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Clinical utility of commonly used neurocognitive tests in assessing occupational performance in Functional Capacity Evaluation.

Narishca Doorasamy Thandrand

A Dissertation submitted to the Faculty of Health Science, University of the Witwatersrand, in fulfilment of the requirements for the degree of Master of Science in Occupational Therapy.

Johannesburg, 2021

DECLARATION

I, Narishca Doorasamy Thandrand declare that this Research Dissertation is my own, unaided work. It is being submitted for the Degree of Master of Science in Occupational Therapy at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.



_____

Signed today on
24th day of June 2021 in Johannesburg
Protocol Number: M170915

DEDICATION

I dedicate this research dissertation to my precious miracle son,

Kriash Thandrand,

who serves as my light, my motivation and my reason each day.

PRESENTATIONS ARISING FROM THIS RESEARCH PROJECT

Professional Development Presentation on *Clinical utility of standardised neuro- cognitive assessment used in FCE's/Medico Legal Evaluations* attended by occupational therapists in the Workipedia Medico-legal Interest group on 15 March 2018. Presented by Narishca Doorasamy. Fourways, Johannesburg.

Professional Development Presentation on *Cognition in Functional Capacity Evaluations* attended by multi-disciplinary team of claims assessors at Momentum on 5 March 2020. Hosted by The OT Link. Presented by Narishca Doorasamy. Momentum Offices, Centurion, Gauteng.

OT Link Coffee Club CPD Presentation on *Cognition in Functional Capacity Evaluations* attended by occupational therapists on 29 May 2020 via online webinar. Presented by Narishca Doorasamy. Zoom meetings webinar.

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Aum Nama Shivaya - In God I find my strength, my purpose and the guidance to strive for better.

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ABSTRACT

The clinical utility of neurocognitive standardised tests in functional capacity evaluations is essential to the assessment being valid, reliable, evidence-based and client-centred. While conventional bottom-up standardised tests appear to be popular, a growing body of research supports performance-based top-down standardised tests to obtain functional indicators of cognition and occupational performance.

The purpose of the study was to describe the perceptions of clinical utility of South African occupational therapists using of standardised neurocognitive assessments in conducting functional capacity evaluations.

A traditional mixed method convergent design was used. Quantitative data was obtained from a survey (n=38) on commonly used neurocognitive test and the selection criteria being used by OTs. Qualitative data was collected from four focus groups (n=18) on exploring the perceptions of occupational therapists of the value and clinical utility of the tests being commonly used in the field of functional capacity evaluation. Q-Methodology was used in the final stage with a Q-set of 36 statements derived from the focus groups with 51 participants. Q-factor analysis was used to interpret the data.

The results of the study mirrored similar research which revealed that bottom-up tests are commonly being used and OTs are in consensus that the results of these tests provide minimal link to function or occupational performance. The participants from the survey, focus groups and Q-sorts agree that most of the tests lack cultural sensitivity, adaptability and validity for the South African demographic. The study revealed that OTs believe a shift toward standardised performance-based testing is needed to assess occupational performance and remain within the OT theoretical framework.

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NOMENCLATURE/LIST OF ABBREVIATIONS

OPERATIONAL ABBREVIATIONS

OT - Occupational therapist

FCE - Functional Capacity Evaluation

ADL - Activities of daily living

IADL – Instrumental activities of daily living

STANDARDISED NEUROCOGNITIVE TEST ABBREVIATIONS:

RBANS - Repeatable Battery for the Assessment of Neuropsychological Status

MOCA - Montreal Cognitive Assessment

CAM - Cognitive Assessment of Minnesota

BNCE - Brief Neuropsychological Cognitive Evaluation

H-CAT - Hirebright Cognitive Ability Test

R2+7ST - Ruff 2 and 7 Selection Test

WASP - Work Ability Screening Profile

PFCE - Psychiatric FCE (PFCE)

VALPAR 6 - VALPAR VCWS Work Sample 6

CMT - Contextual Memory Test

Q METHODOLOGY OPERATIONAL DEFINITIONS

Concourse - It is the list of statements derived from the focus group discussion themes. Also known as Q statements.

Q-set - The concourse statements are printed onto small cards known as the Q-set which are sorted by the participants .

P-set - This is the sample of participants who perform the Q-sorting of the Q-set on the grid.

Q-sort – Is the sorting and ranking of the Q-set or statements on the grid on distribution markers by comparing each statement to the other under specific conditions of instruction. A final Q-sort is recorded for each participant after sorting of the Q-set is complete.

Distribution markers – This is the ranking on the Q-sort grid with 0 (neutral in the center) and -4 (strongly disagree) to-1 (disagree) on the side of disagreement and +1 (agree) to +4 (strongly agree) on the side of agreement.

Q-sort grid- This is a large grid that represents a normal distribution of distribution markers on which the Q-sort is done. Participants place each card (Q-set) onto a slot on the grid. Only one card per grid is allowed.

Q-factor analysis – A process of data reduction in Q methodology whereby individual Q-sorts load on one or more factors to represent similarities (consensus) or differences (distinguishing) between participants viewpoints.

Factor – Represents shared viewpoints derived from participants q-sorts.

Eigenvalue – explains how much of variance there is in the observed variables of a factor. A factor with an eigenvalue greater than 1 explains more variance. The greater the eigen value the greater the loading on the sample's opinion

GENERAL DEFINITIONS

Tests – Refers to standardised test measures used to assess cognition.

Clinical Utility – Refers to the relevance, usefulness and practical application of a test and considers the ability of the test achieving its designed or intended purpose.

Industry – Refers to the field of functional capacity evaluations in occupational therapy.

Industry Standards – Refers to common and acceptable practices employed by OTs conducting functional capacity evaluations. It does not refer to a set of guidelines of fidelity measures that must be adhered to when administering tests.

Defer – OTs defer on to other medical practitioners for their opinion and further investigation on a particular topic within their defined scope of practice e.g. neurosurgeon or neuropsychologist.

Referrer – It is the person or institution from which OTs obtain their instruction or referral to conduct a functional capacity evaluation e.g. attorney or insurer.

CHAPTER 1

Introduction to the study

1.1 Background

Functional Capacity Evaluation (FCE) is a recognised assessment practice used within the medico-legal field, insurance industry, employment sector, and vocational rehabilitation fields in South Africa (Buys and Van Biljon, 2007). Occupational therapists carry out functional capacity evaluation so as to determine a person's functional abilities with respect to their daily functioning, or more specifically the demands of work and a person's ability to cope with the defined inherent demands of an employment position (American Occupational Therapy Association, 2017).

The core contribution of occupational therapists in functional capacity evaluation is the focus on occupational performance. According to the Occupational Therapy Practice Framework: Domain and Process, 4th ed. (OTPF-IV) occupational performance is a person's ability to perform their meaningful occupations (activities of daily living (ADL), instrumental activities of daily living (IADL), health management, rest and sleep, education, work, leisure and social participation), and their roles within a social, cultural and physical environment (American Occupational Therapy Association, 2014). By assessing a person's functional capacity, it is fundamental for occupational therapists to assess the individual's occupational performance to determine their level of ability. Thus, occupation and occupational performance are fundamental in occupational therapy.

The evaluation of occupational performance capacity encompasses a wide range of assessment techniques and procedures which include both standardised and non-standardised testing methods. This encompasses interviewing, clinical observation, and the use of various musculoskeletal, physiological, psychological, and cognitive assessments (American Occupational Therapy Association, 2017). The investigation often entails gathering diagnostic and pathological information from a multidisciplinary team from which the occupational therapist will take information and assess the impact of these deficits on occupational performance. For example, the neurosurgeon and neurologist will confirm the

extent of the neurological injury to the brain followed by the neuropsychologist assessing client factors such as memory, attention and concentration. With this basis, occupational therapists assess the impact of the medical condition on one's occupational performance. Apart from the assessment of client factors, the effect on the occupational performance areas of a person is vital and this constitutes the functional capacity evaluation (American Occupational Therapy Association , 2014).

A comprehensive functional capacity evaluation often entails cognitive testing, especially when clients are cognitively compromised, or demonstrating performance difficulties. Cognition is a component that is integral in one's ability to function and participate in everyday activities and its assessment is important in determining a person's occupational performance. Theoretical frameworks of occupational therapy asserts that cognitive functioning can only be comprehensively determined and understood through the participation in occupations to observe the effects of cognitive processes on occupational performance (American Occupational Therapy Association, 2013). Cognitive impairment contributes to varying degrees of occupational dysfunction whether subtle or severe in presentation (Radomski et al, 2008; Toglia and Kirk, 2000). There is a high prevalence of cognitive dysfunction presenting in numerous illnesses and conditions. These include traumatic brain injuries, neurological conditions, HIV and AIDS, psychiatric conditions, substance abuse, renal disease, multiple sclerosis, rheumatoid arthritis, cancer, systemic lupus erythematosus, hypertension, chronic fatigue syndrome and pain conditions. The need for understanding how cognitive dysfunction affects one's ability to participate in occupations is critical (American Occupational Therapy Association, 2013).

There are a wide variety of standardised neuro-cognitive and neuro-psychological tests on the market which are being used in functional capacity evaluation to assist in providing objective findings. With the increased expectation on health care professionals to defend their assessment process and outcomes in medico-legal cases, employment settings, insurance claims as well as clinical settings, the functional capacity evaluations ought to be legally defendable and clinically sound. The move toward evidenced-based assessment and treatment in occupational therapy is stressed, where occupational therapist may utilise such standardised tools to comprehensively assess their clients and to ensure their results are defendable in court or in insurance claims cases and negotiating return to work (Mandich,

Miller and Law, 2002; Zur, 2012). However, irrespective of the reliability and validity of tests used, it is the clinical interpretation and reasoning drawn from these results that are paramount to the evaluation being credible and trustworthy so to be legally defensible (Schwandt, 2003; Zur, 2012).

Law and Baum (1998) and Law et al. (2005), state that occupational therapists ought to be using validated tools to inform their judgments regarding occupational competence and the decisions associated with such judgments. Thus, whilst aiming to critically evaluate assessment findings occupational therapists may find the need to validate their findings by using numbers and test scores to increase evidence-based practice (Coster, 2008; Heiwe et al., 2011.). A majority of these tests are sourced and normed for the first world countries. There is an ongoing debate as to whether these standardised tests are in fact a valuable assessment tool by means of which to determine occupational performance of neurologically impaired persons in the South African context and research is needed to shed light on this debate.

Thus, the clinical utility of standardised neurocognitive assessments and their ability to assess occupational performance is explored in this research. Clinical utility is defined as the relevance and usefulness of an intervention or test and considers the ability of such an intervention or test achieving its designed purpose, in other words, is it valuable. The clinical utility of tests depends on its ease of use, reasonable administration time, appropriateness of the test to the assessor and the client and most importantly the data derived from the test should provide useful clinical information for its intended use (Toomey et al., 1995; Patrick et al., 2012, Smart, 2006). With the aforementioned in mind, the following questions are raised: what is the relevance and usefulness of the neurocognitive tests in determining occupational performance deficits; will these tests provide clinically relevant information that will be legally defensible, objective and credible?

1.2. Statement of the problem

South African occupational therapists are using a wide variety of costly and internationally validated neurocognitive assessments to inform and defend their clinical reasoning. This brings into question the validity of the test findings not based on a South African population. From clinical experience, there is controversy among occupational therapists in the field

whether standardised neurocognitive tests are needed in assessing clients in functional capacity evaluations to adequately and comprehensively determine one's occupational performance. Currently, there is a paucity of research on the use of standardised neurocognitive assessment in assessing or determining one's functional capacity in occupational performance areas. The information that standardised neurocognitive tests provide about occupational performance in functional capacity evaluation has never been investigated in the South African context.

1.3. Purpose of the study

The purpose of this study was to describe the perceptions of clinical utility of South African occupational therapists using of standardised neurocognitive assessments in conducting functional capacity evaluations. The study explored reasons for the use of commonly used standardised neurocognitive tests and whether the information obtained from the tests link to occupational performance. The study further aimed to identify the value of these tests in functional capacity evaluations.

1.4. Research Question

How useful and relevant are the currently employed standardised neurocognitive tests used in South Africa in functional capacity evaluation to assess occupational performance deficits?

1.5. Justification of the study

Occupational therapists have a unique contribution in assessing function and occupational performance in multi-disciplinary management of clients. This study highlights the usefulness and relevance of standardised test in assessing occupational performance. If usefulness and relevance can be established, it will give confidence to occupational therapists to use tests that indeed determine occupational performance and discontinue using tests that are not focusing on the occupational performance deficits of client who are referred for functional capacity evaluations.

Should the study highlight shortfalls of using standardised neurocognitive tests in informing occupational therapists on their clients occupational performance, then areas of

development in skill, clinical expertise and further development and implementation of evidence-based practice in occupational therapy assessment and functional capacity evaluation may need exploration. By being aware of the shortfalls of the standardised tests occupational therapists may employ a stricter test selection process and to further support the validity and reliability of the assessment with a variety of measures that enhance evidence-based practice. The study may further serve as a reminder of the theoretical frameworks occupational therapists should bear in mind when selecting and interpreting test findings.

1.6. Aim of the study

The aim of the study was to explore how South African occupational therapists select neurocognitive tests for functional capacity evaluations and their perceptions of the clinical utility of these tests to assess occupational performance in functional capacity evaluations.

1.7. Objectives of the study

1. To determine the criteria occupational therapists use in selecting neurocognitive test for a functional capacity evaluation.

2. To explore occupational therapists perception on the intended use of neurocognitive tests, the clinical use and the value of these tests in functional capacity evaluation.

3. To establish a pattern of subjective viewpoints that exist among the occupational therapists that use neurocognitive assessment in functional capacity evaluations on the clinical utility of these tests in assessing occupational performance in functional capacity evaluations.

1.8. Organisation of the dissertation

The study is organised and outlined as follows:

Chapter One: Overview of the study

Chapter Two: Literature review

Chapter Three: Research design and methods

Chapter Four: Data analysis and findings

Chapter Five: Discussion of Finding

Chapter Six: Evaluation and Recommendations

1.9 Summary

This chapter described the introduction and background into the study, problem statement, justification, purpose and objectives of the study. The next chapter will provide a review of the relevant literature.

CHAPTER 2:

Literature review

2.1 Introduction

This literature review details the process, content and reasons of functional capacity evaluation, the use of standardised neurocognitive tests in the functional capacity evaluations and the integral role of cognition in occupational performance to cope with everyday demands. Furthermore, this review elaborates on the value of using standardised neurocognitive tests in functional capacity evaluations. As an holistic view into occupational therapists assessing cognition the review will introduce the newly introduced concept of functional cognition.

Databases that were used included EBSCO, CINAHL and Scopus. Occupational therapy specific journals were searched individually and textbooks on neurocognitive disorders with the focus on occupational therapy were used. Search terms included clinical utility, standardised assessments and neurocognitive disorders, occupational performance and cognition, functional cognition, and functional capacity evaluation.

2.2 Functional Capacity Evaluation: Process, content, reasons for evaluation and predictability

Functional Capacity Evaluation is an internationally recognised practice of assessment by mostly occupational therapists and physiotherapists. Occupational therapists conduct functional capacity evaluations using multi-faceted assessment techniques and testing procedures to assess the clients functional capabilities, fitness for return to work, job-match abilities, level of independence, and need for accommodations. South African occupational therapists conduct functional capacity evaluations in the fields of disability management, vocational rehabilitation and employment sectors, medico-legal field and insurance industry (Fraser, 1992; Buys & Biljon, 2007, King, Tuckwell and Barrett, 1998).

Occupational therapists carry out functional capacity evaluations with the fundamental aim of assessing the client's occupational performance within the context of an occupation and employ various techniques in their testing process (De Baets, Calders, Schalley et al., 2018; Gibson and Strong, 2003; Radomski et al., 2008).

Numerous authors highlight the general methods and procedures of what a functional capacity evaluation encompasses which includes interviewing, questionnaires, clinical observation, and the use of various musculoskeletal, physiological, psychological, and cognitive assessment using both standardised and non-standardised testing methods (Buys & Biljon, 2007). While there is no single golden-standard of assessment protocol in functional capacity evaluations there is however consensus in the literature that the assessments need to demonstrate rigour, validity, objectivity, and reliability in both the assessment processes and selection of specific tests being used (Jones and Kumar, 2003; Schwandt, 2001).

The comprehensiveness and rigours of the functional capacity evaluation lends to the credibility of the testing instruments and that of the occupational therapist skill. Van Bijon (2013) notes that changes to South African legislation have increased the opportunity for occupational therapists working in the field of medico-legal, personal injury assessment, and functional capacity evaluations, or even in clinical practice, to be held publicly accountable to defend and support their assessment results or even intervention processes in a court of law (van Bijon, 2013). Schwant (2001) purports that what makes an assessment trustworthy or rigorous is if four criteria are demonstrated in the assessment process, namely: credibility (internal validity); transferability (external validity); dependability (reliability); and confirmability (objectivity). Thus, therapists or assessors strive to meet this criteria in improving on the defendability of their assessments by making use of standardised assessments tools in addition to theoretical knowledge and clinical skill.

Conversely, should the assessment process lack thorough and rigorous testing methods, a failure to determine the severity of the impairment and the need for rehabilitation or intervention may deprive the client of their owed benefits or therapy by the third party funders (Wolf et al., 2009).

In the functional capacity evaluation process it is important for the assessor to choose appropriate standardised test which yield results that are valid and reliable in order for the assessment findings to be credible, defendable, accountable and evidence-based (Bossuyt et al., 2012; Brown, 1996; Coster, 2008).

2.1.1 Predictability of functional capacity evaluation outcomes in assessing occupational performance

Through the years the occupational therapy evaluation process has evolved from focusing the assessment of specific performance components such as concentration, attention and executive function skills, to a more occupation-based and functional ability-focused assessment (Toglia and Kirk, 2000; Fisher, 1992a, 1994 a; Law et al., 1994).

It was once commonly assumed by occupational therapists that there was a direct link or correlation between the specific performance components (for example concentration, memory, executive function) and the individual's occupational performance. This misconception meant that if there were areas of deficit or improvement in the performance components, that there would be a direct effect on the individuals occupational performance. However, Toglia and Kirk (2000), Coster (2008) and Hocking (2001) affirms the growing body of research, which indicates that improvement in specific performance components does not directly correlate into an improvement in one's occupational performance.

Although much research has gone into the predictability of functional capacity evaluations and performance-based measures on musculoskeletal conditions, even so, findings revealed medium to low or modest correlations in most studies (Kuijer, Gouttebarge, Brouwer, et al., 2012). For example, if the individual's working memory improves with improvement in their attention span this does not necessarily cause an improvement in their vocational capacity or occupational performance areas (Toglia and Kirk, 2000; Hocking, 2001; Coster, 1998; Trombly, 1993). This opinion was further explored in 2018 at the *Symposium on Measurement and Assessment: Directions for the Future in Occupational Therapy,* which cautioned therapist to remain focused on the person who has the condition rather than on the diagnosis itself (Toglia and Kirk, 2000). Gibson & Strong (2003) argue against the disparity in approach, and affirm

that functional capacity evaluations is an assessment process focusing on the client's activity limitations and occupational performance, instead of the impairment itself.

This strong agreement developing in the field, in focusing on occupation rather than performance components, or client factors, as described in the Occupational Therapy Practice Framework 4th edition (American Occupational Therapy Association 2020), stays true to the theoretical frameworks and fundamental models of occupational therapy and is detailed in the constructs underpinning occupational therapy theory such as the Model of Human Occupation (Kielhofner,2008), Model of Creative Ability (Casteleijn & de Vos 2007), the Canadian Model of Occupational performance, and the Person–Environment–Occupation Model (Strong et al., 1999). The use of these models by occupational therapists interchangeably or in combination are of significance in the interplay of the person, environment, and occupation in all aspects of assessment and intervention (American Journal of Occupational Therapy, 2020; Hocking, 2001; Clark et al., 1991). Occupational therapists also rely on international classifications, such as the ICF, since this classification takes into account the interplay between the health condition, personal factors, the environment, activities, and participation (World Health Organisation, 2001).

The predictability of tests used in functional capacity evaluations to determine occupational performance seemingly falls short if occupation and the client-centred holistic approach is not thoroughly employed.

2.2 Selection of Standardised Assessment tools

Occupational therapists carry out functional capacity evaluations with the aim of comprehensive and accurate testing of the client's functional abilities.

Literature indicates that in the selection of tests used in functional capacity evaluations, occupational therapists ought to demonstrate best practice by selecting tests that are reliable, valid, practical and safe, useful (clinical utility), sensitive to the population tested, and objective (Ramano & Buys, 2018; Dube, 2005; Innes & Straker, 2003; Legge & Burgess-Limerick, 2007; Fawcett, 2013). Ramano and Buys (2018) highlight characteristics of the tests used in functional capacity evaluations, which entail the need for the testing to be objective,

comprehensive, accurate, consistent, relevant, reproducible, useful or clinical utility of the testing, ecologically and clinically valid and the use of standardised testing to be employed. These guidelines in test selection and characteristics was further supported by Innes & Straker (2003), Legge & Burgess-Limerick (2007), and Fawcett (2013). Granting consideration to the above test selection guidelines used in functional capacity evaluations is thus a crucial step in conducting comprehensive assessments.

The functional capacity evaluation process encompasses the selection and use of standardised tests to achieve comprehensive assessment of the client's abilities and in particular cognitive abilities as the focus of this study (Ramano and Buys, 2018). There are two theoretical approaches to standardised test types which may serve to guide in the selection of the test being used in assessments. These theoretic approaches include the *bottom-up* and *top-down* approaches.

The bottom-up approach in assessments focuses on assessing the deficits in the specific performance component areas (also referred to client factors or body functions) such as concentration, attention, memory, and orientation, which are considered cognitive pre-requisites to occupational functioning. These assessments usually highlight specific areas of dysfunction and may further indicate the severity of the deficit in comparison to the population norm in scores of numerical values for interpretation (Hocking, 2001; Trombly, 1993; Coster, 1998).

In contrast to the aforementioned approach, the top-down approach allows for the understanding of overall engagement and participation in occupations (Hocking, 2001). These tests usually aim to establish the quality of occupational performance, its observable presentation, and the environmental demands in which it is performed. This approach in testing allows for the understanding of occupational performance disruption and dysfunction (Clark et al., 1991; Hocking, 2001). In the administration of such tests the assessor relies on their clinical reasoning and observation through use of functional activities (Douglas et al., 2007). Hocking (2001) suggests that the most obvious indicator of such occupation-based tests is that it involves the client performing an activity that allows the assessor to understand the skillfulness and effectiveness of the client's performance within the environment (Hocking, 2001).

When selecting from the two approaches (top-down and bottom-up) it is imperative for the assessing occupational therapist to remain cognisant of the theoretical framework of clinical practice, and to be able to decipher between the two theoretical approaches to best inform which tests to use in the assessment process.

Traditional neurocognitive and neuropsychological assessment tests identify specific cognitive deficits (bottom-up approach), whereas occupational performance-based tests assess how the individual interacts within their environment to perform an activity within the client's context (top-down approach) (American Occupational Therapy Association, 2016; Gross, 2004). With consideration to the above-mentioned approaches, this begs the question as to which approach is best suited to the field of occupational therapy.

Gillettes (1991) asserts that "the basic concepts of a profession should be reflected through the tests and measurements used in practice". For occupational therapy this means functional assessments of performance based on tests that measure changes in occupational performance (Gillettes, 1991, p.565). Trombly (1995) further encourages that with the focus on occupation-based assessment, occupational therapists should use "top-down" assessments, focusing on the client's occupational performance rather than the cause of the problem or performance component limitations. Chappell et al. (2003) emphasise the need for a comprehensive and accurate assessment as critical in the return-to-work process for head-injured clients (Chappell et al., 2003). Similarly, Wesson et al. (2016) affirm that the performance-based assessment, whether global or specific, ought to assess a person across several functional domains in real life context (Wesson et al., 2016).

Thus, with a growing need for the focus on occupation-based assessment in functional capacity assessment as the general consensus in the literature the top-down approach appears to gain popularity as the standard in assessing occupational performance.

To support this notion, a review of stroke-specific executive functioning assessments, Poulin et al. (2013) stress the importance of performance-based testing. The review highlighted that traditional cognitive testing often lacks the identification of significant changes in functional capacity, as well as occupational performance deficits, which occupational therapists are strained to skilled in assess. (Poulin, et al., 2013; American Occupational Therapy Association, 2013).

In a study by Douglas et al. (2007) on standardised and non-standardised assessments used by occupational therapists to evaluate cognition, the top-down assessments fit their theoretical framework, predicted safety and identified the need for intervention. It was found that the occupational therapists used more bottom-up standardised assessments to identify deficits and was easier to administer. They noted using top-down non-standardised assessments to predict function and to fit with their theoretical approach. The respondents acknowledged that although bottom-up assessments are more popular, this did not fit in with the occupational therapy framework of practice. This study highlight the need for standardised top-down assessments to be developed so as to enhance evidence-based practice. The study also raises a relevant point that, due to the current emphasis on evidence-based practice, many therapists indicated the perceived view that they should be using more standardised tests rather than non-standardised tests (Douglas et al., 2007).

Similarly, in a 2013 Australian cross-sectional study on cognitive assessment and approaches in working with patients sustaining a stroke or traumatic brain injury, the study found that occupational performance-based assessments were a highly valued assessment tool (Sansonetti & Hoffmann, 2013). The therapists reflected that despite the high value of the performance-based assessments as an assessment tool, one of the greatest disadvantages of these tests are the lack of quantitative data obtained from them. Despite the popularity of the use of standardised tests, the participants noted that non-standardised top-down test fit best with the occupational therapy theoretical framework. These findings were echoed in the aforementioned 2008 Canadian study, where the occupational therapists agreed on the theoretical appropriateness of top-down tests in assessment (Douglas et al., 2007).

The Australian study yielded perceptions of the participants that the results obtained from the standardised cognitive screening tests were difficult to link to the client's occupational performance and limited in informing intervention plans. The participants further reported preference for a combined assessment approach, where standardised tests are used to support their findings of occupation-based assessments. This study, too, highlights the need for cognitive standardised occupational performance-based assessment so as to improve occupational therapy services (Sansonetti & Hoffmann, 2013).

With regard to tests that use the bottom-up approach, a common consensus is the advantage of standardised paper-and-pen based cognitive tests as a diagnostic tool, however the literature indicates that most of these tests lack ecological validity and are limited in providing functional prognostic indicators (Burgess et al., 2006; Christiansen, 1993; Chaytor and Schmitter-Edgecombe, 2003). Ecological validity refers to is the extent to which the test format or procedures reflect everyday activity participation and engagement, as well as real-world demands, and creates a frame of reference for the client. This construct is often not considered, especially when using more traditional standardised cognitive assessment tools (Crist, 2015; Dunn, 1993). Burgess et al. (2006) have emphasised that ecologically valid tests are a need in the rehabilitation community across the board of disciplines (Burgess et al., 2006).

Crist (2015) asserts that by not considering the important construct of ecological validity is "a serious omission" by occupational therapists in assessing a client's functional capacity. In addition to the lack of ecological validity, most of the traditional tests have been criticised for their limitations in educational, language and cultural bias (Royall et al., 2007; Goldstein, 1996). In a Brazilian study by Conti (2017), the review found that out of more than forty cognitive assessment tools that were appropriate for use by occupational therapists only one test was valid and adapted for use with the Brazilian population. The review found that there is lack of cultural and language appropriate cognitive tests valid and standardised for the Brazilian population, and that a great need for translation and validation of test measures exists. Just as in the Brazilian review, these limitations are observed to pose a profound barrier especially in the South African context whereby the multitude of languages, varying levels of education, and an array of cultural perspectives are prevailing.

It appears that barriers to using the top-down approach tests in assessment is not a new problem as was highlighted by Trombly (1993), Coster (1997) and Velozo (1993), and has remained a problem since then. The literature affirms barriers of the top-down approach to assessment remains the availability of valid and reliable standardised performance-based assessment tools focusing on occupation, and reiterates the need for further developments to be made in tests and measurements used. Thus, throughout the years, although much progression has been made, the void still remains for appropriate cognitive standardised tests

that are rooted in the occupational therapy framework in assessing occupational performance in people presenting with cognitive dysfunction.

2.3 Importance of Cognition in Occupational Performance

The impact of cognitive deficits in all areas of occupation is of utmost importance for occupational therapists. Due to the high prevalence of conditions resulting in cognitive dysfunction, such as traumatic brain injuries, stroke, epilepsy, HIV and AIDs, cancer, psychiatric illness, pain disorders, renal disease, hypertension and substance abuse, there is emphasis placed here on the need to comprehensively assess and adequately treat cognitive deficits (Toglia and Kirk, 2000; Conti, 2017). Cognitive impairment, unlike physical deficits, are not overtly apparent, and are less visible, thus patients themselves may often be unaware of them (Conti, 2017). For this reason, a comprehensive assessment is essential to identifying the specific cognitive problem, and further, to assess how it impact on the specific areas of occupation such as work, social participation, IADLs, ADLs, and leisure participation.

