South African psychology's intimate relationship with psychometrics and the continued prevalence of psychometric testing in modern day South Africa, it should obviously be an important site of transformation. The fact is that if psychological tests are used on a large scale to determine who gains access to economic and educational opportunities, and if psychology as a profession is truly interested in empowerment, the reform of testing practices should be one of its priorities. (p. 49)

However, Okusolobu et al. (2016) hold a different view and maintain that selection procedures should not be associated with political mandates such as the EEA of 1998, because this Act has made selection procedures more subjective in nature, negating the very characteristic of psychometric testing that rendered it effective and fair, namely objectivity. Their suggestion is that more attention should be given to the provisions of the inherent requirements of a job, as stated in Section 9 of the EEA. Regardless of whether selection procedures should be used to achieve political mandates or not, it remains clear that psychological assessments have a vital role to play in the movement towards fair and scientific job selection in South Africa.

Variables Important in Selection

Knowledge, skills, and ability (KSA) form the main characteristics to be evaluated in applicants (Okusolubo et al., 2016). Since psychology entered the workplace, human factors such as intelligence and personality have been emphasised by psychologists as determinants of work behaviour (Viteles, 1932). Integrity has also been found to be an effective predictor of job performance (Schmidt et al., 2016), but does not fall within the scope of this research and will not be discussed in further detail.

Cognitive Ability

Cognitive ability tests have been well researched and established as useful and effective in their ability to predict job skill acquisition as well as certain types of performance (Cortina, Goldstein, Payne, Davison, & Gilliland, 2000; Nzama et al., 2008; Schmidt et al., 2016; Scroggins, Thomas, & Morris, 2008a). In an extensive overview investigating the validity of selection methods, it was found that, although many procedures are valid predictors of performance on the job, most have little to no incremental validity over general mental ability (GMA), also known as cognitive ability or intelligence (Schmidt et al., 2016). The economic value of cognitive testing has also been recognised, and some research indicates that valid selection tools with high selection cut-off scores are able to identify superior workers that produce almost 50 % higher outcomes than the average categorical worker in managerial positions (Schmidt & Hunter, 1998).

Research supports the validity of cognitive tests for predicting work performance and trainability (Cortina et al., 2000; Nzama et al., 2008; Schmidt et al., 2016). Cognitive abilities are used in work tasks that involve information processing and learning, which are required in most jobs (Davis, 2013). The types of cognitive ability tests that are typically used in selection include numerical ability tests, verbal ability tests, deductive reasoning tests, mental ability tests, clerical ability tests, and physical ability tests (Bartram, 2005). Verbal and numerical ability tests are particularly common in companies' selection batteries because they measure skills which may predict a candidate's ability to cope in the specific role or training (Davis, 2013).

Nzama et al. (2008) found in their study that Verbal Abstraction, a scale on the Cognitive Process Profile (CPP; Prinsloo, 2000) correlated statistically significantly with work performance ratings. None of the cognitive variables correlated with interview ratings, however, which suggests that these cognitive variables are separate variables that cannot be measured or picked up through interviews, providing further evidence for the usefulness of cognitive tests to predict work performance. Davis (2013) also found that the use of verbal, numerical, and checking ability tests as part of a selection battery for entry-level employees at a large South African commercial airline company showed statistically significant relationships with job competencies, person job match, and job performance.

South African Cognitive Assessments

Two South African cognitive assessments that are of importance to this study are the Verbatim and the Numeratum (JvR Psychometrics, 2015), which measure basic verbal and numerical ability.

The Verbatim. The Verbatim is an assessment of verbal ability (JvR Psychometrics, 2015). It contains 42 multiple-choice questions that determine how a candidate understands words and sentences written in English. The Verbatim consists of five scales. Interpretation is done for each of the five scales as well as the overall score, where percentages of correct responses are provided, as well as a stanine norm score for the overall verbal performance and an indication of whether the individual found each scale easy, moderately hard, or difficult compared to others, based on their performance. Candidates are given 70 minutes to complete the questions. Candidates with high scores can be considered at least minimally proficient in understanding and reading English, and those with low scores are likely to find it difficult to understand and define basic English words. In the initial validation study, the Cronbach's alpha coefficient for the total Verbatim score was 0.75, and reliability is therefore satisfactory. Rasch analysis determined that the items mostly covered the underlying ability trait level of the respondents, and confirmatory

factor analysis (CFA) revealed that one underlying factor of verbal ability is indeed measured, indicating construct validity (JvR Psychometrics, 2015).

The Verbatim scales. The Verbatim is made up of five scales, namely Synonyms, Opposites, Analogies, Reasoning, and Interpretation. The scale definitions are provided in Table 1 below.

Table 1.1. The Verbatim scale definitions (JvR Psychometrics, 2015).

Verbatim scales	Definition
Synonyms	The Synonyms scale indicates a candidate's performance in correctly identifying an alternative word to the provided anchor word.
Opposites	The Opposites scale indicates a candidate's performance in correctly identifying an opposite word to the provided anchor word.
Analogies	The Analogies scale indicates a candidate's performance in correctly identifying one relationship among combinations of words that have a similar relationship to the pair of words presented.
Reasoning	The Reasoning scale indicates a candidate's overall performance in correctly deducing the next letter or word that forms a series.
Interpretation	The Interpretation scale indicates a candidate's overall performance in correctly answering questions based on information contained in a paragraph.

The Numeratum. The Numeratum is an assessment of numerical reasoning (JvR Psychometrics, 2015). It contains 28 multiple-choice questions that determine how candidates work with numbers and solve problems that involve numbers. Candidates are not allowed to use electronic calculators when completing the Numeratum, but may use paper and a pen. The Numeratum consists of three scales. Candidates are given 60 minutes to complete the questions. Interpretation is done for each of the three scales as well as the overall score, where percentages of correct responses are provided, as well as a stanine norm score for the overall numerical performance and an indication of whether the individual found each scale easy, moderately hard, or difficult compared to others, based on their performance. Candidates with high scores are

regarded as having the ability to do simple mathematical calculations and have basic number skills, while those with low scores are likely to be unable to do simple mathematical calculations and are unlikely to be sufficiently numerate. In the initial validation study, the Cronbach's alpha coefficient for the total Numeratum score was 0.80, and reliability is therefore satisfactory. Rasch analysis determined that the items mostly covered the underlying ability trait level of the respondents, and CFA revealed that one underlying factor of numerical ability is indeed measured, indicating construct validity (JvR Psychometrics, 2015).

The Numeratum scales. The Numeratum consists of three scales, namely Number Problems, Patterns, and Interpretation. The scales are defined in Table 2 below.

Table 1.1. The Numeratum scale definitions (JvR Psychometrics, 2015).

Numeratum scales	Definition
Number Problems	The Number Problems scale indicates a candidate's overall performance in accurately performing arithmetic calculations such as addition, subtraction, multiplication, and division.
Patterns	The Patterns scale indicates a candidate's overall performance in accurately deducing the correct number in a series of numbers or in matching a particular numerical relationship.
Interpretation	The Interpretation scale indicates a candidate's overall performance in accurately answering questions based on the information contained in a bar chart.

Research on the Verbatim and Numeratum. Since these are relatively new assessments, there is scant research available on the Verbatim and Numeratum. However, one study was conducted by Olivier and Hayes (2016) exploring the African trends of the Verbatim and Numeratum on samples of 602 South Africans and 118 other African country residents. It was found that reliability estimates were acceptable for both the Verbatim ($\alpha = 0.75$ for South African participants and $\alpha = 0.70$ for participants from the rest of Africa) and Numeratum ($\alpha = 0.79$ for South African participants and $\alpha = 0.82$ for participants from the rest of Africa) across the various

samples, and that there is a significant positive correlation between the Verbatim and Numeratum (probably because they are both measures of mental ability).

Furthermore, a small but significant positive correlation exists between Verbatim scores and age, indicating that the older one gets, the more one's vocabulary expands and the higher one's score is on the Verbatim. However, this correlation was not found between age and Numeratum scores. A small but statistically significant difference was also found between men and women's scores on the Numeratum, with men scoring higher than women. No differences were found in Verbatim scores between men and women.

