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Towards Validation of South African Communicative Development Inventories: An object naming/identification task for South African English and Afrikaans

by

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Abstract

Background: South Africa is a country rich in diversity, with language constituting a large proportion of this diversity as the country has eleven official languages with Afrikaans, isiXhosa and South African English (SAE) being the provincial languages of the Western Cape. Research on language acquisition in South Africa is limited, but vital for the early identification, assessment and management of children who are not developing language in a typical way. A recent project in South Africa has led to the development of Communicative Development Inventories (MB-CDIs) in several of the country's official languages. MB-CDIs are parent-report questionnaires about young children's language acquisition. It is challenging to validate these MB-CDIs in the local context as there are few other language assessments available for comparative purposes.

Aims and Objectives: This project aimed to develop a protocol for language assessments that can be used as part of the validation process for the MB-CDIs in South African languages. The objectives were (1) to devise a protocol for an object naming and object identification task for use with six South African languages (Afrikaans, isiXhosa, SAE, Sesotho, Setswana, and Xitsonga); (2) to describe the expressive and receptive language of children acquiring SAE based on assessment with two different tools/approaches (the object naming/identification task and parent-report MB-CDI); and (3) to describe the expressive and receptive language of children acquiring Afrikaans based on assessment with two different tools/approaches (the object naming/identification task and parent-report MB-CDI).

Methodology: This study used a mixed-methods, descriptive-linguistic approach. The first objective relied on literature only and no participants were needed. I devised a protocol for a novel object naming/identification task[1] which could be used to validate the MB-CDIs in six languages (Afrikaans, isiXhosa, SAE, Sesotho, Setswana, and Xitsonga). For objectives 2 and 3, focusing solely on SAE and Afrikaans, I used the protocol to devise an object naming/identification task to be used with each language, respectively. Participants (toddler-caregiver dyads) were recruited and a pilot study undertaken in which the object naming/identification task was administered to each child participant. I collected parental report data by either administering the MB-CDI in SAE and Afrikaans manually to the adult participants (parents/guardians of the children), or by providing them with a link to the online

[1] The name "object naming/identification task" is merely a short-form working title, as the task includes three subsections: naming, identification and gesture. This working title is used for brevity throughout this dissertation and may be changed in future research.

version of the MB-CDI which they were able to complete in their own time. A total of 35 dyads were included in this study: 17 child and 17 adult participants for SAE and 18 child and 18 adult participants for Afrikaans.

Results: SAE: The descriptive statistics suggested variability in the overall scores on both the object naming/identification task and the MB-CDI. Correlations between the 25 items in the object naming/identification task and the same 25 items in the MB-CDI indicated a significant correlation between the two assessments overall (r=0.928; p<0.01). No correlation was indicated for infants only (r=0.786; p>0.05) and a significant correlation was indicated for toddlers only (r=0.935; p<0.01). Correlations between the object naming/identification task and the entire MB-CDI indicated a significant correlation (r=0.901; p<0.01) for overall vocabulary scores. Internal reliability scores for only the 25 items included in the object naming/identification task and the 25 items in the MB-CDI also indicated a high internal consistency for the language domains (α=0.911). For the gesture domain, a reasonable but lower internal consistency (α=0.673) was found. Internal reliability scores overall indicated a high internal consistency for the language domains (α=0.947). In contrast, the internal consistency indicated for the gesture domain was not satisfactory (α=0.293).

Afrikaans: The descriptive statistics indicated variability among scores obtained on the MB-CDI and the object naming/identification task. Correlations between the 25 items included in the object naming/identification task and only the same 25 items included in the MB-CDI, indicated a strong correlation (r=0.906; p<0.01). No correlation was found for infants only (r=0.692; p>0.05) and a significant correlation was indicated for toddlers only (r=0.901; p<0.01). Correlations between the object naming/identification task and the entire MB-CDI indicated a strong correlation for overall vocabulary scores (r=0.909; p<0.01). Internal reliability scores on only the 25 items included in both assessments indicated a high internal consistency for the language domains (α=0.960). Internal reliability scores between the object naming/identification task and the entire MB-CDI indicated a high internal consistency for the language domains (α=0.950). Similarly, a strong internal consistency was found for the gesture domain (α=0.914).

Conclusion: The findings indicate that when correlating the responses to the 25 items included in the object naming/identification task and the MB-CDI only, as well as from the entire vocabulary and gesture sections of the MB-CDI, there is high concurrent validity between the two assessments overall for both SAE and Afrikaans. Focusing on toddlers and infants more

specifically, although high concurrent validity was found overall, the findings for both SAE and Afrikaans suggest that there is high concurrent validity for both assessments for toddlers, but no correlation between the assessments for infants. High internal consistency indicated reliability for both assessments for SAE and Afrikaans. The object naming/identification task, which was developed and piloted in this study, has the potential to be used as a measure to validate full MB-CDIs in SAE and Afrikaans. Furthermore, it has the potential to be used as a valid and reliable screening tool in its own right, although further refinement is needed for the infant component of the task. The protocol developed in the first objective of this study can now be applied to other local languages, ultimately contributing to the creation of a valid and reliable set of assessments of young children's early language development in South Africa.

Key words: MacArthur-Bates Communicative Development Inventory, South African Communicative Development Inventory, South African English Communicative Development Inventory, Afrikaans Communicative Development Inventory, Language, South African English, Afrikaans, Validity, Reliability, Assessment, Protocol, Object naming/identification task.

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Abbreviations

ICTS:	Information and Communication Technology Services
FHS:	Faculty of Health Sciences
MB-CDI(s):	MacArthur-Bates Communicative Development Inventory (Inventories)
SAE:	South African English
SLP(s):	Speech-Language Pathologist (Pathologists)
SPSS:	Statistical Package for the Social Sciences
UCT:	University of Cape Town

Chapter one

Introduction

1.1. Introduction to the chapter

This chapter introduces the research topic and the context in which the work was undertaken. It starts with a brief introduction to the MacArthur-Bates Communicative Development Inventories (MB-CDIs), the parent-report questionnaires that serve as the study's starting point and whose validation is the main focus of the project. Additionally, the chapter provides insight into the different languages of South Africa and the research available pertaining to how young children acquire these languages. The concept of validity is introduced together with an overview of approaches used to validate adaptations of assessments such as the MB-CDIs.

1.2. Background

South Africa is a country rich in diversity, with language constituting a large portion of this diversity: The country has eleven official languages (Government Communication and Information System, 2018/19). Out of the eleven official languages, South African English (SAE) and Afrikaans are Germanic languages, with the remaining nine languages being Bantu languages (Van der Merwe & Le Roux, 2014). The Bantu languages can be divided into four groups: namely the Nguni, Sesotho, Tsonga and Venda group (Cole, 1992 as cited in Van der Merwe & Le Roux, 2014). These groups are further divided into the following subgroups: Northern Sesotho, Southern Sesotho, isiZulu, isiXhosa, Siswati and isiNdebele (Van der Merwe & Le Roux, 2014). According to Statistics South Africa's (2018) General Household survey, isiXhosa is spoken by 14,8%, Afrikaans by 12,2 %, and SAE by 8,1% of South Africans within their household. Even though SAE is not the most commonly spoken language inside households, it is the second most common language spoken by South Africans outside of their homes (Statistics South Africa, 2018). The Western Cape province, where the current study was conducted, has three official provincial languages, namely Afrikaans, isiXhosa and SAE (Western Cape Language Policy, 2019) with 49,6% of the Western Cape population speaking Afrikaans as a first language; 24,7% isiXhosa as a first language, and 20,2% SAE as their first language (Statistics South Africa, 2011).

Based on this diversity, there is an expectation for speech-language pathologists (SLPs) in South Africa to provide assessment and intervention which is evidence-based and of a high

standard, regardless of the language and cultural differences which they may encounter on a daily basis (Pascoe, Klop, Mdlalo & Ndhambi, 2018; Pascoe & Norman, 2011). To do this, SLPs need to have an in-depth understanding of the experiences, languages and cultures of the South African population, in addition to assessment tools which are relevant in the South African contexts and considered linguistically and culturally appropriate (Mdlalo, Flack & Joubert, 2019; Pascoe & Norman, 2011). This remains a challenge for SLPs as there is limited research available on young children's acquisition of the South African languages (Pascoe & Smouse, 2012), and thus it is also a challenge for SLPs to identify and treat young children who have difficulty acquiring these languages.

Many of the assessments being used by SLPs in South Africa have been developed in other countries, which negatively affects services provided to young children whose cultural backgrounds are different to those for which the assessments were originally developed (Mahura & Pascoe, 2016; Mdlalo et al., 2019; Pascoe & Norman, 2011). A linguistically and culturally appropriate assessment tool can be defined as a tool which has been developed based on a specific population and location (Pascoe & Norman, 2011). The availability of such tools is of utmost importance to SLPs as the entire management of a case rests on the ability of the SLP to conduct an assessment which considers language and culture and will, therefore, yield the most accurate results to base a treatment program on (Pascoe & Norman, 2011). There is, therefore, a need for more research to be conducted on young children's language acquisition and for assessments to be developed which are relevant within South Africa. The starting point of this study was a need to determine the validity of an assessment tool which has recently been developed for use with infants and toddlers who speak one of six South African languages, namely Afrikaans, isiXhosa, SAE, Sesotho, Setswana, and Xitsonga, with SAE and Afrikaans being the languages of focus for the present project[2].

1.3. Language acquisition

Being able to communicate with those around you is essential to human life, and typically the development of language starts from a very young age, with first words expected between 12–18 months (Bowen, 1998; Fenson et al., 1994; McLeod & Bleile, 2003). Literature suggests that one of the very first signs of intentional communication is a pre-linguistic communication skill (Crais, Watson & Baranek, 2009) known as gesture, and that children

[2] Afrikaans and SAE were chosen as the focus of the present study because the researcher is fluent in both of these languages and given the challenges faced as a result of the ongoing pandemic there was limited time available to collect data.

typically acquire manual gestures that pave the way for further lexical development (Capone & McGregor, 2004; Crais et al., 2009). Early language acquisition research, focusing mainly on English acquisition in North America and the UK, suggests common findings which led to the description of a "modal child" (Fenson et al., 1994, p.1). This description implied that every child followed the same pattern of lexical and syntactic language development, but this was soon contested as evidence indicated that language development is influenced by maturational and environmental factors (Dewaele, 2012; Fenson et al., 1994; McLeod & Bleile, 2003) and may follow different trajectories in different languages and cultures. Thus, the patterns of lexical and syntactic language development of young children may be described as similar, as opposed to the same. The focus of several research studies then changed from solely being about typical development to the idea that from a very young age children's development, including speech and language development, is influenced largely by external factors including socio-economic status, the child's home and school environment, what they are exposed to and how much of it, as well as certain internal factors including their own personality (Fenson et al., 1994; Hoff, 2003; McLeod & Bleile, 2003; Southwood, 2013). Further research conducted within South Africa has emphasized the importance of the role parents play in the language acquisition of young children and that the amount, and quality, of input that young children receive during the first years of life is crucial in the development of their language skills (Gonasillan, Bornman & Harty, 2013).