Cognitive functioning is critical for living independently, ability to learn new information, retain information and skills and in participation in daily activities and tasks and thus the assessment of cognition is imperative to understanding a client's functional ability and effects on occupational performance (American Occupational Therapy Association, 2013; American Occupational Therapy Association, 2016; Champagne et al., 2013; Katz and Toglia, 2018).

In carrying out any task whether simple or complex, one uses cognitive function in execution of even the most unassuming activity. An interference in cognition may cause disruption in activity participation and thus the extent of the participation limitations are as important as the measurement of the cognitive impairment (Katz and Toglia, 2018).

Cognitive deficits result in varying degrees of occupational dysfunction, limitations in activity participation and roles, reduction in quality of life and may lead to compromised independence (Radomski et al, 2008; Giles et al, 2017; Katz and Toglia, 2018; Gillen, 2009; Katz, 2005). Occupational therapists are best positioned to understanding the association between cognition and occupational performance or activity limitations. From the above, it is thus evident that literature and occupational therapy theory asserts the critical value of

cognition in everyday occupational functioning (American Occupational Therapy Association, 2013; Toglia and Kirk, 2000; Champagne et al., 2013).

Cognitive ability is often measured statistically with normative comparisons (for example age and level of education) and is compared to the normal distribution of the normed group. It is represented by raw scores and, percentages, and measured against standard deviations (Katz and Toglia, 2018, Royall et al., 2007). The values generated categorise the cognitive ability of the patient as average, below average, low or mild, or moderate or severely impaired, according to the score in relation to the standard deviation of the normed group. Royall et al. (2007), however, disputes that these statistical measures indicate clinical significance to functional performance outcomes. The 2007 study makes an assertion that some specific cognitive components may be more associated with functional deficits than others. To this end, although a patient may score in the mild cognitive impairment range overall, a moderate deficit in a specific domain may in fact be considerably contributing to the occupational performance deficit.

To better understand the clinical significance of the cognitive deficits, it is the role of the OT to assess the impact of cognitive dysfunction on the occupational performance areas. Traditionally, occupational therapists assess the cognitive components with standardised neuropsychological assessments but this practice has been criticised by Law et al.(2011) and Lezak et al. (2012), where the authors point out that these neuropsychological test are too structured and less flexible. It also limit at person's exploration or use of their own internal resources or skills in order to accomplish the tasks in the tests. Occupational therapy standards of practice ought to report on the occupational performance restrictions, due to cognitive dysfunction, and these tests do not provide this evidence (Law et al., 2011; Lezak, et al., 2012; Manchester, Priestly & Jackson 2004).

In a study on *The Cognitive Correlates of Functional Status: A Review From the Committee on Research of the American Neuropsychiatric Association,* the report reviewed research related to the cognitive correlates of functional capacity and found that the association between cognition and functional performance or functional outcomes is modest with a correlation of r0.40. The study comprised 156 models, with 147 cognitive and 65 functional measures

(Royall et al., 2007). The study found that most of the cognitive assessments reviewed yielded statistically insignificant contributions to functional outcomes. Of importance, the study found that cognition alone cannot be used as a predictor of functional capacity, but rather, that various comprehensive assessment processes ought to be employed to obtain an accurate prediction of function. The review refutes the vastly used traditional cognitive tests in predicting functional capacity (Royall et al., 2007; Hajek, Gagnon and Ruderman, 1997).

An alternative to standardised neuropsychological assessments is performance-based tests since research indicates that performance-based tests provide a noteworthy ability to predict functional capabilities in comparison to conventional cognitive testing (Jekel et al., 2015; Puente et al., 2014; Schmitter-Edgecombe et al., 2011). A study by Jekel et al. (2015) found that performance-based tests were advantageous in identifying differences in instrumental activities of daily living (IADL) in even mild cognitively impaired patients with Alzheimer's disease, when compared to the healthy control sample. This study further asserts the need for the development of performance-based tests, as it was found that they allow a valid and reliable assessment of even subtle IADL deficits in persons with mild cognitive impairment.

In a study by Schmitter-Edgecombe et al. (2011) on the effects of cognitive deficits on everyday functioning examined the relationship between and the cognitive correlates of self-report, performance-based, and direct observation measures. The study made use of performance-based everyday problem-solving test and a behavioural simulation measure (OTDL-R) and found that self-report of IADLs and the performance-based EPT may be useful measures for assessing everyday functional status in cognitively healthy older adults. Interestingly, this study is in support of the flawed predictability of functional capacity evaluations in assessing specific performance components to inform on functional capacity and activity participation. In a similar study by Puente et al. (2014), the study concedes that performance-based test are rarely used; it however advocates for the use of performance-based measures such as the Direct Assessment of Functional Status-Revised, as these tests decreased bias while increasing accuracy, and sensitivity. The findings revealed greater sensitivity to detecting deficits in activities of daily living with a performance-based measure, as opposed to a self-reporting questionnaires.

Although these study populations discussed above were older adults, the assumption holds true that it will be the same for adults in the working age groups. Giles et al. (2017), Moore et

al. (2007), Poulin et al. (2013) and Wesson et al. (2016) support that performance-based tests are suited to be used on clients with various diagnoses to assess independent living.

In line with this global shift in standardised assessment in occupational therapy, the emerging approach in recent years in the assessment of cognition, is functional cognition. The term functional cognition refers to the thinking and processing skills used to accomplish everyday tasks and activities in which one lives both clinical and community environments (AOTA, 2017; Giles et al., 2017; Giles & Wolf, 2017; Skidmore, 2017; McCraith, 2011). Wolf et al. (2019, p.2) assert that " the evaluation of functional cognition is therefore a central concern of occupational therapists' professional practice", as functional cognition focuses on the assessment of the clients capacity to tasks in the context of their environment and the interplay of the clients use of strategies, roles, routines, and resources in task execution rather than assessing specific components of cognition in isolation of each other.

Functional cognition is essentially the cognition necessary to carry out everyday tasks (Giles et al., 2017). It appears that although the term itself was not previous coined as the approach to cognitive assessment, the functional assessment and functional implications of cognition in relation to occupational performance has always been rooted in occupational therapy theory since the 1980s (American Occupational Therapy Association, 2020). This functional approach has been highly supported and recognised by AOTA in their advocacy policy as the move toward occupational therapists focusing on competency and performance in carrying out everyday tasks in real-world contexts, rather than the specific cognitive component deficits (American Occupational Therapy Association, 2016; AOTA, 2014; Giles et al, 2017; Wolf et al, 2019). The American Occupational Therapy Association makes the compelling argument that performance-based tests may replace and supersede the conventionally used neuropsychological assessments (American Occupational Therapy Association, 2016).

Functional cognition is considered a naturalistic approach to the assessment of cognition and although much stride has been made in developing performance-based assessments of functional cognition. Giles et al. (2017) and the American Occupational Therapy Association (2020) recognise that there remains a void in these performance-based tests being standardised, validated, normed and easy to use for screening and assessment purposes. Wesson and Giles (2019) recognise that the need for validated and normed assessments have only recently become an area of focus in the profession. This view is favoured in various

literature, that although performance-based testing is an integral assessment tool in assessing functional cognition, its validity is still to be explored in occupational therapy practice (Petruccelli & Delenick, 2013; Poulin et al., 2013; Toglia and Kirk, 2000).

The concept of functional cognition reiterates the importance of actual task performance in assessments to predict ability to perform different occupations (American Occupation Therapy Association, 2020). Thus, emphasis and attention on functional cognition appears to be the way forward in the assessment of cognition (American Occupation Therapy Association, 2020).

2.4 Summary

This chapter provided a critical overview of shortcomings in functional capacity evaluation from an occupational therapy perspective, as much research supports the need to use various assessment methods in assessing cognition. Two main approaches of standardised tests were highlighted. These approaches include both top-down (performance-based) and bottom-up (traditional neuropsychological paper-based) assessment measures. Of the two approaches, occupational therapist favoured the use of performance-based test (top-down) moreover bottom-up client factor-based assessments. The value of using standardised tests in assessing occupational performance to give credibility, rigour, and comprehensiveness to the functional capacity evaluation process is noted. Of significance, the literature brought to light the misconceptions that a link exists in the prediction of occupational performance, by assessing the extent of cognitive components deficit. The review briefly introduced the topic of functional cognition, which although not a new theory in occupational therapy, lends as a term itself lends to defining the scope of cognitive assessment in occupational therapy and highlighting the need and continued lack of standardised occupation-based assessment tools. Overall, the review detailed that an ideal functional capacity evaluation should support the theoretical frameworks in occupational therapy and the link between person, occupation and environment, and that assessment of specific cognitive components in the assessment of cognition is not a predictor of function.

CHAPTER 3

Study Methodology

3.1 Introduction

The study methodology and design are described as well as the data collection methods, analysis of the data and interpretation of the findings. This chapter will detail the research design used and the reason for the use of this design for each objective, how the data is analysed, and the ethical considerations of the study.

3.2 Study Design

The design of the study was a mixed method convergent design, where the quantitative and qualitative data merge to explain the study aim. The purpose of this research design serves to explore new insights or perceptions into a field of study and is used especially in a study with relatively little research previously done (Creswell and Clark, 2017; Akhtar, 2016). The study explored the South African occupational therapists' perceptions of clinical use of the commonly used neurocognitive tests in assessing occupational performance in functional capacity evaluation. Quantitative data was collected in objective one while qualitative data were collected in Objective 2. Objective 3 used Q-Methodology, which is a mix of quantitative and qualitative data (refer to 3.2.1 for an overview of the Q-methodology design). The quantitative data from the questionnaire and qualitative data from the focus groups were collected in the similar timeframe and analysed separately to be used in comparing, supporting and relating the explored perceptions of the participants from the two sets of data. The merging of these mixed data sets was then interpreted and used in the formulation of the Q-methodology q-set. This is a typical results-based convergent design described by Hong et al. (2017). The strength of this study design allows for entire mixed data sets to be holistically triangulated and interpreted to obtain the full picture of what is occurring and understanding the research problem. Each data set held equal weight which added value to the comprehensiveness in answering the research question. This research design further allowed for data-validation in the study as the quantitative data validated the qualitative data

and clearly expressed the perceptions of the participants (Fretters et al., 2013; Moseholm and Fretters, 2017).

Figure 3.1. describes the objectives and the convergent mixed methods design of the study. In Objective One, the online survey determined how occupational therapists select neurocognitive tests. The results informed the questions for the focus groups in Objective Two. The results of objective One and Two converged into Objective Three when the statements for the Q-Methodology were generated, and participants sorted the statements.

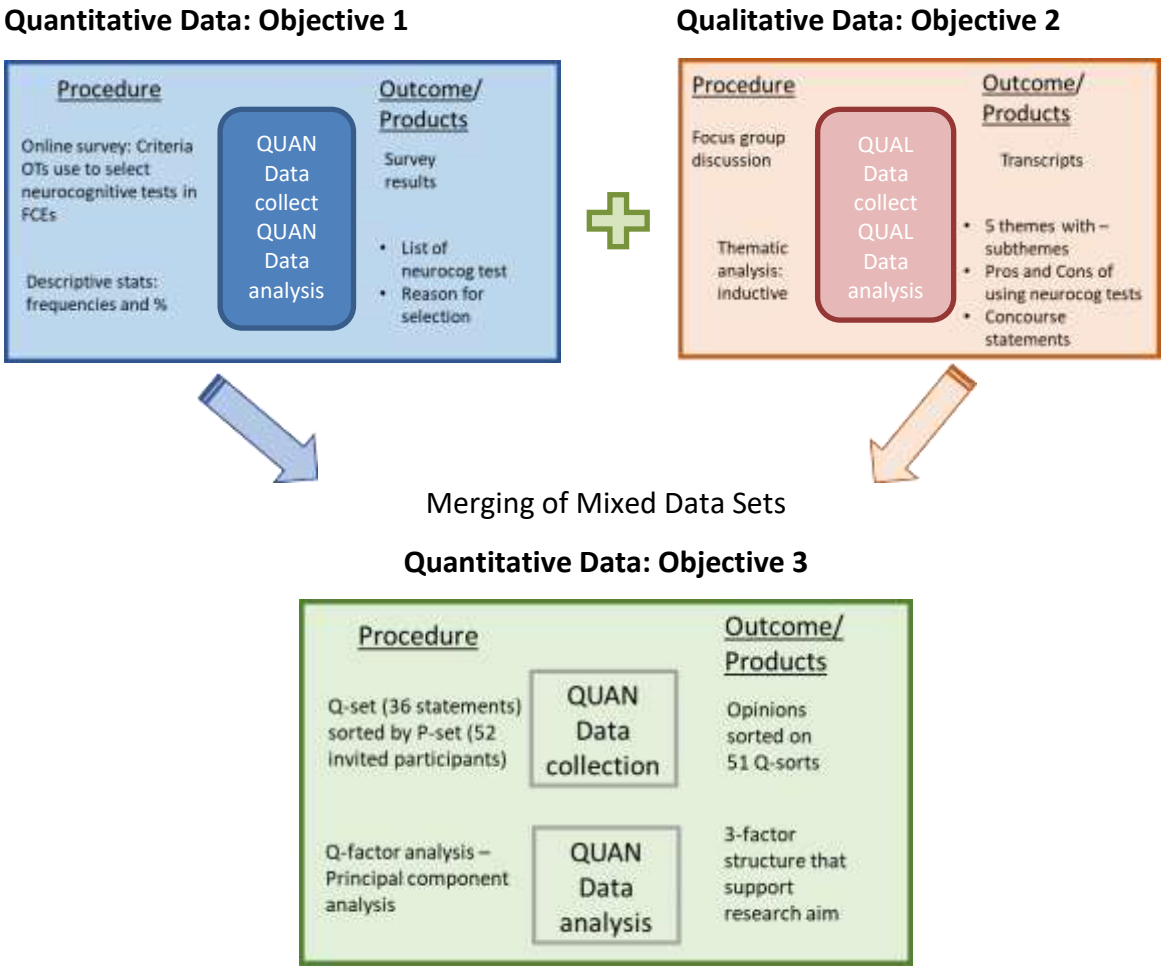


Figure 3.1: A convergent design using the results-based model of convergence.

The data for the first objective of the study was collected by means of survey results, which entailed descriptive statistics of frequencies and percentages. The questionnaire was used as a preliminary tool to ascertain what tests are commonly being used in the field and the criteria

and reasons for the use of the tests by occupational therapists. Data from the questionnaire continued to be collected whilst the focus groups were being conducted in the study.

For the second objective, focus group discussions yielded qualitative data by exploring the perceptions of occupational therapists of the value and clinical utility of the tests being commonly used in the field of functional capacity evaluation. This study used focus groups as the discussions generated with small groups of participants, allowing for various opinions and viewpoints to be expressed and further allowed participants to validate or challenge each other's viewpoints (Skjutar et al., 2010). In this study, themes emerged from the focus groups, which were used to generate the concourse statements (also called the Q-sample) for the Q-Methodology study.

The third objective of the study used the Q-methodology research method. This method gathers both qualitative and quantitative data to study the subjectivity of participants opinions and perceptions (Paige, 2016; Sklarwitz, 2017). The use of Q-methodology has the advantage of removing the researchers' subjectivity whilst studying opinions of the participants (Du Plessis, 2005). The Q-methodology was used in this study to enhance the rigour as the study focused on exploring the subjective opinion of occupational therapists on the clinical utility of commonly used standardised neurocognitive tests in assessing occupational performance in Functional Capacity Evaluation.

3.2.1 Overview of Q-Methodology

The Q-methodology comprised of five steps namely the concourse, deriving Q-set of statements, selecting the P-Set ranking the statements in the Q-sort and analysis of the data in the Q-factor analysis (Van Exel and De Graaf, 2005). Refer to section 3.6 for a detailed description of the steps in Q-methodology research method.

Step 1 was to generate concourse statements on a specific topic as explained above. The concourse is extensive and may comprise of more than 150 statements for example (Bartlett and DeWeese, 2014; Van Exel and de Graaf, 2005; Paige and Morin, 2014). Concourse statements represent a specific topic. In this study, the topic was the use of neurocognitive

tests and their usefulness and relevance to assess occupational performance in clients who are referred for functional capacity evaluations.

Step 2 involves deriving the Q-set whereby the list of statements from the concourse are refined by grouping similar statements, deleting repetitions, rewording and formulating statements to reduce the number of statements (Van Exel and De Graaf, 2005; Bartlett and DeWeese, 2014).The final statements are then printed on cards to be used in Step 3, called the Q-sort.

Step 3 involves selecting the P-Set, which is the sample of participants to which the Q-sort was be administered.

Step 4 entails the P-set ranking the statements in the Q-sort. The statements are ranked by the participants by placement of the statement cards (Q-set) onto a paper-based Q-sort normal distribution grid. Participants ranked the statements ranging from strongly agree to strongly disagree, represented on the paper-based grid. The grid matrix takes on a normal curve distribution, with "neutral" in the middle and on the polar extremes of the grid are "strongly agree" and "strongly disagree". The grid is given numerical distributions ranging from -4 to +4. The researcher provided instructions to participants to do the q-sort.

Step 5 is the Q-factor analysis of the Q-sorts using a Q-methodology analysis programme. Q-factor analysis establishes the similarities or differences between participants views and opinions (Van Exel and De Graaf, 2005) and patterns or factors of viewpoints emerge. Refer to section 3.7 for a full explanation of the Q-factor analysis.

3.3 Study Population and Sample

The participants for all the objectives of the study were occupational therapists conducting functional capacity evaluations for medico-legal purposes, insurance claims, or vocational rehabilitation.

3.3.1 Sample of Participants

- Objective 1: Questionnaire

The sample for Objective One was conveniently selected based on their expertise in functional capacity evaluations. Additionally, individual emails were sent out to identified occupational therapists on data bases such as med-pages and occupational therapy interest groups

directed to occupational therapists who are conducting functional capacity evaluations and vocational rehabilitation practice in South Africa. Inclusion criteria for participants were that they are occupational therapists with at least an undergraduate degree qualification and had to have more than two years of experience conducting functional capacity evaluation; and that they were using standardised cognitive assessment tools in their assessment practice.

- Objective 2: Focus group

A purposive sample of participants situated in the greater Gauteng and Pretoria area were included as Gauteng and Pretoria present with a large number of occupational therapists conducting functional capacity evaluations in South Africa. The selection criteria for inclusion were occupational therapists with more than two years of experience in conducting functional capacity evaluations, and those with experience using neuro-cognitive assessment in their clinical setting. Potentially, a person who participated in the survey, could also volunteer for the focus groups thus an overlap of participants between objective 1 and 2.

A range of perceptions were encouraged from the participant sample, as with the inclusion of newer occupational therapists in the field providing a more current view, and the more experienced occupational therapists providing a more familiar longstanding perspective. The study aimed at a focus group size comprising of not less than four and not more than six participants in a group so as encourage each participants to articulate their experiences and opinions in an open, unrestricted dialogue. The proposed sample size was approximately 20 participants.

- Objective 3 : P-set (q-sort participants)

The study population consisted of occupational therapist working in the field of functional capacity evaluation and medico-legal assessments using standardised neurocognitive assessment tools. Purposive sampling was used for this objective as the invitation for participation was sent out to the initial database of participants as per Objective One. This, thus included and allowed for many of the same participants who participated in the survey and focus groups to participate in the q-sort as they were again invited to participate in the Q-sort. As the data collection occurred face-to-face occupational therapists situated in the greater Gauteng and Pretoria were invited. In Q-Methodology terminology, the participants who do the Q-sort, are called the P-set.

Existing literature states that the P-set must comprise of participants who are familiar with the topic and have an opinion on the information being studied (Van Exel and De Graaf, 2005). Van Exel and De Graaf (2005) stated that the P-set does need to be a large number, as even a small number of people are required to position a large number of statements so that a generalisation on viewpoints can be made on the defined topic, rather than on the population. When using Q-sort technique, significant opinions can be obtained with a small number of participants with a diverse knowledge and experience (Hensel and Change, 2017; Zabala 2014; Du Plessis, 2005; Bartlett and DeWesse, 2014; Ramlo, 2015; Brown, 2016). A p-set sample between 40 to 60 participants is considered to be most effective (Stainton Rogers, 1995). The proposed sample size for the p-set in this study was at least 50 participants.

The inclusion criteria for the occupational therapist participating in the Q-sort of the study was that they have more than two years of experience conducting functional capacity evaluation and were using standardised cognitive assessment tools in assessment of cognition.

3.4 Study Setting

The study setting involved a mix of on-line participant responses, and face-to-face interactions with participants.

Questionnaires were distributed electronically to occupational therapists situated in South Africa.

The focus groups took place at venues suitable to the geographic locations of the participants in the south of Johannesburg, north Johannesburg and Pretoria.

The Q-sort was carried out face-to-face with participants at various venues in Johannesburg and Pretoria that were convenient for the participants which included at or near their practice locations.

3.5 Data collection techniques and procedures

The following data collection procedure was carried out in the study in this sequence:

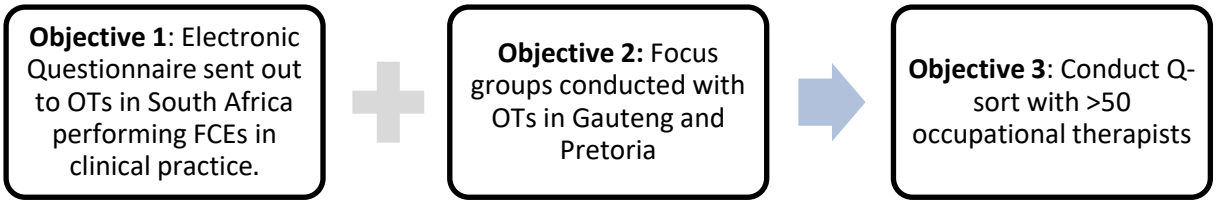


Figure 3.2 The convergent nature of the study.

3.5.1 Questionnaire (Objective 1):

A self-administered on-line questionnaire developed by the researcher in REDCAP software was used to obtain demographic data, a list of commonly used neuro-cognitive tests being used in the field and the reasons for the use of the tests. The questionnaire was piloted to two occupational therapists working in the field of functional capacity evaluations. The questionnaire was then edited as per their critiques and reformulated. The edited questionnaire was then sent back to the respective occupational therapists for verification and confirmation that all change was affected.

An electronic questionnaire via REDCAP was emailed to participants in South Africa. The questionnaire was sent via email with a link which opened the questionnaire and could easily be filled out on a computer, tablet, or cell phone. A sample of the questionnaire is in Appendix E.

The questionnaire comprised of both structured and unstructured questions which left options for elaboration (Rowley, 2014).

The structure of the questionnaire was as follows:

- The layout of the questionnaire consisted of an introduction, demographic profile and possible tests that participants use. The participants were introduced to the research and thanked for their participation in the study. Demographic data was then obtained in closed ended questions comprising of the participants age, gender (male or female

option), location of practice (open ended question), qualifications (undergraduate degree only, post-graduate diploma, master's degree, or PhD qualification in tick box options), years of experience (1-10> tick box options) in the field conducting functional capacity evaluations. Closed ended questions followed which comprised determining whether or not participants are using specific functional capacity evaluation protocols in practice (yes or no tick box options, and if yes, name the protocol used), and to list the standardised neurocognitive test they are using in practice. The questionnaire allowed for eight answers to be provided. Once a test name was filled in and the space allocated, a drop-down menu appeared with various options (refer to Appendix E) for the reasons or deciding factors for use of the test, which entailed qualitative data. Once a test is listed in the allocated space, a drop-down menu would subsequently appear below for the specific test named. The participant would then select the most suitable options for the test in question.

- Size: The questionnaire comprised of seven demographic questions (mostly closed ended questions) and eight options for tests to be named (open-ended questions with a variety of test possibilities to be named). The questionnaire was limited to eight options to keep the survey concise. Only when a test name was filled in and the space available would a drop down menu of 11 reasons or deciding factors (tick box options which are restricted closed ended options) appear, as well as an open-ended option of 'other comments'.

- Clarity: The objective was made clear in the questioning with the main intention to obtain the names of the standardised test being used and the reasons or deciding factors for the use of the selected test. Simple language and vocabulary that was familiar in the field of occupational therapy with short to the point questions was used.

- The participants submitted their complete questionnaire on the REDCAP system.

- Upon receipt and review of the completed questionnaire the data was analysed and documented. The commonly used tests derived from the questionnaires and the criteria for the selection and use of these tests were used as a frame of reference for the focus groups.

3.5.2 Focus Groups (Objective 2):

The researcher compiled focus group questions which was piloted to two occupational therapists; one conducting functional capacity evaluations in her private practice; and another academic lecturer not involved in the study. This was done so as to determine whether the questions yielded information valid to the study. This process helped to identify main issues, and form the basis of the type of questions to be used in the focus groups. In the piloting process it was proposed that tests that started began to present in the questionnaire date be included in the questions to set the context for the participants. It was discussed that the participants would have either already participated in the questionnaire or are aware of the questionnaire as they too would have received the invitation for the concurrent questionnaire being carried out. It was further highlighted that irrespective, the sample would have a working understanding and knowledge of using standardised tests in functional capacity evaluations. The piloting occupational therapists stressed that the researcher should focus on the unique South African context and perspective when questioning and probing in the focus group. Questions were rephrased to focus on occupational performance instead of functional abilities. Repetitions of questions and ways in which questions ought to be rephrased for clarity and limit bias were explored and the piloting occupational therapist made suggestions as to how the questions ought to be changed. Refer to Appendix F for the Interview Schedule.

Potential participants located in Johannesburg and Pretoria conducting functional capacity evaluations including those who may have participated in the questionnaire were emailed a letter of invitation to the focus groups. The participants volunteered via email, and were contacted telephonically by the researcher to set up a suitable time and date for the scheduled focus groups. All sessions were audio recorded with consent and thereafter transcribed.

- Structure of the focus group: the researcher began by introducing the study and what was expected of participants in the focus group. Each participant was identified with a code as P1, P2, P3 and P4 and verbalised their number prior to contributing their opinion in the group throughout the session.

A brief overview of the data on the tests named in the questionnaire was provided in order to introduce the topic with the open question. Thereafter, each interview schedule question was posed in sequential order.

- An interview schedule for the focus groups with the probing questions was carried out (Refer to Appendix F).

- The researcher had to remain mindful not to lead or express bias and focus solely on the participants views. The researcher attempted to demonstrate listening and understanding by paraphrasing what was expressed by the participants following each question.
- The focus groups were carried out until data saturation, or no new themes are were obtained on the occupational therapists perception of the use of the tests. The duration of the focus groups were between one to two hours per group. Four focus groups were conducted comprising of 4-5 participants each.
- The research took notes throughout the focus group to record the featuring themes and to observe if any new opinions emerged during each focus group.
- Bracketing was done during data collection so as to reduce researchers own bias. This method is used in qualitative research in order to limit bias and preconceptions that might impact on the research, and which may improve the rigour of the study (Creswell, 2009; Tufford & Newman, 2010).
- All sessions were audio recorded. The sessions were saved on an audio file and emailed to the transcriber after each session.

- Each focus group was then transcribed to analyse the data.

- The transcriptions were then uploaded to the MAXQDA programme for analysis of the focus group data. MAXQDA is a widely used data analysis software programme used for qualitative and mixed-methods research (VERBI Software, 2019). The programme was used for qualitative text analyses in this study (refer to Section 3.7 for the detailed data analysis procedure using MAXQDA).

- The researcher analysed each focus group session and drew out themes as the sessions occurred. The researcher ceased collecting data from the focus groups at the

point when no new themes arose. The themes identified were formulated into statements, and were used to formulate the concourse for the q-sort in the final stage of data collection.

3.5.3 Q-methodology (Objective 3):

In the third objective of the study, the Q Methodology research method was used.

Step 1: Determining the concourse: The researcher obtained a comprehensive list of statements of all the viewpoints and perceptions that were made in the focus groups. This extensive list of statements is known as the concourse and it encompasses all the possible viewpoints on a given topic (Bartlett and DeWeese, 2014; Van Exel and de Graaf, 2005; Paige and Morin, 2014). The themes that arose from the focus groups was used to formulate the statements for the concourse. There were 56 statements derived from five themes in the concourse (Refer to Appendix G). The statements were piloted to two occupational therapists who contributed to editing the statements. Statements that were repeated or had similar meanings were removed and the therapists assisted in improving the clarity of statements. After the piloting process, 36 statements were retained as the final Q set (Refer to Appendix H).

Thirty-six statements are considered as an acceptable number for the Q-sort to be sorted on a normal distribution curve. Any Q-set with more than 12 statements is considered in the acceptable range for the Q-sort distribution (Sklarwitz, 2017; Cross, 2005). Refer to section 3.7 for a full explanation of the analysis.