Personality

Personality has also been found to predict future job performance (Bakker, Tims, & Derks, 2012; Greguras & Diefendorff, 2010; Schmidt et al., 2016), and many scholars support its use in the selection process (Bartram, 2005; Borman, Penner, Allen, & Motowildo, 2001; la Grange & Roodt, 2001; Schmidt et al., 2016). A personality trait is defined as the tendency to act in a specific way across various situations (Spector, 2012). A distinguishing characteristic of personality is that it tends to remain stable over time, and individuals tend to act distinctly from one another (Barnard, 2010).

The Big Five personality factors of the five-factor model of personality (namely, Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness) have particularly shown correlations with job performance (Blickle et al., 2008; Barrick & Mount, 1991; Hurtz & Donovan, 2000; Kamdar & van Dyne, 2007; Le et al., 2011; Ones, Dilchert, Viswesvaran, & Judge, 2007; Rothmann & Coetzer, 2003). Blickle et al. (2008) found that both Agreeableness and Conscientiousness significantly predicted performance on the job in a sample of 326 working professionals in Germany. Le et al. (2011) further assert that high levels of Conscientiousness and Emotional Stability (or a low level of Neuroticism, depending on the assessment) are beneficial for job performance, especially in high-complexity jobs. Kamdar and van Dyne (2007) also found

that Conscientiousness significantly predicted performance on tasks in a sample of 230 engineers working at a multinational conglomerate.

Personality assessments are widely used in South Africa (van de Vijver & Rothmann, 2004) and they have been proven able to effectively predict job performance (Tett & Christiansen, 2007), with no differential effect on applicants from different cultural groups (Rothmann & Coetzer, 2003).

A South African Personality Assessment

One South African personality assessment that is of importance in this study is the Basic Traits Inventory (Taylor & de Bruin, 2006), a five-factor model measure of personality.

The Basic Traits Inventory (BTI). The Basic Traits Inventory (BTI) is a personality inventory developed in South Africa (Taylor & de Bruin, 2006) that assesses the Big Five personality factors, namely Extraversion, Neuroticism, Conscientiousness, Openness to Experience, and Agreeableness. The BTI consists of 193 items (13 social desirability items) scored on a five-point Likert-type scale, ranging from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*). Raw scores are converted into T-scores for ease of interpretation, with a mean of 50 and a standard deviation of 10. Scores below 40 are interpreted as low, where an individual displays less of a particular personality trait, and scores above 60 are seen as high, where an individual displays more of a particular personality trait. The BTI is completed online via the JvR Online portal and takes approximately 30 to 40 minutes to complete. The reliability coefficients of each of the five factors in the total group were all satisfactory (Taylor & de Bruin, 2016): Extraversion ($\alpha = 0.87$); Neuroticism ($\alpha = 0.92$); Conscientiousness ($\alpha = 0.93$); Openness to Experience ($\alpha = 0.87$); and Agreeableness ($\alpha = 0.89$). In terms of construct validity, CFA revealed that the five personality factors emerged clearly.

The BTI scales. The five scales (called ‘factors’) of the BTI are composed of subscales (called ‘facets’). Extraversion has the following facets: Ascendance, Liveliness, Positive Affectivity, Gregariousness, and Excitement-seeking. Neuroticism has the following facets:

Affective Instability, Depression, Anxiety, and Self-consciousness. Conscientiousness is made up of Order, Self-Discipline, Dutifulness, Effort, and Prudence. Openness to Experience is made up of Aesthetics, Actions, Values, Ideas, and Imagination. Lastly, Agreeableness consists of Straightforwardness, Compliance, Prosocial Tendencies, Modesty, and Tender-mindedness. The factor descriptions can be found in Table 1 below.

Table 1.2. The BTI factor definitions (Taylor & de Bruin, 2013).

Big Five Personality Factor	Definition
Extraversion (E)	Enjoying being around people, liking excitement, and having a cheerful disposition.
Neuroticism (N)	Experiencing negative emotions in response to one's environment.
Conscientiousness (C)	Being effective and efficient in planning, organising, and executing tasks.
Openness to Experience (O)	Being willing to experience new or different things and being curious.
Agreeableness (A)	Being able to get along with other people and having compassion for others.

Research on the BTI. A fair amount of research has been conducted using the BTI, and some of the most relevant studies will be outlined. Sutherland, de Bruin, and Crous (2007) performed a study to determine whether Conscientiousness was related to the job performance of a group of information technology customer support service engineers (n = 101). It was found that Conscientiousness was significantly correlated with empowerment (using a measure of empowerment), but no significant relationship was found between supervisor ratings and job performance.

In a study by Thomson (2007), the relationship between life balance and personality traits was studied in a sample of employees in the corporate sector (n = 175) using the BTI and a life balance questionnaire. It was found that personality accounted for approximately 15 % of the

variance in life balance, with Openness to Experience and Conscientiousness as the biggest contributors. In addition, Openness to Experience, Conscientiousness, and Extraversion were all positively related to life balance with Neuroticism being negatively related to life balance.

A test of measurement invariance was run on the BTI across three South African language groups (Ramsay, Taylor, de Bruin, & Meiring, 2008). The participants were applicants for a clerical job. The language groups were represented by Sepedi (n = 1045), Sesotho (n = 891), and Nguni (n = 496) speakers. It was found by Ramsay et al. (2008) that the BTI was invariant across all three language groups, i.e., cross-cultural comparisons would not pose any problems due to language differences.

Screening in Job Selection

Although many selection techniques could be valid methods for screening out candidates based on the most important job requirements, not all of them are able to provide information about psychological constructs that could be assessed at a later phase in the selection process. Some research suggests that companies have been approaching the selection process backward by first reviewing résumés, then having face-to-face interviews, and only then testing the applicants to determine best fit (Bateson, Wirtz, Burke, & Vaughan, 2013). These authors assert that companies can save money and make better hiring decisions by using short psychometric tests as the first screening step, because such tests effectively screen out the least suitable candidates, leaving a smaller and better-suited pool to partake in the costlier aspects of the process.

The Prospect Screener

The Prospect Screener (JvR Psychometrics, 2017) is a South African screening tool that provides a preliminary screening of basic verbal ability, numerical ability, detail-orientation, and work styles, consisting of emotional stability and dependability. These facets are widely considered important for effective job-fit and performance (Gatewood et al., 2015; Hunter & Hunter, 1984; Muchinsky et al., 2005; Roth, Bobko, & McFarland, 2005). The Prospect Screener consists of 62 items, has South African norms, and has been found reliable and valid for use in the

South African context (JvR Psychometrics, 2017). This tool is not intended to predict or explain ability or behaviour in its own right; rather, its screening function means that candidates are evaluated for suitability for further psychometric assessment, selection, or consideration based on their inherent ability and behavioural orientations (JvR Psychometrics, 2017). The tool thus helps to filter out a large pool of prospective employees by assessing whether they meet the minimum job requirements quickly and inexpensively before they are put through to a more comprehensive assessment stage, which saves time, labour, and money in the psychological assessment process. Candidates who are unlikely to perform effectively on more time-consuming and expensive assessments are screened out, and those who meet minimum requirements are prospects for further assessment. The Prospect Screener therefore functions best for pink-collar jobs (i.e., jobs in the service industry) and white-collar jobs (i.e., office jobs) that require entry-level verbal ability, numerical ability, detail-consciousness, emotional stability, and dependability, where there is a large talent pool to choose from, and where there is doubt that the group has the most basic capacities to meet job requirements (JvR Psychometrics, 2017).

The Prospect Screener's psychometric properties were investigated by analysing the internal consistency reliability of the instrument, determining the instrument's construct validity (through Rasch analysis and CFA), and analysing group differences using a *t*-test. The Cronbach's alpha internal consistency reliability for each of the scales of the Prospect Screener was: 0.54 for Words, 0.63 for Numbers, 0.82 for Details, 0.73 for Dependability, and 0.72 for Emotional Stability. Most of the scales showed acceptable levels of internal consistency reliability, but there is definite room for improvement on the Words and Numbers scales. Rasch analysis as well as CFA proved that the items of each scale appropriately fit the construct it was measuring. The psychometric properties of the Prospect Screener thus indicate that the assessment can be used effectively to assess the entry-level capacities and characteristics of candidates. A *t*-test was completed for men and women in order to determine whether gender has any biasing effect on scale scores (i.e., that men consistently score higher or lower than women, or vice versa).