To date there is limited research focused on the South African population, and children's acquisition of languages used in the country (Mahura & Pascoe, 2016; Pascoe et al., 2018; Pascoe & Norman, 2011; Pascoe & Smouse, 2012). A review of South African research shows some studies on the speech and language development of local languages including isiXhosa (Gxilishe, 2004; Pascoe & Smouse, 2012), Sesotho (Demuth, 2007), Setswana (Mahura & Pascoe, 2016), isiZulu (Pascoe & Jeggo, 2019), SAE (Pascoe et al., 2015; Pascoe et al., 2018; Pascoe & Mahura, 2017; Pascoe, Mahura & Le Roux, 2018) and Afrikaans (Feris, 2017; Van Zyl, 2017) with the majority being focused on phonology, and less work focusing on language acquisition such as the development of vocabulary. Vocabulary refers to all the words which are used in a language, and these words enable us to communicate with one another by expressing ourselves and comprehending what others have expressed. Vocabulary is an area which has increasingly been the focus of research (Alqahtani, 2015), because early and sufficient vocabulary development appears to be linked to school readiness and later

academic success, specifically in terms of the attainment of literacy skills (Hemphill & Tivnan, 2008; Prado et al., 2018; Rijlaarsdam et al., 2013).

Research on children's language acquisition in South Africa is limited, but vital for the early identification, assessment and management of children whose are language is not developing in a typical way. Research suggests that the assessment of early language acquisition may be more of a challenge in countries where children are commonly multilingual, partly due to the fact that standardized assessments are usually not available in their local languages, with this being relevant in the contexts of South Africa (Prado et al., 2012). This was supported by research conducted by Southwood (2013) that reported that given the many different languages spoken in South Africa, the dialectal variety and the cultural and socio-economic diversity of the country, there are many challenges faced in the production of appropriate instruments to assess language skills of South African children. A study by Van Dulm and Southwood in 2013 further emphasized the dire need for assessments that have been standardized on the South African populations. They reported that the language development of SAE-speaking children is generally assessed with measures standardized on international populations. Assessments for languages other than English are scarce, and SLPs in South Africa mainly rely on using assessment material that they have devised themselves, including SLPs working with Afrikaans-speaking children (Van Dulm & Southwood, 2013).

A recent project by Southwood et al. (2021a) in South Africa has led to the development of MB-CDIs in several of the country's official languages. The aim of this project is to develop MB-CDIs for each of South Africa's 11 official languages. The project has been divided into two phases, with six of the languages, namely Afrikaans, isiXhosa, isiZulu, SAE, Sesotho, and Xitsonga, already having long form MB-CDIs (Fenson et al., 1994) which are ready for validation after having been piloted twice. The second phase involves the remaining five languages, namely isiNdebele, siSwati, Sepedi, Setswana, and Tshivenda, for which the MB-CDIs are still in the process of being developed and have thus not been piloted yet. MB-CDIs are parent-report questionnaires about young children's language acquisition. There are many challenges in terms of validating these assessments, as few other standardized language assessments are available for comparative purposes. Validation by means of other assessments are discussed further in section 1.6. The current project set out to develop language assessments that could be used as part of the validation process for the MB-CDIs in six local South African languages, namely Afrikaans, isiXhosa, SAE, Sesotho, Setswana, Xitsonga.

1.4. MacArthur-Bates Communicative Development Inventories (MB-CDIs)

The MacArthur-Bates Communicative Development Inventory (MB-CDI) (Fenson et al., 1994) is an inventory which uses parent report to collect information about the early language development of children. Currently there are three versions of the MB-CDI available, namely MB-CDI-I, MB-CDI-II and MB-CDI-III (Jackson-Maldonado, 2012). The first version of the MB-CDI, *First Words and Gestures*, is used to assess children between the ages of 0; 8 and 1; 6 and is an assessment of phrase comprehension, word comprehension and use, and use of gesture (Jackson-Maldonado, 2012). The second version of the MB-CDI, *Words and Sentences*, is used to assess children between the ages of 1; 3 and 2; 6 and is an assessment of word use and early grammar (Jackson-Maldonado, 2012). The third version of the MB-CDI is used to assess children between the ages of 2;6 and 3;11 and assesses language use, concept knowledge and more complex language (Jackson-Maldonado, 2012). The full assessments of the MB-CDIs have been developed initially and are known as the long-forms, however, short-forms have also been developed in several languages, see chapter 2, section 2.6. These instruments were initially only available in English and Spanish; however, to date, up to 100 adaptations of the instruments have been developed in other languages and dialects (https://mb-cdi.stanford.edu/). These instruments were not simply translated but involved a process of cross-cultural adaptation which ensured validity and reliability and avoided the introduction of bias into the assessment by taking into consideration factors such as language, setting, and the time taken to conduct the assessment (Gjersing, Caplehorn & Clausen, 2010; Vogt, Mastin & Aussems, 2015). Despite the instrument's initial use for research only, it has proved to be an accurate predictor of children's language skills making it suitable for clinical use and increasing motivation for further adaptations of the instrument (Fenson et al., 1994).

1.5. Validity

Validity can be defined as "the extent to which a concept is accurately measured" (Heale & Twycross, 2015, p. 66). There are several different types of validity including content validity, construct validity and criterion validity. *Figure 1* summarises the different types of validity, as well as each subtype of validity, which are discussed below.

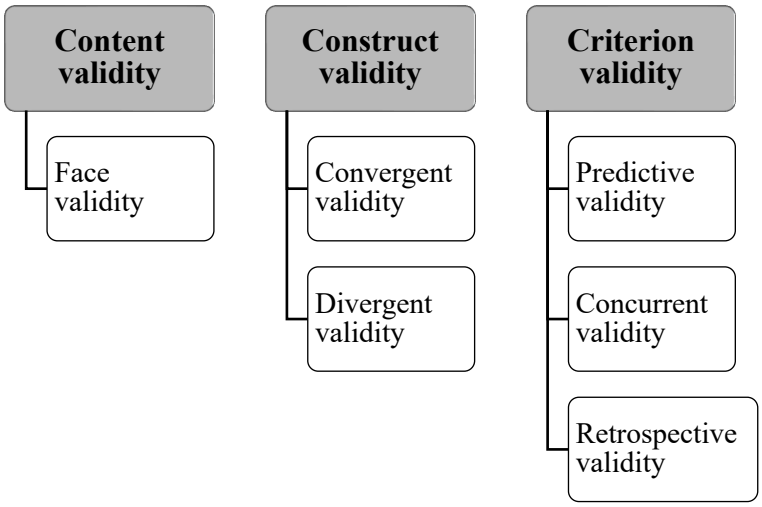

Figure 1: *The different types of validity*

There are many research studies that have set out to validate assessments. Initially the researchers would have investigated the different types of validity, as summarised in *figure 1*, and selected the type/s most pertinent to their study. Some studies have set out to prove that the instruments of focus actually measure what they intend to measure, that an assessment covers all the important areas when it comes to what it measures, and that the results from administering the assessment are relevant to what is being measured; this is known as content validity (Heale & Twycross, 2015). Within content validity, some authors have also set out to measure whether an instrument appears to measure what it intends to measure; this is known as face validity (APA Dictionary of Psychology, 2020). Sheibanie, Ghoreishi, Nilipour, Pourshahbaz and Zamani (2020) proved that the Persian Language Development Scale has content validity after presenting a preliminary version of the scale to a panel of experts and making adaptations accordingly. Additionally, they proved that it has face validity in a pilot study where the scale was presented to 36 children and the different scales were investigated qualitatively.

In contrast, other studies have set out to investigate whether an association can be made between the instrument of focus and another, formal assessment, which has previously been validated, as a point of comparison, and whether the scores attained on both the instrument of focus and the formal assessment are related to the variable under study; this is known as construct validity (Heale & Twycross, 2015). Construct validity can further be divided into two types, namely: 1) convergent validity, which is a measure of the relationship between the

responses on one instrument and another instrument which is considered similar in concept (APA Dictionary of Psychology, 2021), and 2) divergent/discriminant validity, which is a measure of the correlation between two measures with an underlying construct which is considered dissimilar (APA Dictionary of Psychology, 2021). O'Toole & Fletcher (2010) examined the convergent validity of the Irish MB-CDI by comparing the developmental patterns on the Irish MB-CDI to those found on the original MB-CDI. Similarly, Sheibanie et al. (2020) assessed the convergent validity of the Persian Language Development Scale by using confirmatory factor analysis. Mancilla-Martinez, Gamez, Vagh and Lesaux (2016) investigated the discriminant validity of the Spanish-English MB-CDI by correlating the scores on this MB-CDI with direct assessment of children's receptive versus productive language.

Similarly, other studies have set out to measure the association in findings of two similar assessments at one point in time, with one of the assessments often considered an "established standard of comparison" (APA Dictionary of Psychology, 2020). Criterion validity is further divided into: 1) predictive validity, 2) concurrent validity and 3) retrospective validity. Predictive validity is a measure of the extent to which a measurement correlates with a variable, which can only be assessed after the test has been administered or measurement has been made (APA Dictionary of Psychology, 2020). Concurrent validity is a measure of the extent to which one measurement is backed up by a related measurement obtained at about the same point in time. Lastly, retrospective validity is the extent to which an instrument that sets out to measure a particular behaviour can be shown to correlate with past occurrences that demonstrate this behaviour. Deckers, Van Zaalen, Mens, Van Balkom and Verhoeven (2016) tested concurrent validity of the Dutch MB-CDI for children with Down Syndrome by determining the correlation between the MB-CDI scores, mental age and three vocabulary measures. Feldman et al. (2005) tested concurrent validity of the English MB-CDI by correlating scores on the MB-CDI with tests of cognition, receptive language and language samples. Feldman et al. (2005) also tested the predictive validity of the English MB-CDI by correlating scores obtained on the MB-CDI (Word & Sentences) (viz. the toddler version of the MB-CDI) over a 1-year period. Mancilla-Martinez et al. (2016) investigated the concurrent validity of the Spanish-English MB-CDI by correlating scores from the MB-CDI with direct assessment of Spanish and English. Marchman and Martínez-Sussmann (2002) tested the validity of the English and Spanish MB-CDI by correlating results on the MB-CDI with observed language measures. O'Toole and Fletcher (2010) set out to prove the concurrent validity of the Irish MB-CDI by computing Pearson correlation coefficients between the Irish

MB-CDI and direct observations of language, and also tested the predictive validity of the Irish MB-CDI by correlating vocabulary and grammar scores over a 6- to 12-month period. Criterion and concurrent validity are the most important and relevant concepts for the present study as the aim was to demonstrate validity by comparing the results obtained from a newly devised object naming/identification task to the results obtained from the MB-CDIs for SAE and Afrikaans, to determine whether there is a correlation between the two sets of results for each language.

When determining the quality of an assessment, the reliability of the assessment is often determined alongside its validity. Reliability can be defined as "the extent to which an instrument can be expected to give the same measured outcome when measurements are repeated" (Taber, 2018, p. 1274). There are three main types of reliability: 1) inter-rater reliability, which measures variation between variables, 2) test-retest reliability, which measures variation between two assessments conducted at about the same time under the same conditions, and 3) intra-rater reliability, which measures the variation of the data measures in more than one trial (Chenani & Madadizadeh, 2021). One of the measures of reliability commonly applied in research pertaining to assessments, is the calculation of Cronbach's alpha, which can be defined as measuring the reliability of the sum of measurement which may represent test items, and is then referred to as internal consistency (Bonnet & Wright, 2015). The internal consistency can therefore be described as a calculation of whether consistent scores are obtained on the set of test items. Although internal consistency is often associated with reliability, it has also been considered an indication of validity and referred to as "the extent to which items measure the same characteristic" (Pinfold et al., 2004, p. 264). This is relevant to this research study which assessed whether the items on both assessments (object naming/identification tasks and MB-CDI) give an indication of the language abilities of young children, and how well each item does this.