Step 2: Deriving a Q-set: For this study, the concourse was piloted to two occupational therapists familiar with the subject matter, one an academic, and one in private practice, so as to critically review: the relevance of the statements to the research question; clarity of formulation; and variety of statements. The final Q-set was finalised and statements were printed onto small cards to be used in the Q-sort. Each card was numbered on the reverse for analysis of the card sorting (Bartlett and DeWeese, 2014). The number of statements generated on the cards had to be enough to fit a normal distribution grid. This number of statements was manageable for the occupational therapists to sort on the grid and is

considered a fair quantity to be compared against each other (Sklarwitz,2017; Cross, 2005). Refer to section 3.7 for a full explanation of the analysis.

Step 3. Selecting the P-Set: This is the sample of participants that the Q-sort was administered to. For this study, the researcher aimed for a sample of at least 50 participants comprising of an overlap of participants who participated in the questionnaire and the focus group. Refer to section 3.7 for a full explanation of the analysis.

Step 4. Ranking of the statements in the Q-sort: A forced Q-sort was used in the data collection which expected the participants to rank the statements against each other on the normal distribution grid. This method of a forced Q-sort reduces bias of individual opinions due to the ranking process and the comparison of statements to each other on the grid (Sklarwitz,2017).

Clear instructions were given to the participant (Refer to Appendix I) and it was explained that all 36 cards needed to be placed on the normal distribution grid. The participants were instructed that one card placement per slot on the grid was allowed by each participant. Therefore, each card had to be placed on the grid with only one card per slot and no cards could be left unplaced. This forced participants to think about each statement, compare to each other and rearrange statements until they are satisfied.

The process of the Q-sort was explained to the participants. They were instructed to read each statement and do a pre-screening of the statements by placing the cards in an agree, disagree and neutral pile. After that, they had to proceed and place the cards onto the normal distribution grid in the marked position that they feel is most appropriate to the statement on the card. They were made aware that there are 36 cards and 36 slots on the grid. The researcher explained that the grid is arranged with numerical distribution from -4 strongly disagree to +4 strongly agree, with 0 being neutral in the middle of the grid. The statements were ranked by the participants by placement of the statement cards (Q-set) onto a paper-based Q-sort grid ranging from strongly agree to strongly disagree (Appendix I, Figure 1). The participants were allowed to shuffle the cards around until they were satisfied with their distribution on the grid.

After the participants performed the Q-sort, the researcher made field notes of their verbal comments to enhance the understanding of their perceptions. The researcher observed the Q-sort of each participant to make sure there is only one statement per slot and the researcher asked participants for reasons on their specific placements of the statements.

Once complete, the researcher asked each participant to turn over their statement cards on the specific slots according to their placement on the grid and a picture of a completed Q sort was photographically captured (figure 3.3). Each participant's completed grid was identified by their participant number for example P1, P2…P51 etc. Thereafter, each completed grid was transcribed onto paper for analysis of the data.

The participants responses were recorded by the researcher. Refer to section 3.7 for a full explanation of the analysis.

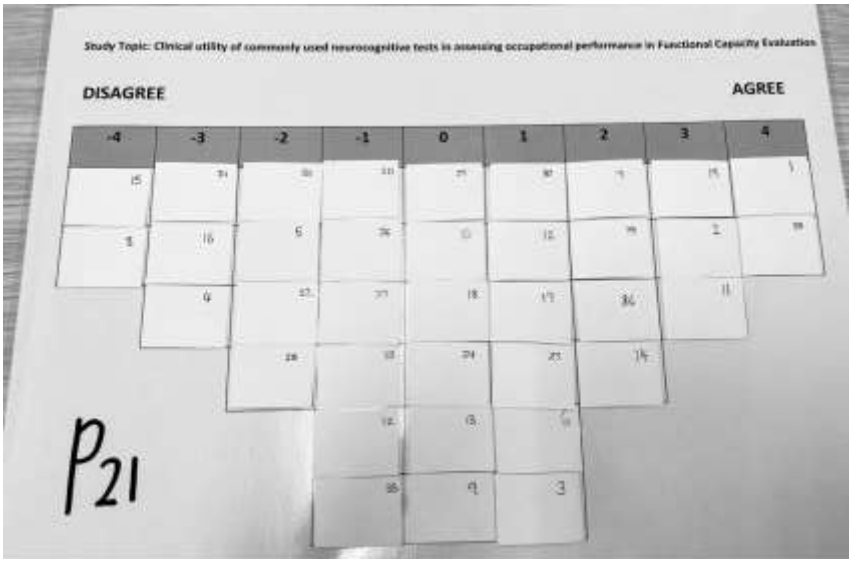


Figure 3.3: Photographic example of completed Q-sort grid.

Step 5. Q-factor analysis: Finally, the researcher analysed the data using the Q-methodology analysis programme. A Q-factor analysis was done as the last step of data analysis to quantitively describe the perceptions of the participants. Refer to section 3.7 for a full explanation of the analysis.

3.6 Data Analysis

Objective 1: Descriptive analysis was used in analysing the questionnaire data. All data acquired on the REDCAP software was generated as graphs and tabulated in the software program as a report. This data was then downloaded by the researcher and reported as descriptive statistics.

Objective 2: The focus group transcripts were analysed using thematic analysis which is a qualitative method of identifying and analysing themes in the focus group data. This form of analysis helps to organise the data and identify patterns in the data by thematic coding (Braun and Clarke, 2006). A theme describes a prevalence in a pattern across the whole data set. Thematic analysis can be either inductive or theoretical. For the purpose of this study an inductive thematic analysis was done whereby themes that arose are derived from the data itself and not by a pre-existing theoretic topic. The themes arising are thus data-driven and allows for rich description of the topic at hand to be identified (Braun and Clarke, 2006).

Thematic analysis was used and was done in a step-by-step order. Verbatim transcription of the data obtained in the individual focus groups was done, where the accuracy of the transcriptions was checked and compared to the audio recording by the researcher. The researcher read and re-read transcripts while making notes, after which the transcripts were uploaded onto the MAXQDA software, and the information was broken down into codes using MAXQDA programme (Refer to Appendix J for coding list) and these codes were then grouped into clusters, and eventually into categories from which sub-themes and themes were identified. A colour coded system was used to highlight specific themes whilst the researcher was analysing the data. Triangulation was achieved as the researcher took notes of the participants verbalised views, opinion, and perceptions, and then referenced and triangulated these views with the themes that arose during the data analysis of the focus groups.

Objective 3: The themes that arose in the focus groups were then further analysed to derive the concourse and Q-set for Objective 3 and to carry out the first step of this objective in the study.

From the focus group, the researcher analysed the data and derived codes which were used to group the viewpoints into thirty four categories, ten sub-themes and five themes. From the five themes a comprehensive list of statements reflecting all the viewpoints of the participants was compiled. This list of statements made up the concourse. Fifty-six statements from the data defined the concourse. The 56 statements were then piloted to two occupational therapists, one clinician and one academic therapist who both have an extensive knowledge and experience in performing functional capacity evaluations and were completely independent of the study. Both OTs were external reviewers and assisted in editing the statements with the following input: limit ambiguity and repetition, phrasing of statements to improve clarity and meaning, making sure that all the viewpoints were represented and retaining the objectivity of the statements reflecting both positive and negative statements. After the piloting process and following the deletion of various statements, 36 statements made up the final Q set (Refer to Appendix H).

The Q-set was used in the Q-sort and analysed with Q- factor analysis using the KenQ analysis version 1.0.6 online software programme (Banasick, 2019).

The person-by-person factor analysis of the Q-sort data allowed for relationships or correlations to be drawn between the participants and factors as it emerged (Van Exel and de Graaf, 2005; Watts and Stenner, 2012). With the factor analysis also known as a data reduction method, fewer factors are generated in comparison to the number of Q-sorts completed because the participants data load onto factors. Factor loading expresses the relationship of each variable (where the participants' views or sorts are the variables) to the underlying factor. Factors are formed when participants with similar Q sort grids have similar opinions in certain positions. Each Q-sort load onto a factor depending on how well the Q-sort relate to that factor. Some Q-sorts may not load onto any factor, due to very different placements, and not having any other Q-sorts with more or less similar placements. Each factor has a degree of overall variance in the observed variables. The factors are always listed in order of how much variation they explain. The value of how much of the variance extracted from each factor is known as the eigenvalue. Any factor with an eigenvalue ≥1 explains more variance than a single observed variable. The factors that have a low eigenvalue which indicated the least amount of variance explained, was discarded (Van Exel and de Graaf, 2005; Watts and Stenner, 2012).

The Q-methodology analysis of the Q-sort comprises of the following steps:

- Each Q-sort with its participants code were loaded onto the KenQ analysis system. The participant demographics were coding and expressed as follows:
    - Number = Participant study number, F = Female, M= Male,
    - Second Number = Age range in years (1 = 20 -29, 2 =30 -39, 3 = 40 -49, 4 = 50 -59, 5 = >60)
    - Alphabet = Level of education (U = Undergraduate Degree, M = Master's Degree, P= Postgraduate Diploma)
    - Third number = Years of experience
- Q-sorts data were manually entered in the order of the numerical matrix of the grid into Ken-Q Analysis system.

- After all the data were captured, the Q-factor analysis was run.

The Q-sorts data were analysed according to the process described by Van Exel and De Graaf, (2005) and Watts and Stenner, (2012) as follows:

Correlation Matrix: The first step of the factor analysis is to calculate the correlation matrix of the Q-sorts which is the extent of similarity and difference in the perceptions of the p-set and the extent of the relationships that is present in the q-sorts data sets. A correlation of 1.00 indicates a perfect agreement between the participants and a correlation of -1.00 indicates a perfect negative relationship, Thus correlations closer to 1.00 indicates common themes in the participants views or perceptions (Van Exel & De Graaf, 2005).

Factor Extraction: Factors are extracted from the correlation matrix. Factors are generated from the participants Q-sorts loading on a factor (Watts and Stenner, 2012). The eigenvalue explains how much of variance there is in the observed variables of a factor. A factor with an eigenvalue greater than 1 explains more variance than a single observed variable thus the greater the eigen value the greater the loading on the sample's opinion.

There are two methods of factor extraction, viz. centroid and principal component analysis. The principal component analysis was used in this study because it uses the best mathematical solution to extract the factors. The centroid method is done when the researcher wants more options to rotate the factors (Watts and Stenner, 2012). After factor

extraction, factor rotation is conducted so to determine whether another pattern of factors emerge.

Factor Rotation: Factor rotation is done so as to maintain as much variance between factors (Watts and Stenner, 2012). This allows the researcher to view the participants perceptions from different perspectives (Osborne, 2015). Varimax rotation was used in the factor analysis as an objective statistical principle (Van Exel and De Graaf, 2005). Once the rotation is completed, factor scores and differential scores are calculated also known as z-scores. Z-scores are used to identify distinguishing and consensus statements. The factor scores range from positive to negative values. Z-scores closer to 1 or -1 are significant and show a correlation of the statement to the factor. Z-scores closer to 0 shows a weak correlation (Zabala, 2014). Z-scores or factor scores indicate how strongly a participant's Q-sort correlates with the factor. Distinguishing statements are statements that were significant in one factor and distinctly show the uniqueness of that factor's viewpoint. Consensus statements are statements that were significant in more than one factor. The differences and similarities between factors are thus highlighted by distinguishing and consensus statements.

Factor Interpretation: The last step in the factor analysis is factor interpretation where the researcher interprets the ranking and distribution of the participants statements and the z-score, and loading for each factor. Factor loading is the relationship of each variable to the underlying factor thus the higher the loading the stronger the association of the variable to the underlying latent variable (in this case the latent variables are the q-sorts) (Kelly and Young, 2017). Factors were also named so as to identify the different viewpoints. This was a qualitative process, undertaken by inspecting the type of statements that loaded onto a factor, and deciding on a name or label that represents those statements. The researcher further interprets and discusses the distinguishing and consensus statements, and what these mean in terms of the research question and objectives.

Mixing of the data from the qualitative (Objective One) and quantitative sets (Objectives Two and Three) were analysed and merged to derive the overall perceptions of clinical utility on the use of standardised tests in assessing occupational performance from a South African perspective. Although the quantitative findings were not directly used in the q-methodology, these results were used to compare, support and related the findings of the perceptions of

the participants. The mixing of the various findings from the three data sets allowed for the interpretation and understanding of what is occurring in the South African context. Thus the findings of the quantitative survey data was used to support the perceptions expressed in the qualitative findings and ultimately answering the research question. By merging the various data sets a comprehensive picture of what tests are being used, reasons for use of such tests and the value or usefulness of these test could be explored and derived in the study.

Table 3.1 summarises the objectives, sample, type of data, data collection techniques, and data analysis.

Table 3.1: Summary of Methodology

Objectives	**Sample**	**Data Collection Techniques**	**Types of Data**	**Data Analysis**
Objective 1				
To determine the criteria occupational therapists use in selecting neurocognitive test for a functional capacity evaluation.	Occupational therapists conducting functional capacity evaluations	Self-administered questionnaire	Qualitative Data	Descriptive Analysis
Objective 2				
To explore occupational therapists' perception on the intended use of neurocognitive tests, the clinical use, and the value of these tests in functional capacity evaluation.	Occupational therapists conducting functional capacity evaluations	Focus Groups	Qualitative Data	Thematic Analysis
Objective 3				
To establish a pattern of subjective viewpoints on the clinical utility of neurocognitive tests in assessing occupational performance in functional capacity evaluations.	Occupational Therapists who took part in the Focus Group and OTs conducting functional capacity evaluations	Forced Q- sort: ranking statements on a normal distribution grid	Quantitative Data	Q-methodology Factor analysis

3.7 Ethical Considerations

The Health Professions Council of South Africa general ethical guidelines informed and directed the ethical considerations carried out in this research study (HPCSA, 2016).Ethical considerations of this research study were carried out throughout all interactions with human participants and their personal data to respect their autonomy, privacy, and confidentiality, as well as to protect the participants from harm (Guillemin and Gillam, 2004).

In accordance with the National Health Act (Act No. 61 of 2003), this study's research protocol was approved unconditionally by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand before the researcher commenced the study (Refer to Appendix C).

Information was provided to participants in the English language, wherein it was assumed by the researcher that the study sample report on the functional capacity findings in the English language, and therefore that their fluency and understanding of the language would suffice for the understanding of the study information.

Participants were advised in writing of the voluntary nature of their participation and that they could withdraw from the study at any time without penalty for each form of data collection i.e., online questionnaire, focus groups, and Q-sort. Participation at all data collection points was voluntary and not coerced. Each participant was provided with the research objectives that were clearly defined in the information sheet provided on request of their participation and on acceptance to participate in the study.

Objective 1: Online questionnaire: Informed consent was informed and assumed automatically when the participants completed the online questionnaire of their own volition. Client names were not recorded at any stage and their demographic details were captured on the REDCAP system. Only the researcher had access to this information on the password protected data capturing system.

Objective 2 and 3: Focus group and Q-sort: Prior to the commencement of the focus group the researcher requested each participant to sign two written consent forms (participation in study and audio-recording consent). Refer to Appendix D for the respective consent forms. The written consent was requested prior to commencement of the Q-sort. The research

objectives that were clearly defined in the information sheet and discussed with the participants face-to-face in the focus groups. The role of the participants was clearly stated, such that they are aware of their participation in the focus group and Q-sort group sessions, and the approximate duration of their time needed. For both the focus group and the Q-sort, provisions were made for documenting the data collected so as to ensure the confidentiality of the participants. Each participant was identified by a number such as P1, P2, P3 etc. In the focus group, the participants were requested to indicate their participant number preceding their discussion points and thus the audio recording and transcription details the participant numbers and not names or identifying demographics of the participants.

Findings of the study will be made available to participants and dissemination of the study will not include any participant names and nor will any identifying demographics appear in future manuscripts for publication.

3.8 Summary

This chapter described the research design which was a mixed method study and specifically the convergent design. Details of the data collection for the three objectives of the study namely the questionnaire, focus group and Q methodology approach were detailed in terms of how the data were analysed. This chapter further described the ethical considerations of the study. The next chapter will cover the findings of the study.

CHAPTER 4

Findings of the study

4.1 Introduction

This chapter describes the findings of the quantitative and qualitative data and results of from the study. Each objective and the findings will be described and a presentation of the demographic details of the participants in the different objectives will be detailed. For Objective 1 of the study the findings of the questionnaire listing the commonly used standardised neurocognitive tests and the criteria and reasons for the participants using such tests in their assessments are detailed.

For Objective 2 of the study; the perceptions of the participants on the clinical utility of the tests generated in focus groups are presented.

For the Objective 3, the findings of the Q-methodology Q-sort findings with the factor loadings are described and a factor array (based on Factor 1), with the most common viewpoint being presented.

4.2 Objective 1: Survey on commonly used tests and the criteria for test selection

4.2.1 Description of the sample

The participants in this phase of the study were occupational therapists conducting functional capacity evaluations with more than two years' experience in this specialised field. More than seventy occupational therapists were invited to participate in the study and only 39 responses were received, representing a 55.7% response rate. However, one participants response (Participant 3) had to be discarded from the sample as she indicated one year of experience in the field which was outside the inclusion criterion of two years; thus adjusting the valid response rate to 54.4 percent.

The demographics of participants are presented in Table 4.1:

Table 4.1: Participants Demographics

	Number (n=38)	**Percentage %**	**Mean**	**Standard Deviation**
Sex:				
Male	1	2.6	-	-
Female	37	97.4	-	-
Age ranges:				
20- 29 years	4	10.5	27.75	1.89
30- 39 years	23	60.5	34.30	3.00
40-49 years	6	15.8	43.83	3.35
50-59 years	4	10.5	52	3.37
>60 years	1	2.6	62	-
Years of experience:				
2-5 years	7	18.4	3.38	1.19
6-10 years	18	47.4	7.39	0.78
>10 years	13	34.2	10	0
Level of Education:				
Undergraduate degree	16	42.1	-	-
Postgraduate diploma	16	42.1	-	-
Master's degree	6	15.8	-	-
Use of standardised protocol:				
Yes- using a protocol	33	86.8	-	-
No- not using a protocol	5	13.2	-	-
Location of participants' practice:				
Johannesburg	30	78.9	-	-
Pretoria	3	7.9	-	-
Bloemfontein	1	2.6	-	-
Kwa-Zulu Natal	1	2.6	-	-
Western Cape	1	2.6	-	-
Limpopo	1	2.6	-	-
North West Province	1	2.6	-	-

The findings presented in Table 4.1 above describe the demographics on 38 occupational therapist working in the field of functional capacity evaluation who participated in the questionnaire in the study. The majority (97.4%) of the occupational therapist are female with only one (2.6%) being male. The majority of the occupational therapists (60.5%) are between the ages of 30 and 39 years, with 26.3% of the occupational therapist aged between 40 and 59 years old. It can be seen from the sample demographic table above that most occupational therapists (57.9%) have achieved either a post-graduate diploma or a master's degree, with less than half the sample 42.1% having achieved an undergraduate degree only. Almost half the sample 47.4% have between 6-10 years of experience in the field of functional capacity evaluation and 34.2 % of participants having more than 10 years of experience in performing functional capacity evaluations. The sample thus comprised of more experienced and higher qualified participants with most occupational therapists practicing in the Johannesburg area (78.9%) and only 3 (7.9%) from Pretoria . Only five other provinces with only one respondent per province participated in the study.

4.2.2 Commonly used standardised neurocognitive tests and criteria for test selection

The study yielded 38 tests as detailed in Appendix K. Due to low frequency of use less than four was not considered as frequently or commonly used in the sample and a cut off of 5 was used in the study. For the purposes of the study a frequency of five and above was considered clinically relevant.

The most commonly used standardised neurocognitive tests identified by the participants are presented in Table 4.2.

Table 4.2: Frequency of use of the commonly used standardised tests.

Name of test	Frequency of use in sample:	Percentage of Use in sample:
1. Repeatable Battery for the Assessment of Neuropsychological Status (RBANS)	23	60.5
2. Montreal Cognitive Assessment (MoCA)	20	52.6
3. Cognitive Assessment of Minnesota (CAM)	16	42.1
4. Brief Neuropsychological Cognitive Evaluation (BNCE)	7	18.4
5. Hirebright Cognitive Ability Test (H-CAT)	7	18.4
6. Ruff 2 and 7 Selection Test (R2+7ST)	7	18.4
7. Work Ability Screening Profile (WASP)	6	15.7
8. Psychiatric FCE (PFCE)	5	13.1
9. VALPAR VCWS Work Sample 6 (VALPAR 6)	5	13.1
10. Contextual Memory Test (CMT)	5	13.1

The findings presented in Table 4.2 above indicate the 10 most commonly used standardised neurocognitive assessments by the participants derived from the survey in the study.

The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) was observed to be the most used test with 60.5 % of participants preferring the use of this test. More than half the sample 52.6 % preferred to use the Montreal Cognitive Assessment (MoCA) and 42.1% of participants using the Cognitive Assessment of Minnesota (CAM) in conducting cognitive testing in functional capacity evaluations. The Brief Neuropsychological Cognitive Evaluation (BNCE), Hirebright Cognitive Ability Test (H-CAT), and the Ruff 2 and 7 selection test (R2+7ST) were used by 18.4% of participants.

Table 4.3 details the participants main criteria or reasons for use of a specific test (in percentage).

Table 4.3: Criteria used in neurocognitive test selection.

Name of test	Criteria for test selection and use (%)											
	Freq of use in sample	Freely Available	Cost Effective	Quick to administer	Basic screening tool	Comprehensive assessment tool	Used for low level of education clients	Used for higher cognitive functioning clients	Predominantly used in the field	Provides a good overview of cognition	Uses functional activities in assessment of cognition	Understanding of the client's occupational performance challenges
1. RBANS	23	13.0	8.7	34.7	21.7	39.1	-	39.1	21.7	56.5	-	13.0
2. MoCA	20	75	65	80	85	-	65	10	20	10	-	10
3. CAM	16	-	12.5	43.7	50	31.2	50	31.2	25	68.8	37.5	6.3
4. BNCE	7	-	28.6	71.4	57.1	14.3	57.1	28.6	14.3	42.9	-	14.3
5. H-CAT	7	-	14.3	14.3	14.3	28.6	-	100	-	28.6	-	28.6
6. R2+7ST	7	-	14.3	71.4	14.3	-	28.6	57.1	-	28.6	-	14.3
7. WASP	6	66.7	33.3	33.3	33.3	16.7	66.7	50	-	33.3	33.3	16.7
8. PFCE	5	-	-	-	-	40	40	40	-	20	80	100
9. VALPAR 6	5	-	20	80	20	-	40	60	40	20	-	60
10. CMT	5	40	40	60	20	20	20	60	20	-	20	-

*** NOTE:** The percentages above are calculated using the frequency of use in the sample and not on the whole test population.

Four of the ten tests listed were indicated to be freely available by the sample, viz. RBANS, MoCA, WASP, and CMT. However, this is a misconception on the part of the participants as only the MoCA until recently (September 2019) was freely available from the list above, as the remainder of the tests needed to be purchased at a cost per test and material. The most cost-effective test listed with 65% was the MoCA. Both the MoCA and VALPAR6 were indicated as the quickest tests to administer (80% of the 20 participants who use the test) with the BNCE and R2+7ST at 71.4% (7 participants respectively use these tests). MoCA (85%),

CAM (50%), and the BNCE (57.1%) were indicated as basic cognitive screening tests. The most comprehensive cognitive assessment tools of the list was the RBANS (39.1%) and PFCE (40%). WASP (66.7%) and MoCA (65%) test were noted as the tests most used for low level of education clients and the H-CAT (100%), and R2 + 7 ST (57.1%) were indicated to be most suitable for the assessment of higher functioning clients. Tests that were used with the criteria of predominantly being used in the field are VALPAR VCWS- 6 (40%), CAM (25%), RBANS (21.7), MoCA (20%) and BNCE (14.3%). CAM (68.8), RBANS (56.5%) and the BNCE were chosen as the tests that provides a good overview of cognition. Of all ten tests, only four tests were indicated as using functional activities in their assessment of cognition namely PFCE (80%), CAM (37.5%), WASP (33.3%), and CMT (20%). Overall, when considering the criteria of the tests that gives an understanding of the client's occupational performance challenges, all the participants who make use of the PFCE (100%) indicated this criteria as a reason for test selection. Following this, the VALPAR VCWS- 6 yielded 60% of participants who use this test as selecting it for the above criterion. The tests with the least value in giving an understanding of the client's occupational performance challenges were CMT (0%), CAM (6.3%) and MoCA (10%). The remainder of the tests also scored in percentiles too low for providing an understanding of the client's occupational performance challenges.

Test 1: RBANS: 23 participants noted the use of this test. A majority of the sample that make use of RBANS indicated that it provides a good overview of cognition (56.5%), it is a comprehensive assessment tool (39.1%) and is used for higher cognitive functioning clients (39.1%). The test does not make use of any functional activities (0%) and scores low on giving an understanding of the client's occupational performance challenges (13%).

Test 2: MoCA: 20 participants noted the use of this test. The test scored most favourable for the criteria of freely available (75%); quick to administer (80%); used as a basic screening (85%); being cost-effective; as well as used for low-level functioning clients (65%). Participants responded that this test ought not to be understood as a comprehensive assessment tool, and that it does not make use of functional activities (0%). As additional comments added by the participants in the questionnaire it was noted that participants use this test in combination with other test to supplement the other testing.

Test 3: CAM: Sixteen participants noted the use of this test. This test yielded almost 70% of the participants who indicated that it provides a good overview of cognition. Fifty percent of participants indicate that it is used as a basic screening tool and used on clients with low level of education. This test scored poorly for cost-effectiveness (12.5%) and giving an understanding of the client's occupational performance challenges (6.3%).

Test 4: BNCE: Seven participants noted the use of this test. A majority of the sample that make use of the BNCE note that it is quick to administer (71.4%). More than 50% of test users in the study indicated that it is a basic screening tool and is used with low-level of education clients (57.1%). All participants who use the test record that it is not freely available and does not make use of functional activities for cognitive testing.

Test 5: H-CAT: Seven participants noted the use of this test. All participants who made use of this test note that the test is used for higher level of education clients. Almost a third (28.6 %) of participants indicated that the test is a comprehensive assessment tool, provides a good overview of cognition and gives an understanding of the client's occupational performance challenges. All participants indicate the following criteria of the test as not freely available, not suitable for low level of education clients, is not predominantly used in the field and that is does not use functional activities in assessment of cognition.

Test 6: R2+7ST: Seven participants noted the use of this test. The main criterion participants indicated for this test use is that it is quick to administer (71.4%) and that it can be used for higher level of education clients (57.1%). All participants who use the test that the following criteria applies that it not freely available, it is not a comprehensive assessment tool, not predominantly used in the field and that the test does not use functional activities in the assessment of cognition.

Test 7: WASP: Six participants noted the use of this test. 66.7 participants who use this test indicate that the test is freely available and can be used with low level of education clients. Fifty percent of participants also use this test on higher level of education clients. The least favourable criteria for test use was that it is a comprehensive assessment tool (16.7%) and that it gives an understanding of the client's occupational performance challenges (16.7%).

Test 8: PFCE: Five participants noted the use of this test. All participants who use the PFCE indicate that the test gives an understanding of the client's occupational performance challenges and 80% indicated that the test uses functional activities in assessment of cognition. All participants further reflect the following criteria does not apply to this test selection: it being a freely available, cost-effective, quick to administer, basic screening tool, not predominantly used in the field.

Test 9: VALPAR 6: Five participants noted the use of this test. Of the participants who use the test, 80% note that the test is quick to administer, while 60% indicate that it is used with clients with high levels of education, and that it gives an understanding of the client's occupational performance challenges. All participants did not select the following criteria in test selection; freely available, comprehensive assessment tool and indicate that the test does not make use of functional activities in the assessment of cognition.

Test 10: CMT: Five participants noted the use of this test. Sixty percent of participants who use the test indicated that they make use of the test as it is quick to administer and is suitable for clients with a higher level of education. All test users indicated that the test did not provide a good overview of cognition, nor an understanding of the client's occupational performance challenges.

With consideration of the top-down and bottom-up approach of test formats, only four of the tests, namely the CAM, WASP, PFCE and VALPAR-6 are tests which fall into the category of top-down approach to testing. The remaining six of the commonly used tests namely RBANS, BNCE, H-CAT, MoCA, R2+7ST and CMT all fall into the bottom-up testing approach. The tests with the highest frequency of use by the respondents are the RBANS (60.5% of respondents), MoCA (52.6% of respondents) and the CAM (42.1% of respondents).

4.3 Objective 2: Occupational therapists' perceptions of clinical utility of neurocognitive tests

4.3.1 Description of the sample

The participants in the focus group were occupational therapists located in Gauteng and Pretoria, conducting functional capacity evaluations with more than two years' experience in this field. Six focus groups were planned, however saturation of data was achieved in four focus groups; giving a sample size of 18 participants. For this reason data collection was terminated after the fourth focus group. Each focus group comprised of four to five participants.