Statistically significant differences were found between men and women on the Words and Emotional Stability scales of the Prospect Screener, with men scoring higher on both. The effect sizes for the differences were, however, small, suggesting that these differences are for the most part negligible.

The Prospect Screener Scales. The Prospect Screener consists of four scales, namely Words, Numbers, Details, and Work Styles. The Work Styles scale is divided into two subscales, namely Emotional Stability and Dependability. The scale definitions are found in Table 2 below.

Table 1.3. The Prospect Screener scale definitions (JvR Psychometrics, 2017).

Prospect Screener scales	Definition
Words	This scale measures candidates' understanding of the meaning of English words by asking them to match words of similar meaning.
Numbers	This scale measures candidates' basic numeracy by asking them to complete mathematical problems which are composed of simple addition, subtraction, multiplication, and division.
Details	This scale measures detail-checking ability by presenting candidates with copied words and numbers and asking them to determine whether the copies are identical.
Work Styles	This scale measures a candidate's behavioural orientation towards work environments. The scale is composed Emotional Stability (10 items) and Dependability (10 items). The scale measures whether candidates are emotionally stable (not prone to anxiety, self-doubt, and vacillation of mood) and dependable (conscientious, rule-abiding, careful, and detail conscious).

Research on the Prospect Screener. The first validation study was performed on a group of employees in the service industry and the results were written up in the Prospect Screener Technical/User Manual (JvR Psychometrics, 2013). In 2017, the manual was updated and a second validation study was conducted, including a larger and more representative sample of 10 422 respondents representing all the language groups in South Africa (JvR Psychometrics, 2017).

Except for research by the developers of the tool, not much research has been conducted on the Prospect Screener. This study will thus enrich the existing knowledge base regarding this screening tool.

Contribution of the Study

The promulgation of the EEA (1998) has led to heightened 'conscientisation' of practitioners, researchers, and the public in that large-scale validation studies are being undertaken to ensure that tests used are valid, reliable, and fair, and do not discriminate against any population group (Laher & Cockroft, 2013). Certain private institutions and companies have also started to limit their use to tests that are empirically supported through research.

This study hopes to contribute to the literature by evaluating the use and effectiveness of the Prospect Screener for the selection of entry-level service industry employees in South Africa (entry-level refers to people with no job experience who are entering the workforce for the first time). An investigation into the psychometric properties of the Prospect Screener would provide confirmation that it is suitable for use in the organisational context. By validating the Prospect Screener, this study can help ensure that its stated use is appropriate for the context for which it was designed, thereby equipping HR professionals with evidence that this tool functions in the way in which it is intended.

Convergent validity will be established by correlating results on the Prospect Screener with results on the Verbatim and Numeratum, another South African tool measuring basic verbal and numerical ability (JvR Psychometrics, 2015), and with results on two scales of the Basic Traits Inventory, a South African tool measuring the five personality factors (Taylor & de Bruin, 2006). Strong relationships between the Prospect Screener and more comprehensive tests would suggest convergent validity of the Prospect Screener. This would allow human resources (HR) professionals and organisations to better understand its function in the job selection process. If no relationships are found, it would imply that the Prospect Screener does not perform adequately,

and should not be used in the organisational context. It would also help uncover any potential deficiencies in the assessment that might need to be addressed.

Hypothesis Statement

The preceding discussion provides the researchers with the impetus to test the following five hypotheses. The first four have to do with the prediction of verbal ability, numerical ability, emotional stability, and dependability in employees, using each of the relevant Prospect Screener scales. The last has to do with predicting those same factors using the overall Prospect Screener score.

Hypothesis 1.1. The Words scale on the Prospect Screener will have a significant positive correlation with the overall Verbatim score.

Hypothesis 1.2. The Words scale on the Prospect Screener predicts performance on the Verbatim.

Hypothesis 2.1. The Numbers scale on the Prospect Screener will have a significant positive correlation with the overall Numeratum score.

Hypothesis 2.2. The Numbers scale on the Prospect Screener predicts performance on the Numeratum.

Hypothesis 3.1. The Emotional Stability scale on the Prospect Screener will have a significant negative correlation with the Neuroticism scale on the BTI.

Hypothesis 3.2. The Emotional Stability scale on the Prospect Screener predicts performance on the Neuroticism scale on the BTI.

Hypothesis 4.1. The Dependability scale on the Prospect Screener will have a significant positive correlation with the Conscientiousness scale on the BTI.

Hypothesis 4.2. The Dependability scale on the Prospect Screener predicts performance on the Conscientiousness scale on the BTI.

Hypothesis 5.1. There will be significant differences in Verbatim scores based on individuals' overall performance on the Prospect Screener (i.e., Screened Out, Prospect, or Good Prospect).

Hypothesis 5.2. There will be significant differences in Numeratum scores based on individuals' overall performance on the Prospect Screener (i.e., Screened Out, Prospect, or Good Prospect).

Hypothesis 5.3. There will be significant differences in Neuroticism scores (BTI) based on individuals' overall performance on the Prospect Screener (i.e., Screened Out, Prospect, or Good Prospect).

Hypothesis 5.4. There will be significant differences in Conscientiousness scores (BTI) based on individuals' overall performance on the Prospect Screener (i.e., Screened Out, Prospect, or Good Prospect).

The following postulate will also be tested:

Postulate 1.1. In a confirmatory factor analysis (CFA), the structure of the Prospect Screener will emerge in a way that is consistent with the theoretical model of the test.

Aims and Objectives

The aim of this research is to examine the validity evidence of the Prospect Screener for use in job selection in the South African context.

The following objectives have been set out in order to achieve this aim:

1. Determine the reliability of the scales of the Prospect Screener, the BTI, the Verbatim, and the Numeratum for this sample.
2. Determine the correlation between the scales of the Prospect Screener and the Verbatim, Numeratum, and BTI scales (to establish convergent validity).
3. Determine the ability of the overall Prospect Screener score to distinguish between high and low performance on the Verbatim, the Numeratum, and the

Neuroticism and Conscientiousness scales on the BTI (through analysis of variance; ANOVA).

4. Examine the structural/factorial validity of the scales of the Prospect Screener (through CFA).
5. Investigate the predictive validity of the Prospect Screener scales (through regression analysis).

Conclusion

In this section, the reader was provided with an overview of the literature which informed the research conducted in this study. An introduction to the topic of job selection was provided, explaining the context in which job selection takes place and the processes used when selecting individuals into positions. The reader was further orientated towards psychological assessment in South Africa and the idiosyncratic circumstances and regulations within which psychological assessment takes place. Then, two of the most important variables to be considered in job selection, namely cognition and personality, were discussed. Cognitive and personality assessments were discussed, after which the reader was introduced to the cognitive and personality assessments that are of specific relevance to this study, namely the Verbatim, Numeratum, and BTI. Hereafter, screening in job selection was discussed, and the reader was introduced to the screening tool used in this study, namely the Prospect Screener.

Next, the research study will be presented in Section 2, including an introduction, the method followed, a presentation of the results, a discussion, and a conclusion.

Article Format

The conducted research will be presented in an article format. The context of the research will be informed by the literature overview that has been presented above. It is the aim of this article to evaluate the validity of the Prospect Screener for use in job selection of entry-level service industry employees in South Africa. After the article has been presented, the research will

conclude in Section 3 with a critical reflection in which the results and impact of the research as well as the method will be critically reviewed and reported.

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CHAPTER 2
ARTICLE

Validation of the Prospect Screener for the selection of entry-level service industry employees in the South African context

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Abstract

Organisations can save money and make better hiring decisions by using short psychometric tests as the first screening step since such tests effectively screen out the least suitable candidates, leaving a smaller pool to partake in the costlier aspects of the process. The Prospect Screener is a South African screening tool that provides a preliminary screening of basic verbal and numerical ability, detail-orientation, and work styles. The aim of this study was to evaluate the effectiveness of the Prospect Screener in selecting entry-level employees in South Africa. A sample of 371 South African entry-level service industry employees was assessed using the Prospect Screener, the Basic Traits Inventory, the Verbatim, and the Numeratum. Results suggest that the Prospect Screener is reliable and valid for use in South Africa. This study therefore concludes that the Prospect Screener can be used as a screening tool in the South African service industry.