1.6. Validation of the MB-CDIs

The validity of assessments or assessment adaptations can be demonstrated through methods that include comparing data with naturalistic samples, experimental methods, home observations and measurements of vocabulary comprehension (Alcock et al., 2015; Reese & Read, 2000). There are several studies which set out to validate MB-CDIs. Some undertook validation by correlating test scores with naturalistic language samples (O'Toole & Fletcher, 2010; Vogt et al., 2015), results from a similar assessment (Alcock et al., 2015; Rubio-Codina,

Araujo, Attanasio, Muñoz & Grantham-McGregor, 2016; Rescorla, Ratner, Jusczyk, & Jusczyk, 2005; Reese & Read, 2000) or with both language samples and similar assessments (Heilmann, Weismer, Evans & Hollar, 2005; Thal, DesJardin & Eisenberg, 2007; Wooden, 2006). Ensuring the validity of assessments – or of adaptations of assessments – is an imperative step in furthering linguistic knowledge, not only from an educational perspective but also within clinical practice (Alcock et al., 2015). Validation studies of MB-CDIs – and their methods and outcomes – are reviewed in more detail in the following chapter.

1.7. Chapter conclusion

There are many different languages spoken in South Africa and children's acquisition of each language will follow a slightly different course and have different characteristics. Limited research is available on the acquisition of these languages by young children in South Africa and linked to this is a paucity of tools available to identify young children who have difficulty with this process. Within the South African contexts, the MB-CDIs have recently been adapted into six languages (Afrikaans, isiXhosa, SAE, Sesotho, Setswana, Xitsonga), with five more language adaptations underway. The next step for this MB-CDI-based research in South Africa is to demonstrate the adapted MB-CDIs' validity, which gave rise to this research project. The next chapter provides an in-depth review of the literature on language acquisition of SAE and Afrikaans, and MB-CDI validation.

Chapter two

Literature Review

2.1. Introduction to the chapter

This chapter presents a detailed review of literature on the language acquisition of SAE and Afrikaans in South Africa, before moving on to a review of validation work that has been undertaken with the MB-CDI. Considering the numerous factors that may contribute to early language development including – but not limited to – characteristics of the different languages, it cannot be assumed that the lexical development of young children is exactly the same or similar across languages (Haman et al., 2017). Within the South African contexts specifically, the literature available on the developmental norms of the South African languages is limited. It is important to consider SAE and Afrikaans separately to 1) contribute to the developmental norms available on South African languages, and 2) allow for further cross-linguistic comparisons (Potgieter, 2016). The first part of this chapter introduces SAE, describes its place amongst the other variations of English internationally and outlines literature available on its acquisition by young children in South Africa. The second section focuses on Afrikaans and outlines the literature on its acquisition by young children in South Africa. The third section focuses on factors which could affect the development of SAE and Afrikaans. The fourth section discusses test development, and the final theme of this chapter is to describe validation work undertaken with the MB-CDI, exploring the approaches that other researchers have used to validate MB-CDIs, their strengths and weaknesses, and outcomes of the work.

2.2. Language acquisition of SAE

In 2017, Trudgill and Hannah described the different varieties of English in their book titled "International English: A guide to varieties of English around the world". In the book, they described that in any given country where English is spoken, it is either considered 1) a native language, e.g., in Australia, Canada, and Ireland, 2) a foreign language, e.g., in Poland, China, and Brazil, or 3) a second language, e.g., in India, Pakistan, Nigeria, Kenya and Singapore. Considering the statistics described in Chapter 1, SAE can be categorised as both a native language and a second language in South Africa. English was brought to South Africa for the first time in the 19th century by working immigrants who settled in the Eastern Cape, Kwazulu-Natal, Kimberly and the Witwatersrand (Silva, 1997; South African English, 2020; Trudgill & Hannah, 2017). Although the communities within South Africa at the time were initially unwilling to accept the English language, it soon became one of the most-widely

spoken languages and is today considered one of the official languages of the country and one of three official provincial languages of the Western Cape, spoken by 20,2% of the Western Cape population (Western Cape Language Policy, 2019). SAE is spoken by approximately 8,1% of South Africans as a first language within their household and holds second place for languages spoken by South Africans outside of their households (Statistics South Africa, 2018). Although it is home language for a relatively small proportion of the population, it is widely spoken as a second, third or fourth (or other) language by many people especially in urban centres.

The many different variations of English all over the world have similarities and differences, which came about as a result of expansion, settlement and colonization trends. These similarities and differences are most evident in terms of pronunciation. In terms of pronunciation, two types of English predominate: firstly the 'English' type and secondly, the 'American' type (Trudgill & Hannah, 2017). SAE falls under the 'English' type alongside British English, Welsh English, Australian English and New Zealand English (Trudgill & Hannah, 2017). SAE has been found to be most similar to Australian and New Zealand English, all three of which are found in the Southern Hemisphere, with SAE having the most variation of the three (Trudgill & Hannah, 2017). SAE differs from Australian English and New Zealand English in terms of vowel and consonant pronunciation (Trudgill & Hannah, 2017). When compared to British English, there are fewer differences in grammar between SAE and British English (Trudgill & Hannah, 2017). Within Africa, SAE has been found to be similar to the variety of English spoken in Zimbabwe, Namibia, Zambia and Kenya (Trudgill & Hannah, 2017).

Keeping in mind that South Africa is a plurilingual country with each official language having its own sub-varieties, the English which was rooted in South Africa was naturally influenced by the other languages, including but not limited to Afrikaans, isiXhosa, and isiZulu. It is evident that South African English differs from other varieties of English internationally, as well as amongst different English-speaking communities within South Africa (Silva, 1997; South African English, 2020). Research on the topic suggests that these differences exist mainly in terms of vocabulary and pronunciation, but other differences may include intonation and often grammar (Potgieter & Southwood, 2016). There are many different ways in which the characteristics of other South African languages have been integrated in different communities with different socio-cultural settings, to produce many variations of SAE in itself.

In terms of lexical development, children acquiring SAE commonly use nouns, verbs, social phrases, negatives and numbers by the age of 2;0 (Gonasillan et al., 2013). Furthermore, at the age of 2;0, their lexicon commonly consists of words which fall into the categories of vehicles, toys, people, clothes, animals, body parts, food and household. We also know that between the age of 3;6 and 3;11, there are 10 consonants which are still being acquired, that the prevalence of a speech difficulty was found to be 6.66%, and that the common phonological processes which may present are gliding, cluster reduction, stopping and fronting (Pascoe et al., 2015). At the age of 4;0, monolingual SAE-speaking children may have a larger vocabulary than trilingual speakers and their language comprehension will be better than their language production (Potgieter & Southwood, 2016; Potgieter, 2016).

Gonallisan, Bornman and Harty (2013) found that by the age of 2;0, SAE-speaking toddlers' vocabularies consist of words from the following semantic categories: vehicles, toys, people, clothes, animals, body parts, food, and household (Gonallisan et al., 2013). This is relevant in the current research study as the MB-CDI includes these semantic categories (and more) and the results may add to the existing evidence regarding the vocabulary items commonly used by SAE-speaking toddlers. With regards to language acquisition in general, the lexical development of young children is often similar regardless of the language they are acquiring (Erard, 2019). For young children acquiring American English, the 10 most common words used derive from the categories of people, toys, animals and food (Erard, 2019). Furthermore, sounds, body parts, vehicles, clothing and animals were also described as common categories for early words (Erard, 2019). South African children acquiring SAE tend to confirm these findings.

Aside from the commonly used items in specific semantic categories, there might be a certain order in which SAE-speaking children acquire vocabulary items. Gonallisan et al. (2013) also reported finding that young children may acquire vocabulary items in the following order: nouns, verbs, social phrases, negatives and numbers. This suggests that 2;0-year-old SAE-speaking children acquire nouns earlier than verbs, or that nouns are acquired at a faster rate than verbs, which is important to consider in this study because nouns and verbs will be included in the assessments used, and it is anticipated that participants will score higher on nouns than verbs. Erard (2019) reported that regardless of the language which children acquire, by the age of 1;0, most children are able to understand and say more nouns than verbs. This developmental trend is followed by SAE, based on the data of Gonallisan et al. (2013). Contrastingly, an analysis of noun and verb production and comprehension for Kiswahili- and

Kigiriama-speaking children, aged 0;8 – 1;8, revealed that children with a 1-50 word vocabulary tend to say nouns first but that children with a 1-20 word vocabulary tend to understand verbs earlier than nouns (Alcock, 2017)

In acquiring these vocabulary items, young children are expected to understand the items before they produce them (Haman et al., 2017; Potgieter, 2016; Visser-Bochane, Reijneveld, Krijnen, Van der Schans & Luinge, 2020). In 2016, Potgieter and Southwood set out to compare the proficiency levels in 4;0-year-old monolingual and trilingual speakers of Afrikaans, isiXhosa and SAE. The results indicated that the total scores for comprehension were higher than total scores for production, which supports the general finding that young children understand items before they use them (Potgieter, 2016). Furthermore, Potgieter (2016) set out to investigate the lexical and grammatical development in trilingual speakers of isiXhosa, English and Afrikaans, by assessing participant's acquisition of vocabulary and passive constructions formally, and comparing the results to those of monolingual speakers. The results indicated that comprehension scores were higher than production scores for both monolingual speakers of SAE and trilingual SAE speakers (Potgieter, 2016). This adds to the evidence which suggests that comprehension precedes production in the language development of young SAE-speaking children and it is, therefore, anticipated that comprehension scores will be higher than production scores in the current research study.

Language development can be impacted by multilingualism and within the South African contexts, it is common for children to speak more than one language. Potgieter (2016), who set out to investigate the lexical and grammatical development in trilingual speakers of isiXhosa, English and Afrikaans, confirmed this by reporting that young South African children are not commonly monolingual, and found that in terms of both lexical and grammatical development, trilingual SAE-speaking children obtained lower scores than monolingual SAE-speaking children. This suggests that language development is indeed impacted by the number of languages that young children speak. This is supported by research which also found that the lexical and grammatical development of young SAE-speaking children who are monolingual is ahead of the development of young children who are bi/multilingual (Potgieter, 2016; Potgieter & Southwood, 2016). Furthermore, it has been reported that children who are bi/multilingual are often thought to have a language delay in the language/languages which they have had the least exposure to (Potgieter & Southwood, 2016). It should be taken into consideration that in the current research study, the inclusion criteria for participants will state that SAE should be the main language spoken by participants. However, given the multilingual

context in which South African children grow up, it is anticipated that they have most likely been exposed to more than one language to some degree.

In addition to lexical and grammatical development, research has been conducted on the phonological development of SAE. Although this is not directly related to the current research study, phonology is a domain of language and the research pertaining to phonological development should be considered alongside the other domains. In 2015, Pascoe et al. set out to describe the speech development of 3-year-olds acquiring SAE in Cape Town. The results indicated that there are 10 consonants which SAE-speaking children may still be developing between the ages of 3;6 and 3;11, namely: ŋ, v, z, ʃ, ʧ, ɵ, ð, ʒ, ʤ, and ɹ.

In the language development of young SAE-speaking children above the age of 4;0, language comprehension is also anticipated to precede language production (Haman et al., 2017; Potgieter, 2016; Visser-Bochane et al., 2020). Haman et al. (2017) assessed noun and verb knowledge in monolingual children between the ages of 4;0 and 6;0 and found that lexical comprehension was ahead of lexical production for all participants. Although they attributed this finding to the comprehension task having specific answers to choose from and the production being limited to the child's existing lexical knowledge, it supports the point that comprehension precedes production in young children. Building on the information pertaining to the knowledge of nouns and verbs, SAE-speaking children older than 4;0 acquire nouns before verbs. Haman et al. (2017) found that monolingual SAE-speaking children between the ages of 4;0 and 6;0 obtained higher scores on nouns than verbs which indicates that their rate of acquisition of nouns is higher than that for verbs. Similar to that of SAE-speaking children below the age of 4;0, this finding could be impacted by picture-based assessment tasks, as it is simpler to choose pictures for nouns than it is for verbs (Haman et al. 2017).