The demographics of the focus group participants are presented in Table 4.4 below:

Table 4.4: Focus Group Participants Demographics

	Number (n=18)	**Percentage %**	**Mean**	**Standard Deviation**
Sex				
Female	18	100	-	-
Male	0	0	-	-
Age ranges:				
20- 29 years	1	5.5	26	-
30- 39 years	9	50	34.4	2.46
40-49 years	3	17	44	3.0
50-59 years	4	22	53.3	2.87
>60 years	1	5.5	62	-
Years of experience:				
2-5 years	5	27.7	3.8	1.30
6-10 years	9	50	7.89	1.36
>10 years	4	22.2	10	0
Level of Education				
Undergraduate Degree	8	44.4	-	-
Post-graduate Diploma	4	22.2	-	-
Master's degree	6	33.3	-	-

All the participants were female. Half of the focus group participant sample (50%) were between the ages 30 and 39 years, with 22% of the occupational therapists aged between 50-59 years old. A majority of the occupational therapists (55.5%) have achieved post-graduate training up to a master's degree qualifications. Fifty percent of the population sample had between six to 10 years of experience in the field of functional capacity evaluation and 22.2 % of participants having more than 10 years of experience in performing functional capacity evaluations. Twenty-eight percent of the participants had two to five years of experience in the field of functional capacity evaluations.

4.3.2 Focus group findings

Table 4.5 details the themes, sub-themes and categories that were analysed from the four focus groups.

Table 4.5: Themes, sub-themes and categories that emerged from the focus groups.

Themes →	Sub-themes →	Categories
1. Value of the standardised tests	1. Test outcomes	1. Scores indicating cognitive components 2. Provides a score or number 3. Limited functional indicators
	2. Lack of functional outcomes	4. Link to occupation performance to be established 5. Lack of indicators if the client is able to live independently.
	3. Clinical significance of assessment tool and technique	6. Clinical observations in assessment 7. Test used to add weight to assessor's opinion 8. Comprehensive evaluation technique 9. Test provides baseline to start commenting on function. 10. Test provides a structured assessment process
2. Administration of the tests	4. Limitation in test administration	11. Language barriers 12. Level of education of clients 13. Effects of the use of translators
3. Selection of the tests	5. Test norms, validity and reliability.	14. Appropriateness of the tests to the South African demographic 15. Validity and reliability of the test results 16. Internationally normed tests
	6. Practicalities of tests	17. Variety of tests available 18. Cost factor
	7. Industry Standards in cognitive testing	19. Time of administration of test 20. Tests trending in the industry currently

Themes →	Sub-themes →	Categories
		21. Functional capacity evaluation industry standards being used
4. Format of the tests	8. Format of the tests lack activities	22. Lack of activity-based tasks in the tests 23. Paper and pen based test format 24. Relevance of actual test scores 25. Assessment structure versus real-life job setting 26. Functional activity testing
5. Assessors skills	9. Skills as an assessor and expert witness 10: Skills in test administration.	27. Importance of clinical observation 28. Assessors competence as an expert witness 29. Ability to defend results in court 30. Confidence of assessors in testifying in court 31. Competence of assessors in administering the test 32. Training on the specific tests 33. Role of Neuropsychologist 34. Limitations in scope of practice

The analysis of the focus group data revealed five themes, namely: value of the standardised tests; administration of the tests; selection of the tests; format of the tests and assessors skills. From these five themes, 10 sub-themes and thirty-four categories arose. Findings are represented in Table 4.5 above by displaying the themes, the corresponding sub-themes and categories that were derived from the respective theme.

Theme 1: Value of standardised tests

The theme of value of standardised tests gave rise to three sub-themes, viz. test outcomes, lack of functional outcomes and clinical significance of assessment tool and techniques.

Sub-theme 1: Test outcomes

The participating occupational therapists discussed that standardised neurocognitive test outcomes provide an indication of the clients cognitive abilities which are used to inform their opinion in the clients functional capacity in the evaluation. Under the sub-theme of test outcomes, three categories arose, viz.: scores indicating cognitive components, provides a score or number and limited functional indicators.

The participants recognise that the scores generated from the standardised neurocognitive tests indicate specific cognitive components (for example memory, concentration or attention) and an overall cognitive ability scored against the norms of that test. The OTs recognised that the scores provided an indication of the clients' cognitive deficits and serve as a basic understanding of the clients' cognitive profile. Participants are cited verbatim below.

"The best I find that the test offers me is a potential – there might be potential problems in that particular area that you would then seek to verify." (Focus Group 4, Participant 4, line 62)

The OTs expressed that the strengths of having scores indicating the specific cognitive components add to the credibility, validity, reliability and comprehensiveness of their assessment. They also expressed a strength in using the scores to assist the OT in defending their opinion to the referrer or in a court setting.

"The results are valid and reliable, especially if you have to defend the findings in a court setting, or any setting that you can" (Focus Group 2, Participant 3, line 108*)*

A few participants noted that the scoring of the tests can be complex which may affect the validity of the scores and the interpretation of the findings.

"The scoring is very complicated." (Focus Group 3, Participant 2, line 22)

The participating OTs expressed that having standardised test results in the form of a score or number in their assessment findings is often a requirement of their referrer. Although most participants agreed that these scores or numbers rarely relate to function, they reported having these values in the assessment is often a requirement.

"You know the referral sources would quite heavily rely on what tests we used and is it a standardized kind of test so from that point of view, I feel like it is important for us to actually use tests like that. In our assessments to be able to kind of back ourselves up a little bit

although like we were saying we don't purely rely on those alone." (Focus Group 2, Participant 4, line 59)

The role of the occupational therapist in a functional capacity evaluation is to provide a clinical picture of the clients functional abilities. The limitation of functional indicators was recognised to be a major area of contention in using standardised tests. The analysis of the data highlighted that all of the OTs recognised the shortfall of most neurocognitive standardised tests in providing functional indicators or occupational performance deficits.

"but in terms of occupational performance, the functional implication of the findings are not clear enough" (Focus Group 2, Participant 1, line 40)

"only sometimes that score can correlate to occupational performance, I still get a lot of value from actually seeing how they organise themselves in relation to the task." (Focus Group 3, Participant1, line 58)

The OTs recognised that although the tests provide valuable information on cognitive components the overall opinion was that the link to functional abilities was lacking.

"I think lots of the assessment tools that we using currently assess very important [cognitive] components in function like memory, attention, concentration but I think what's lacking is what we would gain from activity based assessment" (Focus Group 1, Participant 4, line 174)
"They are not useful in giving occupational performance, they have more value in cognition but is the cognition necessarily going to mean anything." (Focus Group 3, Participant 2, line 34)

In contrast, one occupational therapist opined that the standardised tests she makes use of are highly valuable in determining functional abilities, however, discredited the scoring process. She expressed:

"So the test is great, the test is wonderful and it gives you so much information in terms of that person's occupational performance components but the scoring is a problem." (Focus Group 3, Participant 2, line 45)

It was apparent in the data that the expressed limitation has resulted in the OTs relying on their observational skills, the clients behaviour during testing and their clinical reasoning, in order to determine the clients occupational performance.

"A number doesn't actually equate to function. Your observations during the execution of the test, as OTs you actually see a lot of clinical signs of the intensity of a problem"... "so I don't think there's a test that you can just use to get level of performance, occupational performance." (Focus Group 4, Participant 4, line 47)

"I often supplement for occupational performance areas because none of our tests actually really give us an indication." (Focus Group 3, Participant 1, line 36).

The sub-theme of test outcomes overlapped with subtheme 2, which further focussed on the lack of functional outcomes.

<u>Subtheme 2: Lack of functional outcomes</u>

The analysis highlighted the lack of functional outcomes of the tests as expressed by the participants. Two categories were apparent, viz.: link to occupational performance to be established; and lack of indicators if the client is able to live independently.

The link to occupational performance to be established was stressed by the participants as a void in the use of these standardised tests. OTs explained that although the tests provide an indication of the clients cognitive abilities, it does little to assist the therapist in interpreting the scores into occupational performance capabilities.

"...in terms of occupational performance, the functional implication of the findings are not clear enough." (Focus Group 2, Participant 1, line 40)

Participants further elaborated that the test outcomes provide a lack of indicators if the client is able to live independently. It was expressed that the test result can be misleading in

understanding the client functional ability and their ability to live independently. For example, if a client scores in the significantly impaired range of cognition, it does not always indicate that they are incapable of living independently.

" I've often found is that based on the test results, this person shouldn't be living independently for example, but yet they are functioning, they are an active member of the community so purely based on those results it can really give you a completely wrong picture." (Focus Group 2, Participant 4, line 57)

Sub-theme 3: Clinical significance of the assessment tool and techniques

For this sub-theme, five categories emerged, namely clinical observations in assessment; tests are used to add weight to assessor's opinion; comprehensive evaluation technique; test results provides a baseline to start commenting on function; and the test provides a structured assessment process.

Although the OTs explained that they all use the standardised neurocognitive tests in their functional capacity evaluation process, all the therapists agree that they heavily rely on their clinical observation whilst administering the tests. The participants stressed that the use of clinical observation is imperative in their cognitive assessment process. Comments were made that the clinical observations were as important- if not more important- than the test scores themselves.

"...I rely more on observation during the administration of the test than the actual results, so it is more the observation than the actual result." (Focus Group 1, Participant 1, line 55)

The use of standardised neurocognitive tests was also recognised by the participants as adding weight to their clinical opinion.

"I feel like it is important for us to actually use tests like that. In our assessments to be able to kind of back ourselves up a little bit, although like we were saying, we don't purely rely on those scores alone." (Focus Group 2, Participant 4, line 59)

Therapists further elaborated that the standardised test results substantiate their clinical opinion when defending their opinions in court or to the referrer.

"If you going to be taking to court at the stand your lawyers will want to know what standardised test you using and you can't say 'I just observed it'; doesn't make sense." (Focus Group 1, Participant 5, line 68)

One participant disagreed and said: *"I think just because it's a requirement, doesn't make it necessarily better to defend my opinion…you can do functional activities and comment on that and that would be acceptable."* (Focus Group 2, Participant 4, line 76)

OTs unanimously agreed that the use of standardised neurocognitive tests in an FCE is considered a comprehensive evaluation technique and adds to the rigour of the assessment process.

"*I think the strength of them is they increase the comprehensiveness of your assessment."* (Focus Group 3, Participant 3, line 76).

In using standardised assessment tools, many of the participants described that the test administration and the test results provide a baseline to start commenting on function.

"I think another strength for example is that you get a baseline of what even if you have to compare your results in the end with the norms there's a baseline of how the client scored, and that provides just more consistent recordings of what the client is able to do." (Focus Group 4, Participant 1, line 94)

The use of the tests was further described as providing a structured assessment process for the OTs to use in the evaluation. Participants described that the process of administering the test and the format of the tests themselves assisted in providing a structure to the cognitive assessment process.

"I still get a lot of value from actually seeing how they organise themselves in relation to the task, how they actually tackle it, the planning, […] seeing how they follow the instructions, step by step and all those kind of things, versus getting scores given to me, on a paper ...from neuro cognitive assessment." (Focus Group 3, Participant 1, line 58)

Theme 2: Administration of the tests

From Theme 2 on the administration of the tests, the sub-theme limitation in test administration arose.

Sub-theme 4: Limitation in test administration

Limitations in test administration came to the fore as a sub-theme. Three categories arose from the analysis and comprised of language barriers, level of education of clients and effects on the use of translators.

In the focus groups, one of the most stressed and highly re-iterated limitation in the use of standardised neurocognitive test was language barriers. Due to the multitude of official languages in the South African context, participants noted their concerns in using mostly English-medium tests, with no translation possible, as the validity of the tests would be compromised.

"I think the language is a big struggle that we have and that it automatically compromises the validity of our result when we using these standardized test." (Focus Group 1, Participant 4, line 40)

The vast majority of the South African population are not first language English speakers, thus, with the variety of cultural and ethnic backgrounds of the clients that are assessed, the language barrier limitation is profound. This is well detailed by an OT who noted*: "… 90% of my patients are not English and so sometimes we don't even try neurocognitive tests because I deal with a translator and some things are being translated incorrectly so I just defer to the Neuropsychologist."* (Focus Group 1, Participant 1, line 44)

Another challenge noted by the participants was the clients level of education. Many of the tests used are normed for client with at least a Grade 12 level of education and thus the population these test can be used on is limited.

"Level of education is most difficult thing to use in some of these tests." (Focus Group 1, Participant 3, line 42)

"So there are so many tests out there are for our higher functioning [clients], when it comes to a person who may never have gotten educated there's no test that actually helps" (Focus Group 3, Participant 1, line 117)

When considering the South African context and the educational system, there is vast divide in the quality of private, public, and rural education institutions. This was therefore raised as a difficulty for the OTs in selecting and appropriately using standardised tests that were normed for a first world country education system for example:

"*We have quite a wide range of quality of education (3rd world versus 1st world)…*
1st world when tests were established there's a more equally playing field in terms of quality of education, whereas here it would have been so broad, we scoring somebody based on their 12 years of education, but what was the quality of input they received during that time." (Focus Group 1, Participant 4, line 43)

Due to the language barriers often the use of translators in an assessment is employed. However the effects of the use of translators was highlighted as a limitation in carrying out standardised neurocognitive assessment. Participants explained that the use of translators compromises the validity and reliability of the tests.

"…In your home language we compromising the validity of the assessment in any case because it's no longer being done in the language for which it was standardised and that norm referenced information." (Focus Group 1, Participant 4, line 40)

In addition, the therapists recognised that the translators often do not directly translate content and often assist the client.

"I find lot of translators end up helping them" (Focus Group 1, Participant 5, line 45)

Theme 3: Selection of the tests

From the theme of selection of tests three sub-themes arose, namely: test norms, validity and reliability, availability, and practical use of the tests and industry standards in cognitive testing.

Subtheme 5: Test norms, validity and reliability.

The sub-theme of test norms, validity and reliability consisted of three categories, the first of which is appropriateness of the tests to the South African demographic; secondly the variety of tests available; and thirdly internationally normed tests.

As highlighted in the analysis of the focus group discussion previously, appropriateness of the standardised neurocognitive tests to the South African population arose as an area of concern for the OTs.

The majority of the participants expressed the following sentiment "…*these tests are not based on norms for South African individuals"* (Focus Group 2, Participant 2, line 63). Due to the tests mainly being sourced from and validated for first world country populations, the appropriateness of these test for the South African demographic was contentious. Some of the participants have resorted to putting clauses and disclaimers in their report findings to mitigate this limitation.

"we usually including the clause to say please note that this test was not standardised for a South African population so we essentially at the onset saying well here is the standardized score but it's not really the true reflection given the population etc." (Focus Group 1, Participant 4, line 70)

The aforementioned category was further elaborated in the participants views on the questionable validity and reliability of the standardised test results. They questioned the

standardisation of the testing and results if the normed population, language barriers and levels of education were not applicable to the South African demographic. This sub-theme linked to sub-theme 4 in the limitations of test administration.

The participants reflected that due to the tests not being validated for South Africans, the results and interpretation thereof can be called into question. Comments were made that for medico-legal assessments, attorneys may invalidate the results in cross questioning based on the limitations of having tests suitable for the South African demographic.
"...if you were in court and an attorney had to ask you what tests did you use for South African individuals, they're going to grill you on that." (Focus Group 2, Participant 2, line 63)

Subtheme 6: Practicalities of tests

The practicalities of tests was detailed in three categories: variety of tests available, cost factor, and time of administration of the test.

With regard to the variety of tests available category, the participants recognised that there are a variety of standardised neurocognitive tests being used in functional capacity evaluation.

"There's a wide variety of tests in use at the moment" (Focus Group 2, Participant 4, line 129).

As most of these standardised tests are purchased internationally, the participants emphasised the cost factor category. Although prices of the tests vary according to the foreign exchange rate and the therapist often having to purchase numerous standardised tests for evaluation purposes, the high cost implications were expressed as a limitation in using these tests. Many OTs expressed this sentiment: "*…the high cost of buying these tests will be the limiting factors."* (Focus Group 1, Participant 3, line 114)

As with any assessment process, duration of the assessment and allocation of time to various testing measures is the prerogative of the OT in carefully planning the evaluation to obtain relevant information in a reasonable timeframe.

The time of administration of the test is thus a category that the participants discussed in the selection of tests to be used. The participants favoured tests that were quick and easy to administer however also commented that dependent on what was being assessed they would make use of tests spanning longer durations.

"*So tests like the MOCA takes 5 minutes. The CMPT maybe 7 minutes. Whereas if you're looking at a TEST like the Rivermead (memory test) you're looking at 45 minutes."*
"I don't have 45 minutes to spend just looking at memory" (Focus Group 3, Participant 2, line 22)

The majority agreed that the duration of test administration was a limitation.

"…definitely the time factor is the limitation of using these tests." (Focus Group 1, Participant 5, line 111)

However a few participants disagreed that the time factor was a limitation in the use of standardised tests.

"It's not time consuming depending on the test." (Focus Group 2, Participant 2, line 116)
When selecting tests based on the time factor, OTs ought to be cognisant that choosing a quick to administer test may have negative implications on comprehensiveness of testing.

Sub-theme 7: Industry Standards in testing

The need for assessments to be of a good standard and comprehensive enough to meet the needs of the referrer and to best describe the clients functional capacity is crucial in the industry. The theme of industry standards in testing described two categories, namely: tests trending in the industry currently; and functional capacity evaluation industry standards being used.

The participants discussed that they prefer to use standardised neurocognitive tests that are trending in the industry and generally used by other OTs. With the variety and high quantity of tests available the OTs reflected that there are a number of tests that are specifically being

used in the industry and are familiar to many OTs, giving them more confidence in their test selection.

"...we tend to use tests being used in the industry and that makes us feel a bit more comfortable using the test as well, but I think there are so many tests in the market…" (Focus Group 2, Participant 4, line 131)

As is the case with the preferred use of certain tests in the industry, occupational therapy assessments are held to the industry standards in conducting functional capacity evaluation. These standards may include the comprehensiveness of the assessment bearing on mind the referrers directive, the tests being used, the interpretation of the results and the objectivity of the assessment results. With there being a standard of quality that is considered acceptable in functional capacity evaluation, the OTs expressed that there is a requirement to keep up with the standard and meet the expectations of the industry and the referrers. Some participants described the demand to keep up with the standards of the industry as pressurising.

"I do feel that we are confident enough in our clinical evaluations and so on, but the pressure is from the referrer to put it into standardised set ups." (Focus Group 4, Participant 2, line 86)

Theme 4: Format of the tests

Subtheme 8: Format of the tests lack activities

Most of the tests described by the sample noted that conventional bottom-up approach standardised neurocognitive tests were being used more often than not. The sub-theme of 'format of the tests lack activities' detailed five categories: lack of activity-based tasks in the tests, paper and pen based test format, relevance of actual test scores, assessment structure versus real-life job setting, functional activity testing.

Participants frequently discussed that the more conventional standardised neurocognitive tests being used lack activities or tasks that are work sample based or reflect real-life situations.

"*There's a shortage of activity in standardised assessments."* (Focus Group 2, Participant 1, line 139)

Some OTs did, however, name a few tests that were more activity-based and reflected that they were able to acquire a better understanding of their clients cognitive abilities with the use of these tests. One such test mentioned was detailed by a participant: "*the Psych FCE has got beautiful activity things and the multitasking is very much part of the Psych FCE"* (Focus Group 3, Participant 2, line 120)

In addition to the above category, the participants expressed their concern for the tests being paper and pen based which may further jeopardise their clients performance in such tests.
"...they're all so paper based" (Focus Group 2, Participant 1, line 135)
"the activity is mostly table based for most of people like it's for first time they using pen and paper in the last three years." (Focus Group 1, Participant 2, line 150)

The opinion of the participants was that the scores themselves were less valuable in determining the client cognitive ability when being compared to the observations that can be made during the test execution.

"I have in the past use the assessments purely as an observational tool" (Focus Group 1, Participant 4, line 75)

An OT expressed that the standardised assessment scores itself are sometimes misleading as to the clients holistic functional picture and thus less reliance is given to the scores as such. *"I definitely don't just rely on those scores and there are other instances where a person has achieved perfectly normal scores within the normal ranges and above average and those people I recommended shouldn't go back to work for other reasons."* (Focus Group 3, Participant 2, line 66)

The category of assessment structure versus real-life job setting was highlighted by the participants as limiting in being able to observe and gain a good understanding of the specific environmental client-centred setting.

"…if you do a test in a clinical set up like this, and you go and do a work visit afterwards the results are very different." (Focus Group 4, Participant 4, line 47)

Overall, the participants agreed that functional activity testing would be more in line with the theoretical framework and scope of occupational therapy. It was evident in the discussions that the sample were aware of the challenges in using conventional standardised neurocognitive assessment and that a need still existed for assessment tools to be more activity-based.

"*We require the assessment to be activity based."* (Focus Group 2, Participant 1, line 158)

Theme 5: Assessors skills

Making use of assessment tools in isolation does make for a comprehensive evaluation, and thus, assessor skills were raised as an important tool in the functional capacity evaluation process. Two subthemes arose, namely: skills as an assessor, and expert witness and skills in test administration.

Subtheme 9: Skills as an assessor and expert witness

The clinical skills of the assessor and expert witness was discussed under the following five categories: importance of clinical observation, assessors competence as an expert witness, ability to defend results in court, confidence of assessors in testifying in court, competence of assessors in administering the test.

As mentioned previously, the OTs use clinical observation as an integral assessment tool and thus rely on their clinical skill to a great degree in being able to draw on a clinical picture of the clients capabilities. The participants explained that weight ought to be given to the clinical observations made with less reliance on the actual scores of the standardised tests. They advocated for OTs to be confident in relying on their clinical observations as an assessment tool, instead of being pressured to have standardised scores to represent the clients abilities.

"I think it's taking away our confidence we not trusting our own observation and it's like we know that these standardized test are not 100% effective in getting us the answers we want" (Focus Group 1, Participant 2, line 116)

The assessor's competence as an expert witness was also emphasised as important to medico-legal functional capacity evaluations. The participants commented that clinical observations alone may discredit the competence of the assessor and the validity of the assessment in court.

"…if you are just giving subjective observations, the validity of that information might be brought into question" (Focus Group 3, Participant 2, line 41)

They advocated that the use of standardised tests help to support their clinical opinion and assists validating the assessment.
*"I think another strength is that they help to settle any self-doubt" (*Focus Group 3, Participant 3, line 83)

The participants reflected that skills as an expert witness and skills as a test administrator often ends up in OTs being caught between the legal system and the OT assessment.

"I think we've been pressurised a lot in the legal system. To have results that are going to show a particular thing and especially in our practice we've negotiated this but at the end of the day I still feel that we have been called as an expert witness not as an expert test administrator." (Focus Group 3, Participant 1, line 69)

With that being said, the participants recognised that the use of standardised tests in the assessment add to their ability to defend their results in court and provide a sense of confidence as assessors in testifying in court.
"*But in the medico legal field… it's such a kind of combative environment and there's kind of everyone wants to be on their high horse sometimes that they want something more concrete to fall back onto; and I think that's why they expect something more concrete in your*

assessment, that you can comment on, even if in your clinical reasoning there are sufficient findings." (Focus Group 2, Participant 4, line 76)

However, some OTs expressed a more confident view:

"*I don't think we need to justify the value of the observation clinical skills I mean that is an assessment tool and we should be able to happily go to court and say from my observations and in my experience cause that's what's makes you an experts in the field."* (Focus Group 1, Participant 2, line 71)

The participants highlighted that the competence of assessors in administering the tests was important for the assessment process to be valid. Many of the OTs recognised that they were ill-equipped in test administration from an undergraduate studies level.

"Walking out of university you don't feel competent enough to take on a tool like this and say I'm going to use it to inform my clinical opinion." (Focus Group 3, Participant 3, line 115)

"I think these tests should be taught properly at student level, at varsity. The first time I saw most of these tests was after." (Focus Group 3, Participant 4, line 103)

Subtheme 10: Skills in test administration

The scope of practice in test administration sub-theme was analysed into the following categories: training on the specific tests, role of the neuropsychologist, and limitations in scope of practice.

The participants expressed that training on the specific tests was lacking, and that the limitation in proper test administration training may compromise the validity and reliability of the test results.

"Not everybody's been trained to execute (administer) the tests and therefore they don't necessarily execute it in the correct manner and that affects the validity." (Focus Group 4, Participant 4, line 113)

As many of the standardised neurocognitive tests being used by OTs have been developed in the field of neuropsychology, participants felt more comfortable deferring to the neuropsychologist assessment for comment on the clients cognitive abilities.

They further noted they would prefer to defer to the Neuropsychologist for comprehensive testing of the cognitive components.

"We would refer to that neuropsychologist for cognitive outcomes, for testing outcomes, which has led to us really using it as a screening and a clinical observation more than as a score generating exercise." (Focus Group 3, Participant 1, line 102)

However, many OTs commented that although neuropsychological assessment would provide an indication on the cognitive components, where the results provided limited information on occupational performance or functional outcomes which constitute the scope of the occupational therapy assessment.

"I defer to the neuropsychologist I am perhaps neglecting more functional areas of cognition that will be within my scope of practice to assess." (Focus Group 1, Participant 2, line 94)

Limitations in scope of practice was discussed by the participants as the area of cognitive assessment is a point of contention in the industry. The OTs explained that assessors ought to remain cognisant of the scope of occupational therapy, which is functional capacity and occupational performance.

"From an occupational performance perspective I feel that we need to meet the need of our own concerns, which is function, occupational performance, dependability on our results and also having evidence based practice." (Focus Group 1, Participant 5 , line 173)

Overall, the participants agreed that remaining within the scope of occupational therapy, assessor should be selective in the choice of standardised tests being used.

"…it makes me call to question of whether I'm selecting the correct types of assessment and should I go more core OT in my selection of those assessments to make it more functionally based and functionally reflective" (Focus Group 1, Participant 4, line 70)

From the above, there was a link and overlap in viewpoints that became apparent between the themes and sub-themes. This link is represented in Figure 4.1.

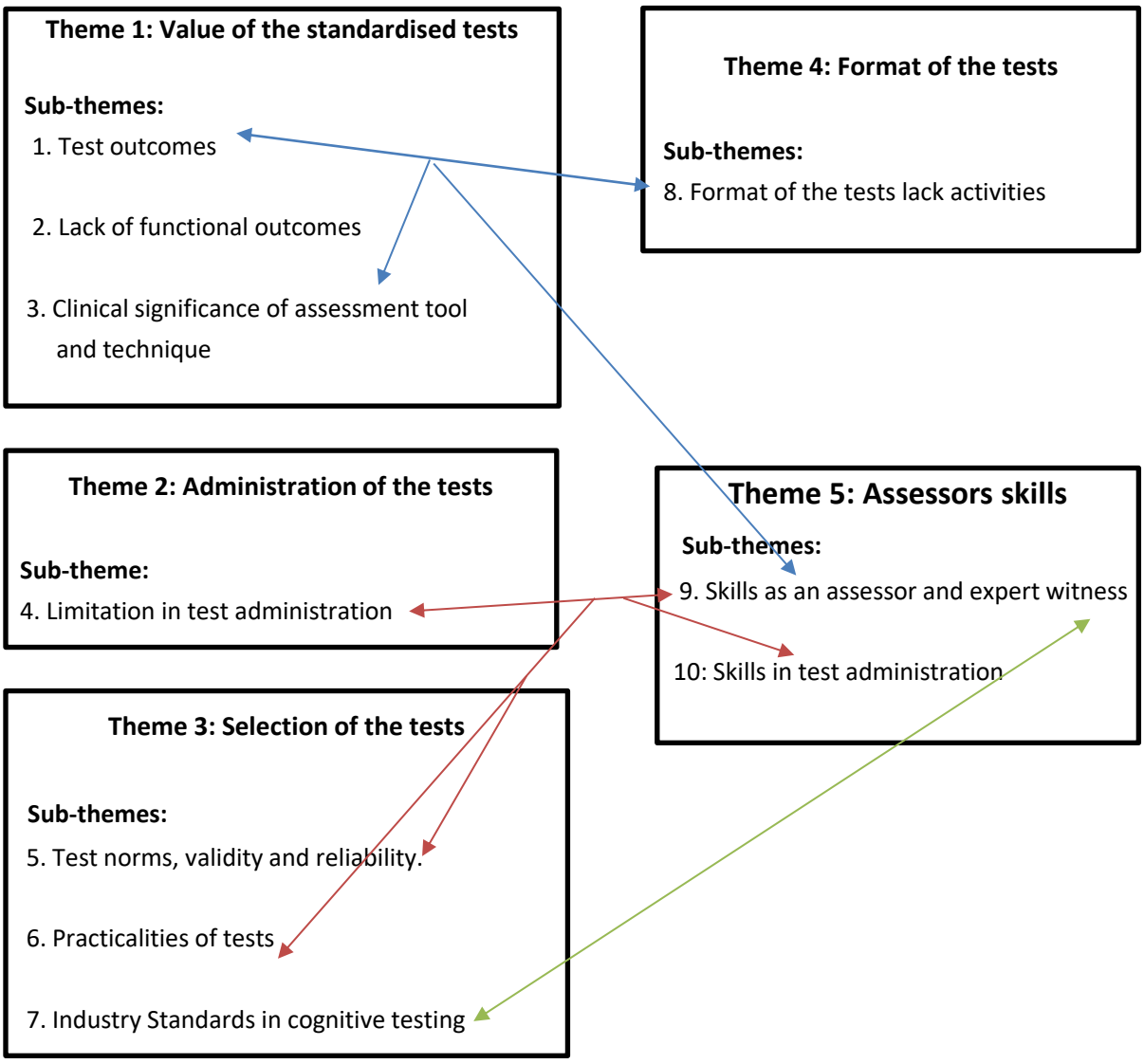


Figure 4.1: The link and overlap between the themes and sub-themes that arose in the focus groups.