Keywords: *assessment; entry-level; job selection; Prospect Screener; psychometry; screening*

For organisations to perform at globally competitive levels, they need to select and retain the best employees (Marimuthu, 2017). The objective of the selection process is to identify and hire the right people by matching their individual characteristics (e.g., ability and experience) with the requirements of the job (DeRue & Morgeson, 2007). Not having the right people for the job can incur great costs in terms of time and money, and could lead to poor service and unfair

distribution of workload in companies (Joubert, 2003). As Grobler, Warnich, Carrell, Elbert, and Hatfield (2010, p. 178) state: "without a high-quality labour force, an organisation is destined to have mediocre performance." Organisations are therefore obligated to ensure that their selection practices allow for the selection of people who will be able to perform the required tasks and contribute effectively to the organisation (Nzama, de Beer, & Visser, 2008).

The Job Selection Process

Most organisations have recruitment and selection processes in place that assist them in filling positions, and selection is the process of choosing from a pool of applicants those individuals that are best suited for the available positions (Grobler et al., 2010). The specific job selection techniques and strategies employed may be unique for each organisation, but most follow a similar overarching process. Job applicants will go through several stages during which they can be rejected at any time. Schenk (2013) describes the typical process that organisations usually follow. First, during initial selection, preliminary 'rough cuts' are used to decide whether an applicant meets the basic job requirements. This may include the use of application forms and background checks. Applicants who meet the basic requirements are accepted into the second stage, namely substantive selection. The goal of this stage is to determine the most qualified applicants from among those who meet the basic requirements, and written tests, performance tests, and interviews may be used here. Those applicants best qualified for the job then go through to the third and last stage of the process, namely contingent selection, where final checks such as drug tests and medical tests may be performed. If all checks have proved positive, the best applicants will receive the job offer (Schenk, 2013).

Psychometric Testing

The most important factors underlying the impact of selection techniques on employee turnover are procedural fairness in selection processes, consistency, objectivity, and confidentiality. Although some of the abovementioned selection instruments and techniques (such as interviews, résumés, and reference-checking) have been found useful in selection, they are not

characterised as being objective, reliable, valid, and standardised for all selection contexts (Muchinsky, Kriek, & Schreuder, 2005).

The use of psychological tests (also called psychometric tests) can serve as a solution to this problem. A psychometric test is a "sample of behaviour gathered under standardised conditions with clearly defined rules for scoring the sample, with a view to describing current behaviour or to predicting future behaviour" (Moerdyk, 2009, p. 270). Using selection methods with increased predictive validity such as valid psychometric assessments leads directly to significant increases in employee job performance (Schmidt et al., 2016).

Psychological Assessment in the South African Context

In South Africa, there have historically been advocates for and against the use of psychological assessment to assist in job selection (Nzama et al., 2008). However, despite continuous debates in the academic literature, psychological assessments are still widely used in South African organisations (Donald, Thatcher, & Milner, 2014). In addition, the promulgation of the Labour Relations Act (LRA; 1995) and the Employment Equity Act (EEA; 1998) contributed to a major growth spurt in the use of psychological assessment, as these new regulations forced organisations to ensure and prove that their employment practices are fair, i.e., that they must have specific, objective criteria against which job applicants are measured and that any tests used must be valid, reliable, and fair. These regulations impact directly on recruitment practices, selection criteria, employment testing, diversity management, and affirmative action measures (Schenk, 2013). It obligates employers to become aware of and eradicate unfair discrimination in the workplace, and to refine their policies and practices accordingly.

In a comparison of global and South African trends (Schenk, 2013), it was shown that South Africa continues to rank comparatively low in annual global competitiveness surveys, especially with regard to human resource management. South Africa was ranked 52nd out of 60 countries in the IMD Global Business School's world competitiveness rankings, and 53rd out of 148 countries in the World Economic Forum's (WEF) global competitiveness report

(Maswanganyi, 2014). A particularly important finding was that one of the highest contributory factors to these low rankings is South Africa's hiring and firing practices. This implies that there is a great need for improvement in this regard, and research exploring potential solutions to the problem is indispensable. The WEF report reaffirmed this by stating that South Africa will have to make the labour market more efficient if it wants to address its high unemployment rate of 27.7 % (Statistics South Africa, 2017).

Variables Important in Selection

Since psychology entered the workplace, human factors such as intelligence and personality have been emphasised by psychologists as determinants of work behaviour (Viteles, 1932). These two variables are briefly discussed below.

Cognitive Ability

Cognitive ability tests have been well researched and established as useful and effective in their ability to predict job skill acquisition as well as certain types of performance (Nzama et al., 2008; Schmidt et al., 2016; Scroggins, Thomas, & Morris, 2008a). Cognitive abilities are used in work tasks that involve information processing and learning, which are required in most jobs (Davis, 2013). Verbal and numerical ability tests are particularly common in companies' selection batteries, because they measure specific abilities which may predict a candidate's ability to cope in the specific role or training (Davis, 2013).

Personality

Personality has also been found to predict future job performance (Bakker, Tims, & Derks, 2012; Greguras & Diefendorff, 2010), and a meta-review by Schmidt et al. (2016) has found that many scholars support its use in the selection process. A personality trait is defined as the tendency to act in a specific way across various situations (Spector, 2012).

The Big Five personality factors of the five-factor model of personality (namely, Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness) have particularly shown correlations with job performance. Blickle et al. (2008) found that both

Agreeableness and Conscientiousness significantly predicted performance on the job in a sample of 326 working professionals in Germany. Le et al. (2011) further assert that high levels of Conscientiousness and Emotional Stability are beneficial for job performance, especially in high-complexity jobs. Kamdar and van Dyne (2007) also found that Conscientiousness significantly predicted performance on tasks in a sample of 230 engineers working at a multinational conglomerate.

Personality assessments are widely used in South Africa and they have been proven able to effectively predict job performance (Tett & Christiansen, 2007), with no differential effect on applicants from different cultural groups (Rothmann & Coetzer, 2003).

Screening in Job Selection

Although many selection techniques could be valid methods for screening out candidates based on the most important job requirements, not all of them are able to provide information about psychological constructs that could be assessed at a later phase in the selection process. Some research suggests that companies have been approaching the selection process backward by first reviewing résumés, then having face-to-face interviews, and only then testing the applicants to determine best fit (Bateson, Wirtz, Burke, & Vaughan, 2013). These authors assert that companies can save money and make better hiring decisions by using short psychometric tests as the first screening step, because such tests effectively screen out the least suitable candidates, leaving a smaller and better-suited pool to partake in the costlier aspects of the process.

The Prospect Screener (JvR Psychometrics, 2017) is a South African tool developed to assist in the initial screening phase of the selection process. This assessment is not intended to predict or explain ability or behaviour in its own right; rather, the screening function of this tool means that candidates are evaluated for suitability for further psychometric assessment, selection, or consideration based on their inherent ability and behavioural orientations. The Prospect Screener thus helps to filter out a large pool of prospective employees by assessing whether they meet the minimum job requirements quickly and inexpensively *before* they are put through the

assessment round, which saves time, labour, and money in the psychological assessment process. Candidates who are unlikely to perform effectively on more time-consuming and expensive assessments are screened out, and those who meet minimum requirements are prospects for further assessment. The Prospect Screener therefore functions best for entry-level pink-collar jobs (i.e., jobs in the service industry) and white-collar jobs (i.e., office jobs) where there is a large talent pool to choose from and where there is doubt that the group has the most basic capacities to meet job requirements (JvR Psychometrics, 2017). The aim of this study was to evaluate the effectiveness of the Prospect Screener for service industry job selection in a South African context.

Method

This study followed a quantitative approach and made use of a non-experimental, cross-sectional survey design.