Some of the same factors which have been considered to have an impact on the language development of SAE-speaking children below the age of 4;0, could also have an impact on language development beyond the age of 4;0. In 2015, Nel set out to investigate the comprehension and production of later developing language constructions by SAE-, Afrikaans- and isiXhosa-speaking children between the ages of 6;0 and 8;2. The findings suggested that factors which could influence language development, and subsequently later literacy skills, include the language input received at home and at school, and the socio-economic status of their family (Nel, 2015).

In 2017, Pascoe and Mahura described the speech development of 308 children acquiring SAE. Their findings indicated that age is a factor in predicting phonetic inventories of children, and that children who are 5;0 and older have acquired more consonants than the younger children (Pascoe & Mahura, 2017; Pascoe et al., 2018). In addition to the phonetic inventories of children increasing with age, they also found that the accuracy with which children produce speech improves with age, and that the most prevalent phonological process for this age group was gliding (Pascoe & Mahura, 2017; Pascoe et al., 2018). Furthermore, they reported a 9.09% prevalence of difficulties in terms of speech, with a phonological delay being the most common type of difficulty for their sample (Pascoe & Mahura, 2017; Pascoe et al., 2018).

In summary, we know that children acquiring SAE commonly acquire nouns, verbs, social phrases, negatives and numbers first (Gonasillan et al., 2013). We also know that by the age of 3, children have acquired all consonants apart from a small set of 10 and that 6.66% of young children acquiring SAE could have a speech difficulty. In addition, we know which phonological processes are prevalent in this age group (Pascoe et al., 2015). There is a gap in the information which is available pertaining to the language development, specifically in terms of the vocabulary development of SAE by children younger than 3 years.

Table 1 below outlines the main points taken from a review of studies pertaining to the language acquisition of SAE by children aged 4 years and younger.

Table 1. *Literature review on the language acquisition of SAE by children aged 4 years and younger*

Authors	Domain	Participant age (in years)	Sample size	Main findings
Gonasillan et al. (2013)	Lexical	2;0	40	• Commonly used items: nouns, 8 verbs, a social phrase, a negative and numbers. • Commonly used vocabulary items fell into the following categories: vehicles, toys, people, clothes, animals, body parts, food and household.
Pascoe et al. (2015)	Phonology	3;6-3;11	150	• 10 consonants not yet acquired: ŋ, v, z, ʃ, tʃ , ɵ, ð, ʒ, ʤ, ɹ

				• Phonological processes present: Gliding, cluster reduction, stopping and fronting • Prevalence of speech difficulties: 6.66%
Potgieter and Southwood (2016)	Lexical	4;0	Overall: 41 SAE: 10	• Monolingual SAE-speakers scored higher on cross-linguistic lexical tasks than trilingual speakers • Multilinguals are not, due to necessarily reduced exposure, invariantly developmentally delayed in each of their languages.
Potgieter (2016)	Lexical and grammatical: Trilingual speakers of isiXhosa, English and Afrikaans	4;0	Overall: 41 SAE: 10	• Total vocabulary scores for comprehension were higher than total scores for production. • For the lexical and grammatical measures, the trilingual group scored significantly lower than the monolingual groups

2.3. Language acquisition of Afrikaans

Afrikaans, a language native to South Africa, is a West Germanic language which has often had its origin questioned (Potgieter & Southwood, 2016). One theory is that it stemmed from Dutch in the 16th century, whereas others have argued that it is 'semi-creole' and was influenced by Khoikhoi (Potgieter & Southwood, 2016; Giliomee, 2004). Afrikaans went from being considered a despicable public language and an embarrassment by SAE-speakers in Cape Town in the 1860s, to being considered the strongest language in South Africa by a sociologist in 1994 (Giliomee, 2004). Afrikaans has since become the most spoken language out of the three official provincial languages in the Western Cape, with 49,6% of the province's population speaking Afrikaans (Statistics South Africa, 2011). In addition, Afrikaans is spoken by 12,2% of South Africans within their household.

A number of research studies have focused on describing the vocabulary development of young children, more specifically the acquisition of nouns and verbs, and findings have indicated that young Afrikaans-speaking children acquire nouns earlier than verbs (Potgieter, 2016), at around the same time (Potgieter and Southwood, 2016), and that this acquisition may

depend on several factors (Oosthuizen and Southwood, 2020). This is important for this research study as the MB-CDI includes measures of vocabulary comprehension and production, which includes nouns and verbs. A research study conducted in 2016 by Potgieter, which described lexical and grammatical development of children at the age of 4;0, reported that the monolingual Afrikaans-speaking children scored higher on nouns than verbs, which supports research that states that nouns are acquired before verbs. Conversely, Haman et al. (2017) found that nouns were not acquired earlier than verbs for Afrikaans-speaking children between the ages of 3;6 and 4;0. This does not concur with further reports stating that research studies which collect data on the language development of young children using picture-based tasks, provides an advantage for nouns as it is easy to include simple picture prompts for nouns, but verbs require an agent and an action or instrument (Haman et al., 2017). This is relevant to the current research study because the protocol to be devised in the first objective will be used to develop an assessment task which will incorporate picture prompts. Based on the above findings, it is anticipated that Afrikaans-speaking children might obtain higher scores for nouns than verbs. These findings concur with those for SAE, that nouns are generally acquired before verbs (Gonasillan et al., 2013).

In terms of these findings on the lexical development of young children, it has been reported that monolingual Afrikaans-speaking children progress faster in their lexical development than multilingual Afrikaans-speaking children, but not necessarily in their grammatical development. In 2016, Potgieter investigated the lexical and grammatical development of trilingual speakers of isiXhosa, English and Afrikaans, and compared the results of monolingual speakers to those of trilingual speakers. This supports research which suggests that lexical development is influenced by the amount of exposure that the child has had to that language over time (Messerschmidt, Ramabenyane, Venter & Vorster, 2008; Potgieter, 2016).

In addition to the findings on lexical and grammatical development for monolingual Afrikaans-speaking children, comprehension has been proven to precede production in their overall language development. Potgieter (2016), who investigated lexical and grammatical development in 4;0-year-olds, found that the total scores obtained were higher for comprehension than for production. This is supported by Haman et al. (2017), who described the lexical development of Afrikaans-speaking children between the ages of 3;6 and 4;0, and found that lexical comprehension scores exceeded the production scores for all participants. These findings add to a large body of research which provide evidence for language

comprehension preceding language production (Haman et al., 2017; Potgieter, 2016; Visser-Bochane et al., 2020).

Although the research available for children acquiring Afrikaans above the age of 4;0 is not necessarily relevant to the objectives of the current research study because the age of the children studied is far above the age-bracket for the current work, it is relevant to report because it could provide insights with regards to the age effect. Similar to the finding for Afrikaans-speaking children below the age of 4;0, lexical development is often more advanced than grammatical development. Southwood (2007) reported that children continue to develop pronouns until after the age of 6;0, that present tense verb forms could be acquired earlier than past tense verb forms (Southwood & Van Hout, 2010), and that by the first grade, children understand and use quantifiers and articles more than binding relations and passives (Nel, 2015). Similarly, in 2020, Hattingh, and Tönsing examined the core vocabulary of children between the ages of 5;2 and 6;10 and found that their core vocabulary consisted of more content words than function words.

These findings suggest that age could be a good predictor of grammatical development. This is supported by research conducted by Southwood and White (2021), which aimed to investigate the elicited production of articles by Afrikaans-speaking monolinguals between the ages of 4;0 years and 9;0. Their findings indicated a significant correlation between the participant's age and their production of articles. Research by Southwood (2006) which aimed to investigate the morpho-syntactic abilities of Afrikaans-speaking pre-schoolers opposes this slightly, as findings suggest that an improvement in grammatical development was seen with age but only for some aspects. Note, however, that the Southwood (2006) study had small numbers of participants, which could have affected the patterning of results across the age groups.

The findings from this literature review suggest that the main focus of research on the language acquisition of Afrikaans has been on lexical and grammatical development. We know that there is uncertainty surrounding whether young children acquiring Afrikaans acquire nouns before verbs (Potgieter, 2016) or whether nouns are not acquired before verbs (Haman et al., 2017). We also know that lexical development may occur at a faster rate than grammatical development (Hattingh & Tönsing, 2020), and that children develop pronouns until after the age of 6;0 (Southwood, 2007) and articles until after the age of 9:11 (Southwood & White, 2021).

In 2017, Breed and Brink conducted research to explore the way in which 21 young Afrikaans-speaking children connected meaning to their early vocabulary. After conducting a literature review on the first language acquisition of Afrikaans and reviewing parent's reports regarding their children during a 5-month period, they concluded that the children use their first lexical items to make simplex and complex mappings (Breed & Brink, 2017). Simplex mappings were described as a standard process which children establish without difficulty and complex mappings are more challenging and require more detail to be understood (Breed & Brink, 2017).

In 2020, Oosthuizen and Southwood explored the challenges faced in the fair assessment of language of young Afrikaans-speaking children, due to many different variations of the language. Their study formed part of the ongoing MB-CDI project in South Africa and they therefore aimed to develop a parent report questionnaire which includes sections on gesture, words and sentence construction (Oosthuizen & Southwood, 2017). Furthermore, they stated that the very earliest stages of language confusion are dominated by the production of lexical items that are difficult to classify in terms of grammatical class, for example sound effects labels, names of the child's caregivers and routine labels (Oosthuizen & Southwood, 2020 as seen in in Brink's (2018) data set of Afrikaans-speaking children's first lexical items). They reported that differences in words acquired by young Afrikaans-speaking children are often accounted for by geographical differences, different ethnic groups and socio-economic status (Oosthuizen & Southwood, 2020). There remains a need for more research to be conducted into the vocabulary development of young children acquiring Afrikaans, as well as their phonological development. Table 2 presents a summary of the literature on the language acquisition of Afrikaans by children aged 4 years and younger.

Table 2. *Literature review on the language acquisition of Afrikaans by children aged 4 years and younger*

Authors	Domain	Participant age (in years)	Sample size	Main findings
Potgieter (2016)	Lexical and grammatical	4;0	Overall: 41 monolingual Afrikaans: 10	Lexical measure: • Total scores for comprehension were higher than for production. • Acquire nouns before verbs. • Monolingual Afrikaans speakers scored higher than trilingual speakers on the test as a whole (comprehension and production). Grammatical measure: • Comprehension scores exceeded production scores for all participants. No significant differences were found between monolingual and trilingual participants.
Haman et al. (2017)	Lexical	3;6–4;0	21	• No age effect was found for Afrikaans. • Nouns were not found to be learned earlier than verbs. Lexical comprehension was more advanced than production for all participants.
Potgieter and Southwood (2016)	Lexical	4;0	Afrikaans: 11	• Participants from low socio-economic backgrounds acquire nouns much later than participants from mid-socio-economic backgrounds, and verbs at around the same time.
Breed and Brink (2017)	Lexical	0;8–2;0	21	• Young Afrikaans children connect meaning to vocabulary through simplex and complex form-meaning mappings as a result of differing conceptualisation processes
Oosthuizen and Southwood (2020)	Lexical	1;0–3;6	11 Adults (parent/caregiver)	• First lexical items depend on, amongst others, children's cultural, ethnic, socio-economical, geographical contexts

2.4. Factors affecting the language acquisition of SAE and Afrikaans

The language acquisition of SAE and Afrikaans may be influenced by a range of variables including socio-cultural factors outside of the household, and household-related and personal factors.