The themes, sub-themes and categories detailed above was used to develop the concourse statements in the third objective. Results from the survey on the tests used and criteria for selection were also used for the concourse statements such as criteria for selection of the tests. This aspect also emerged from the focus groups. The specific tests that were used (as mentioned in the survey, clarified statements in the focus groups e.g. a specific test that lacks functional outcomes.

4.4 Objective 3: Q-Methodology results

4.4.1 The concourse statements and Q-set

The concourse and Q-set formulation were derived from the themes, sub-themes, and categories as detailed in Table 4.6. The data initially generated 56 concourse statements (refer to Appendix G) derived from five themes following the focus group. The concourse was then reduced to 36 statements after the piloting process and removing repeated, similar and ambiguous statements as tabulated below.

Table 4.6: Statements generated from themes.

Themes →	**Sub-themes** →	**Categories** →	**Statements**
1. Value of the Standardised tests	1. Test outcomes 2.Lack of functional outcomes 3.Clinical significance of assessment tool and technique	1. Scores indicating cognitive components 2. Provides a score or number 3. Limited functional indicators 4. Link to occupation performance to be established 5. Lack of indicators if the client is able to live independently. 6. Clinical observations in assessment 7. Test used to add weight to assessor's opinion 8. Comprehensive evaluation technique 9. Test provides baseline to start commenting on function.	1. Most neurocognitive standardised tests yield scores on specific cognitive components such as memory, attention and concentration, rather than occupational performance. 2. I feel that the scores generated from the test do not directly relate to the client's functional abilities. 3. Scores generated in the test are used to support my clinical observation. 4. I prefer having a numerical value/score in order to comment on the client's cognitive abilities. 5. I could not carry out a comprehensive neuro-assessment without the use of standardised tests.

Themes →	Sub-themes →	Categories →	Statements
		10. Test provides a structured assessment process	6. I use the standardised test to add weight and credibility or to support my opinion. 7. The standardised tests provide structure and a starting point in assessing cognition in my assessment process. 8. The test results obtained link directly to the client's occupational performance. 9. I feel that the test results fall short of advising me on the client's functional abilities and level of independence. 10. Clients who score poorly on the standardised tests cannot return to work most times.
2. Administration of the tests	4. Limitations in test administration	11. Language barriers 12. Level of education of client 13. Effects of the use of translators	11. Language barriers often prevent me from administering or using these tests in the practice. 12. Most of my clients' demographic profile are disadvantaged by the norms of the tests. 13. Level of education of the clients I assess affects their performance in the tests. 14. I have to make use of a translator regularly to assist in using the test as an observational tool for non-English speaking clients. 15. Use of translators do not interfere with reliability and/ validity of the test results. 16. I find it easy to score and interpret the findings of the tests.
3. Selection of the tests	5.Test norms, validity and reliability. 6. Practicalities of tests 7. Industry standards in cognitive testing	14. Appropriateness of the tests to the South African demographic 15. Variety of tests available 16. Validity and reliability of the test results 17. Cost factor 18. Time of administration of test 19. Tests trending in the industry currently	17. I feel that most standardised test available are not suited to the South African demographic profile. 18. Most of the commonly used tests available do not have norms for the South African population. 19. I use tests currently being used by OTs in the field of medico-legal and FCE assessment. 20. I only chose tests that are valid and/ reliable for the clients I assess. 21. Most of the tests being used for FCEs are readily available for purchase.

Themes →	Sub-themes →	Categories →	Statements
		20. FCE Industry standards being used 21. Internationally normed tests	22. Most of the standardised tests are affordable. 23. Most of the standardised neurocognitive test being used do not assess the impact of cognitive deficits on occupational performance 24. I feel pressured into keeping up with the standards of the FCE/Assessment industry in using specific standardised tests. 25. Time of administration of the test plays a role in my selection of the test in the assessment.
4. Format of the tests	8. Format of the tests lack activities	22. Lack of activity-based tasks in the tests 23. Paper and pen based test format 24. Relevance of actual test scores 25. Assessment structure versus real-life job setting 26. Functional activity testing	26. Most of the standardised tests entail activity-based tasks as the format of the test. 27. I prefer using paper and pen based tests to assess my client's functional abilities. 28. Most standardised tests available rely more heavily on paper-based tasks rather than activity-based tasks. 29. I would prefer to assess the functional implications of cognitive fallout using more activity-based tasks.
5. Assessors skills	9. Skills as an assessor and expert witness 10. Skills in test administration	27. Importance of clinical observation 28. Assessors competence as an expert witness 29. Ability to defend results in court 30. Competence of assessors in administering the test 31. Training on the specific tests 32. Role of Neuropsychologist 33. Limitations in scope of practice 34. Confidence of assessors in testifying in court	30. I feel more confident defending my opinion with standardised tests scores. 31. My referral sources expects that standardised tests be included in neuro-cognitive testing. 32. I believe that I am not skilled enough to comprehensively assess functional cognitive abilities without the use of standardised tests. 33. I feel that I have been adequately trained to correctly administer and interpret findings for most of the standardised tests I use. 34. I believe that a neuropsychologist is better skilled to assess cognitive abilities whereas OTs are better skilled to identify functional implications of cognitive dysfunction. 35. I am a confident assessor in using standardised tests to assess

Themes →	Sub-themes →	Categories →	Statements
			cognitive abilities that impact on occupational performance. 36. I rely more on my clinical observations and clinical reasoning to support my opinion on the client's functional abilities rather than test scores.

Table 4.6 demonstrates how the 36 statements were derived from each of the five themes, sub-themes and categories. A total of 36 statements were derived as the final Q set that was used in the Q-sort in the final stage of the study.

4.4.2 The P-set

The participants in the final phase of the study were occupational therapists conducting functional capacity evaluations with more than two years' experience in this field and who may or may not have participated in the previous phases of the study. Sixty-two (62) occupational therapists were invited to participate in the study and only 51 responses (Q-sorts) were received, representing a 82.2% response rate. The P-set participant demographics are presented in the table below.

Table 4.7: P-set Participants Demographics

	Number (n=51)	**Percentage %**	**Mean**	**Standard Deviation**
Sex				
Male	2	4	-	-
Female	49	96	-	-
Age ranges:				
20- 29 years	16	31	27.38	1.63
30- 39 years	24	47	33.88	3.23
40-49 years	6	12	43.71	3.09
50-59 years	3	6	54	5.65
>60 years	2	4	63.5	2.12

Years of experience:				
2-5 years	24	47	3.53	1.42
6-10 years	16	31	7.64	1.21
>10 years	11	22	19.27	8.17
Level of Education				
Undergraduate degree	40	78	-	-
Postgraduate diploma	9	18	-	-
Master's degree	2	4	-	-
Use of standardised protocol				
Yes- using a protocol	51	100	-	-
No- not using a protocol	0	0	-	-
Location of participants' practice :				
Johannesburg	23	45	-	-
Pretoria	27	53	-	-
Kwa-Zulu Natal	1	2	-	-

Table 4.7 presents the demographics on 51 occupational therapist who participated in the final stage of the study and are working in the field of functional capacity evaluation. Forty-nine (96%) of the occupational therapist are female, with two (4%) of the sample being male. The majority of the occupational therapists (47%) are between the ages 30 and 39 years, 31% are between the ages of 20 to 29 years old and 22% of the sample is older than 40 years old. A majority of the participants achieved an undergraduate degree qualification (78%), and 22% of the participants obtained post-graduate diplomas and master's degree qualifications. Forty-seven percent of the sample have between two to seven years' experience in the field, and 53% of the sample have more than six years of experience in the field of functional capacity evaluation; of which 22% have more than 10 years' experience in the carrying out functional capacity evaluations. The sample comprises a large contingent of occupational therapists with extensive experience in the specialised field. A majority of the sample's practices are located in the Johannesburg and Pretoria regions.

Participants were coded according to their participant number from P1, P2, P3 to P51. Their demographic details comprising of their sex, age range, level of education, and years of experience was used in their code. The coding is explained in Methodology section.

4.5 Q-factor analysis

The Q-sort data was analysed through a process of Q-factor analysis using the Ken-Q software. The Q-factor analysis was carried out in the following steps: factor extraction, factors scores, factor arrays, as well as distinguishing and consensus statements, which have been interpreted in this section.

4.5.1 Factor Extraction

Three factors were extracted from the Q-methodology data. In Q-methodology, a factor reflects similar viewpoints of participants based on the distribution of their Q-sorts. The factor extraction was based on the eigen value of that factor as eigen values greater than 1 are considered significant (Van Exel and De Graaf, 2005; Watts and Stenner, 2012).

Table 4.8 demonstrates the three factors that were extracted and the eigen values of each factor.

Table 4.8: Factors extracted and the eigen values for each factor

Unrotated Factor Matrix			
Variable	**Factor 1**	**Factor 2**	**Factor 3**
Eigen-value (% Explained Variance)	**19.6** (38)	**4.5** (9)	**3.1** (6)
Loading participants:	n=22	n= 18	n=6

As seen in Table 4.8, factor 1 had the highest eigen value of 19.6. Factor 2 had an eigen-value of 4.5 and Factor 3 an eigen-value of 3.1. Thus, all the factors generated high eigen-values with Factor 1 being the strongest factor and explaining the most variance of 38%. This three factor model explains 52% of the variance in the data set, pointing to more overlapping than different viewpoints.

The scree plot below (Fig 4.2) clearly shows the prominence of factor one. A scree plot depicts the eigen values in a descending order. The first bend in the graph shows where the next factor starts and the next bend shows the third factor.

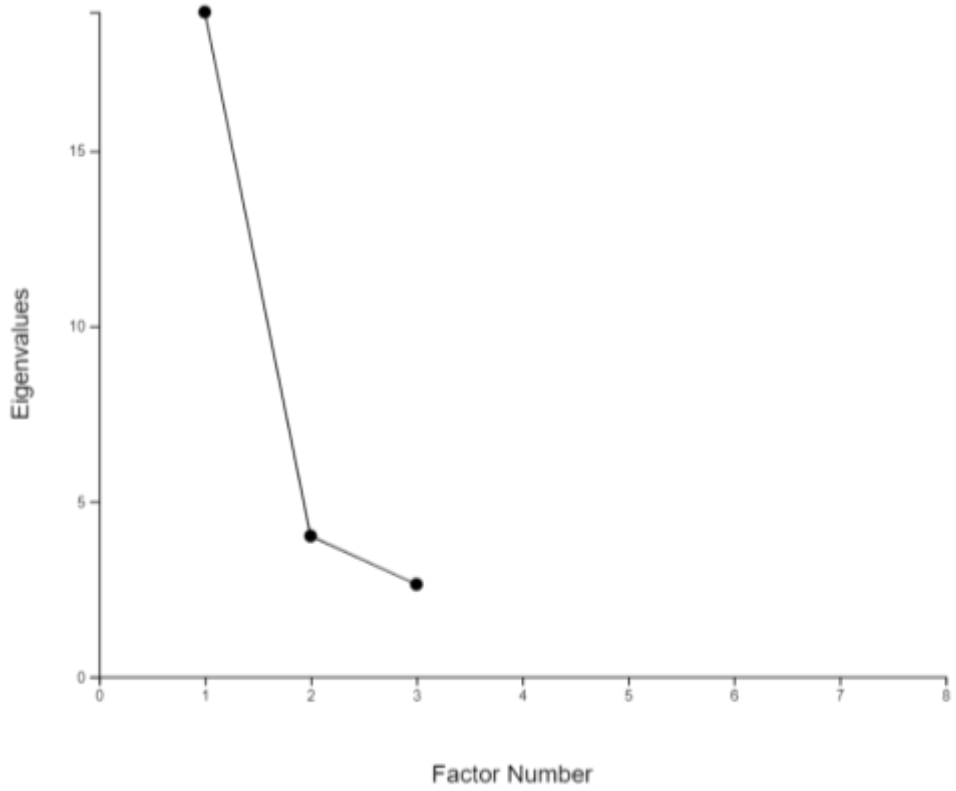


Figure 4.2 Scree plot of the three factors extracted from the correlations

The factor matrix with flagged Q-sorts ($p < 0.05$) are detailed in Appendix L. If a Q-sort is flagged on the respective factor, it means that was the most significant or most probable placement. Table 4.9 shows that 46 participants (90.2 %) loaded on a factor while five participants (9.8%) did not load on any factor. Participants 25, 31, 35, 39 and 46 did not load on any factor, meaning that their viewpoints are unique and did not correlate with any of the factors.

Of the 46 participants that loaded onto a factor, 22 participants almost half (37.8%) had similar viewpoints and loaded onto factor 1. Factor 2 had 18 participants (39.1%) and thereafter factor 3 with six participants (13%) loading on to the factors. For a factor to be considered important it should have at least five participants loading on to it. Thus, as detailed in Table 4.8, all three factors are considered important.

Table 4.9: Demographic of participants loading and not loading on the factors

Variable	Factor 1	Factor 2	Factor 3	Not Loading
Loading Participants	n=22 2, 4, 6, 11, 13, 18, 19, 21, 22, 24, 26, 27, 28, 29, 30, 32, 41, 47, 48, 49, 50, 51.	n= 18 1, 3, 5, 7, 9, 12, 15, 16, 17, 20, 33, 34, 36, 37, 40, 42, 43, 44.	n=6 8, 10, 14, 23, 38, 45.	n=5 24, 31, 35, 39, 46
Male	0	1	1	0
Female	22	17	5	5
Age Range (years old):				
20 – 29	6	8	1	1
30 – 39	12	8	1	3
40 – 49	2	1	3	1
50 – 59	1	1	0	0
> 60	1	0	1	0
Level of education:				
Undergraduate degree,	16	16	4	4
Master's degree	2	0	0	0
Postgraduate diploma	4	2	2	1
Years of experience (mean)	9 (ranging between 2-40 years)	6.5 (ranging between 2-14 years)	10.8 (ranging between 3-22 years)	7.6 (ranging between 2-8 years)

4.5.2 Factor Description

Factor scores are represented by the z-score. Z-score close to 1 or -1 shows a greater correlation of the statement to the factor. Z-scores close to 0 indicate a weak correlation of the statement to the factor (Zabala, 2014). The characteristics of each factor are presented below.

4.5.2.1 Factor score description of Factor 1

Table 4.10 details the factor scores for statements that are correlating with factor 1.

Table 4.10: Factor scores for Factor 1 on occupational therapists' perceptions.

Factor Scores for Factor 1			
Statement Number	**Statement**	**Z-score**	**Sort Values**
36	I rely more on my clinical observations and clinical reasoning to support my opinion on the client's functional abilities rather than test scores.	1.673	4
1	Most neurocognitive standardised tests yield scores on specific cognitive components such as memory, attention and concentration, rather than occupational performance.	1.631	4
23	Most of the standardised neurocognitive test being used do not assess the impact of cognitive deficits on occupational performance	1.524	3
29	I would prefer to assess the functional implications of cognitive fallout using more activity-based tasks.	1.523	3
2	I feel that the scores generated from the test do not directly relate to the client's functional abilities.	1.386	3
18	Most of the commonly used tests available do not have norms for the South African population.	1.288	2
34	I believe that a neuropsychologist is better skilled to assess cognitive abilities whereas OTs are better skilled to identify functional implications of cognitive dysfunction.	1.055	2
9	I feel that the test results fall short of advising me on the client's functional abilities and level of independence.	1.002	2
17	I feel that most standardised test available are not suited to the South African demographic profile.	0.755	2
28	Most standardised tests available rely more heavily on paper-based tasks rather than activity-based tasks.	0.665	1
12	Most of my clients' demographic profile are disadvantaged by the norms of the tests.	0.644	1
3	Scores generated in the test are used to support my clinical observation.	0.417	1
6	I use the standardised test to add weight and credibility or to support my opinion.	0.411	1
11	Language barriers often prevent me from administering or using these tests in the practice.	0.404	1
13	Level of education of the clients I assess affects their performance in the tests.	0.303	1
19	I use tests currently being used by OTs in the field of medico-legal and FCE assessment.	0.272	0
14	I have to make use of a translator regularly to assist in using the test as an observational tool for non-English speaking clients.	0.023	0
7	The standardised tests provide structure and a starting point in assessing cognition in my assessment process.	-0.141	0
30	I feel more confident defending my opinion with standardised tests scores.	-0.223	0
24	I feel pressured into keeping up with the standards of the FCE/Assessment industry in using specific standardised tests.	-0.225	0

Factor Scores for Factor 1			
Statement Number	**Statement**	**Z-score**	**Sort Values**
25	Time of administration of the test plays a role in my selection of the test in the assessment.	-0.289	0
20	I only chose tests that are valid and/ reliable for the clients I assess.	-0.363	-1
35	I am a confident assessor in using standardised tests to assess cognitive abilities that impact on occupational performance.	-0.397	-1
16	I find it easy to score and interpret the findings of the tests.	-0.412	-1
4	I prefer having a numerical value/score in order to comment on the client's cognitive abilities.	-0.433	-1
21	Most of the tests being used for FCEs are readily available for purchase.	-0.543	-1
33	I feel that I have been adequately trained to correctly administer and interpret findings for most of the standardised tests I use.	-0.616	-1
31	My referral sources expects that standardised tests be included in neuro-cognitive testing.	-0.62	-2
32	I believe that I am not skilled enough to comprehensively assess functional cognitive abilities without the use of standardised tests.	-0.715	-2
5	I could not carry out a comprehensive neuro-assessment without the use of standardised tests.	-1.024	-2
22	Most of the standardised tests are affordable.	-1.288	-2
10	Clients who score poorly on the standardised tests cannot return to work most times.	-1.39	-3
27	I prefer using paper and pen based tests to assess my client's functional abilities.	-1.425	-3
26	Most of the standardised tests entail activity-based tasks as the format of the test.	-1.495	-3
15	Use of translators do not interfere with reliability and/ validity of the test results.	-1.51	-4
8	The test results obtained link directly to the client's occupational performance.	-1.869	-4

Twenty-two of the forty six flagged Q-sets loaded on Factor 1 for perceptions of occupational therapists on the clinical utility of using neurocognitive tests in assessing occupational performance in functional capacity evaluations. Factor 1 represents the viewpoints of the majority of the participants who loaded on a factor.

The following statements yielded z-scores either close to 1 or -1:

The participants ranked statement 36 and 1 as 'strongly agree', statements 23, 29, 2 as 'agree' and statements 18, 34, 9 as 'somewhat agree'. They 'strongly disagree' with statements 15 and 8; 'disagree' with 10, 27 and 26 as 'disagree' and 'somewhat disagree' with statements 5

and 22. From the statements ranked with significant factor scores on Factor 1, the opinion of these participants indicate that they perceive **standardised neurocognitive tests to be limited in indicating functional ability or occupational performance.**

The three statements that most support the above factor 1 description are: Statement 36 (strongly agree)*: I rely on my clinical observations to support my opinion on functional ability rather than scores*; Statement 1 (strongly agree): *neurocognitive standardised tests yield scores on specific cognitive components, not occupational performance* and Statement 8 (strongly disagree): *test results link directly to occupational performance*.

4.5.2.2 Factor score description of Factor 2

Table 4.11 details the factor scores for statements that are correlating with Factor 2.

Table 4.11: Factor scores for Factor 2 on occupational therapists' perceptions.

Factor Scores for Factor 2			
Statement Number	**Statement**	**Z-score**	**Sort Values**
18	Most of the commonly used tests available do not have norms for the South African population.	1.885	4
17	I feel that most standardised test available are not suited to the South African demographic profile.	1.636	4
13	Level of education of the clients I assess affects their performance in the tests.	1.283	3
12	Most of my clients' demographic profile are disadvantaged by the norms of the tests.	1.103	3
30	I feel more confident defending my opinion with standardised tests scores.	1.072	3
6	I use the standardised test to add weight and credibility or to support my opinion.	1.015	2
3	Scores generated in the test are used to support my clinical observation.	0.958	2
11	Language barriers often prevent me from administering or using these tests in the practice.	0.902	2
1	Most neurocognitive standardised tests yield scores on specific cognitive components such as memory, attention and concentration, rather than occupational performance.	0.869	2
19	I use tests currently being used by OTs in the field of medico-legal and FCE assessment.	0.751	1
35	I am a confident assessor in using standardised tests to assess cognitive abilities that impact on occupational performance.	0.717	1
28	Most standardised tests available rely more heavily on paper-based tasks rather than activity-based tasks.	0.612	1
7	The standardised tests provide structure and a starting point in assessing cognition in my assessment process.	0.547	1

Factor Scores for Factor 2			
Statement Number	**Statement**	**Z-score**	**Sort Values**
23	Most of the standardised neurocognitive test being used do not assess the impact of cognitive deficits on occupational performance	0.411	1
4	I prefer having a numerical value/score in order to comment on the client's cognitive abilities.	0.324	1
16	I find it easy to score and interpret the findings of the tests.	0.256	0
33	I feel that I have been adequately trained to correctly administer and interpret findings for most of the standardised tests I use.	0.224	0
29	I would prefer to assess the functional implications of cognitive fallout using more activity-based tasks.	0.217	0
31	My referral sources expects that standardised tests be included in neuro-cognitive testing.	-0.007	0
5	I could not carry out a comprehensive neuro-assessment without the use of standardised tests.	-0.064	0
20	I only chose tests that are valid and/ reliable for the clients I assess.	-0.084	0
25	Time of administration of the test plays a role in my selection of the test in the assessment.	-0.396	-1
9	I feel that the test results fall short of advising me on the client's functional abilities and level of independence.	-0.409	-1
14	I have to make use of a translator regularly to assist in using the test as an observational tool for non-English speaking clients.	-0.443	-1
2	I feel that the scores generated from the test do not directly relate to the client's functional abilities.	-0.564	-1
34	I believe that a neuropsychologist is better skilled to assess cognitive abilities whereas OTs are better skilled to identify functional implications of cognitive dysfunction.	-0.572	-1
27	I prefer using paper and pen based tests to assess my client's functional abilities.	-0.65	-1
36	I rely more on my clinical observations and clinical reasoning to support my opinion on the client's functional abilities rather than test scores.	-0.697	-2
24	I feel pressured into keeping up with the standards of the FCE/Assessment industry in using specific standardised tests.	-0.736	-2
10	Clients who score poorly on the standardised tests cannot return to work most times.	-0.851	-2
8	The test results obtained link directly to the client's occupational performance.	-0.953	-2
32	I believe that I am not skilled enough to comprehensively assess functional cognitive abilities without the use of standardised tests.	-1.044	-3
26	Most of the standardised tests entail activity-based tasks as the format of the test.	-1.406	-3
21	Most of the tests being used for FCEs are readily available for purchase.	-1.706	-3
15	Use of translators do not interfere with reliability and/ validity of the test results.	-2.083	-4
22	Most of the standardised tests are affordable.	-2.117	-4

Eighteen of the forty-six flagged Q-sets loaded on Factor 2 for perceptions of occupational therapists on the clinical utility of using neurocognitive tests in assessing occupational performance in functional capacity evaluations. Factor 2 represented 39% of the participants viewpoints.

Of the significant factor scores, the participants ranked Statement 18 and 17 as 'strongly agree', statements 13, 12, 30 as 'agree' and statements 6 and 3 as 'somewhat agree'. They 'strongly disagree with statements 15 and 22, 'disagree' with statements 32, 26 and 21 and 'somewhat disagree' with Statement 8.

The participants 'strongly agree' with Statement 18: *most tests available do not have norms for SA population* and statement 17: *most standardised tests available are not suited to the South African demographic profile.* They 'agree' with Statement 13: *level of education affects their performance in tests* and statement 12: *Most of the clients demographic profile are disadvantaged by norms of the tests*. Statement 15: *Translators do not interfere with the reliability and validity of the results* was 'strongly disagreed' on by the participants.

The factor description of Factor 2 indicates that the participants perceive **the standardised neurocognitive tests are not suited to the South African demographic.**

4.5.2.1 Factor score description of Factor 3

Table 4.12 details the factor scores for statements that are correlating with factor 3.

Table 4.12: Factor scores for Factor 3 on occupational therapists' perceptions.

Factor Scores for Factor 3			
Statement Number	**Statement**	**Z-score**	**Sort Values**
19	I use tests currently being used by OTs in the field of medico-legal and FCE assessment.	2.013	4
16	I find it easy to score and interpret the findings of the tests.	1.772	4
36	I rely more on my clinical observations and clinical reasoning to support my opinion on the client's functional abilities rather than test scores.	1.547	3
1	Most neurocognitive standardised tests yield scores on specific cognitive components such as memory, attention and concentration, rather than occupational performance.	1.265	3
6	I use the standardised test to add weight and credibility or to support my opinion.	1.263	3
30	I feel more confident defending my opinion with standardised tests scores.	1.238	2
34	I believe that a neuropsychologist is better skilled to assess cognitive abilities whereas OTs are better skilled to identify functional implications of cognitive dysfunction.	1.041	2
29	I would prefer to assess the functional implications of cognitive fallout using more activity-based tasks.	0.862	2
20	I only chose tests that are valid and/ reliable for the clients I assess.	0.845	2
5	I could not carry out a comprehensive neuro-assessment without the use of standardised tests.	0.775	1
35	I am a confident assessor in using standardised tests to assess cognitive abilities that impact on occupational performance.	0.733	1
18	Most of the commonly used tests available do not have norms for the South African population.	0.707	1
13	Level of education of the clients I assess affects their performance in the tests.	0.648	1
3	Scores generated in the test are used to support my clinical observation.	0.547	1
33	I feel that I have been adequately trained to correctly administer and interpret findings for most of the standardised tests I use.	0.541	1
21	Most of the tests being used for FCEs are readily available for purchase.	-0.052	0
17	I feel that most standardised test available are not suited to the South African demographic profile.	-0.076	0
32	I believe that I am not skilled enough to comprehensively assess functional cognitive abilities without the use of standardised tests.	-0.268	0
12	Most of my clients' demographic profile are disadvantaged by the norms of the tests.	-0.336	0

Factor Scores for Factor 3			
Statement Number	**Statement**	**Z-score**	**Sort Values**
31	My referral sources expects that standardised tests be included in neuro-cognitive testing.	-0.368	0
23	Most of the standardised neurocognitive test being used do not assess the impact of cognitive deficits on occupational performance.	-0.387	0
4	I prefer having a numerical value/score in order to comment on the client's cognitive abilities.	-0.511	-1
2	I feel that the scores generated from the test do not directly relate to the client's functional abilities.	-0.56	-1
7	The standardised tests provide structure and a starting point in assessing cognition in my assessment process.	-0.641	-1
8	The test results obtained link directly to the client's occupational performance.	-0.679	-1
22	Most of the standardised tests are affordable.	-0.75	-1
26	Most of the standardised tests entail activity-based tasks as the format of the test.	-0.775	-1
28	Most standardised tests available rely more heavily on paper-based tasks rather than activity-based tasks.	-0.803	-2
15	Use of translators do not interfere with reliability and/ validity of the test results.	-0.885	-2
9	I feel that the test results fall short of advising me on the client's functional abilities and level of independence.	-0.93	-2
27	I prefer using paper and pen based tests to assess my client's functional abilities.	-1.212	-2
11	Language barriers often prevent me from administering or using these tests in the practice.	-1.232	-3
14	I have to make use of a translator regularly to assist in using the test as an observational tool for non-English speaking clients.	-1.263	-3
10	Clients who score poorly on the standardised tests cannot return to work most times.	-1.307	-3
25	Time of administration of the test plays a role in my selection of the test in the assessment.	-1.309	-4
24	I feel pressured into keeping up with the standards of the FCE/Assessment industry in using specific standardised tests.	-1.453	-4

Six (13%) of the forty six flagged Q-sorts loaded on Factor 3 for perceptions of occupational therapists on the clinical utility of using neurocognitive tests in assessing occupational performance in functional capacity evaluations.

Statements with factor scores of significance (close to 1 or -1) were statements 19 and 16 ('strongly agree'), statements 36, 1 and 6 ('agree') and statements 30 and 34 ('somewhat agree') in Factor 3.

The participants 'strongly disagree' with statements 24 and 25, ranked statements 10, 14 and 11 as 'disagree' and 'somewhat disagree' with statements 9 and 27.

With consideration paid to the significant factor scores on Factor 3, the opinion of these participants indicate that they perceive **the scores add weight to the occupational therapists opinion.**

4.5.3 Factor Arrays and Distinguishing Statements

The factor array for Factor 1 is focused on as this was the prominent factor that emerged with a high eigen value of 19 with most participants (n=22) loading onto this factor. Factor 1 is thus a very strong factor and Figure 4.3 shows the position of statements of this viewpoint on a new grid.