Participants

The participants were entry-level service industry employees between the ages of 18 and 34, lived in Johannesburg, and were employed on a short-term contract basis as part of a community project. Due to the fact that the recruiters for the project applied specific predetermined requirements that labelled the sample as 'youth', the method of sampling was purposive. For inclusion in this research study, participants had to have completed the Prospect Screener and at least one of the three other assessments for research purposes only. Of the 371 participants who completed the Prospect Screener, 357 completed the Verbatim, 361 the Numeratum, and 358 the Basic Traits Inventory.

Instruments

The Prospect Screener (JvR Psychometrics, 2017) is a South African screening tool that provides a preliminary assessment of basic verbal ability, numerical ability, detail-orientation, and work styles (which consists of emotional stability and dependability). These facets are considered important for effective job-fit and performance (Gatewood et al., 2015). It consists of 62 items and has South African norms.

In its development phase and a subsequent update to the manual, the reliability and validity of the Prospect Screener were investigated (JvR Psychometrics, 2013, 2017). The average Cronbach's alpha internal consistency reliability for the scales of the Prospect Screener was 0.71 (JvR Psychometrics, 2017), which is considered an acceptable reliability for psychometric instruments used in selection or screening. No statistically significant mean differences across gender groups were found for all scales of the Prospect Screener. This suggests that men and women respond to the scales of the Prospect Screener in a similar manner, with gender having no biasing effect on the responses of candidates. Rasch analysis also demonstrated that the items of each scale appropriately fit the construct it was measuring. The psychometric properties of the Prospect Screener thus indicate that the assessment can be used effectively to assess the basic capacities and characteristics of entry-level candidates (JvR Psychometrics, 2017).

The Verbatim is an assessment of verbal ability (JvR Psychometrics, 2015). It contains 42 multiple-choice questions that determine how a candidate understands words and sentences written in English. The Verbatim consists of five scales, namely Synonyms, Opposites, Analogies, Reasoning, and Interpretation. Percentages of correct responses are provided, as well as an indication of whether the individual found each scale easy, moderately hard, or difficult compared to others. Candidates are given 70 minutes to complete the questions. Candidates with high scores can be considered at least minimally proficient in understanding and reading English, and those with low scores are likely to find it difficult to understand and define basic English words. The Cronbach's alpha coefficient for the total Verbatim score was 0.75 and reliability is therefore satisfactory. In the validation study of the assessment (JvR Psychometrics, 2015), Rasch analysis determined that the items mostly covered the underlying ability trait level of the respondents, and confirmatory factor analysis (CFA) revealed that one underlying factor of verbal ability is indeed measured, indicating construct validity.

The Numeratum is an assessment of numerical reasoning (JvR Psychometrics, 2015). It contains 28 multiple-choice questions that determine how candidates work with numbers and solve

problems that involve numbers. The Numeratum consists of three scales, namely Number Problems, Patterns, and Interpretation. Candidates are given 60 minutes to complete the questions. Percentages of correct responses are provided, as well as an indication of whether the individual found each scale easy, moderately hard, or difficult compared to others. Candidates with high scores are regarded as having the ability to do simple mathematical calculations and have basic number skills, while those with low scores are likely to be unable to do simple mathematical calculations, and are unlikely to be sufficiently numerate. In the validation study (JvR Psychometrics, 2015), it was found that the Cronbach's alpha coefficient for the total Numeratum score was 0.80, and reliability is therefore satisfactory. Rasch analysis determined that the items mostly covered the underlying ability trait level of the respondents, and CFA revealed that one underlying factor of numerical ability is indeed measured, indicating construct validity.

The Basic Traits Inventory (BTI) is a South African personality inventory (Taylor & de Bruin, 2006). This tool is used to assess the Big Five personality factors. The BTI consists of 193 items scored on a five-point Likert-type scale, ranging from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*). Scores below 40 are interpreted as low, where an individual displays less of a particular personality trait, and scores above 60 are seen as high, where an individual displays more of a particular personality trait. The reliability coefficients of each of the five factors in the total group were all good (Taylor & de Bruin, 2016): Extraversion ($\alpha = 0.87$); Neuroticism ($\alpha = 0.92$); Conscientiousness ($\alpha = 0.93$); Openness to Experience ($\alpha = 0.87$); and Agreeableness ($\alpha = 0.89$). In terms of construct validity, CFA revealed that the five personality factors emerged clearly.

Procedure

The employees that were part of the community project were sent an e-mail inviting them to complete the four assessments mentioned above as part of the research study. This e-mail contained a link that directed them to an online portal where the assessments could be completed. Participation was voluntary and not linked to their employment status in any way. If the participants clicked on the link and got to the online portal, they had to give their informed consent

prior to completing the assessments, and on this form they indicated that their results may also be used for future research.

Ethical Considerations

Informed consent was obtained for each of the participants in this study. It was explained in the form that completion of the assessments is absolutely voluntary and confidential, and that the privacy and anonymity of the participants would be protected at all times. Ethical approval for this study was obtained through the North-West University Human Research Ethics Committee with the ethical approval number NWU-00130-17-S1.

Data Analysis

Descriptive and inferential statistical techniques were used to investigate the psychometric properties of the Prospect Screener, BTI, Verbatim, and Numeratum. First, to determine the reliability of all the scales used in this study, Cronbach's alpha and Guttman's lambda coefficients were determined for the Prospect Screener scales and the other three assessments in order to gauge how consistently participants respond to one set of items (a.k.a. internal consistency). Second, convergent validity was established by correlating the scales of the Prospect Screener with the Verbatim, Numeratum, and the two relevant scales of the BTI. The Detail-checking scale of the Prospect Screener was not included in the correlation analysis, because the participants had not completed another measure of detail-checking. A high correlation between the relevant assessments and scales would indicate that they measure a similar construct or area of behaviour; however, the correlation should be only moderately high, otherwise the new assessment is merely a duplicate of the others. Third, construct validity was assessed. Analysis of variance (ANOVA) was conducted to determine whether there are mean differences on the overall Prospect Screener scores and overall scores for the other four scales (i.e., whether people who have been categorised as Screened Out, Prospect, or Good Prospect performed significantly differently on the other four scales). Fourth, structural (also called factorial) validity was investigated by means of a confirmatory factor analysis (CFA), which evaluates the structural model of an assessment based

on the theoretical framework it was designed from. Fifth, predictive validity was investigated. A regression analysis was performed to investigate the predictive power of the Prospect Screener scales regarding performance on the Verbatim, Numeratum, and the Emotional Stability and Dependability scales on the BTI.

Results

Reliability Analysis

The results of the reliability analysis for the relevant scales and subscales are presented in Table 2.1 below. The Cronbach's alpha values for most of the scales are satisfactory to high ($\alpha > 0.70$); however, the values for the Words and Numbers subscales of the Prospect Screener are low ($\alpha = 0.56$; $\lambda^2 = 0.57$ for Words, and $\alpha = 0.57$; $\lambda^2 = 0.64$ for Numbers).

Table 1.4. Reliability analysis.

Assessment	Scale	n items	Cronbach's Alpha (α)	Guttman's Lambda (λ^2)
Prospect Screener	Overall	62	.688	.744
	Words	8	.558	.574
	Numbers	10	.573	.637
	Detail-checking	24	.851	.862
	Work Styles	20	.804	.816
Verbatim	Overall	42	.712	.725
Numeratum	Overall	28	.799	.809
BTI	Neuroticism	34	.928	.930
	Conscientiousness	33	.920	.922

Validity Analysis

Convergent validity. Correlations were found between the different scales as expected. Statistically significant and moderate correlations were found between Words and the Verbatim ($r = 0.35$; $p = .000$) and between Numbers and the Numeratum ($r = 0.34$; $p = .000$). Statistically significant and strong correlations were found between Emotional Stability and Neuroticism ($r = -0.70$; $p = .000$) and between Dependability and Conscientiousness ($r = 0.70$; $p = .000$).

Differential validity. Analysis of variance (ANOVA) was conducted to determine whether the Prospect Screener adequately assesses the construct that it is supposed to assess. Results

suggest that the Prospect Screener overall score is able to distinguish between high and low performance on the Verbatim, Numeratum, Neuroticism, and Conscientiousness. For the ANOVA, participants were divided into three groups (Screened Out, Prospect, and Good Prospect). The results can be seen in Table 2.2 below.