In 2021, Southwood et al. investigated socio-cultural factors affecting vocabulary development in young South African children between the ages of 1;4 and 3;6, using newly developed MB-CDIs for four local languages, namely Afrikaans, isiXhosa, SAE and Xitsonga, as the assessment instrument. The two languages that form the focus of this research study are SAE and Afrikaans, and therefore, Southwood et al.'s (2021) findings for these two languages were paid close attention to. The factors which were under investigation included the number of children residing in a household, socio-economic status, and maternal education level (Southwood et al., 2021).

In South Africa, children often grow up in households alongside many other children; however, Southwood et al. (2021) found no significant correlation between the number of children in a household and the vocabulary size of the participants. With regards to socio-economic status, contrasting with what was suggested by Potgieter and Southwood in 2016, Southwood et al. found that socio-economic status may not have a direct relation to language abilities of SAE-speaking children and suggested that this was due to different education and cultural norms within the South African contexts. Research done by Potgieter and Southwood in 2016 set out to investigate the lexical development of Afrikaans-speaking children at the age of 4;0, and found that socio-economic status had an influence on the acquisition of nouns and verbs. Compared to children who had a mid-socio-economic background, children who had a low socio-economic background acquired nouns later and verbs at approximately the same time (Potgieter & Southwood, 2016). This is relevant to this research study because participants could be from different socio-economic backgrounds.

In contrast to the findings of socio-cultural factors which could influence the language acquisition of children below the age of 4;0, findings suggest that socio-economic status could have an impact on language abilities of Afrikaans-speaking children above the age of 4;0. Children from a low socio-economic background are often associated with having poor language development (Southwood, 2013). In 2013, Southwood set out to investigate the role of socio-economic status in assessing the language skills of Afrikaans children between the

ages of 4;0 and 9;11 and reported that children from a low socio-economic background obtained low scores overall. This is supported by Southwood and White (2020) who set out to investigate the fast mapping of verbs in Afrikaans-speaking children. Although their study included children with a language impairment, they also concluded that children from low socio-economic backgrounds typically have smaller vocabularies and are often mistaken for having a language impairment (Southwood & White, 2020). These findings provide evidence that socio-economic status could be a factor that impacts the language development of young Afrikaans-speaking children above the age of 4;0 (Southwood & White, 2020).

Although previous research has indicated that maternal education could predict or impact language development (Southwood, 2013), Southwood et al. (2021) found no significant correlations between this factor and vocabulary size for SAE-speaking and Afrikaans-speaking participants. For maternal education, the findings were accounted for by reporting that maternal education itself may not have a direct impact on the language abilities of young children, but instead that the maternal level of education impacts the amount and the quality of the input that the child receives (Southwood et al., 2021). It might also be accounted for if the mother is not the primary caregiver, in which case the level of education of the primary caregiver will be more relevant (Southwood et al., 2021). For Afrikaans-speaking children above the age of 4;0, a study conducted by Southwood (2013) found significant correlations between maternal level of education and the overall scores of participants in the syntax, pragmatics and semantic domains. This suggests that maternal level of education could have an impact on the language development of young Afrikaans-speaking children above the age of 4;0 (Southwood, 2013). Although maternal education was not found to be a major influencer, the mothers of young Afrikaans-speaking children were found to play an important role in the general interaction with their children and tended to incorporate elements which encourage language development (Messerschmidt et al., 2008). This is important to consider as the current research study is based on the South African contexts and participants are likely to be from differing educational backgrounds.

Factors that were found to predict vocabulary size for SAE-speaking and Afrikaans-speaking children included age, sex and geographic area (Southwood et al., 2021). Age was found to be the strongest predictor – as would be expected – and the findings of the Southwood et al. (2021) study adds to a body of evidence that vocabulary size increases with age. Contrastingly, Haman et al. (2017) studied noun and verb knowledge in monolingual Afrikaans-speaking children between the ages of 3;6 and 4;0, most of whom have a mid to high

socio-economic background, and found that age was not a predictor of vocabulary size. The sample size of the study was smaller than that of Southwood et al. (2021), which could account for this finding, in addition to the narrow age range in the Haman et al. (2017) study. This is an important consideration for the current research study as, according to the above findings, an age effect is anticipated. Furthermore, the lexical development of young children has been proven to be influenced by the quantity and quality of language input received by the child (Messerschmidt et al., 2008), although it has been suggested that this influences vocabulary to a lesser extent than their geographic location (Southwood et al., 2021).

Building on the factors which could impact language development of SAE-speaking children, the environment in which SAE-speaking children grow up could impact the acquisition of vocabulary items specifically. In 2013, Gonallisan et al. (2013) investigated vocabulary used by South African toddlers at the age of 2;0. Findings indicated that children who are frequently in an educational environment, such as a pre-school, may acquire certain vocabulary items earlier than those who are not (Gonallisan et al., 2013). This could be because these environments provide children with opportunities to interact and engage with others, thereby increasing the quantity and diversity of the language input they receive. However, this needs to be investigated further due to limited research available pertaining to the environment as an influencing factor on the language acquisition of young SAE-speaking children.

Furthermore, the presence of a primary male caregiver could have an impact on the language abilities of young Afrikaans-speaking children. In 2010, Southwood conducted a research study which aimed to explore the effect that the presence of a primary male caregiver has on children's language skills. Findings from this study suggested that the absence of a primary male caregiver is associated with lower language skills and, thus, difficulties with later literacy skills. In contrast, Southwood (2013) set out to investigate the role of socio-economic status on the performance of children between the ages of 4;0 and 9;11 on a language assessment. The difference between scores obtained by participants with and without a primary male giver was not statistically significant, suggesting that the presence of a primary male caregiver may not have an impact on the language development of young children (Southwood, 2013).

A summary of the research related to these factors is presented in table 3 below.

Table 3. *A review of the literature available on factors affecting the language acquisition of SAE and Afrikaans*

Southwood et al. (2021)	Lexical	1;4–3;6	SAE: 105 Afrikaans:110	• Maternal level of education did not correlate with vocabulary scores. • Socio-economic status did not correlate with vocabulary scores. • Predict overall vocabulary size in order of ranking from most to least: age, sex, geographic area.
Messerschmidt et al. (2008)	Lexical: language development	1;6–2;4	Overall: 6 Afrikaans: 4	• Adults, especially mothers, played an important role in the interaction with their children. • Afrikaans-speaking mothers, and sometimes fathers, were raising the level of language development and scaffolding in a variety of ways and on different language levels.
Gonallisan, Bornman and Harty (2013)	Lexical	2;0	40	• Growing up in a learning environment could have an impact on vocabulary development.
Potgieter and Southwood (2016)	Lexical development	4;0	Afrikaans: 11	• Participants from low socio-economic backgrounds acquire nouns much later than participants from mid-socio-economic backgrounds, and verbs at around the same time.
Southwood (2010)	Lexical	4;0–9;0	342	• Children who grow up without a primary male caregiver have less well-developed language skills and are thus more likely to experience problems acquiring reading and writing skills.
Southwood (2013)	Lexical	4;0–9;11	231	• Positive correlation between maternal level of education and overall scores. • No significant difference between participants with and without a primary male caregiver.

2.5. Test development

Many years ago, the use of standardized assessments in many aspects of life was not as common as it is today. After the second world war, a spiking interest in children's higher-level education and the special educational needs of children resulted in a need for the development of assessments (Oakland, Poortinga, Schlegel & Hambleton, 2001). These assessments were initially only designed and used for research purposes, but once it came to light that the assessments were able to provide accurate information about the behaviour of those who were being assessed, they moved into clinical use (Oakland et al., 2001). As more assessments were developed, the International Test Commission (ITC) was formed. The ITC is an advisory council who delegates and assists in the development and sharing of all information pertaining to assessments and their development (Oakland et al., 2001). Although assessments are currently used globally, the availability of assessments are not the same for every country. Countries such as South Africa do not have many assessments available which have been standardized on the South African population. This led to a team of researchers setting out to develop the South African MB-CDIs, with a view to producing assessments which are culturally and linguistically appropriate for the South African population.

According to the ITC (International Test Commission, 2017), there is a clear difference between test translation and test adaptation. Test translation refers to the simple act of presenting a test in a different language and could result in a loss of the denotative and connotative meanings, whereas test adaptation refers to the entire process and all aspects considered in developing a new test (International Test Commission, 2017). The ITC lists aspects that need to be considered, and provides guidelines for test adaptation which include 1) pre-condition guidelines, 2) test development guidelines, 3) confirmation guidelines, 4) administration guidelines, 5) score scales and interpretation guidelines, and 6) documentation guidelines (International Test Commission, 2017). The current research study follows these guidelines as it forms part of establishing the validity of the South African MB-CDIs.

2.6. Validation of MB-CDIs

The MB-CDI is an inventory which uses parent report to collect information about the early language development of children (Fenson et al., 1994). Originally developed for US-English, over many years, the valid and reliable parent report questionnaire has been adapted into at least 100 languages from all over the world making it a widely used assessment (https://mb-cdi.stanford.edu/). Recently, MB-CDIs have been developed in several of South

Africa's official languages. Many of the adaptations developed elsewhere have been accompanied by validation studies, which are essential as the validity of the parent report questionnaire needs to be demonstrated for it to be used as a formal assessment within clinical practice. Validity, defined as "the extent to which a concept is accurately measured" (Heale & Twycross, 2015, p. 66 see chapter 1. p.15), includes many different types of validity which are all measured in different ways. Within the South Africa context, validating the MB-CDIs is challenging as few other standardized language assessments are available for comparative purposes. Therefore, this research project set out to develop a protocol for an object naming/identification task that could be used as part of the validation process for the South African MB-CDIs.

The MB-CDI long-form has been shown to be a valid parent report form used to assess the language development of young children who are monolingual, for several languages around the world. Two forms of the MB-CDI are currently being used by the countries for the languages in which they are available, a long-form and a short-form. The long-forms of the MB-CDI are the adaptations which include all the sections exactly as they are found in the original, American MB-CDI. Although the long-forms are widely used and considered a thorough parent-report form, they often take considerable time to complete and require a certain level of literacy to be completed (Fenson et al., 2000). For these reasons, short-forms of the MB-CDI have been created as a more rapid assessment measure, more practical in clinical and multilingual settings (because in the case of multilingual children, parents complete one MB-CDI per language to which the child is exposed, for each of the child's languages in which the MB-CDI is available). Short-forms have been devised based on the long-forms, contain fewer items than the long-form, and take less time to complete (Fenson et al., 2000). With reference to table 4, research groups have set out to prove criterion validity of several language adaptations of the MB-CDI, more specifically concurrent validity. This has been done by conducting direct assessments with children, and then comparing the results with the scores obtained on the relevant MB-CDI. For some researchers, this has been a challenge because standardized assessments do not yet exist for the population under study. This was the case with Caselli et al. (2020), who set out to examine the validity of the American Sign Language MB-CDI. As indicated in table 4, they developed two new assessment measures – a measure of receptive language and a measure of expressive language. The results from these direct measures were then correlated with the results from the MB-CDI to prove concurrent validity. This relates directly to the South African contexts because there are no 'gold standard'

assessment available which have been standardized on the populations of focus in the current research study.

Proving validity was less of a challenge for others, where standardized assessments existed for the populations being studied. This relates to Deckers et al. (2016), who correlated the results on the Dutch MB-CDI with results on a standardized assessment, in addition to spontaneous language samples. Moderate to high levels of concurrent validity were found for the Dutch MB-CDI for children with Down syndrome (Deckers et al., 2016).