The distinguishing statements represented on the factor array grid in Figure 4.3 show how Factor 1 is different from Factor 2 and 3. These distinguishing statements are reflecting what makes this factor distribution unique. A p-value represents the statistical significance of the distinguishing statements. A p-value less than 0.05 ($p<0.05$) is considered statistically significant and a p-value of less than 0.01 ($p<0.01$) is indicating high statistical significance (Zabala, 2014).

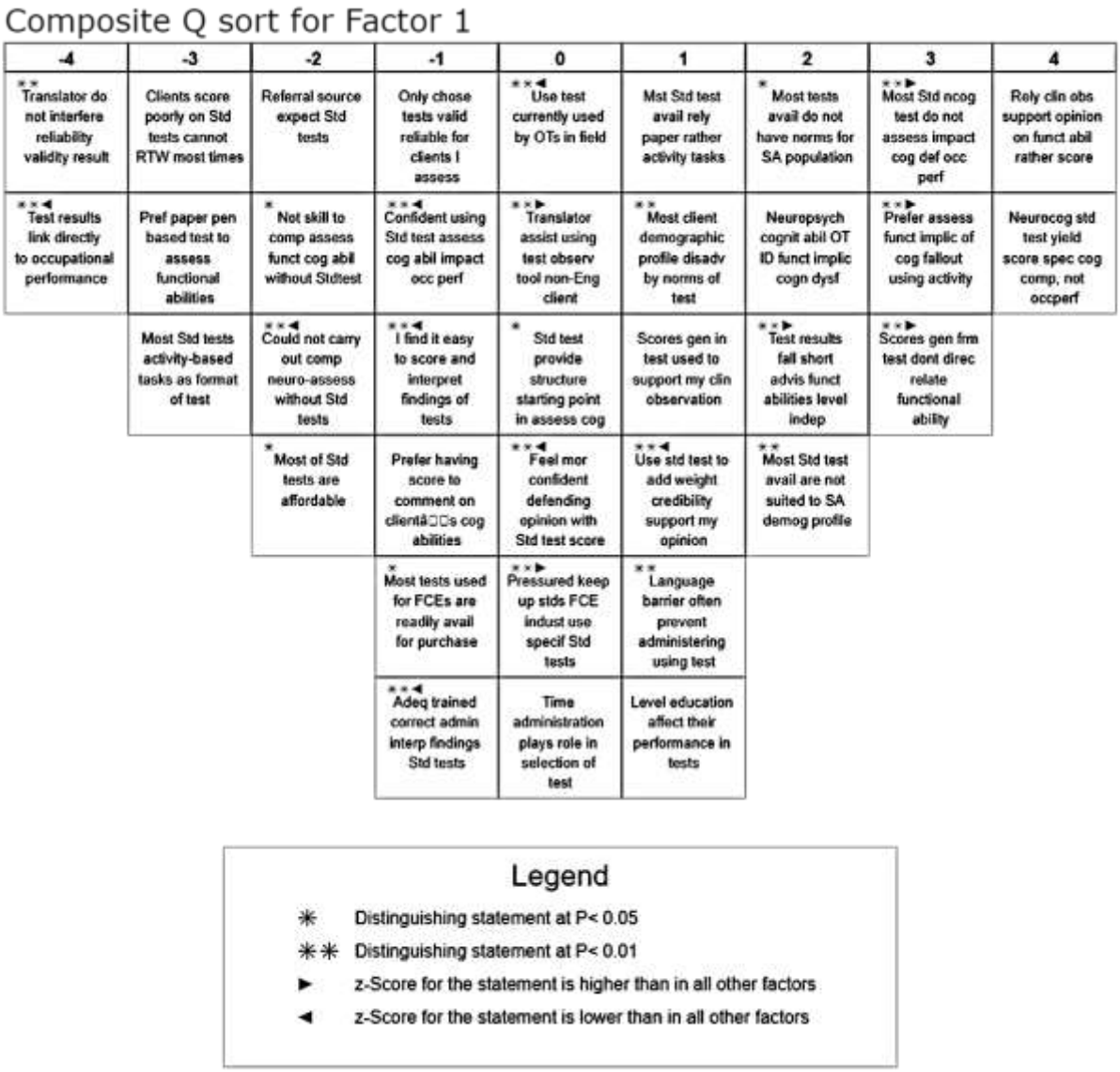


Figure 4.3: Factor array of factor 1

The strongest distinguishing statements for Factor 1 as represented on the grid distribution was Statement 15: *Translators do not interfere with the reliability and validity of the results* (-4, strongly disagree); Statement 8: *Test results link directly to occupational performance* (-4, strongly disagree); and Statement 23: *most standardised neurocognitive tests do not assess the impact of cognitive deficits on occupational performance* (+3, agree)*;* Statement 29: *I prefer assessing functional implications of cognitive fallout using an activity* (+3, agree); and Statement 2: *Scores generated from the tests do not directly relate to functional ability* (+3, agree).

Table 4.13 details the factor arrays of the three factors and indicates the consensus versus distinguishing statements.

Table 4.13 Factor Arrays with consensus versus distinguishing statements

Factor Q-sort Values for Statements sorted by Consensus vs. Distinguishing					
Statement Number	**Statement**	**factor 1**	**factor 2**	**factor 3**	**Z-Score variance**
3	Scores generated in the test are used to support my clinical observation.	1	2	1	0.053
10	Clients who score poorly on the standardised tests cannot return to work most times.	-3	-2	-3	0.056
31	My referral sources expects that standardised tests be included in neuro-cognitive testing.	-2	0	0	0.063
1	Most neurocognitive standardised tests yield scores on specific cognitive components such as memory, attention and concentration, rather than occupational performance.	4	2	3	0.097
32	I believe that I am not skilled enough to comprehensively assess functional cognitive abilities without the use of standardised tests.	-2	-3	0	0.101
26	Most of the standardised tests entail activity-based tasks as the format of the test.	-3	-3	-1	0.103
27	I prefer using paper and pen based tests to assess my client's functional abilities.	-3	-1	-2	0.107
6	I use the standardised test to add weight and credibility or to support my opinion.	1	2	3	0.128
4	I prefer having a numerical value/score in order to comment on the client's cognitive abilities.	-1	1	-1	0.142
13	Level of education of the clients I assess affects their performance in the tests.	1	3	1	0.165
25	Time of administration of the test plays a role in my selection of the test in the assessment.	0	-1	-4	0.209
18	Most of the commonly used tests available do not have norms for the South African population.	2	4	1	0.231
7	The standardised tests provide structure and a starting point in assessing cognition in my assessment process.	0	1	-1	0.237
33	I feel that I have been adequately trained to correctly administer and interpret findings for most of the standardised tests I use.	-1	0	1	0.238
15	Use of translators do not interfere with reliability and/ validity of the test results.	-4	-4	-2	0.239
24	I feel pressured into keeping up with the standards of the FCE/Assessment industry in using specific standardised tests.	0	-2	-4	0.254
8	The test results obtained link directly to the client's occupational performance.	-4	-2	-1	0.259
20	I only chose tests that are valid and/ reliable for the clients I assess.	-1	0	2	0.267

Factor Q-sort Values for Statements sorted by Consensus vs. Distinguishing					
Statement Number	**Statement**	**factor 1**	**factor 2**	**factor 3**	**Z-Score variance**
35	I am a confident assessor in using standardised tests to assess cognitive abilities that impact on occupational performance.	-1	1	1	0.28
14	I have to make use of a translator regularly to assist in using the test as an observational tool for non-English speaking clients.	0	-1	-3	0.283
29	I would prefer to assess the functional implications of cognitive fallout using more activity-based tasks.	3	0	2	0.284
22	Most of the standardised tests are affordable.	-2	-4	-1	0.316
12	Most of my clients' demographic profile are disadvantaged by the norms of the tests.	1	3	0	0.36
30	I feel more confident defending my opinion with standardised tests scores.	0	3	2	0.427
28	Most standardised tests available rely more heavily on paper-based tasks rather than activity-based tasks.	1	1	-2	0.462
21	Most of the tests being used for FCEs are readily available for purchase.	-1	-3	0	0.481
17	I feel that most standardised test available are not suited to the South African demographic profile.	2	4	0	0.489
19	I use tests currently being used by OTs in the field of medico-legal and FCE assessment.	0	1	4	0.539
5	I could not carry out a comprehensive neuro-assessment without the use of standardised tests.	-2	0	1	0.54
34	I believe that a neuropsychologist is better skilled to assess cognitive abilities whereas OTs are better skilled to identify functional implications of cognitive dysfunction.	2	-1	2	0.583
23	Most of the standardised neurocognitive test being used do not assess the impact of cognitive deficits on occupational performance	3	1	0	0.614
9	I feel that the test results fall short of advising me on the client's functional abilities and level of independence.	2	-1	-2	0.666
11	Language barriers often prevent me from administering or using these tests in the practice.	1	2	-3	0.831
16	I find it easy to score and interpret the findings of the tests.	-1	0	4	0.835
2	I feel that the scores generated from the test do not directly relate to the client's functional abilities.	3	-1	-1	0.843
36	I rely more on my clinical observations and clinical reasoning to support my opinion on the client's functional abilities rather than test scores.	4	-2	3	1.185

From Table 4.13, the most distinguishing statement between the three factors was Statement 36 ("*I rely on my clinical observations to support my opinion on functional abilities rather than a score"*). This statement yielded the highest Z-score variance of 1.185. Although it is a

distinguishing statement is not statistically significant. There was no agreement on the grid position of this statement on any of the three factors.

4.5.4 Consensus Statements

Statements that rank in a similar position of Q-sort distribution in the factor arrays (across the three factors) are termed consensus statements. These statements demonstrate the similarity in the factors. From Table 4.13, it appears that there are no consensus statements. The closest consensus was noted in statements 3 and 10, which had a degree of consensus but was not statistically significant.

Statement 3 (*Scores generated in the test is used to support my clinical observations)* positioned on the grid under 1 ('somewhat agree') for Factor 1 and Factor 3 however ranked under 2 ('agree') for Factor 2, thus with showing some consensus with a low score variance of 0.053. Statement 10 (*Clients score poorly on standardised tests cannot return to work most times)* was the other statement with a low Z-score variance of 0.056 and positioned on the grid at -3 ('disagree') for factors 1 and 2 and positioned at -2 ('somewhat disagree') for Factor 2.

From Table 4.13, it can be seen that participants who loaded on factors 1 and 2 share the same viewpoint on Statement 26: *most standardised tests are activity-based tasks as the format of the test* (-3 'disagree' grid position); Statement 15: *translators do not interfere with the reliability and validity of the results* (-4, 'strongly disagree' grid position) and Statement 28: *most standardised test available rely on paper-based rather than activity-based tasks* (1, 'agree' grid position).

Participants who loaded on factors 1 and 3 shared the same viewpoints and disagree (-1 grid position) on Statement 4: *I prefer having a score to comment on the client's cognitive abilities* and agree (+1 grid position) on Statement 13: *level education affect their performance in tests.*

Participants who loaded on factors 2 and 3 disagree (-1 grid position) on Statement 2 (*Scores generated from the test do not directly relate to functional ability*).

Table 4.14: Correlation between factor scores for occupational therapists perceptions.

Factor score correlations			
	Factor 1	**Factor 2**	**Factor 3**
Factor 1	1		
Factor 2	0.5397	1	
Factor 3	0.3669	0.426	1

Table 4.14 demonstrates the factor correlations between the three factors. There is a stronger correlation between factors 1 and 2 with a correlation of 0.5397. The weakest correlation is between factors 1 and 3 of 0.3669. A weak correlation of 0.426 also exists between factors 2 and 3. For the weak correlations between factors it indicates that the factors are different enough from each other for distinguishing to be obtained from the factors.

4.6 Summary

This chapter detailed the findings of each of the three objectives. For Objective One, the findings of the questionnaire on commonly used standardised test and the selection criteria for these tests were indicated. The focus group yielded themes, sub-themes and categories of the participants viewpoints and these opinions were used to derive the concourse and q-set for Objective 3. The findings of the Q-sort were detailed for the third objective, and three factors emerged from the data analysed. Factor 1 yielded the strongest eigen value thus showing highest loading of the participants' opinion on this factor. The next chapter will discuss and provide and in-depth interpretation of the findings of this study.

CHAPTER 5

Discussion

5.1 Introduction

The aim of the study was to explore how South African occupational therapists select neurocognitive tests for functional capacity evaluations and their perceptions of clinical utility of these tests to assess occupational performance in functional capacity evaluations.
This chapter will discuss the findings and results of the study. The study comprised of three objectives thus the discussion on the respective findings is presented under each objective in this section. The chapter ends with a conclusion.

5.2 Commonly used standardised neurocognitive tests and criteria for test selection

The sample of 38 respondents comprises experienced occupational therapists, as more than half the sample obtained postgraduate qualifications with more than six to 10 years' experience, thereby indicating a sample demographic of highly qualified and experienced therapists in the field of functional capacity evaluation. The sample was mostly female and this is reflective of the mostly female demographic in the field of occupational therapy in South Africa. Although the response rate was low, the value of the findings lies in the experiential use of commonly used standardised tests and knowledge-base of the sample of respondents. As Gauteng is the metropolis for functional capacity evaluations, it was expected that majority of the sample hail from this area of the country.

With test selection being emphasised in the broader literature as such an important part of carrying out a comprehensive, valid, and reliable functional capacity evaluation (Ramano & Buys, 2018; Dube, 2005; Innes & Straker, 2003; Legge & Burgess-Limerick, 2007; Fawcett, 2013), the study aimed at identifying the commonly used standardised neurocognitive tests and the selection criteria for these tests. The results of the survey showed 38 commonly used standardised neurocognitive assessments being used by the sample. From the aforementioned list, 10 tests emerged, with popularity of use in the sample as detailed in Table 4.2.

From this, the study clearly reveals that a majority of the standardised tests being used by the occupational therapists conducting functional capacity evaluations are bottom-up approach testing (RBANS, BNCE, H-CAT, MoCA, R2+7ST and CMT), which are more focused on specific components of deficit rather than the functional cognitive abilities of the tested person. The popularity of bottom-up standardised tests in this study echoed the findings in a 2020 global study by Manee et al., where it was found that African OTs infrequently use occupational performance-based tests, such as the COPM, in comparison to the global use of such tests. The authors found that OTs in Africa rely more on bottom-up (skills-based) standardised tests such as the MoCA to name one, rather than top-down (occupational performance-based) assessments. Similarly, in a Canadian study by Douglas et al. (2007), bottom-up assessments were found to be favoured by the OTs and were considered easier to administer. Although it was recognised in this and many other studies that the bottom-up tests may be popular, this testing approach was acknowledged to overtly stray from the occupational therapy theoretical framework of practice (Douglas et al., 2007; Manee et al., 2020, DE Klerk et al., 2016; Nicholls et al., 2011, Mahoney et al., 2021).

Of the standardised tests comprising of functional activities (P-FCE, CAM, WASP, CMT) and that give an understanding of the client's occupational performance challenges (P-FCE and VALPAR-6), these tests were infrequently used by the sample as opposed to the bottom-up tests. Although these tests fit the theoretical framework of occupational therapy, only a few of the therapists are using these tests in their assessments, thus, there is a disparity in the focus on occupation-based assessment in functional capacity evaluation among the sample. The sample identified they used the VALPAR-6, CAM, RBANS, MoCA and BNCE as tests commonly being used in the field as selection criterion. Of the tests being commonly used, two tests (VALPAR-6 and CAM) are activity-based top down standardised tests. Although the bottom-up tests showed popularity of use by the sample, having at least four top-down activity-based standardised tests being used is a move in the right direction toward the focus on functional abilities, rather than being diagnosis-focused, as urged by the 2018 *Symposium on Measurement and Assessment: Direction for the future in occupational therapy* (Toglia and Kirk, 2000).

Although a noteworthy drive has gone into urging and encouraging assessment of cognition using more occupation and activity-based standardised assessments, it is evident that

implementation in the field of functional capacity evaluations is slow to evolve toward functional cognition assessment.

5.3 Occupational therapists' perceptions of clinical utility of neurocognitive tests

The focus group sample demographic comprised all-female occupational therapists, of which half the sample were aged between 30 to 39 years old. A majority of the sample had more than six years' experience, with 22% having more than 10 years' experience. The focus group sample, similar to the sample of questionnaire respondents, comprised of more experienced and higher qualified participants, as more than 55% of the participants obtained a postgraduate degree or diploma qualification.

The perceptions of occupational therapists on the intended use of neurocognitive tests, where the clinical use, and the value of these tests in functional capacity evaluations will be discussed here. This study findings yielded five themes and ten subthemes. The five themes that arose were: 1) value of the standardised tests; 2) administration of the tests; 3) selection of the tests; 4) format of the tests; and 5) assessors skills. From this, ten subthemes were derived, namely: test outcomes; lack of functional outcomes; clinical significance of assessment tool and technique; limitation in test administration; test norms; validity and reliability; practicalities of tests; industry standards in cognitive testing; format of the tests lack activities; skills as an assessor and expert witness; and lastly, skills in test administration. The findings revealed that there was a link between the themes with shared perspectives in some sub-themes and thus an overlap of the participants viewpoints exists as noted in figure 4.1.

The OTs perceptions of clinical utility of the standardised neurocognitive tests overwhelmingly support previous research by Poulin et al. (2013) that bottom-up tests or conventional neurocognitive tests lack in identifying significant changes in occupational performance. This study found that the quantitative test results were limited in interpreting functional outcomes, and that although the scores add to the assessor's rigour and comprehensiveness in testing, the functional implication on occupational performance is often derived by other means, rather than from the test scores themselves. While the 2013

study highlighted the value of using conventional standardised neurocognitive tests as part of a comprehensive and structured evaluation process, the format of the mostly paper-based tests lack activities and limit the involvement of the person in an occupation with an environmental context.

The OTs in this study expressed that the conventional standardised tests yield scores of specific cognitive components and lack functional indicators. The study found that OT perceptions identified the missing link in assessment of cognition as lack of activity or performance-based standardised assessment tools. These findings are supported by research highlighting the higher predictability of functional abilities from performance-based tests in comparison to conventional neurocognitive tests (Brink, 2007; De Klerk et al., 2016; Jekel et al., 2015; Puente et al., 2014; Manee et al., 2020; Schmitter-Edgecombe et al., 2011). In a study by Mahoney et al. (2021), OTs advocate for occupational performance-based test in assessing functional cognition, with the development of a standardised self-awareness test. This demonstrates that with the development of more of these types of tests it has the potential to satisfy a number of assessment and psychometric requirements e.g. being a standardised tool, requires a person to perform activities of real-life, results link to performance indicators and can be defended as credible.

The OTs in this study revealed that the when comparing the limitations of the commonly used bottom-up neurocognitive tests, this study mirrored the findings of a Brazilian review study, which found that OTs of the third world country, not dissimilar to South Africa, face challenges in validity, reliability, and sensitivity to the populations assessed (Conti, 2017). As Crist(2015), Brink (2007), Manee et al. (2020) and Royall et al. (2007) aptly expressed that most standardised neurocognitive tests are criticised for their ecological validity, limitations in being able to be adapted cross-culturally, or cultural bias and limitations in language and education. These limitations draw close similarity to the expressed professional perspectives found in this research. The OTs explicitly identified that the standardised neurocognitive tests are limited in their use for the multitude of languages spoken in South Africa, the barriers to translating these tests as the validity of such tests become flawed, and so too do the results and that the test content itself is not culturally or educationally sensitive to the South African context.

From the research, as most of the tests being used are internationally sourced and validated on first world populations, such tests are highly questionable as appropriate to the South African demographic. This void in appropriateness to the South African demographic calls into question why the OTs are continuing to use such tests. The MoCA, which is one of the most widely used cognitive screening tests, comprises of items for example, the camel, which is not an animal of relevance or familiarity to the South African people. In addition, in the prevailing technological and digital age, the drawing of a clock in the MoCA may also be an outdated item, as most people make use of analogue or digital clocks on their electronic devices. Thus, if these items are not within the frame of reference of the tested person, this destabilises the potential validity of the test to determine their actual cognitive abilities. Irrespective of the aforementioned limitations, an explanation for the continued use of these tests could be that they provide structure to the assessment process and a baseline in the assessment of cognition and allows for clinical observations to be made whilst the client is performing the test.

Interestingly, in a quest to provide defensible and evidence-based findings, the OTs are in fact selecting tests that are not always validated or appropriate to the population assessed. Manee et al. (2020) and other similar studies found that the availability of the test in the setting and the quicker administration time of the test often trumped the appropriateness of the test to the client, for use by OTs. In another South African study by De Klerk et al. (2016), it was found that, as in the case with cognitive testing, barriers to the implementation of occupation performance-based assessment were the availability to test measures, limited familiarity in using performance-based tests, limited reimbursement for use of these tests, and the preferences of the OTs in using certain tests. However, an easily available and a quick to administer test may be preferred for the purposes of efficiency in a lengthy functional capacity evaluations, and may in fact be jeopardising the comprehensiveness, client-centredness, and sensitivity of the assessment findings (Manee et al., 2020; Cook et al., 2007).

It is noteworthy that the study highlighted the paucity of performance activity-based tests being used in the functional capacity evaluations by the OTs. The participants expressed that most test being used are bottom-up, activity lacking ,and paper-based test formats.

This practice is not supported by various literature, as it is stressed that in order for the functional capacity evaluation findings to be credible, defensible, accountable, and evidence-based, it is important for the assessor to select appropriate standardised tests which are sensitive to the population tested, objective and yield valid and reliable results (Bossuyt et al., 2012; Brown, 1996; Coster, 2008; Dube, 2005; Fawcett, 2013; Innes & Straker, 2003; Legge & Burgess-Limerick, 2007; Ramano & Buys, 2018). One such test that is generic and appropriate for any population is the Canadian Occupational Performance Measure (COPM). As noted in the Manee et al. (2020) study, with the exception of African OTs, this test was found to be the most commonly used standardised test globally, and it may be for this reason that it is so widely used. The COPM is an example, where there is not a set of goals to achieve, but rather, a procedure to get to these goals. However, the draw-back of assessments such as the COPM is that it requires sound judgement and decision-making of clients, and is more suitable as an outcome measure that track change in clients and not so much helpful in functional capacity evaluations.

It was addressed by the participants that adding a more real-life context or simulated activity whilst performing top-down assessments would ideally be a better approach to cognitive assessment. By way of contrast, in a study by Nicholls et al. (2011), the study cautions that with the increased validity that comes with performing tasks in real-world or simulated settings, the reliability of the test results may, however, be jeopardised by the flexibility in the assessment approach. This study found this to be a common point of contention in the field of functional capacity evaluation (Nicholls et al., 2011).

Irrespective of which testing methods are preferred, research showed that a combination approach of conventional standardised top-down, standardised performance-based assessments, clinical observations, and non-standardised assessment tools makes for a comprehensive assessment in the assessment of occupational performance (Nicholls et al., 2011, Manee et al., 2020, Toglia and Kirk, 2000; Hocking, 2001, Innes & Straker, 2003; Ramano & Buys, 2018).

Overall, the perceptions derived in this study concurs with the Australian cross-sectional study by Sansonetti & Hoffmann (2013) on cognitive assessment, and a Canadian study by Douglas

et al. (2007), which found that occupational performance-based assessments were a highly valued assessment tool and that although it may lack quantitative test scores, these activity-focused top-down tests and the results obtained relate to functional ability fit within the occupational therapy framework. It was evident that just like the Australian study, most OTs prefer a combined approach of using both top-down and bottom up standardised tests to comprehensively assess their clients. Furthermore, it was overtly recognised that there is a need for more standardised occupation-based cognitive tools to be developed to allow for functional cognition assessment to take place (Sansonetti & Hoffmann, 2013). As with the newly developed Occupational Therapy Anticipatory Awareness test noted by Mahoney et al. (2021) in the assessment of functional cognition and occupational performance, it seems that headway is being made to address this problem.

As important as test selection and use of appropriate tests are, assessor skills and competence was recognised to be an imperative part of a credible, valid, and rigorous assessment. As mentioned previously, the use of the standardised assessments allows for the opportunity for assessors to employ clinical observations as a critical skill to their assessment process. Many of the participants in the focus group of this study expressed the latter to be true in their assessment process, and further added that the use of such tests add weigh to their opinion, and allows them to feel confident when defending their findings in court or to an insurer.

From a positive stance, the invaluable opportunity for clinical observations during test administration was evident in the viewpoints of the participants of the focus groups expressed. In the end, it was not the number or the quantitative results derived from the test but rather the observations that were of greater importance in understanding the cognitive abilities of the client being assessed. While a majority of the OTs acknowledge the shortfalls in the validity of the standardised tests being used, they advocated for the tests being a great tool for valuable observations to be made. Many use their observations alone to provide an understanding of the clients occupational performance and merely support their views with the quantitative scores of the standardised tests. These findings were supported by studies conducted by Manee et al. (2020) and Nicholls et al. (2011), where similarly, it was found that clinical observations were widely used and preferred as a non-standardised assessment tool across the board in functional capacity evaluations. Literary evidence highlights, while clinical

observations are a valuable clinical skill as a non-standardised assessment tool, that the validity and reliability of these observations may be called into question, and are further jeopardised by the interpretation of the observations by others (Manee et al., 2020; Nicholls et al., 2011).

From the study, noting that the OTs use their clinical skill as an assessment tool more than the actual standardised test results, it is understandable that the high cost of many of these tests and the often complicated scoring and interpreting of the tests do not justify their use for many OTs. Furthermore, as many of these tests are developed in the field of neuropsychology, OTs in the focus group revealed that they often defer to the opinion of the neuropsychologist for comprehensive assessment of cognition. However, the OTs acknowledge that by merely relying on the neuropsychologist findings, it would lead to neglect of assessment of functional areas and the indicators of functional aspects of cognition. Thus, this study reiterates the value of occupational therapy in the assessment of functional cognition and the need for OTs to remain focused on the theoretical framework of the profession.

Misconceptions were noted in the responses from the participants in both the questionnaire and the focus groups. The first was that the MoCA is freely available. As of February 2020, the use and administration of MoCA requires a fee for training on the administration of the test. This misconception may be occurring as the test has been freely available for use for many years, and therapists may have not yet realised the change in availability and use of the test as of recent.

The second misconception concerned norm and criterion referenced testing. Many OTs interchangeably used ‘norm’ in relation to criterion reference tests or standardised scores, which is incorrect. This error in statistical terminology alludes to limited understanding and need for further training on psychometric properties, statistical terminology, and critical selection of tests.

A third misconception found was that many OTs expressed that they are not effectively trained in administering and selecting standardised tests. This may be due to a limited

understanding of the statistical terms such as validity and reliability, norm- or criterion referenced and the rigour with which tests are selected and for what purposes. At an undergraduate level, it is part of the syllabus that all universities educate scholars on the selection of standardised appropriate and valid assessment tools. This is an Health Professional Council of South Africa (HPCSA) minimum standard of training requirement. Manee et al. (2020) expressed that occupation performance-based standardised tests should be emphasised in undergraduate OT studies. The study by Manee notes that along with reinforcing the psychometric properties that guide test selection, educators ought to encourage cultural appropriateness and relevance to the context being applied in use of the tests.

5.4 Q-Methodology discussion

In establishing a pattern of subjective viewpoints on the clinical utility of neurocognitive tests in assessing occupational performance in functional capacity evaluations, the study revealed viewpoints continuing to emerge as noted in the focus groups.

Factor 1 represented a majority of viewpoints in the study, with 48% of participants views represented on this factor. With a high eigen value, Factor 1 strongly represents the most common viewpoints of the participants. The demographics of the participants loaded on Factor 1 showed an all-female therapist view with a spread of age ranges, however half of the sample were aged between 30 to 39 years old, and represented by mostly therapists with undergraduate degree qualifications. The loaded participants had an average of nine years of experience in the factor. Interestingly, the OT with the most years of experience in the sample, 40 years, loaded onto this factor.

It was revealed that much like the focus groups, there is an explicit agreement that the commonly used standardised neurocognitive tests lack functional indicators, or are limited in linking to occupational performance. Thus, the factor description given to Factor 1 was *standardised neurocognitive tests fall short in indicating functional ability or occupational performance*. It was strongly agreed that these bottom-up assessment tools yielded scores on specific cognitive components and provided minimal link to occupational performance

thus therapist resort to using more of their clinical observations to support their opinion on the functional abilities of the client being assessed instead of the test scores. These findings paralleled the study by Royall et al. (2007), where it was found that conventional standardised neurocognitive test results yield statistically insignificant contribution to functional outcomes and fails to predict functional performance. Similarly, a review by Poulin et al. (2013) found these bottom-up standardised assessment tools fail to identify significant changes in occupational performance deficits when assessing stoke patients. This sentiment was strongly agreed on in the study and demonstrates an overall understanding of the shortfalls in using bottom-up conventional standardised tests.