Table 1.2. ANOVA.

	Screened Out			**Prospect**			**Good Prospect**			***F***	***df***	***p***	**η^2**
	n	**M**	**SD**	**n**	**M**	**SD**	**n**	**M**	**SD**				
Verb	9	15.89	4.14	270	18.71	4.63	78	21.37	5.48	11.449	2, 354	.000*	.06
Num	9	11.00	2.40	277	15.47	4.47	75	17.75	4.20	13.599	2, 358	.000*	.07
Neur	9	90.22	25.99	271	79.51	20.28	78	63.46	15.91	22.707	2, 355	.000*	.11
Cons	9	167.67	12.93	271	178.94	15.56	78	186.62	11.92	11.547	2, 355	.000*	.06

* Statistically significant differences at the $p < .01$ level.

An ANOVA on the scores yielded significant variation among conditions where significant differences between groups were found for all of the scales; however, effect sizes (partial eta squared; η^2) of these differences were moderate as they were between 0.06 and 0.11 (Borenstein, 2009). With a larger sample size, the magnitude of the differences could be greater.

Post-hoc analyses were conducted to confirm where the differences occurred between the Prospect Screener groups. Equal variances were found for all scales using Levene's statistic of Homogeneity of Variances. Scheffe's post-hoc test was thus used. The results of the post-hoc tests are presented in Table 2.3 below.

Table 1.3. Scheffe post-hoc analysis.

Scales and Prospect Screener groups		***Sig.***	***d***	**Higher scorer**
Verbatim				
Screened Out	Prospect	.225	0.64	Prospect
	Good Prospect	.006*	1.13	Good Prospect
Prospect	Good Prospect	.000*	0.52	Good Prospect
Numeratum				
Screened Out	Prospect	.011	1.25	Prospect
	Good Prospect	.000*	1.98	Good Prospect
Prospect	Good Prospect	.000*	0.53	Good Prospect
Neuroticism				
Screened Out	Prospect	.272	0.46	Screened Out
	Good Prospect	.001*	1.24	Screened Out
Prospect	Good Prospect	.000*	0.88	Prospect
Conscientiousness				
Screened Out	Prospect	.081	0.79	Prospect
	Good Prospect	.001*	1.52	Good Prospect
Prospect	Good Prospect	.000*	0.55	Good Prospect

* Statistically significant differences at the $p < .01$ level.

On all of the scales except Neuroticism, significant differences were found between people from the Good Prospect group and people from both the Prospect and Screened Out groups. This means that the Screened Out group tended to score the lowest, followed by the Prospect group and then the Good Prospect group which tended to score the highest. For Neuroticism, the opposite was found (as would be expected), with the Screened Out group scoring the highest, followed by the Prospect and then the Good Prospect groups. Effect sizes for these differences were small to negligible, with Cohen's *d*-values ranging from .079 to .312. Notably, no significant differences were found between the Screened Out and Prospect groups on any of the scales. However, there were only 9 respondents who fell into the Screened Out category, so it is possible that larger samples would render a statistically significant result, given the mean differences observed in Table 2.2.

Structural/factorial validity. Confirmatory factor analysis was run in R using a maximum likelihood (ML) estimator. Three potential models were investigated based on the existing structure of the Prospect Screener.

Model 1. This is a hierarchical model that consists of a general factor (Overall Prospect Screener score), with the 5 scales of the Prospect Screener (Words, Numbers, Detail-checking, Dependability, and Emotional Stability) loading onto this general factor.

Model 2. This model consists of 4 correlated factors aligned with the Prospect Screener scales (Words, Numbers, Detail-checking, and Work Styles).

Model 3. This is a hierarchical model that consists of four correlated factors, namely Words, Numbers, Detail-checking, and Work Styles, with Work Styles composed of two distinct sub-factors (Dependability and Emotional Stability). In this model, the observed variables are the total scores for the scales and subscales of the Prospect Screener, and not the item-level responses.

The main statistics of model fit that were explored were the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardised root mean square residual (SRMR). For each of these, the maximum likelihood value was examined. Hu and Bentler (1999) suggest that CFI and TLI statistics should be higher than 0.95, while the RMSEA value should be below 0.06 and the SRMR value should be below 0.08. The results are presented below.

Table 1.4. Model fit statistics.

	Model 1	**Model 2**	**Model 3**
Chi square	3444.16	4026.79	5.923
p-value of Chi square	.000*	.000*	.205
Comparative fit index (CFI)	.693	.582	.967
Tucker-Lewis index (TLI)	.681	.567	.918
RMSEA	.049	.057	.036
p-value of RMSEA <.05	.739	.000	.581
Standardised Root Mean Square Residual (SRMR)	.067	.077	.025

For Model 3, the null-hypothesis was not rejected (*p* of Chi square = .205), indicating that this model presented better fit than the baseline model. In terms of CFI, TLI, RMSEA, and SRMR, Model 3 met all the criteria and presented the best fit of all the models, confirming the current hierarchical structure of the Prospect Screener, with the overall Prospect Screener score as the second-order factor, Words, Numbers, and Detail-checking as first-order factors, and Emotional

Stability and Dependability as first-order factors of Work Styles. Model 3 is presented in Figure 1 below.

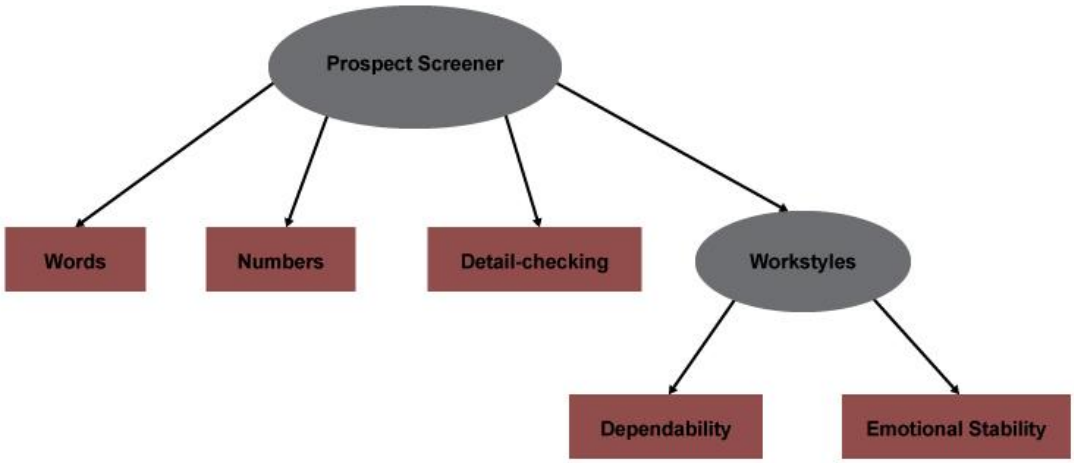

Figure 1.2. Model 3.

Predictive validity. In a standard multiple regression analysis, the predictive power of each of the four relevant Prospect Screener scales was investigated. All of the Prospect Screener scales contributed to 18.2 % of the variance in the Verbatim, 22.3 % of the variance in the Numeratum, 50.9 % of the variance in Neuroticism, and 49.3 % of the variance in Conscientiousness. These findings were statistically significant (p = .000) in all four cases.

Table 1.5. Standard multiple regression coefficients.

	F	Sig	R	R Square
Verbatim	15.634	.000[b]	.427[a]	0.182
Numeratum	20.430	.000[b]	.473[a]	0.223
Neuroticism	71.939	.000[b]	.711[a]	0.505
Conscientiousness	68.564	.000[b]	.702[a]	0.493

To see which Prospect Screener scales contributed most to each of the independent scales, see Table 2.6 below.

Table 1.6. Beta weights.