Other researchers have examined validity by obtaining spontaneous language samples, from which lexical and grammatic diversity were then calculated, and results correlated with scores obtained on the MB-CDI. This was the case for O'Toole and Fletcher (2012) when validating the Irish MB-CDI. They made use of a standard set of toys and picture books to collect a language sample from child/parent dyads, and then correlated the results with the results on the Irish MB-CDI (O'Toole & Fletcher, 2010). The findings suggested a high level of concurrent validity for the Irish MB-CDI for children between the ages of 1;4 and 3;4 (O'Toole & Fletcher, 2010). Similarly, in 2011, Pérez-Pereira and Resches set out to test the concurrent validity of the Galacian MB-CDI by obtaining spontaneous language samples which were correlated with results on the Galacian MB-CDI. They reported strong correlations overall in terms of vocabulary, with significant correlations of .86 and .89 at the age of 1;6, and .80 and .74 at the age of 2;0, indicating high concurrent validity (Pérez-Pereira & Resches, 2011).

Similar to the MB-CDI long-form which has been proven to have criterion and construct validity in several languages, the short-form is also a valid parent report form which can be used to assess the language development of young monolingual children. This is important to consider as many of the MB-CDIs have been adapted into short-forms as the long-form is often considered to be time-consuming and impractical in clinical settings (Mayor & Mani, 2019). In 2019, Mayor and Mani set out to prove the validity of a German short-form of the MB-CDI for children between the ages of 1;6 and 2;6. They correlated the parental responses from the MB-CDI with 1) data from Wordbank and 2) language samples from a new set of participants, and found a high level of concurrent validity with correlations of .97 (Wordbank data) and .96 and .94 (language samples) (Mayor & Mani, 2019). This proves that the German short-form of the MB-CDI is another valid parent report measure which can be

used to assess the language skills of young children and paves the way for further research into MB-CDI short-forms.

Building on the concurrent validity of the MB-CDI long-form, several of the same adaptations of the measure have been shown to have predictive validity. Proving that an assessment has predictive validity in addition to concurrent validity is an important factor in the validation process because it strengthens the overall argument that the assessment has criterion validity. Deckers et al. (2016) found significant correlations that indicated moderate to high predictive validity for the Dutch MB-CDI, for children with Down syndrome between the ages of 2;0 and 7;6. Good predictive validity was found for the Irish MB-CDI for children between the ages of 1;4 and 3;4, by correlating vocabulary and grammar measures of the MB-CDI over 6–12 months (O'Toole & Fletcher, 2010).

In addition to the adaptations of the MB-CDI long-form, which have been proven to have criterion validity, a number of the adaptations also set out to prove that the MB-CDI has construct validity, more specifically convergent and divergent validity. The convergent validity of the Irish MB-CDI was investigated by O'Toole and Fletcher (2010), by correlating vocabulary and grammar scores yielded by the Irish MB-CDI and direct language observations, for 48 Irish-speaking children. The correlations indicated that the vocabulary and grammar skills of Irish-speaking children between the ages of 1;4 and 3;4 were similar to those based on the original, American MB-CDI, and therefore it was indicated to have convergent validity (O'Toole & Fletcher, 2010). Mancilla-Martinez et al. (2016) calculated the discriminant/divergent validity of the Spanish-English MB-CDI for bilingual children by calculating the associations between the MB-CDI and a direct assessment of the children's productive versus receptive vocabulary. Stronger associations were found between the MB-CDI and productive vocabulary, indicating divergent validity for the MB-CDI for children between the ages of 2;0 and 4;0 (Mancilla-Martinez et al., 2016). Overall, the findings of convergent and divergent validity indicate that the scores yielded from these adaptations of the MB-CDI can be interpreted as relating to the variable being studied, that is the language development of young children.

Besides the long and short forms of the MB-CDI which have been shown to be valid measures of language development for young monolingual children, certain MB-CDI long-forms have been proven to be concurrently valid measures of language development for young children who are bilingual, as discussed above. This adds to the knowledge regarding validity

and could be relevant within the South African contexts as children are likely to speak more than one language (Potgieter, 2016). Mancilla-Martinez et al. (2016) set out to prove the validity of the Spanish-English MB-CDI for children between the ages of 2;0 and 4;0. The associations between the MB-CDI scores and direct measures of the children's vocabulary provided evidence for concurrent validity (Mancilla-Martinez et al., 2016). The findings from these studies indicate that the MB-CDI long forms are valid for children between the ages of 1;11 and 4;0 who speak Spanish and English.

Certain adaptations of the MB-CDI have not only been demonstrated as valid measures of language development for young children, but also reliable ones. In 2019, Mayor and Mani correlated the scores on the MB-CDI with data from Wordbank and found the short-form of the German MB-CDI to be a reliable measure of the language abilities of children between the ages of 1;6 and 2;6. The MB-CDI was completed once by the parents of the children prior to their visit to the research lab and a questionnaire similar to the CDI was completed upon their visit to the lab, although the time interval was not indicated (Mayor & Mani, 2019). The validity and reliability of the Irish MB-CDI was investigated by O'Toole and Fletcher (2010), by correlating vocabulary and grammar scores yielded from the Irish MB-CDI and direct language observations, for 48 Irish children. Initially a pilot study was conducted. Thereafter the MB-CDI was administered three times per child, each after a six-month interval (O'Toole & Fletcher, 2010). A high internal consistency was demonstrated for both the vocabulary domain (.97) and for the grammatical domain (.99). These findings provided evidence of reliability, in terms of vocabulary and grammar. However, they also reported that internal consistency estimates from parent report measures may often produce exaggerated results due to parents over-estimating the language abilities of their children (O'Toole & Fletcher, 2010), which could affect both validity and reliability. These findings suggest that both the long- and short-forms of the MB-CDI are reliable in assessing the language abilities of young children, although the findings regarding MB-CDI reliability should be interpreted with caution due to the above-mentioned possibility of parents often over-estimating the language abilities of their children.

Table 4 presents the main findings of research studies which have set out to validate the different MB-CDIs which are available in other languages in other countries. The criteria for an article to be included in the review was articles published after the year 2010 with concurrent validity as the type of validity being examined.

Table 4. *The main findings of research studies which have set out to validate different language versions of the MB-CDI*

Authors	Type of validity and context	Participant age (in years)	Sample size	Method	Main findings
Caselli, Lieberman and Pyers (2020)	Concurrent validity: American Sign Language	Deaf: 1;10–5;8 Hearing: 2;0–5;7	Deaf: 29 Hearing : 11	Concurrent validity was measured by comparing the results on the direct assessment measures to the results on the MB-CDI. Two direct assessment measures were developed to validate the MB-CDI and was based on the MB-CDI: 1. A picture-matching task for receptive language 2. A picture-naming task for expressive language	• High level of concurrent validity overall
Mayor and Mani (2019)	Validity: Short-form of MB-CDI	1;6–2;6	19	Correlated the scores obtained on the long-form with scores obtained on the short-form.	• Good concurrent validity overall
O'Toolean d Fletcher (2010)	Concurrent, convergent and predictive validity: Irish MB-CDI	1;4–3;4	21	The concurrent validity was measured by computing Pearson correlation co-efficient between the vocabulary measures on the Irish MB-CDI and direct observations of language.	• High concurrent validity overall • High predictive validity • Convergent validity • High internal consistency, hence high reliability
Pérez-Pereira and Resches (2011)	Concurrent and predictive validity:	1;6, 2;0, 4;0	42	Spontaneous language samples were obtained and correlated with results on the MB-CDI to measure concurrent validity.	• High concurrent validity at ages 1;6 and 2;0 • Good predictive validity at all ages

	Galacian MB-CDI				
Mancilla-Martinez et al. (2016)	Concurrent and discriminant validity: Spanish-English bilingual children	2;0–4;0	194	Concurrent validity was examined by correlating the scores from the MB-CDI with scores on direct assessments of vocabulary (formal assessment).	• Good concurrent validity overall • Good discriminant/ divergent validity
Deckers et al. (2016)	Concurrent and predictive validity: Dutch; children with Down Syndrome	2;0–7;6	25	Concurrent validity was examined by calculating Spearman's correlation coefficient between the MB-CDI, mental age and three vocabulary measures (formal assessment, two spontaneous language samples).	• Moderate to high concurrent validity • Moderate to high predictive validity

2.7. Chapter conclusion

Although much is known about the acquisition of English in general, there is relatively little research that has focused on young children's acquisition of SAE. Afrikaans – another widely spoken, West-Germanic language in South Africa – similarly has a relatively small body of literature describing young children's early language acquisition. Information that is known about these two languages includes information pertaining to lexical development, grammatical development and, to a lesser extent, phonological development. In addition to this, there is also information available on factors which could influence this development. There are gaps in the literature pertaining specifically to the vocabulary development of SAE-speaking and Afrikaans-speaking children younger than the age of 3;6.

Validation of an assessment is important because it will add to the linguistic knowledge of the languages, and may influence educational and clinical practice. It is an important step in enabling the formal use of the assessment, but challenges include the unavailability of

standardized assessments to act as a "gold standard" for the languages under study. There are many MB-CDI adaptations and many of the studies have undertaken validation, most often using direct assessment measures including standardized assessments (Deckers et al., 2016), newly created assessments (Caselli et al., 2020), and spontaneous language samples (Pérez-Pereira & Resches, 2011). The findings presented in this chapter provided evidence for the concurrent validity of the MB-CDI, and this is imperative to this study as research suggests that the strongest evidence of validity of this assessment is to prove that it has criterion/concurrent validity (O'Toole & Fletcher, 2010). The current study correlates the results on the MB-CDI with the results from an object naming/identification task which were obtained at the same point in time, thus setting out to calculate the concurrent validity. Considering findings of studies on the reliability and validity of other language versions of the MB-CDI, parents can be regarded as good informants in terms of their child's language skills and thus the MB-CDI long-form has been shown to be a valid parent report measure to use when assessing the language development of young monolingual children. The current study pilots the validation of the long-form of the SAE and Afrikaans versions of the MB-CDI, and the next chapter contains a description of the methodology used to do so.

Chapter three

Methodology

3.1. Introduction to the chapter

This chapter describes the methodology of the study and how the study was designed to respond to the specific objectives. I start by presenting the study aims and objectives, followed by an overview of the study design. This is then followed by a detailed description of each of the separate phases (linked to each specific objective), giving a framework for the processes that led to the development of a protocol for an object naming/identification task; a description of the language abilities of children acquiring SAE and Afrikaans based on two assessments; and a comparison of the findings.

3.2. Problem statement

The research which is available focusing specifically on young children's language acquisition of Afrikaans and SAE is limited. A gap has been identified in the literature which exists on vocabulary development for children younger than 3;6 and thus formal assessments which are based on the South African population and are available within South Africa to measure this

vocabulary development. This presented a need for the development of South African MB-CDIs and for them to be validated prior to formal use.

3.3. Aim

The aim of this study was to develop a protocol for an object naming/identification task that will be used to validate the South African Communicative Development Inventories (MB-CDIs) of Afrikaans and SAE.

3.3.1 Objectives:

1) To devise a protocol for an object naming/identification task for use with six South African languages (Afrikaans, isiXhosa, SAE, Sesotho, Setswana, and Xitsonga).
2) To describe the expressive and receptive language of children acquiring SAE based on assessment with two different tools/approaches (the object naming/identification task and parent-report MB-CDI).
3) To describe the expressive and receptive language of children acquiring Afrikaans based on assessment with two different tools/approaches (the object naming/identification task and parent-report MB-CDI).

3.4. Research Design

This study used a mixed-methods, descriptive-linguistic approach, integrating both qualitative and quantitative research methods throughout all of its objectives (Guetterman, Fetters & Creswell, 2015; Shorten & Smith, 2017). Although a mixed-methods approach to research is considered time-consuming, it allowed me to draw from the strengths of both qualitative and quantitative methods, which include the ability to apply the study to different settings, freedom of bias, and allowing for an in-depth understanding of the data collected (McKim, 2017; Shorten & Smith, 2017). Within the mixed-methods approach, this study followed an exploratory sequential design which is the collection and analysis of qualitative data initially, which was then used to develop a context-specific instrument, prior to using that instrument to further collect quantitative and qualitative data (Creswell, 2014; Shorten & Smith, 2017). In addition to the mixed-methods approach, a descriptive-linguistic approach aims to describe the language under study and is often associated with content analysis (Atmowardoyo, 2018).