It is interesting to note that when faced with these testing limitations, OTs revert back to their clinical skill and observations, thus bringing the assessment to a client-centred focus as the assessment tool of choice showing that clinical judgement to ensure objective and comprehensive assessment is employed. It is refreshing to know that the core skills of occupational therapy when assessing cognition is not lost in administering paper-based assessment tools but rather in a critical evaluation process.

This presents a positive stance towards the development of standardised testing to be more occupational-performance focused and for cognitive testing in functional capacity evaluations to employ top-down assessment tools to better fit with the occupational therapy framework of practice. De Klerk et al. (2016) found that hand therapists in South Africa still focus too much on performance components, where it was however found that this sample seems to realise the importance of occupational-based assessments. Considering the global study on cognitive assessment perspectives, although there is inconsistency in cognitive assessment practices, it was found that the most commonly used standardised test used world-wide was the COPM, which is a top-down performance-based test (Manee et al., 2020). Thus, it appears that the move toward using tests that best fit with the theoretical framework of OT is being realised to an extent.

Factor 2 was described as *the standardised neurocognitive tests were not suited to the South African demographic*. This view was expressed by 39% of the viewpoints loading onto a factor. The demographics of most of the participants that loaded onto this factor show a scattered

age distribution, with majority of the sample having an undergraduate degree qualification, as in Factor 1. The average range of experience in years of conducting functional capacity evaluations was 6.5 years (ranging from 2-14 years).

As in the focus groups, the sensitivity and validity of the tests to the South African demographic was questioned as language barriers, need for use of translators, level and quality of the third world country education and content of the test formats were raised as invalidating or jeopardising the client's ability to effectively perform in the tests. As mentioned previously, this appears to prevail as a problem for other third world countries where English is not the only official language of the country. As reviewed in the Brazilian study on more than 40 cognitive assessment tools, Conti (2017), it was found that only one test could be adapted and validated for the Brazilian population. Evidence suggests that this phenomena with limited or lacking cultural and language appropriateness invalidates the findings of most of the tests for our population. Crist (2015) too, criticised standardised cognitive assessment tools for their lack and bias in language, educational, and cultural appropriateness. As such, by using these tools which are insensitive, inappropriate, and not validated for the South African population, OTs are risking their reputations and reliability of their assessment findings on tools which they know stray from valid and reliable evidence-based practice.

Considering the limited options that are suitable for use by OTs as in the case with the Conti 2017 review, this study further advocates for the development of cultural and language appropriate cognitive tests to better service the South African population.

Factor 3 was represented by 18% of viewpoints and was named *the scores generated by the neurocognitive tests add weight to the occupational therapist's opinion*. The participants who loaded onto the factor vary in age, with most of the sample obtaining undergraduate degrees and their years of experience range from three to 22 years. The study revealed that the OTs agreed that they use the standardised test scores to add weight and credibility to their opinions, which enhances their confidence in being able to defend their findings to their referrers or in court testimony. It is understandable that having quantitative data to support objective observations would reflect a comprehensive and well supported opinion. By having

largely qualitative observation findings in an assessment, this may pose a risk to the assessment being viewed as unsubstantiated, subjective and lacking evidence irrespective of the clinical judgement of the OT.

In a 2020 New Zealand study on fitness to drive by comparing on-road driving assessment to standardised cognitive assessments (MoCA, Maze Navigation Test and the Trail Making Test) in individuals with dementia, they found that patients scored poorly on the standardised tests, and that due to their cognitive deficits, the multidisciplinary team deemed them unable to drive, yet they passed the on-road driving test. Against expectations, the study highlighted that the unconscious bias of people with cognitive deficits and subjective judgement as well as results of standardised tests may be inaccurate in predicting driving ability (Ma'u and Cheung, 2020). This was further supported by Bennett et al. (2016), as the study revealed that MoCA or similar global tests of cognition are not suited to predict fitness to drive. Mahoney et al. (2021) similarly highlighted that the OTs in their study described many instances where a client who is able to perform basic activities of daily living struggle with higher demand of real-work activities, due to functional cognition deficits that were overlooked in basic cognitive screening. The converse also applies, as raised by the OTs in this study, as it occurs that clients can yield significantly compromised cognitive impairment findings in the conventional standardised cognitive assessment, which translates to them being deemed unsuited to work or live independently. However, many OTs agreed that these false cognitive component-based results purely indicate their cognitive skill and not their functional abilities in real-world contexts, thus bringing to the fore that OTs play a pivotal role in picking up performance deficits with assessment of functional cognition that would often be overlooked by the multidisciplinary team.

As Zur (2012) asserts, with the need to present assessment findings that are legally defendable and demonstrate evidence-based practice in medico-legal cases, in return-to-work cases to the employers or insurers in insurance claims, OTs use standardised tools to add to the comprehensiveness of the assessment.

Interestingly, it was found in this study that most OTs disagreed that that they are pressured to use standardised tests in their assessments to keep up the FCE industry standards.

However, many prefer to support their clinical deductions with the standardised assessments. Literature to support these findings from the study, was limited.

The correlation between Factor 1 and 2 was moderate (r = 0, 538) which means that there were similarities and with the consensus statements, there were two statements which were positioned at -4 and -3 respectively for factor 1 and 2. This could have caused the moderate correlation. The study revealed shared viewpoints (consensus statements) between Factor 1 and 2 as the participants in both factors disagree that most standardised tests are activity-based tasks as the format of the test and agree that most of these tests rely on paper-based formats. This is evidence that mostly bottom-up tests are being carried out in assessments of cognition. These findings, much like those found the studies by Douglas et al. (2007) and Manee et al. (2020), especially on the African perspective, where the popularity of bottom-up tests were evident, despite this the OTs identified that these tests, do not fit with the occupational therapy framework. It appears that even though OTs are aware of the shortfalls in using the bottom-up tests, their popularity for use has remained fairly unchanged. The reason for this may be the ease of administration and structure provided by the tests. Overall, Manee et al. (2020) continued to praise the use of standardised tests (component or skills-based or performance based) to limit subjectivity, bias, risks of incorrect interpretation, and to support evidence-based practice.

The weakest correlation was found between factors 1 and 3 (r= 0.3669), however consensus statements were found between Factor 3 and Factor 1, with regard to preference of having a score to comment on the client's cognitive abilities. A weak correlation of r =0.426 also exists between factors 2 and 3, yet Factor 2 and Factor 3 share the view that they disagree on the score generated from the test relating to functional abilities. These shared viewpoints between the factors show a common thread that having results represented with a score adds more face-value to the findings, yet in fact, the OTs knowingly find the scores limiting the ability to relate it to occupational performance. It appears that this is common practice and may be due to the need to represent the OT scope of practice in a more evidence-based manner.

The most significant distinguishing statements that made Factor 1 unique were statements 15, 8, 23, 29 and 2, Factor 1 being the strongest factor expressed that the majority view of perceptions in the sample. This factor's views refuted those the commonly used neurocognitive tests used assess occupational performance, and their results link directly to occupational performance. This factor was further distinguished from the other factors by being in agreement on their preference of using activities to assess cognition instead of paper-based tests. The uniqueness of this factor and the views expressed are supported by much research as detailed above.

Between all three factors, one distinguishing statement (Statement 36: I rely on my clinical observations to support my opinion on functional abilities rather than a score) stood out. The grid position of factors this statement varied between the, although factors 1 and 3 were in agreement with the statement. Interestingly, Factor 2 showed a grid position of the sample disagreeing with this statement (grid position -2), this may be due to the opinion as shared by Ma'u and Cheung (2020) where the risk of error in interpretation is high with clinical observation.

5.5 Conclusion of discussion

This chapter discussed the findings and interpreted the results of the study. A discussion on each objective was presented in this chapter.

The survey on commonly used standardised neurocognitive tests and criteria for test selection revealed that much like global trends in occupational therapy in the assessment of cognition, many therapists make use of bottom-up conventional test, which stray from the theoretical framework of occupational therapy. Whilst there are top-down performance or activity-based tests being used, these test are used infrequently in comparison to the conventional paper-based neurocognitive tests.

The perceptions of the participants in the focus groups on the clinical utility of the commonly used neurocognitive tests were that most of the test being used are not suited or appropriate to the South African demographic due to being culturally bias, limited in language and education levels, they use these tests due to the limited availability or awareness of standardised performance-based tests. It was unanimously agreed that conventional cognitive test scores provide insights into the extent of the cognitive impairment (specific

components of deficit) and not on the clients functional ability or occupational performance. Many of the OTs thus prefer to use their clinical observations and clinical judgement during the execution of these tests to bridge the gap on the link to occupational performance. Overall, there was consensus that performance or activity-based standardised cognitive test would be the best to assess occupational performance deficits and remain within the occupational therapy framework of practice.

The Q-methodology findings yielded Factor 1 as notably strong with an eigen-value of 19. This factor represented the majority view of the sample, which, much like the focus group findings, reiterated the shortfalls of using conventional standardised cognitive assessments. There was consensus pertaining to this factor that the results of the tests do not link directly to occupational performance and that it lacks functional indicators. The perceptions detailed parallel many similar studies. Factor 2 revealed perceptions that the standardised neurocognitive tests were not suited to the South African demographic. This view demonstrates agreeance with similar third world country studies that question the cultural appropriateness and limited adaptability of most conventional neurocognitive assessment measures. Although there was a general tone of inappropriateness of the conventional cognitive tests, Factor 3 expressed the viewpoint that irrespective of the draw backs of using these tests, their value to the OTs is that they add weight and support to the occupational therapist's opinion thus increasing their confidence in defending their clinical judgement to the referrer, insurer, testifying in court or when engaging with an employer.

The finding of the survey merged with that of the focus group and Q-sorts and provided support to the qualitative findings of the focus group and quantitative Q-sort findings. The survey results highlighted the lack of performance-based standardised tests being used which was further echoed in the findings of the participants viewpoints in the focus groups and Q-sorts. A common thread was seen from the survey, to the focus groups and the Q-sorts, namely that OTs are of the opinion that conventional standardised tests are limited in linking to occupational performance and lack functional indicators. Furthermore, it was evident in the findings from both the quantitative and qualitative data that these tests are limited for use and appropriateness to the South African demographic. The findings from all three data

sets (survey, focus groups and Q-sorts) merged to reveal a holistic picture of shared perceptions of clinical utility on the tests being commonly used by the South African OTs.

These viewpoints are not different from previous studies and showed that the South African viewpoint regarding the use of standardised neurocognitive tests are not unique. This study thus reiterated the need for occupational therapists to select and use standardised neurocognitive tests that remain within the theoretical framework of OT practice and to employ stricter selection criteria to ensure valid, sensitive and appropriate tests are being used for the South African demographic.

CHAPTER 6

Evaluation and Recommendations

6.1 Introduction

This chapter concludes the research study, and will evaluate its objectives. It will further detail the limitations, provide a reflection on the methodology chosen and consider future research opportunities and recommendations.

6.2 Evaluation of the objectives of the study

The aim of the study was to explore what standardised neurocognitive tests South African OTs are using and the selection criteria of these tests when conducting functional capacity evaluations, with the purpose of describing their perceptions of clinical utility of such tests in assessing occupational performance. The research question of this study was '*How useful and relevant are the currently employed standardised neurocognitive tests in functional capacity evaluation to assess occupational performance deficits?*'

Three objectives were set out to answer the question. The first objective to do a survey and understand which standardised tools OTs are using to assess cognition in functional capacity evaluations and the criteria that is being used. This objective was achieved with the main finding being that OTs are using mainly bottom-up standardised tests in assessment of cognition. Of the 10 commonly used standardised tests being used, only four tests were top-down performance-based tests.

The second objective was to carry out focus groups and explore occupational therapists' perception on the intended use of neurocognitive tests, the clinical use and the value of these standardised tests in assessing occupational performance in functional capacity evaluations. The main finding from this objective was that OTs were in agreeance that most standardised cognitive test findings did not link to occupational performance, and lacked functional indicators. The OTs further detailed the limitations of these mostly internationally sourced tests being inappropriate from a language, cultural and educational perspective with limited

adaptability to the diverse South African demographic. With that being said, the participants made use of their clinical skills in observation and clinical judgement to draw the link to occupational performance and compensate for the functional indicators lacking in the standardised tests. It was highlighted that there remains a paucity of performance or activity-based standardised assessments for use by occupational therapist as most are developed in the field of neuropsychology. The findings of this objective were used to compile the concourse for the Q-Methodology study, and this was done successfully.

The final objective was to perform a Q-methodology to test the viewpoints of OTs to identify similarities or differences that exist in their perspectives on the clinical utility of these tests in assessing occupational performance in functional capacity evaluations. The main findings of this objective was that three factors emerged, with Factor 1 yielding the strongest representation of a viewpoint of the sample. As with objective two's findings, the majority viewpoint of the sample unanimously agreed on the standardised cognitive test lacking the link to occupational performance and functional indicators and further confirmed the view on test limitations and administration. Also in line with the focus group findings, Factor 2 described the viewpoint that most of these tests are not appropriate for the South African demographic. Although, the general consensus existed on the limited clinical utility of these tests in assessing the effects of cognitive deficits on occupational performance and the value of these tests in the South African context, Factor 3 yielded the viewpoint that these tests are used to add credibility and support the OTs opinion and clinical judgement, which augment the assessors confidence in defending their opinion in the return to work process, to third parties, or when testifying as an expert witness in court. This objective was thus also successfully achieved.

The Q-methodology findings yielded Factor 1 as highly strong with an eigen value of 19. As mentioned above, this factor represented the majority view of the sample. There was consensus regarding this factor that the results of the tests do not link directly to occupational performance and that it lacks functional indicators. This perception was also described in other similar studies. The perception from Factor 2 that standardised neurocognitive tests were not suited to the South African demographic was in agreeance with similar third world country studies that question the cultural appropriateness and limited adaptability of most

conventional neurocognitive assessment measures. Although there was a general tone of inappropriateness of the conventional cognitive tests, Factor 3 expressed the viewpoint that irrespective of the draw backs of using these tests, their value to the OTs is that they add weight and support to the occupational therapist's opinion, thus increasing their confidence in defending their clinical judgement to the referrer, insurer, testifying in court, or when engaging with an employer.

Chapter Five individually discussed the findings of the three objectives, but when reflecting on the outcomes as a whole, it is clear that at every stage in the research process, it was evident that OTs carrying out functional capacity evaluations often shared common challenges and relatable sentiments. They continuously expressed their need for occupational performance focused assessment tools that were standardised. This view is not different from literature and studies in other countries as discussed in Chapter Five.

What this study however added, was the OTs realised that change is necessary. They acknowledged their discrepancy in using mostly bottom-up tests to assess cognition and further recognised that the cultural inappropriateness and adaptability of these tests to the South African demographic. Although they were aware of the limitations, they were still using these tests in clinical practices and revealed that many shared the same challenges in the clinical utility of these tests. Thus, the study may have challenged perspectives to elicit change in the approach to cognitive testing and redirect the focus to the theoretic frameworks of occupational therapy.

Unexpected viewpoints were also raised by participants which were discussed as misconceptions in Chapter Five. These were if MoCA test is freely available, training on test selection is an area of need and error in statistical terminology which was interchangeably used by some participants. It was not possible to trace these misconceptions back to certain participants due to confidentiality and no real names were used. It would have been helpful to know whether it came from a certain demographic profile e.g., younger or older population, in which case it could be addressed appropriately. However, the researcher has reflected on these unexpected findings and came up with recommendations for this later in this chapter.

6.3 Reflection on the methodology

The study employed a mixed-methods convergent design methodology as quantitative data obtained in Objective One was used as a basis and introduction to the focus group discussion and obtaining the qualitative data obtained in objective two which merged to yield the concourse used in the Q-methodology of Objective Three. The researcher found that using a mixed convergent study design worked well in highlighting the richness and uniqueness of each data set. The Q-methodology and factor analysis was the most apt method of analysing the qualitative and quantitative data, such that the viewpoints yielded in the study were able to be statistically reflected, rather than just quantitatively presented. The researcher highly recommends the Q-methodology for analysis of similar data especially when studying phenomena of a subjective nature.

In the collection of data in the study, data gathering challenges arose. The study was based in a Gauteng, so the results may not be applicable across other regions in South Africa where different perspectives may exist. It was challenging to obtain responses on the questionnaire as the emailed survey seemed to broach the attention of only a small number of respondents. Data gathering in the focus group may have been restricted by the researcher as the interview questions could have been phrased more open ended to engage the participants in elaborating on their perceptions and viewpoints. However, the data were sufficient to generate statements for the Q methodology study.

6.4 Limitations of the study

Limitations of the study were: 1) small sample size of questionnaire respondents; 2) data gathering challenges, and limited geographical representation of the sample.

The small sample size of the questionnaire respondents limits the generalisability of findings and the study is limited in being able to derive a comprehensive and reflective list of the commonly used standardised neurocognitive tests. Consensus on the list of commonly used neurocognitive tests could not be determined.

In hindsight, the researcher identifies the study may have been broken up into two separate research studies, with objective one being a study on its own as noted by the recent Manee et al. (2020) study. Elaboration and focus on the list of commonly used standardised neurocognitive tests and the criteria for test selection ought to be studied in greater detail and be expanded to a larger more representative sample. This data base of tests can go a long way in assisting the profession in evidence-based practice. By using tests that are recognised in the field of functional capacity evaluation, are standardised performance-based, validated and client-centred, value would be added in the functional assessment of cognition, and the study would be able to further advocate for the scope of occupational therapy in cognitive assessments.

6.5 Implications of the study

As an overview, this study provides OTs with an idea of what tests are commonly being used and the criteria for test selection that can help inform their critical decision-making in test selection. The study highlights the shortfalls of using standardised bottom-up tests and reiterates the need to have occupation as the focus in assessment for OTs.

Furthermore, with the high costs of purchasing standardised tests in clinical practice, this study, supported by other studies urged the use of a combined approach in functional cognition assessment, thus potentially assisting in the comprehensive assessment process being made more cost-effective. With the study taking into consideration recent studies and literature, new standardised performance-based tests came to the fore and the move toward functional cognition testing is the new directive for occupational therapy.

The findings of this study may be useful for further development and focus on test selection critique in undergraduate studies as well as to OTs carrying out FCEs, those entering this field of practice, and developers of test measures in occupational therapy.

6.6 Recommendations

6.6.1 Recommendations for FCE practice in assessment of cognitive dysfunction

It is recommended that in a movement toward functional cognition assessment, occupational therapists conducting functional capacity evaluations will benefit from the following suggestions discussed below.

Occupational therapists ought to critically expand on their strict test selection process in ascertaining whether an assessment tool employs the bottom-up or top-down approach to testing. This can be implemented by OTs understanding if the test is activity-based and the performance of tasks or paper-and-pen based measuring mostly components of cognition. A better test selection process is required, which critically evaluates the psychometric properties of the test, the appropriateness of the test to the client, the age and education range that the test is suitable for, and whether the test results meet the intended outcome that the OT is requiring for the assessment. Familiarising oneself to the properties of each individual test and monitoring the strengths and shortfalls of the tests being practically used with clients may further assist in the selection process in addition to having a sound understanding of the psychometric properties of each test. This can be carried out as done in the questionnaire findings on the criteria of test selection.

With a focus on remaining client-centered, tests selected should be sensitive to the client's demographic profile and allow for the client to show his/her potential and functional abilities rather than the test posing an undue challenge to prejudice the client. Tests such as the COPM mentioned in the Manee et al. (2020) study, and test such as the WASP and PFCE (both South African developed) and VALPAR-6 as noted in this study may be test examples that are activity and performance-based, but it is the OTs critical evaluation of each test that will discern whether the test is suitable to the client on an individual basis.

Functional capacity evaluations and the assessment of cognition ought to entail a combination of assessment approaches by means of which to ensure a comprehensive and valid assessment. An example of this approach to testing may include the use of a self-

awareness cognitive screening test, screening basic cognitive measures (e.g. MMSE), standardised conventional cognitive tests such as the RBANS, LOTCA, CAM etc. and non-standardised work-simulated and activity-based tests or tasks ought to be used such that a sound clinical picture can be derived. It is also important to be mindful as an OT that if something is questionable or not adding up in an assessment, delve further into investigating the contributors to the dysfunction, rather than merely relying on test results. Moreover, as shown in studies, OTs are uniquely positioned to advocate for the client abilities and explain their areas of dysfunction that may often be overlooked by the multidisciplinary team.

Continued professional development by attending courses, being exposed to current literature and developments in the field as well as new assessment tools being developed is paramount to evidence-based practice and professional skill development. This process of professional development is an ongoing and evolving expectation of any professional who seeks to advocate for their clients' needs and that of the OT profession. Courses through OT Link, INSTOPP and the Skill Basket as advertised on the Occupational Therapy Association of South Africa website may assist in the skill development opportunities. From this study, there is an identified need for a test selection and critique webinar to be developed and refresher courses on psychometric properties of standardised tests to be held.

For OTs to advocate for the scope of the profession, assessment results ought to reflect sound theoretical basis and should be interpreted from an occupational performance perspective, rather than detailing specific cognitive component impairments. Results should be presented in a way that describes: the cognitive abilities and limitations of the client in the context of their roles; independence; awareness of the severity of the cognitive impairment; what domains of cognitive impairment is most affecting their functional abilities; degree of assistance required; compensatory measures needed; and the functional clinical picture should be reflected from the assessment. The clinical picture ought to further reflect the interplay between the client's environmental context, the interplay between psychosocial factors, and their occupations. In doing so, we limit the overlap with neuropsychologists and cement occupation being the focus of the assessment.

6.6.2 Recommendations for further research

From this study, the following recommendations for future research is proposed.
It would be informative and useful to compile a data-base of commonly used and newly developed standardised occupational performance-based assessment tools that are more generic than specific to populations. This may assist occupational therapists in better test selection practices that further encourage use of valid and reliable test measures.

Further research may seek to explore combinations of performance-based standardised tests and conventional top-down cognitive assessment that are more reliable in assessing occupational performance. As much research detailed that the best method to assessment of cognition is a combination approach with various test modalities being used. Although this may be a tedious endeavour, a preferred start would be to look at test combinations for specific conditions such as mild traumatic brain injury or stroke.

Ideally, the development of top-down client-centered standardised cognitive assessment tools with a focus on occupational therapy will promote evidence-based practice in the field of occupational therapy and address the longstanding void in availability and variety of such tools.

6.7 Conclusion

With a growing body of research supporting the need for standardised occupational performance-based top-down assessment tools in assessing cognition, conventional standardised tests appear to be lacking functional performance indicators. Although a number of noteworthy efforts in the development of performance-based assessment tools and push from occupational therapy associations to encourage use of performance-based tests in the assessment of functional cognition, implementation in the field of functional capacity evaluations is still slow to react. As this study has highlighted, much like compelling global evidence, the use of conventional bottom-up standardised cognitive tests remains in popularity, however occupational therapists acknowledge their theoretical shortfalls and limitations in relevance to real-world contexts and link to occupational performance. From a South African perspective, these tests prove to be inappropriate and insensitive to the

country's unique demographics with cultural, language, and educational biases that call into question the validity and reliability of the findings. There is still a need for the development of standardised functional performance cognitive tests that will further improve on evidence-based practices and assist occupational therapist in remaining focused on the occupational therapy framework of practice in assessment. OTs in the study acknowledged the shortfalls in test selection and availability and moreover highlighted their unique abilities and skills in functional testing approaches. Overall, it was evident in the study that they are motivated to embrace change and would benefit from exposure to resources that enhance their skills in assessing cognition in the ever-expanding functional capacity evaluation field of occupational therapy.

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Request to participate in a research study on the use of neurocognitive tests in FCE

Dear Occupational Therapist

I am Narishca Doorasamy Thandrand; an occupational therapist currently enrolled in MSc OT (Dissertation Research) at the University of Witwatersrand. I am conducting research in regards to OTs' perceptions of the clinical utility of commonly used neurocognitive tests in assessing occupational performance in Functional Capacity Evaluation (FCE). I would be most grateful if you would consider participating in the study and provide your unique expertise in the field on vocational rehabilitation and assessment.

There is controversy in the field if standardised neurocognitive tests are needed in assessing clients in FCE's to adequately and comprehensively determine ones occupational performance. Little research has been done on the use of standardised neurocognitive assessment in assessing or determining ones functional capacity in occupational performance areas. With majority of the tests being sourced and normed for the international market it would be interesting to determine if these standardised tests are in fact a valuable assessment tool in determine occupational performance of neurologically impaired persons in the South African context. Do we actually need these tests to provide legally defensible, objective, rigorous, and credible evaluations?

I am inviting you to provide your unique clinical experience and insight into the use and value of using standardised assessments in the field of FCE testing.

1) I will require your participation in focus groups which will be between one to two hours of your time at a convenient location. This will include a discussion on the above mentioned topic and providing your unique insight into your current experiences in the field. Suitable locations of the focus groups will be chosen to assist with convenience for the participant's attendance.
2) You will then be required to perform a paper-based Q-sort at your convenience to give insight into your perceptions of the use and value of the neurocognitive assessments.

Your participation as experts in the field will be most appreciated. Kindly respond with confirmation of your participation and please sign the attached consent form and email to narishcad@gmail.com or call 011 028 5752 and I will be in contact with you directly.

Thank You

Narishca Doorasamy Thandrand

INFORMATION SHEET

Dear Occupational Therapist

I am Narishca Doorasamy Thandrand; an occupational therapist currently enrolled in MSc OT (Dissertation Research) at the University of Witwatersrand. I am conducting research in regards to OT's perceptions of the clinical utility of commonly used neurocognitive tests in assessing occupational performance in Functional Capacity Evaluation. I would be most grateful if you would consider participating in the study and provide your unique expertise in the field on vocational rehabilitation and assessment.

Why am I conducting this research?

There are a wide variety of standardised neuro-cognitive and neuro-psychological tests on the market which are being used in FUNCTIONAL CAPACITY EVALUATION testing to assist in providing objective findings. With the increased expectation of being required to defend ones assessment process and outcomes in medico-legal cases, employment settings, in insurance claims as well as clinical settings, the functional capacity evaluations should be legally defendable and medically sound. The move toward evidenced based treatment as well as assessment in occupational therapy is being stressed (Zur, 2012). However, irrespective of the reliability and validity of tests used, it is the clinical interpretation and reasoning drawn on these results that are paramount to the evaluation being credible and trustworthy so to be legally defensible (Schwandt, 2001; Zur, 2012).

There is controversy in the field if standardised neurocognitive tests are needed in assessing clients in FCE's to adequately and comprehensively determine ones occupational performance. Little research has been done on the use of standardised neurocognitive assessment in assessing or determining ones functional capacity in occupational performance areas. However, Law and Baum, 1998; Law et al., 2005, state that OT's should be using these validated tools to inform their judgments regarding occupational competence and the decisions associated with such judgments (Zur, 2012). Thus whilst aiming to critically evaluate assessment findings OT's may find the need to validate their findings by using numbers and test scores to increase evidence-based practice (Coster, 2008).

With majority of the tests being sourced and normed for the international market it would be interesting to determine if these standardised tests are in fact a valuable assessment tool in determine occupational performance of neurologically impaired persons in the South African context. Do we actually need these tests to provide legally defensible, objective, rigorous, and credible evaluations?

What do we expect from you, the participant?

Your participation is requested on the basis of being an Occupational Therapist conducting functional capacity evaluations, medico-legal assessments and vocational rehabilitation practice. A two part participation in required in the study:

3) I will require your participation in focus groups which will be between one to two hours of your time at a convenient location. This will include a discussion on the above mentioned topic and providing your unique insight into your current experiences in the field.
   Audio Recordings will be taken by the researcher during the testing session.
4) Following the analysis of the transcripts, you will be required to perform an paper-based q-sort to give insight into your perceptions of the use and value of the neurocognitive assessments.

What about confidentiality?

Confidentiality will be maintained by the use of codes instead of using your name to identify you, on all results. Only the researcher will have access to your names and personal information.

May I withdraw from the study?

Certainly, you may do so without having to give a reason. The study is completely voluntary and not taking part in it or withdrawing from it, carries no penalty of any sort. All personal information collected till the point of withdrawal will still remain confidential irrespective of the situation.

If you have any queries please feel free to contact the Wits University Occupational Therapy department on 011 717 3071 or Narishca at narishcad@gmail.com.

If you agree to participate in the study by volunteering please sign the attached consent form.

Thank You

Narishca Doorasamy Thandrand

BSc (Wits), BSc OT (Wits), Dip. Voc Rehab (UP)

R14/49 Ms ND Thandrand

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M170915

NAME: (Principal Investigator)	Ms ND Thandrand
DEPARTMENT:	School of Therapeutic Sciences Department of Occupational Therapy Medical School
PROJECT TITLE:	Clinical utility of of commonly-used neurocognitive tests in assessing occupational performance in functional capacity evaluation
DATE CONSIDERED:	29/09/2017
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Professor D Castelein
APPROVED BY:	Professor CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	07/03/2018

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on 3rd floor, Phillip V Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.
I/We fully understand the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to resubmit to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in **September** and will therefore be due in the month of **September** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature _____ Date _____

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

INFORMED CONSENT FORM

Participation in Study

I, _____ (full name) hereby consent to be a participant in the study on ***Clinical utility of commonly used neurocognitive tests in assessing occupational performance in Functional Capacity Evaluation.***

I consent to the researcher:

- Using my demographic data as an Occupational Therapist in the field of FUNCTIONAL CAPACITY EVALUATION testing
- Taking an audio recording of my participation in the focus groups
- Using the results found in the study (excluding my name)

I consent to:

- Full and honest participation in the study
- Participating in the two part study namely attendance to the focus group and completion of the Q-sort.