		Words	Numbers	Detail-checking	Depend-ability	Emotional Stability
	Beta	**.285***	.079	**.205***	-.018	.081
	B	1.03	0.25	0.22	-0.02	0.06
Verbatim	S.E.	0.18	0.16	0.05	0.05	0.04
	Beta	.180*	**.272***	**.247***	-.006	.017
	B	0.60	0.79	0.25	-0.01	0.01
Numeratum	S.E.	0.16	0.14	0.05	0.05	0.03
	Beta	-.093	-.032	.035	-.001	**-.689***
	B	-1.41	-0.43	0.16	-0.01	-2.14
Neuroticism	S.E.	0.59	0.51	0.18	0.17	0.12
	Beta	.016	-.030	-.006	**.683***	.073
	B	0.18	-0.29	-0.02	2.15	0.17
Conscientiousness	S.E.	0.44	0.38	0.13	0.12	0.09

* Statistically significant differences at the $p < .01$ level.

For the Verbatim scale, the Words subscale of the Prospect Screener made the highest unique contribution (Beta = .285) and the Detail-checking scale also made a surprisingly high unique contribution (Beta = .205). Similar results were found for the Numeratum, with the Numbers scale making the highest unique contribution (Beta = .277) and Detail-checking also making a high unique contribution (Beta = .247). These somewhat weak predictions can be explained by the relatively low reliability coefficients found for the Words and Numbers subscales (Nathans, Oswald, & Nimon, 2012). For the Neuroticism scale, Emotional Stability made the highest unique contribution (Beta = -.689) and for Conscientiousness, Dependability made the highest unique contribution (Beta = .683). All of these results are significant ($p = .000$), indicating that each of the Prospect Screener scales are making a statistically significant unique contribution to the prediction of the dependent variable.

Discussion

This study aimed to investigate the effectiveness of the Prospect Screener for use in the South African job selection context. Reliability analysis demonstrated satisfactory to good internal consistency for all of the assessments used in this study, with some room for improvement on two of the Prospect Screener subscales (Words and Numbers). A possible reason for the low reliability

of these two subscales is the number of items that they contain, with only 8 items making up the Words subscale and 10 making up the Numbers subscale. As reliability is a function of test length (Doty, McKeown, Lee, & Shaman, 1995), it might have to be investigated whether including more items in each of these scales improve their reliability coefficients. It might be advised that reliability be investigated through other means, for example, test-retest reliability, which could show consistency in performance over time. Nevertheless, the fact that most of these assessments have shown to be reliable is good news for psychometrics in South Africa, where a great need exists for the use of South African assessments with appropriate content and norms for the population (Laher & Cockroft, 2013).

The validity analysis of the Prospect Screener revealed some important results as well. In the convergent validity analysis, construct validity was demonstrated in that its scales correlated significantly with other scales that measure the same construct. This is not surprising, as the verbal and numerical tests and subscales are based on the same theoretical framework, and the personality subscales are based on the same Big Five traits (and thus theoretical framework). It is further expected that the personality measures correlate more strongly with each other than the cognitive ability measures, because the personality scales contain far more items than the cognitive scales, giving it a greater variance and heightening the chance of measuring a broader extent of the construct.

In the differential validity analysis, it was found that the Prospect Screener overall score effectively distinguishes between high and low performance on the other four tests on a statistical level. This result may be influenced by the small sample size found in the Screened Out group (n = 9), where there is a chance that the ANOVA could not have picked up significant differences because of the lack of power of the test. Accordingly, in future studies it would be preferable to have a larger sample in order to identify possible differences. Furthermore, the post-hoc analyses revealed that the greatest differences were between the Good Prospect group and the other two groups. There was no statistically significant difference between the scores of the Screened Out

group and the Prospect group, which poses a potential area of improvement for the Prospect Screener. A solution may be to combine the Screened Out and Prospect groups to form one larger Screened Out group, which could potentially prove more effective for companies wishing to filter/screen out a large number of applicants so that only the most qualified few remain eligible for selection. Another solution may be to adapt the cut-off points in the scoring syntax of the Prospect Screener, making it more difficult for the participants to be classified as a Prospect.

The Prospect Screener was designed to screen out candidates based on verbal ability, numerical ability, detail-checking, and work styles, consisting of two personality traits, namely dependability and emotional stability. CFA confirmed the current theoretical model that is used in the Prospect Screener and showed that these five factors are indeed exhibited with reasonable factor loadings. The model presented satisfactory fit and performed better than other suggested models, offering evidence for its structural validity.

The regression analysis delivered results that were in line with the research hypotheses, with the Words scale predicting scores on the Verbatim, the Numbers scale predicting scores on the Numeratum, and the Emotional Stability and Dependability scales predicting scores on Neuroticism and Conscientiousness, respectively. This provides evidence that the Prospect Screener scales each measure what they were designed to measure and concurrently eliminates, to some extent, the need to corroborate Prospect Screener scale scores with other verbal, numerical, and personality measures in the job selection process. It is important to note that the researchers in this study did not include any job performance data in this study, and are thus not asserting that Prospect Screener scores predict job performance. Future studies may, however, include such data which would provide important information regarding the predictive validity of the Prospect Screener.

Given the scarcity of psychometric screening tools that screen out candidates who do not meet the minimum job requirements, the Prospect Screener's reliability and validity suggest that

it can be used to meet this need in the job selection context. In so doing, it can play an important role in saving time and money, and improving objectivity and fairness in the recruitment process.

Limitations and Recommendations

One limitation of this study is that there was a fairly small sample in the Screened Out group, which impacted on some the quantitative methods of analysis. The small sample size can be attributed to the fact that there has already been a selection process involved to include participants in the project. It is, therefore, probable that the number of candidates who would have fallen in this group was reduced automatically, and that the distribution of candidates was to a certain degree influenced by this fact. In future studies, it is recommended that members of the general population be assessed with the Prospect Screener before any other selection processes take place, as the sample size of the Screened Out group would probably be larger and more representative.

Another limitation of this study is that the sample was not wholly representative of the South African population in that most of the participants were black, Gauteng-based, non-native English speakers. In order for the Prospect Screener to be useful for the screening of all population groups in South Africa, its discriminant validity ought to be investigated between all the different population groups.

As discussed earlier, the low reliability coefficients for some of the subscales of the Prospect Screener could be explained by the limited amount of items included in each subscale; therefore, the use of test-retest reliability analysis is recommended for future studies on this tool.

Conclusion

Overall, the present study supports the validity and reliability of the Prospect Screener and, therefore, confirms its effectiveness for use in the South African service industry in the job selection context. Although some of the psychometric properties of the Prospect Screener remain to be investigated, it is one of the only South African screening tools for job selection for which the reliability and validity evidence have been reported. Given South Africa's inadequate

performance regarding its hiring practices when compared to the rest of the world (Maswanganyi, 2014), using this screening tool and other valid and reliable psychometric assessments could greatly improve the effectiveness, scientific rigour, and fairness of its recruitment processes.

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CHAPTER 3
CRITICAL REFLECTION

In this chapter, the conclusions of the study, drawn from the literature review and the empirical study, are presented in accordance with the study's objectives. Throughout the chapter, a critical stance is taken by which the limitations of the research are discussed, and some recommendations for future research are proposed.

The first objective was to determine the reliability of the scales of the Prospect Screener, the BTI, the Verbatim, and the Numeratum for this sample. It was found that all the assessments demonstrated satisfactory to good internal consistency; however, the Words and Numbers scales of the Prospect Screener had coefficients below what would be deemed satisfactory. One of the possible reasons for the lower reliability of these two scales is the small number of items that they contain (ten or less). Doty, McKeown, Lee, and Shaman (1995) assert that reliability is a function of test length, meaning that the fewer items a test or scale contains, the harder it will be to determine its internal consistency. Therefore, the researchers encourage the reader to interpret these lower coefficients with caution, as they may well not be a true reflection of the reliability of the scales they represent. It is further recommended that the Words and Numbers subscales be adapted; either to include more items per scale or to replace them entirely with measures of verbal and numerical reasoning. The latter proposition will be qualified and discussed in more detail further along this section. A final recommendation is that reliability be investigated not only through internal consistency, but also through other means. To accomplish this, test-retest reliability could be measured as it will show consistency in performance on the scales over time.