The first objective of this study was to devise a protocol to develop an object naming/identification task for all six languages, which would then be applied specifically to

SAE and Afrikaans in this research study. The second and third objectives included a quantitative and qualitative description of the data collected from the two assessments, followed by a descriptive-linguistic analysis and a quantitative approach in comparing the findings from the two assessments. Figure 2 below summarises the study design and how each objective built on the others.

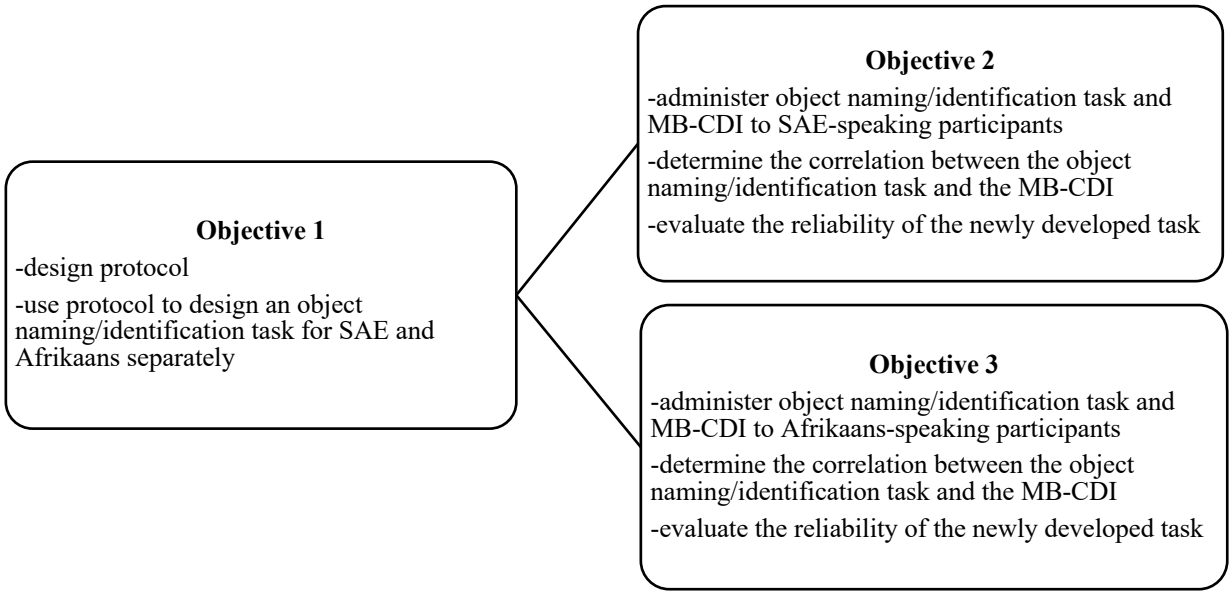

***Figure 2**: An outline of the research design*

The research design was based on that used for other MB-CDI studies and the literature related to test validation (Marchman & Martinez-Sussman, 2002; Thal, Jackson-Maldonado & Acosta, 2000).

3.5. Objective 1: To devise a protocol for an object naming/identification task for use with six South African languages (Afrikaans, isiXhosa, SAE, Sesotho, Setswana, and Xitsonga).

3.5.1. Sampling Method

This phase of the study did not require participants and was completed by doing a review of the literature and examination of MB-CDI data which had been previously analysed. This work could therefore take place easily during the COVID-19 lockdown as face-to-face data collection was not required.

3.5.2. Materials

For this objective, the relevant literature and MB-CDI data were used. I reviewed MB-CDI validation studies and literature describing principles of lexical assessment development. In addition, I reviewed the MB-CDI data available for the six languages, which was obtained in the form of a Microsoft Excel spreadsheet with the assistance from the administrator of the larger MB-CDI project.

Objects and pictures[3] were collected according to the items selected for inclusion in the object naming/identification task. The process followed for the selection of the items to be included is described in section 3.4.3. below. The databases used to select pictures for the task included PIXA bay and Pinterest. The pictures on these databases are royalty free with no copyright and are therefore free for all to access. The process of searching for pictures included typing the name of the item into the search bar and then selecting a realistic picture with a neutral background, as research suggests that young children are more likely to relate to pictures that give a more realistic representation of the item instead of, for example, a cartoon (Ganea, Pickard, & DeLoache, 2008; Strouse, Nyhout & Ganea, 2018). The objects were bought from stores in Cape Town including PEP Stores, Shoprite and China Town according to availability at each store. These stores were selected as there were cost-effective toys readily available and these toys will be easily replicated throughout South Africa for use in future studies aiming to validate the MB-CDI in other languages, using the protocol devised in this study as a guide.

3.5.3. Procedure

To achieve this objective, I took on two main tasks: a literature review and an analysis of MB-CDI data available for six of the South African languages. The literature review was focused on developing a list of requirements that the validation test would need to meet. Other MB-CDI validation studies were reviewed, as well as literature describing lexical assessment development principles. The literature review was used to answer questions including: How should test items be selected? How should practice items be selected? What materials are needed? What forms, instructions and scoring procedures are needed? A list of possible responses to these questions was tabulated in Table 7 below under section 4.2., and further

[3] Both objects and pictures were included in this study as it incorporated nouns and verbs. Initially, the objects would be presented to the infants and the pictures to the toddlers. However, if the toddlers indicated little interest in the pictures, then the objects were brought out.

questions/considerations were added to the table. Then the MB-CDI data for the six South African languages was considered to determine the feasible responses to these questions. For example, one possible response to the question: "How should test items be selected?" was that all test items must be matched across the six languages in terms of semantic categories. Looking at the MB-CDI data enabled me to determine whether or not this was feasible. This required an iterative process of moving between the data and the literature and finally led to the development of a protocol that specifies exactly how the naming/identification task was to be devised (see appendix J attached separately).

Following the guidelines set out in the protocol, I then devised the object naming/identification tasks for SAE and Afrikaans. Each task included 25 items in total and was divided into the following categories: 10 identifications, 10 naming, and 5 gestures. Once the items had been selected, I collected objects and pictures to represent each item. Thereafter, the items were piloted with three adult first-language speakers, for SAE and Afrikaans separately, and changes to items were made according to the responses of these adult speakers. For example: the target item to be named was "dog", and two of the SAE speakers responded with "dog" but the third speaker responded with "puppy." Thus, the object or the picture was replaced with a more suitable item.

3.6. Objectives 2 and 3: To describe the expressive and receptive language of children acquiring SAE and Afrikaans, based on assessment with two different tools/approaches (the object naming/identification task and parent-report MB-CDI).

3.6.1. Sampling Method

The target population for this study was defined as people residing in the Western Cape, more specifically Cape Town and the immediate surrounding areas as I resided in Cape Town at the time and had to be able to travel to the participants. The sampling frame was defined as SAE- and Afrikaans-speaking adults with young children between the ages of 0; 8 and 3;6. This study employed non-probability sampling methods which are often associated with smaller sample sizes and include quota sampling, snowball sampling, convenience sampling and purposive/judgemental sampling (Battaglia, Sampling & Lavrakas, 2008; Taherdoost, 2016). For this study, convenience and snowball sampling techniques were used to recruit potential participants. Convenience sampling is selecting individuals who may be readily available or easily accessible, and snowball sampling is reaching out to those individuals who have been identified as readily available, easily accessible or individuals in your network who

then introduce you to individuals from their network in an ongoing cycle (Battaglia et al., 2016). These techniques were deemed appropriate for this study as not only are they cost effective and convenient, but given the ongoing COVID-19 pandemic I anticipated some difficulty in the recruitment of participants through other sampling methods.

The sample size for this pilot study was 40 children and 40 adults in total for both languages together, with 2 additional participants as a pilot for the object naming/identification task. (This excluded the 6 adults – 2 per language – who verified the clarity of the objects and pictures, referred to above). Therefore, I aimed to recruit 20 children and 20 adults in total for each language, with an additional child and adult pair for SAE to include in the pilot for the object naming/identification task. According to Johanson and Brooks (2010), when it comes to sample size, the sample needs to be an accurate representation of the study population and sufficiently large. In addition, studies which aim to determine validity usually employ a smaller sample size because of the time taken to conduct direct language assessments (O'Toole & Fletcher, 2010). The sample size also follows guidelines from the MacArthur-Bates Foundation (MB-CDI.stanford.edu) for a pilot validation study as well as similar work in previous validation studies. For instance, in 2010, O'Toole and Fletcher measured the validity of the Irish MB-CDI and included 21 children in their study. Similarly, in 2015, Vogt et al. described the validation of the MB-CDI in Mozambique, using a small sample of 28 participants from rural and urban settings. Alcock et al. (2015) described the validation of the Kenyan developmental inventories and included 19 Kigiriama-speaking mothers and children and 20 Kiswahili-speaking mothers and children in the first part of the validation and 23 Kigiriama-speaking children in the second part of the validation.

3.6.2. Participants

The second and third objectives of the study involved the recruitment of 41 adult participants and 41 child participants – as described in the previous section. This selection of participants was appropriate for this research study as the validity of the MB-CDI, which is a parent report measure providing information about the early language development of children, was being investigated. Twenty-one of the adult participants were SAE-speaking and the remaining 20 were Afrikaans-speaking. The child participants comprised 21 participants who speak SAE, 10 infants (aged 0;8 – 1;4) and 11 toddlers (aged 1;5 – 3;6); and 20 participants who speak Afrikaans, 10 infants (aged 0;8 – 1;4) and 10 toddlers (aged 1;5 – 3;6). Once the results were inspected to ensure that they were free from errors, a total of 12 participants, 8

SAE-speaking and 4 Afrikaans-speaking, had to be excluded from the study due to incomplete MB-CDIs. The total number of SAE-speaking participants included in the study was thus 34, with 8 being infants (aged 0;8 – 1;4) and 9 toddlers (ages 1;5 – 3;6). The total number of Afrikaans-speaking participants included in the study amounted to 36 participants: 10 infants (ages 0;8 – 1;4) and 8 toddlers (1;5 – 3;6).

Table 5 summarises the background information for SAE-speaking participants and table 6 presents background information for Afrikaans-speaking participants in the study, with the highlighted rows indicating those participants who were excluded from the study due to incomplete data on the MB-CDI.

Table 5. *Background information of SAE-speaking participants*

Child participant code	**Adult participant code**	**Age** (years; months)	**Infant** (0;8-1;4) **/Toddler** (1;5-3;6)	**Sex**	**Maternal level of education**
SAE1C	SAE1A	1;7	Toddler	Male	Beyond High School (HS)
SAE2C	SAE2A	0;10	Infant	Male	Beyond HS
SAE3C	SAE3A	1;2	Infant	Female	Beyond HS
*SAE4C	SAE4A	2;0	Toddler	Female	Beyond HS
SAE5C	SAE5A	2;5	Toddler	Female	Completed HS
*SAE6C	SAE6A	2;1	Toddler	Male	Beyond HS
SAE7C	SAE7A	2;5	Toddler	Female	Beyond HS
SAE8C	SAE8A	1;0	Infant	Male	Beyond HS
SAE9C	SAE9A	1;8	Toddler	Female	Beyond HS
SAE10C	SAE10A	2;0	Toddler	Female	Beyond HS
SAE11C	SAE11A	2;1	Toddler	Female	Beyond HS
SAE12C	SAE12A	3;6	Toddler	Female	Completed HS
SAE13C	SAE13A	1;7	Toddler	Female	Beyond HS
SAE14C	SAE14A	1;8	Toddler	Female	Completed HS
SAE15C	SAE15A	1;4	Infant	Female	Beyond HS
*SAE16C	SAE16A	0;8	Infant	Female	Beyond HS
*SAE17C	SAE17A	0;8	Infant	Female	unknown
SAE18C	SAE18A	0;9	Infant	Female	Beyond HS
SAE19C	SAE19A	1;2	Infant	Female	Beyond HS
SAE20C	SAE20A	0;11	Infant	Male	Beyond HS
SAE21C	SAE21A	0;8	Infant	Female	HS Incomplete

*These participants were excluded from the study.