I am aware that I may withdraw from the study at any time, and that my participation in the study is voluntary.

Signed _____

Witness _____

Date_____ Place_____

INFORMED CONSENT FORM

Consent to Audio Recording of Focus Group Session

I, _____ (full name) hereby consent to be a participant in the study on ***Clinical utility of commonly used neurocognitive tests in assessing occupational performance in Functional Capacity Evaluation.***

I consent to the researcher:

- Taking an audio recording of my participation in the focus groups
- Using the audio recording for transcription purposes.

I am aware that I may withdraw from the study at any time, and that my participation in the study is voluntary.

Signed _____

Witness _____

Date_____ Place_____

INFORMED CONSENT FORM (Q-Sort)

Participation in Study

I, _____ (full name) hereby consent to be a participant in the study on ***Clinical utility of commonly used neurocognitive tests in assessing occupational performance in Functional Capacity Evaluation.***

Ethics Reference number: M170915

I consent to the researcher:

- Using my demographic data as an Occupational Therapist in the field of functional capacity evaluation testing
- Using the results found in the study (excluding my name).

I consent to:

- Participating in the completion of the Q-sort .

I am aware that I may withdraw from the study at any time, and that my participation in the study is voluntary.

Signed _____

Witness _____

Date_____ Place_____

Sample Questionnaire

Confidential

Commonly Used Standardised Neurocognitive Assessments Questionnaire

Dear Occupational Therapist working in the field of Functional Capacity Evaluation and Medico-legal Assessment.

I am Narishca Doorasamy Thandrand, an Occupational Therapist currently enrolled in MSc OT (Dissertation Research) at University of Witwatersrand. I am conducting research in regards to OT's perceptions of the clinical utility of commonly used neurocognitive tests in assessing occupational performance in Functional Capacity Evaluation.

Ethics Reference number: M170915

I would be most grateful if you participate in the study by completing the survey below on Commonly Used Neurocognitive Standardised Assessments in FCE and Medico-legal evaluations. Consent for your participation will be assumed by your completion of the survey.

Thank you!

Age:	_____
Gender	◯ Male ◯ Female
Qualification:	◯ Undergrad degree ◯ Post-grad Diploma ◯ Masters degree ◯ PhD
Years of experience conducting functional capacity evaluations:	◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10>
Location of Practice (Gauteng/Pretoria/KZN/ Limpopo etc)	_____
Do you use a specific FCE protocol/s in your practice?	◯ Yes ◯ No
If YES, name the protocol/s:	_____

List your most commonly used standardised tests when assessing NEUROCOGNITIVE FUNCTIONING, and the reasons or deciding factors for use:

1. NAME OF NEUROCOGNITIVE TEST: _____

Reasons or deciding factors for the use of this test:	☐ Freely available ☐ Cost effective ☐ Quick to administer ☐ Basic screening tool ☐ Comprehensive assessment tool ☐ Used for low level of education clients ☐ Used for higher cognitive functioning ☐ Predominantly used in the field ☐ Provides a good overview of cognition ☐ Uses functional activities in assessment of cognition. ☐ Gives an understanding of the clients occupational performance challenges.
Other comments/ reasons:	_____
2. NAME OF NEUROCOGNITIVE TEST	_____
Reasons or deciding factors for the use of this test:	☐ Freely available ☐ Cost effective ☐ Quick to administer ☐ Basic screening tool ☐ Comprehensive assessment tool ☐ Used for low level of education clients ☐ Used for higher cognitive functioning ☐ Predominantly used in the field ☐ Provides a good overview of cognition ☐ Uses functional activities in assessment of cognition. ☐ Gives an understanding of the clients occupational performance challenges.
Other comments/ reasons:	_____
3. NAME OF NEUROCOGNITIVE TEST	_____
Reasons or deciding factors in use of this test:	☐ Freely available ☐ Cost effective ☐ Quick to administer ☐ Basic screening tool ☐ Comprehensive assessment tool ☐ Used for low level of education clients ☐ Used for higher cognitive functioning ☐ Predominantly used in the field ☐ Provides a good overview of cognition ☐ Uses functional activities in assessment of cognition. ☐ Gives an understanding of the clients occupational performance challenges.
Other comments/ reasons:	_____

4. NAME OF NEUROCOGNITIVE TEST _____

Reasons or deciding factors for the use of this test:	☐ Freely available ☐ Cost effective ☐ Quick to administer ☐ Basic screening tool ☐ Comprehensive assessment tool ☐ Used for low level of education clients ☐ Used for higher cognitive functioning ☐ Predominantly used in the field ☐ Provides a good overview of cognition ☐ Uses functional activities in assessment of cognition. ☐ Gives an understanding of the clients occupational performance challenges.
Other comments/ reasons:	_____
5. NAME OF NEUROCOGNITIVE TEST:	_____
Reason or deciding factor in use of this test:	☐ Freely available ☐ Cost effective ☐ Quick to administer ☐ Basic screening tool ☐ Comprehensive assessment tool ☐ Used for low level of education clients ☐ Used for higher cognitive functioning ☐ Predominantly used in the field ☐ Provides a good overview of cognition ☐ Uses functional activities in assessment of cognition. ☐ Gives an understanding of the clients occupational performance challenges.
Other comments/ reasons:	_____
6. NAME OF NEUROCOGNITIVE TEST	_____
Reason or deciding factor in use of this test:	☐ Freely available ☐ Cost effective ☐ Quick to administer ☐ Basic screening tool ☐ Comprehensive assessment tool ☐ Used for low level of education clients ☐ Used for higher cognitive functioning ☐ Predominantly used in the field ☐ Provides a good overview of cognition ☐ Uses functional activities in assessment of cognition. ☐ Gives an understanding of the clients occupational performance challenges.
Other comments/ reasons:	_____
	_____

Confidential

7. NAME OF NEUROCOGNITIVE TEST

Reason or deciding factor in use of this test:	☐ Freely available ☐ Cost effective ☐ Quick to administer ☐ Basic screening tool ☐ Comprehensive assessment tool ☐ Used for low level of education clients ☐ Used for higher cognitive functioning ☐ Predominantly used in the field ☐ Provides a good overview of cognition ☐ Uses functional activities in assessment of cognition. ☐ Gives an understanding of the clients occupational performance challenges.
Other comments/ reasons:	_____

8. NAME OF NEUROCOGNITIVE TEST

_____

Reason or deciding factor in use of this test:	☐ Freely available ☐ Cost effective ☐ Quick to administer ☐ Basic screening tool ☐ Comprehensive assessment tool ☐ Used for low level of education clients ☐ Used for higher cognitive functioning ☐ Predominantly used in the field ☐ Provides a good overview of cognition ☐ Uses functional activities in assessment of cognition. ☐ Gives an understanding of the clients occupational performance challenges.
Other comments/ reasons:	_____

THANK YOU FOR YOUR PARTICIPATION IN THE SURVEY AND STUDY.

Interview Schedule for focus groups

Interview Schedule of Questions:	Examples of Probing questions used in the focus group:
1. From the questionnaires sent out to OTs conducting FCE's in South Africa the following commonly used neurocognitive tests have been identified.	Name a few of the standardised neurocognitive test you are currently using in conducting FCE's? Are you familiar with these tests mentioned in the questionnaire and do you use them yourself in clinical practice? Are there any other tests that you would like to mention?
2. Do you find these tests appropriate for the South African Demographic of clients you are assessing?	How suited are they to the clients you assess? What are useful about these tests?
3. Are the test results obtained useful in determining the clients performance in their occupational performance areas?	So you were saying the observation is what is most useful to us rather than the results? Can you explain a bit more? Do the tests give you performance components or are they giving you components of cognition? Is there a direct link, an indirect link, can you then extrapolate the information that you've gotten, so the scores and

	the findings that you get from the percentiles into that population, does that give you a link to the occupational performance?
4. Do these tests results provide an understanding or link with the client's occupational performance?	Does the scores derived give you enough information to link to occupational performance? So you're gauging at where the client's functioning is but you're still using clinical reasoning? Do you think we are using occupation/activity based assessments in the field?
5. Do these tests help you to provide defendable results in your FCEs?	Are we using these assessments so that we can defend them, we can defend our reports? Do you feel that it allows more, you rely on the, standardized assessment, to, as a back up to your opinion, does it add more weight to your opinion? Is it a requirement from your referrers?
6. What are the strengths of using standardised tests in your FCEs?	What is your reasoning for choosing these assessments? Why are you using them in your FCE evaluation?

7. What are the limitations of using these standardised test in your FCE's?	Is there any limitation to assessing occupational performance? When you say it's mostly paper based are you saying that there's not enough activity? So there's a demand for a functional cognitive assessment but obviously that you need, basic skills and more executive skills so it has to be a wide range of functional testing. In your clinical opinion is there a need for OTs to have OT based or functional based cognitive assessment?

56 Statements Derived from five themes in the concourse

Themes →	Statements
1. Value of the Standardised tests	1. The scores generated in most commonly used tests yield results on specific cognitive components such as memory, attention and concentration for example. 2. I feel that the scores generated from the test do not directly relate to the client's functional abilities. 3. Scores generated in the test are used to support my clinical observation. 4. I prefer having a numerical value/score in order to comment on the client's cognitive abilities. 5. I do not rely on the scores generated to inform me on the client's occupational performance. 6. I could not carry out a comprehensive neuro-assessment without the use of standardised tests. 7. I rely heavily on my clinical observations in commenting on the client's cognitive abilities irrespective of the test results. 8. My clinical observations during the test administration are more valuable to me being able to comment on the client's cognitive abilities. 9. I use the standardised test to add weight or support my opinion. 10. The standardised tests provide structure in the assessment of cognition in my assessment process. 11. The tests assist in giving me a starting point in the assessment of cognitive abilities. 12. The test results obtained link directly to the client's occupational performance. 13. I feel that the test results fall short of advising me on the client's functional abilities and level of independence. 14. Clients who score poorly on the standardised tests cannot return to work most times. 15. Standardised neurocognitive assessments are the gold standard in assessing cognition in FCE's. 16. I find the use of standardised cognitive tests a valuable assessment tool. 17. Using standardised cognitive assessments makes it easier for me to comment on the client's occupational performance.

2. Administration of the tests	18. Language barriers prevent me from administering these tests often in the practice. 19. Most of my client demographic are disadvantaged by the norms of the tests. 20. Level of education of the clients I assess affects their scoring in the tests. 21. I have to make use of a translator regularly to assist in administering the test to non-English speaking clients. 22. Most translators provide accurate verbatim repetition of what the client says. 23. Use of translators do not negatively affect the test results. 24. Most of the tests I use are simple to administer. 25. I find it easy to score the tests I use and understand what the findings mean.
3. Selection of the tests	26. I feel that most standardised test available are not suited to the South African Demographic. 27. Most of the commonly used test available are normed for an international population. 28. I am aware of a variety of standardised neuro-cognitive tests being used by OT in FCE's assessments. 29. I make sure to use tests that majority of the OTs in the field are using. 30. I find that most of the standardised tests are valid and reliable for the test population I assess. 31. The validity and reliability of the test are being invalidated by the use of translators. 32. I only chose tests that are valid and reliable for the clients I assess. 33. Most of the tests being used for FCE's are readily available for purchase. 34. Most of the standardised tests are affordable. 35. Most of the standardised neurocognitive test being used in the field are compiled by OT's 36. I only use the test that are being commonly used in the field of FCE's. 37. I feel pressured into keeping up with the standards of the industry in using specific standardised tests. 38. Time of administration of the test plays a role in my selection of the test in the assessment. 39. I select test specifically to assess occupational performance. 40. Most tests are suitable to the clients I assess. 41. I keep in mind the referrers needs when selecting tests.

4. Format of the tests	42. Most of the standardised tests entail activities as the format of the test. 43. I prefer using paper and pen based tests to assess my client's functional abilities. 44. I believe that the assessment format of most tests being used do not provide sufficient variety tasks to assess the client's functional abilities. 45. I would prefer to use more activities in comprehensively assessing cognition functionally. 46. The test scores obtained are highly indicative of the client's abilities.
5. Assessors skills	47. I feel more confident defending my opinion with scores and the use of standardised tests. 48. My referral sources expects that standardised tests be included in neuro-cognitive testing. 49. I believe that I am not skilled enough to comprehensively assess functional cognitive abilities without the use of standardised tests. 50. I feel more confident providing expert witness testimony in court or to the referrer if I have numerical values to base my opinion of. 51. I feel that I have been adequately trained to correctly administer most of the standardised tests I use. 52. I would like to obtain more training in administering the tests I use. 53. I believe that the neuropsychologist are better skilled to assess cognitive abilities. 54. I feel that my scope of practice in assessing cognitive abilities is limited and I should defer to a neuropsychologist. 55. I am a confident assessor in using standardised tests to assess cognitive abilities related to occupational performance. 56. I rely more on my clinical skills and clinical reason to support my opinion on the client's functional abilities.

Final Q-set of 36 Statements

Themes	Sub-themes	Statements
1. Value of the Standardised tests	1. Test outcomes 2.Lack of functional outcomes 3.Clinical significance of assessment tool and technique	1. Most neurocognitive standardised tests yield scores on specific cognitive components such as memory, attention and concentration, rather than occupational performance. 2. I feel that the scores generated from the test do not directly relate to the client's functional abilities. 3. Scores generated in the test are used to support my clinical observation. 4. I prefer having a numerical value/score in order to comment on the client's cognitive abilities. 5. I could not carry out a comprehensive neuro-assessment without the use of standardised tests. 6. I use the standardised test to add weight and credibility or to support my opinion. 7. The standardised tests provide structure and a starting point in assessing cognition in my assessment process. 8. The test results obtained link directly to the client's occupational performance. 9. I feel that the test results fall short of advising me on the client's functional abilities and level of independence. 10. Clients who score poorly on the standardised tests cannot return to work most times.
2. Administration of the tests	4. Limitations in test administration	11. Language barriers often prevent me from administering or using these tests in the practice. 12. Most of my clients' demographic profile are disadvantaged by the norms of the tests. 13. Level of education of the clients I assess affects their performance in the tests. 14. I have to make use of a translator regularly to assist in using the test as an observational tool for non-English speaking clients. 15. Use of translators do not interfere with reliability and/ validity of the test results. 16. I find it easy to score and interpret the findings of the tests.

Themes	Sub-themes	Statements
3. Selection of the tests	5.Test norms, validity and reliability. 7.Practicalities of tests 7. Industry standards in cognitive testing	17. I feel that most standardised test available are not suited to the South African demographic profile. 18. Most of the commonly used tests available do not have norms for the South African population. 19. I use tests currently being used by OTs in the field of medico-legal and FCE assessment. 20. I only chose tests that are valid and/ reliable for the clients I assess. 21. Most of the tests being used for FCEs are readily available for purchase. 22. Most of the standardised tests are affordable. 23. Most of the standardised neurocognitive test being used do not assess the impact of cognitive deficits on occupational performance 24. I feel pressured into keeping up with the standards of the FCE/Assessment industry in using specific standardised tests. 25. Time of administration of the test plays a role in my selection of the test in the assessment.
6. Format of the tests	8. Format of the tests lack activities	26. Most of the standardised tests entail activity-based tasks as the format of the test. 27. I prefer using paper and pen based tests to assess my client's functional abilities. 28. Most standardised tests available rely more heavily on paper-based tasks rather than activity-based tasks. 29. I would prefer to assess the functional implications of cognitive fallout using more activity-based tasks.
7. Assessors skills	9. Skills as an assessor and expert witness 10. Skills in test administration	30. I feel more confident defending my opinion with standardised tests scores. 31. My referral sources expects that standardised tests be included in neuro-cognitive testing. 32. I believe that I am not skilled enough to comprehensively assess functional cognitive abilities without the use of standardised tests. 33. I feel that I have been adequately trained to correctly administer and interpret findings for most of the standardised tests I use. 34. I believe that a neuropsychologist is better skilled to assess cognitive abilities whereas OTs are better skilled to identify functional implications of cognitive dysfunction. 35. I am a confident assessor in using standardised tests to assess cognitive abilities that impact on occupational performance. 36. I rely more on my clinical observations and clinical reasoning to support my opinion on the client's functional abilities rather than test scores.

Q- Methodology: Instructions on how to carry out the Q-sort

- Read each statement on the cards provided and understand the statements
- Place the statements into three piles:
  - "Agree" pile (statements you agree with)
  - "Disagree" pile (statements you agree with)
  - "Neutral" pile (statements you are impartial/have no opinion on)
- Sort the "agree" and "disagree" piles further using the graph provided to you (Figure 1.
- The + side of the graph ranges from somewhat agree (+1), agree (+2) highly agree (+3) and strongly agree (+4). The same applied to the – side of the graph (somewhat disagree, disagree, highly disagree (+3) and strongly disagree (+4).
- Place each card on the graph in the slot of your choice.
- Note: that there are an exact number of cards available for the number of slots in the graph. Thus there should not be any cards left over.
- You can rearrange the cards as many times as you wish until you are satisfied with your choices.

Figure 1: Q-sort Grid

DISAGREE **AGREE**

-4	-3	-2	-1	0	1	2	3	4
1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
	19	20	21	22	23	24	25	
		26	27	28	29	30		
			31	32	33			
			34	35	36			

Coding List

Code System	#
Code System	1694
Baseline	6
Comparison	3
Compare	9
Comfortable	13
Confident	8
Correlate	5
Analysis	5
Assistance	4
Feedback	5
Value	8
Instructions	8
Disadvantage	2
Appropriate	27
Complicated	3
Specific	24
Tests/testing	343
Approach	7
Familiar	11
Paper (pen and paper/paper-based)	11
Tasks	31
Functional	51
Time	50
Scope	8
Limitation	31
Comprehensive	10
Strength	18
Occupational	45
Occupation	52
Dependent	15
Scoring	12
Activity	32
Activities	8
Cost	11
Expert	4
Clinical	54
Skills	34
South African	25
Court	18

Relevant	7
Performance	76
Function	80
Conclusion	19
Rely	21
Perspective	10
Information	48
Capacity	13
Impairment	5
Tool	19
Independently	10
Observation	48
Administer	11
Neuropsychologist	6
Translator	5
Translate	7
English	13
Quality	11
Context	20
Education	20
Results	53
Norms	21
Standardize	82
Reliability	6
Validity	10
Language	46
Population	16

List of 38 commonly used tests found in the study

Name of test	Frequency of use in sample:
1. Repeatable Battery for the Assessment of Neuropsychological Status (RBANS)	23
2. Montreal Cognitive Assessment (MoCA)	20
3. Cognitive Assessment of Minnesota (CAM)	16
4. Brief Neuropsychological Cognitive Evaluation (BNCE)	7
5. Hirebright Cognitive Ability Test (H-CAT)	7
6. Ruff 2 and 7 Selection Test (R2+7ST)	7
7. Work Ability Screening Profile (WASP)	6
8. Psychiatric FCE (PFCE)	5
9. VALPAR VCWS Work Sample 6 (VALPAR 6)	5
10. Contextual Memory Test (CMT)	5
11. Chessington Occupational Therapy Neurological Battery (COTNAB)	4
12. Behavioural Assessment of Dysexecutive Syndrome (BADS)	4
13. Developmental Test of Visual Perception-A (DTVP-A)	4
14. Thurstone Clerical Test	4
15. Test of Informational Processing Skills (TIPS)	4
16. Minnesota Clerical Test	3
17. Rookwood Driving Battery	3
18. Therapist Portable Skills Assessment Laboratory (T/PAL)	3
19. Wide Range Assessment of Memory and Learning 2 (WRAML2)	3
20. Rivermead Behavioural Memory Test 3 (RBMT-3)	3
21. Doll Chair Assembly Task (DCAT)	3
22. Test of Visual Perceptual Skills (TVPS)	3
23. Dover	2
24. Addenbrooke Cognitive Examination	2
25. Dynamic Lowenstein Occupational Therapy Cognitive Assessment (DLOTCA)	2

26. Beta-4	2
27. Writing Cognitive Assessment/Screen	1
28. Allen Cognitive Level Scale (ACLS)	1
29. Rey Complex Figure (RCF)	1
30. The Visual Object and Space Perception Battery (VOSP)	1
31. Sensory Integration and Praxis Test (SIPT)	1
32. Assessment of Motor Processing Skills (AMPS)	1
33. Cognitive Linguistic Quick Test (Clqt)	1
34. Developmental Test of Visual Perception-2 (DTVP-2)	1
35. Quick Neurological Screening Test (QNST)	1
36. Berry Buktenica Visual Motor Integration Test (VMI)	1
37. Saint Louis University Mental Status Examination (SLUMS)	1
38. Mini Mental State Examination (MMSE)	1

Table on Factor Matrix Defining Sorts Flagged

Factor Matrix with Defining Sorts Flagged						
	Factor 1		Factor 2		Factor 3	
Eigen value	19,6		4,5		3,1	
Participant						
1 F1U2	0,2683		0,613	flagged	0,1219	
2 F2D7	0,6948	flagged	0,4225		-0,1085	
3 F3U2	0,2116		0,5853	flagged	0,3703	
4 F1U5	0,7627	flagged	0,2875		0,084	
5 F2U7	-0,0214		0,5399	flagged	0,2809	
6 F5U40	0,7544	flagged	0		0,3761	
7 F4D20	0,1082		0,4944	flagged	0,4723	
8 F5U22	0,3921		0,0553		0,5281	flagged
9 F1U3	-0,1335		0,6809	flagged	0,2155	
10 F3U4	0,0599		0,2491		0,7781	flagged
11 F2U13	0,6405	flagged	0,324		0,2784	
12 F2U13	0,2709		0,6324	flagged	0,2501	
13 F2U8	0,4835	flagged	0,1076		0,4266	
14 F2U3	0,2299		0,2374		0,4279	flagged
15 M1U2	0,1139		0,4733	flagged	0,3942	
16 F2U6	0,4828		0,4953	flagged	0,0714	
17 F2U10	0,1675		0,8204	flagged	-0,0741	
18 F1M5	0,6251	flagged	0,0335		0,5435	
19 F2U5	0,7974	flagged	0,0715		0,3576	
20 F2U2	0,1836		0,5665	flagged	-0,0223	
21 F1M3	0,6287	flagged	0,2001		-0,0625	
22 F1U2	0,4949	flagged	0,3977		-0,1278	
23 M1U3	0,1344		0,0903		0,5791	flagged
24 F2D7	0,6234	flagged	0,2505		0,2709	
25 F3U6	0,4203		0,3371		0,4047	
26 F2U2	0,6002	flagged	0,3936		-0,0817	
27 F2D8	0,7523	flagged	0,3556		0,191	
28 F1D8	0,8031	flagged	0,38		0,0489	
29 F2U10	0,4093	flagged	0,2594		-0,065	
30 F3U23	0,8198	flagged	0,256		0,2386	
31 F2U14	0,5622		0,5404		0,1832	
32 F4U20	0,7493	flagged	0,2201		0,2749	
33 F1U3	0,4016		0,6571	flagged	0,0938	
34 F1D6	0,1392		0,59	flagged	0,2941	

Factor Matrix with Defining Sorts Flagged						
	Factor 1		**Factor 2**		**Factor 3**	
35 F1D2	0,4087		0,4902		0,3121	
36 F1U5	0,0425		0,6646	flagged	0,1289	
37 F1U2	0,1953		0,5873	flagged	0,377	
38 F3D22	-0,118		0,1109		0,5059	flagged
39 F2U8	0,3414		0,4188		0,4104	
40 F2U14	0,381		0,4142	flagged	0,1418	
41 F3U3	0,6541	flagged	0,1728		0,1834	
42 F2U7	0,3409		0,3801	flagged	0,105	
43 F2U7	0,3437		0,5931	flagged	0,0468	
44 F1U6	0,4772		0,6017	flagged	-0,2988	
45 F3D11	0,0133		0,0499		0,549	flagged
46 F2U8	0,3365		0,4595		0,3252	
47 F2U5	0,7105	flagged	0,0181		0,3981	
48 F2U5	0,8877	flagged	0,0301		0,0599	
49 F2U4	0,8742	flagged	0,0111		0,0352	
50 F1U4	0,7574	flagged	0,2319		0,1639	
51 F2U5	0,838	flagged	0,1766		-0,0393	

Note: Key to participant information

First two digits = Participant study number, followed by F = Female, M= Male,

Fourth digit = Age range in years (1 = 20 -29, 2 =30 -39, 3 = 40 -49, 4 = 50 -59, 5 = >60)

Alphabet = Level of education (U = Undergraduate Degree, M = Master's Degree, P = Post-graduate Diploma)

Last digit = Years of experience

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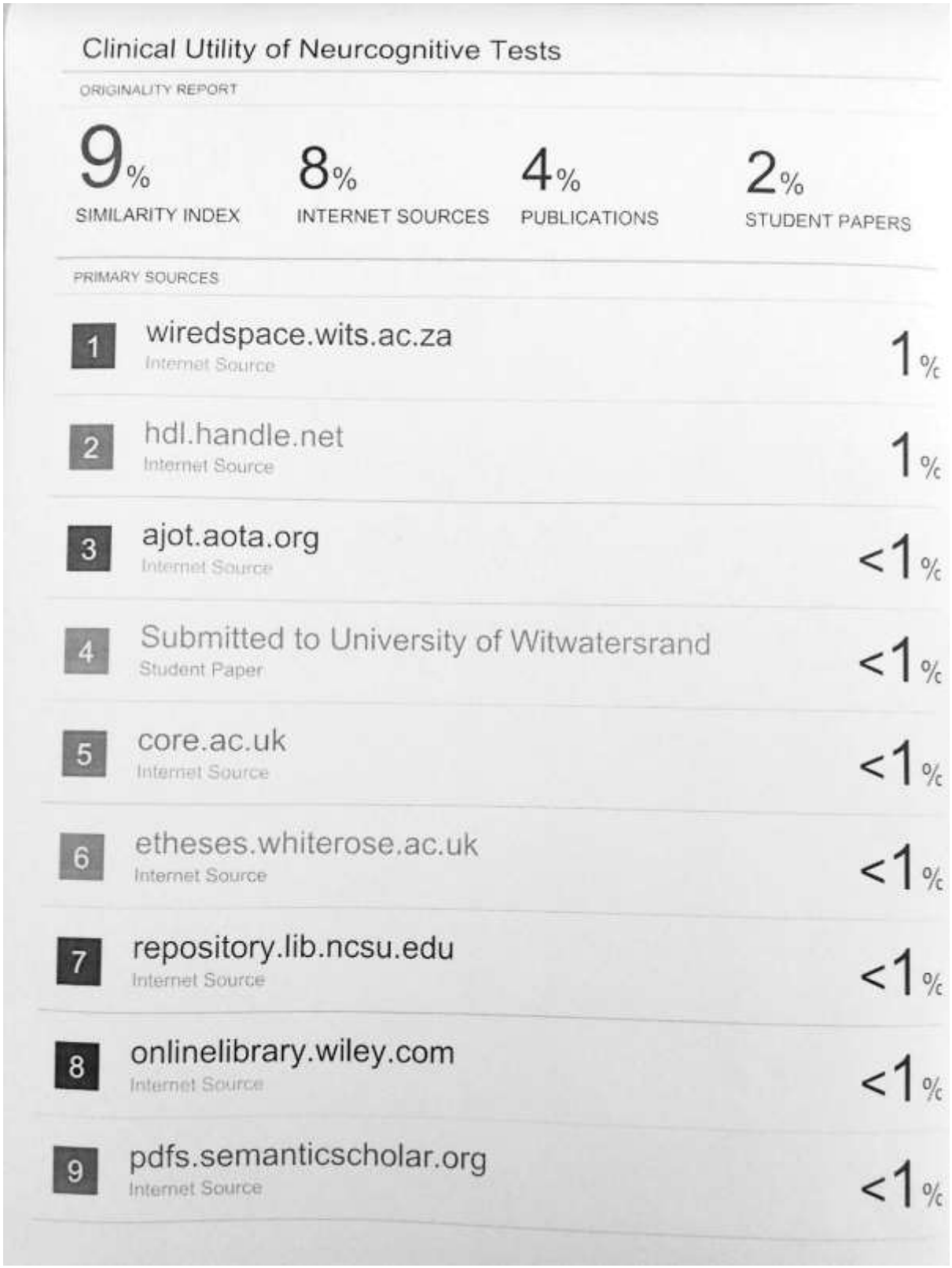
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Clinical utility of commonly used neurocognitive tests in assessing occupational performance in Functional Capacity Evaluation

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Narishca Doorasamy Thandrand

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Genevieve Wood
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