The second objective was to establish the convergent validity of the Prospect Screener by determining the correlation between its scales and the Verbatim, the Numeratum, and two of the BTI scales. Construct validity was indeed demonstrated in that the scales of the Prospect Screener significantly correlated with other scales measuring the same construct, and convergent validity

was thus achieved, confirming research hypotheses 1.1, 2.1, 3.1, and 4.1 (as set out in Chapter 1). The researchers postulated that the finding of good convergent validity of the Prospect Screener would be expected, because the assessments against which it was measured are based on the same theoretical framework (being numerical ability, verbal ability, and Big Five trait-based personality). Also not surprising is the fact that the personality measures correlated more strongly with each other than the cognitive ability measures correlated with one another. This is again likely due to the greater number of items contained in the personality scales than in the cognitive ability scales of the Prospect Screener. More items in this case mean a greater variance and a higher probability of measuring a broader extent of the construct. This reinforces the recommendation to the test developers of the Prospect Screener to include more items in the Words and Numbers scales.

The third objective was to determine the ability of the overall Prospect Screener score to distinguish between high and low performance on the Verbatim, the Numeratum, and the Neuroticism and Conscientiousness scales on the BTI through analysis of variance (ANOVA). Significant differences were found for all of the scales and the Prospect Screener, therefore, effectively distinguishing between high and low performance on the other measures and confirming research hypotheses 5.1, 5.2, 5.3, and 5.4. However, the effect sizes of these differences were moderate, and it is here where the small sample size of the Screened Out group (n = 9) plays a role. With a bigger sample, more accurate estimations of the magnitude of the differences would be possible. The reader is advised to consider this finding to be an indication of a likely pattern that would need to be confirmed by additional research. It is recommended that future studies take into account the sample size of each of the groups that they include in their analyses, and that they ensure that all groups include at least thirty participants. This can be achieved by ensuring that no previous selection process had taken place before the Prospect Screener was administered (as had been done in this study), and that the sample is taken from the general population. Post-hoc analyses shed some light as to where the differences between specific groups lay, and it was found

that although there were significant differences between the Good Prospect group and the other two groups, the difference between the Screened Out group and the Prospect group was not statistically significant. This poses a very important challenge to the developers of the Prospect Screener, as the objective of the assessment is to categorise applicants into three distinct groups, and these results suggest that the assessment is, in effect, only forming two categories (Good Prospect and Prospect/Screened Out). Again, it is possible that a larger sample size could have rendered a statistically significant difference; however, if one were to interpret the result as is, the researchers have the following propositions: 1) the Screened Out and Prospect groups could be combined in the interpretation of the results to form one larger Screened Out group, and only the candidates falling within the Good Prospect group may be considered for further selection; 2) the cut-off points in the scoring syntax could be adapted to make it more difficult for the participants to be classified as a Prospect. Whichever option is finally opted for by the test developers, it is clear that the matter should be further investigated in order to provide practitioners and companies with a more valuable selection tool. The fourth objective was to examine the structural/factorial validity of the scales of the Prospect Screener through confirmatory factor analysis (CFA). In this particular analysis, no questionable results were produced, and the theoretical model of the Prospect Screener was unequivocally validated with the five factors being exhibited with reasonable factor loadings and fit to the model, confirming postulate 1.1. The Prospect Screener, therefore, demonstrates adequate structural validity, thereby strengthening the researchers' claim of its effectiveness as a South African screening tool.

The fifth and last objective was to investigate the predictive validity of the Prospect Screener scales through regression analysis. One of the most important roles of psychometric assessments is the accurate prediction of behaviour. This study did not measure the ability of the Prospect Screener to predict behaviour as no performance data were included; rather, it measured its ability to predict performance on other psychometric tests. The researchers do propose, however, that researchers include performance data in future studies, as this would generate

invaluable evidence regarding the use of the Prospect Screener in job selection. As hypothesised, results showed that the Words scale accurately predicts performance on the Verbatim, as with the Numbers scale predicting scores on the Numeratum, and the Emotional Stability and Dependability scales predicting scores on Neuroticism and Conscientiousness, respectively. This confirms hypotheses 1.2, 2.2, 3.2, and 4.2. This serves as evidence that the Prospect Screener scales each measure what they were designed to measure. Organisations could hereby save a great amount of money by using an inexpensive screening tool such as the Prospect Screener to reduce the number of people who need to complete the more expensive tests at a later stage in the selection process. The money saved on this stage in the process could then be put to better use to further improve their selection practices, e.g., providing candidates with feedback at no cost to them, or employing more and better qualified practitioners to use assessments in the organisation.

Further limitations were also identified upon critical reflection by the researchers. The sample used in this study cannot be deemed completely representative of the South African sample, as it consisted of mainly black, non-native English-speaking participants from Gauteng (a province in South Africa). As the country houses many other population groups, it is recommended that a more representative sample be included through stratified sampling methods, and that discriminant validity, test equivalence, and bias be investigated between the groups to ensure that the Prospect Screener does not discriminate against any particular group. It is further noted that the results of this study give an account of the reliability and validity of a measure as applied to black, entry-level service industry employees between the ages of 18 and 34. Therefore, the results cannot be generalised to other population groups in South Africa, and more studies are needed to explore the psychometric properties of the Prospect Screener in other working populations and industries. Although the sample of the study was not of such a nature that the instrument could be validated as such, the sample was adequate to determine the psychometric properties of the Prospect Screener, which was the primary aim of this study.

Further elaborating upon the above limitation, it is noted that South Africa has 11 official languages, and the majority of the population do not speak English as a first language. Although English is the commercial language in South Africa, the question must be raised whether assessing candidates on their vocabulary in a second language is a fair practice and would be beneficial in the greater job selection process. The researchers will argue both sides and conclude with their recommendation. On the one hand, testing a candidate in a language other than their first language has been met with objection, as the candidate's proficiency in the second language invariably impacts on their performance on the measure (Foxcroft & Roodt, 2013; Paterson & Uys, 2005). One solution to this problem could be translating the assessment into the other 10 official languages of South Africa; however, this could be a costly process and, more importantly, prospective employers would no longer be able to gauge the candidate's English verbal competency and therefore not have an accurate idea of whether the candidate would be able to perform in an English setting or not. On the other hand, given that English is the language in which most of the business in South Africa is conducted, it is generally assumed that candidates should have a basic proficiency of English in order to succeed in the job. From that point of view, the use of the English language and, specifically, the Words scale in the Prospect Screener would not pose any threat to the integrity of the job selection process. The researchers would thereby assert that it is still beneficial to the job selection process to assess candidates' basic proficiency in the English language as this is also the language in which they will have to conduct their work in most organisations in South Africa. It is, therefore, not recommended to translate this assessment as it would be counterproductive to the assessment process in the long haul.

Another limitation of this study is that the participants completed the assessments online and independently and that no monitoring took place during the completion of the assessments. This could mean that the researchers were not aware of certain circumstances that might have influenced the participants' performance on the test, for example, Internet connection, power conditions, hardware/software compatibility and capability, screen size and clarity, etc. (Davies,

Foxcroft, Griessel, & Tredoux, 2013). It would have also been possible for participants to consult dictionaries or calculators during completion of the assessment as there were no supervisors present to prevent them from doing so. These being some of the common disadvantages of online testing, it is recommended that measures are put in place to avoid such factors influencing the selection process. Since the Prospect Screener is usually administered in a supervised setting, it is recommended that organisations and assessment practitioners keep to the general rule of always having a trained professional administer ability tests to candidates.

Conclusion

The results of this study enrich national and international literature on job selection, with the unique contribution of investigating the psychometric properties of a screening tool for job selection in entry-level service industry employees in South Africa. A great need exists in South Africa for assessments that are valid, reliable, fair, and normed against the South African population (Foxcroft & Roodt, 2013). The need is especially poignant in the job selection context, as it has been found that the country has shown gravely inadequate performance when compared to other countries in global surveys (Maswanganyi, 2014). Overall, the present study supports the validity and reliability of the Prospect Screener and, therefore, confirms its effectiveness for use in the job selection context. With regard to the unique climate in South Africa, responsible use of psychometric assessments has the potential to benefit the selection and development of disadvantaged candidates, and equity in the workplace can thus be achieved (Paterson & Uys, 2005). Given the abovementioned need and the fact that the Prospect Screener is one of the only screening tools in South Africa for which evidence of its psychometric properties exists, the results of this study suggest that the Prospect Screener can indeed be used to improve the objectivity and fairness in entry-level service industry job selection in South Africa.

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