Table 6. *Background information of Afrikaans-speaking participants*

Child participant code	**Adult participant code**	**Age** (years; months)	**Infant** (0;8-1;4) **/Toddler** (1;5-3;6)	**Sex**	**Maternal education**
A1C	A1A	1;2	Infant	Female	Beyond High School (HS)
*A2C	A2A	2;4	Toddler	Male	HS incomplete
A3C	A3A	1;8	Toddler	Male	Completed HS
*A4C	A4A	2;4	Toddler	Female	unknown
A5C	A5A	0;10	Infant	Female	Completed HS
A6C	A6A	3;6	Toddler	Male	Completed HS
A7C	A7A	0;10	Infant	Female	Completed HS
A8C	A8A	2;8	Toddler	Female	HS incomplete
A9C	A9A	1;2	Infant	Female	HS incomplete
A10C	A10A	1;6	Toddler	Male	Completed HS
A11C	A11A	1;9	Toddler	Female	HS incomplete
A12C	A12A	2;9	Toddler	Male	Completed HS
A13C	A13A	1;7	Toddler	Female	Completed primary school
A14C	A14A	2;1	Toddler	Female	Completed Primary School (PS)
A15C	A15A	1;3	Infant	Male	Completed PS
A16C	A16A	0;11	Infant	Male	Completed HS
A17C	A17A	1;4	Infant	Male	Completed HS
A18C	A18A	1;4	Infant	Male	Completed HS
A19C	A19A	0;8	Infant	Female	Completed HS
A20C	A20A	1;4	Infant	Male	HS incomplete

*These participants were excluded from the study.

3.6.3. Materials

During participant recruitment, I created flyers (appendix I) that invited individuals to participate in the study and summarised who was eligible to participate. The flyers were available in both SAE and Afrikaans and were distributed either as a hardcopy at local creche's, or digitally via platforms including Facebook, WhatsApp and per e-Mail to the public and personal contacts. In addition, information letters were required (Appendices A1, A2, B1 and B2). These were written by me and provided each potential participant with information pertaining to the background of the research, the aim of the study and what participation would

entail. These forms were available in both SAE and Afrikaans. Lastly, I required consent forms for adult participants (Appendices C1 and C2) and child participants (Appendices D1 and D2). These consent forms were given to individuals who wished to participate in the study and, again, were available in both languages.

During data collection, I required the scoring sheet for the newly developed object naming/identification tasks devised for SAE and Afrikaans based on the protocol developed in the first part of the study, along with the pictures and objects collected. I made use of a mobile device (Apple iPhone 8) to audio-record responses in those cases where this was possible and consent to record was provided. In addition, I used the MB-CDI long-forms for SAE and Afrikaans. A sample of the SAE MB-CDI is provided in Appendix E. The MB-CDI instrument has two forms, one for the assessment of infants (words and gestures) and the other for toddlers (words and sentences) (MB-CDI Advisory Board, 2015). The infant form focuses on children aged 0;8 and 1;4 while the toddler form focuses on those aged 1;5 to 2;6. The infant form is composed of two major sections which include 'early words' and 'actions and gestures'. The 'Early Words' section focuses on the assessment of signs of understanding, productive skills such as imitation and labelling, and on the size of receptive and expressive vocabulary. To this end, caregivers are requested to mark off which words on the list the child understands (receptive vocabulary) and which the child both understands and says (expressive vocabulary). The 'Actions and Gestures' section centres on communicative actions and gestures. The toddler form documents words that the child uses, as well as his/her sentences and grammar. It is composed of two parts. Part I is a checklist of 680 words divided into 22 broad semantic categories such as body parts, names of small household items, animals etc. Part II focuses on early grammar. Each MB-CDI form took approximately 20–45 minutes to be completed. The forms were either completed online via a link or manually with assistance from myself. I, therefore, required the links to the online versions of the MB-CDI. There were 4 links in total (one each for the infant and one each for the toddler version of the Afrikaans and the SAE MB-CDIs), and they were obtained with assistance of a member of the larger MB-CDI project.

The Family Background Questionnaire (Appendix F) was also used during data collection and was available in both SAE and Afrikaans. This is a case history form developed by the Southern African MB-CDI team for use in all their MB-CDI-related studies. The questionnaire was used to collect basic information about the children and covered demographic information about the child, medical history, motor development, social skills, parental education, speech and language development, and language predominantly used at

home as well as other languages their children are exposed to. This questionnaire was completed as the first section, before the MB-CDI.

Once data collection was complete, the 41 hardcopy answer sheets with the results from administration of the object naming/identification task to child participants were collated. Each answer sheet was labelled with the participant code and the chronological age of the participant. In addition, I required the parental report data from the MB-CDI which was either completed online independently or by the researcher together with the adult participants. The results were retrieved from the online platform, Qualtrics, in the form of Microsoft Excel spreadsheets with assistance from a member of the larger MB-CDI project. The spreadsheets were divided according to SAE or Afrikaans and Infant or Toddler. In total, 8 spreadsheets were received, 4 with results as text and the remaining 4 with results as numerical data. Lastly, the relevant statistical software was required for statistical analysis of the data. I sought guidance from another member of the larger MB-CDI project who suggested the use of the Statistical Package for the Social Sciences (SPSS). I downloaded this software as it is freely available to UCT staff/students to download from the university's Information and Communication Technology Services (ICTS) website.

3.6.4. Data collection

Having obtained ethical approval from UCT's Faculty of Health Sciences' Human Research Ethics Committee (appendix G), sampling for the second and third objectives commenced. The non-probability method of convenience sampling was used with target areas for recruitment being local registered creches, personal contacts and social media with the use of flyers (appendix I) and information letters (appendices A1, A2, B1 and B2). In an effort to minimise undue influence and possible coercion, personal contacts were provided with the flyer and/or information letters and given the opportunity to contact me at a later stage if they were interested in participating in the study. Two information letters were provided to potential participants, and it was made clear that participation was completely voluntary. Once a potential participant was identified, snowball sampling was used to identify other suitable candidates via the potential participant. Due to the challenges faced in recruiting participants as a result of the COVID-19 pandemic, I employed a trusted fieldworker, who has been a part of the larger MB-CDI project, to assist in the recruitment of participants in different areas of Stellenbosch. The fieldworker assisted by finding members in and around his community who fit the criteria and then invited them to participate. He liaised with each potential participant by

arranging a time and location during which data collection would take place and then accompanied me to the location of data collection.

3.6.4.1 Participant criteria: Adults

Adult participants were identified according to the following inclusion criteria:

- Speaks SAE or Afrikaans as main language
- Aged 18 years and older
- Has a child that speaks SAE or Afrikaans
- Has a child that falls within the age range of 0;8 to 3;6

Exclusion criteria for adults were the following:

- Has a child with a history of delayed language development
- Has a child with a history of language intervention
- Adult participants who obtained between 0–70% progress on completion of the MB-CDI were subsequently excluded from the study

3.6.4.2. Participant criteria: Children

Child participants were identified according to the following inclusion criteria:

- SAE or Afrikaans is the main language spoken in the home
- Falls within the age range of 0; 8 to 3;6

Exclusion criteria for children were as follows:

- Has a history of delayed language development
- Has a history of language intervention

3.6.5. Procedure

Once I had identified the first potential adult and child participant pair, a pilot session was held to pilot the object naming/identification task. During this session, I administered the object naming/identification task to the child participant, and took note of the effectiveness of the instructions provided in the protocol. The MB-CDI was administered manually, while using a paper scoresheet, to the adult participant and recorded online at a later stage. Results from

this pilot session were then used to alter the protocol according to what went well throughout the session and what had to be changed during future sessions.

After the adjustments had been made to the protocol and the object naming/identification task, I proceeded with further participant recruitment. The study procedure was discussed with each potential adult participant at a time convenient to them. This was done telephonically as a precautionary measure for COVID-19 protection. The requirements, expectations, rights as participants and the significance of the study were discussed. Each participant was given an information letter (Appendices A1, A2, B1 and B2), either as a hardcopy delivered by me or sent via e-Mail and/or WhatsApp, which provided further information on the study. In line with the World Medical Association (2013), the adult participants who indicated a willingness to participate, along with their child as a participant, were asked to give their written informed consent (Appendices C1, C2, D1 and D2).

I then arranged a convenient time and location for data collection with each adult participant to ensure safety and comfort. For some of the participants, this was done with the assistance of a fieldworker. I administered the object naming/identification task to each child participant. The task was administered to the child only if they displayed a willingness to participate, and this was done in an environment familiar to the child with a familiar adult present. For the items, in the receptive domain, two pictures or objects were placed next to each other and the child was asked to point out one of the items (see Appendix K: Example 1). For the items in the expressive domain, the picture or object was shown to the child and they were asked to name it (see Appendix K: Example 2). This was repeated for all items classified as nouns. In the case where the item was classified as a verb, the picture was shown to the child and they were asked what they are doing in the picture, or I carried out the action and asked the child what I was doing (see Appendix K: Example 3). In each case the familiar adult present during the administration of the task was the same adult who completed the Family Background Questionnaire as well as the MB-CDI. Each adult participant was then provided with a link to complete the relevant MB-CDI and Family Background Questionnaire online. The adult participants were able to complete the MB-CDI online in their own time, however, in the case where the adult participant did not have access to the resources to complete the MB-CDI online or preferred not to do so, the MB-CDI was completed online during the session together with me. The duration of each session varied according to the age of the child participant and whether or not the MB-CDI was completed manually during this time. Responses to the test were audio-recorded, where possible, and recordings were used during data analysis. For

Afrikaans, the shortest recording time was 5 minutes and 42 seconds, and the longest recording time was 28 minutes and 35 seconds. For SAE, the shortest recording time was 5 minutes and 6 seconds and the longest recording time was 21 minutes and 51 seconds. No risks, apart from COVID-19 infection, were foreseen during this process as assessments are performed with individuals for diagnostic purposes within speech therapy practice and I, a speech-language therapist, carried out the assessment. Risk of infection with COVID-19 can be reduced; precautions taken for COVID-19 included wearing masks correctly at all times, maintaining a 1 metre distance between myself and each participant at all times, sanitizing of hands by me and participants prior to, during and after each session, and sanitizing all materials used during each session before and after each session.

Once data collection was complete, I manually recorded the results from the object naming/identification task. The data were recorded digitally using Microsoft Excel and different codes for each pair of participants. The data for SAE and Afrikaans were recorded separately and were further divided into results for infants and toddlers for each language. The next step was to link the results from the object naming/identification task and the results from the MB-CDI for each adult and child participant pair. This was done by using either times of completion provided by the adult participant or alternatively by checking dates of birth and ages. Each line on the Microsoft Excel spreadsheet was then linked to a participant code. The results from the entire MB-CDI were then recorded manually on Microsoft Excel using the corresponding participant codes as recorded in the previous step. All the data of the participants to be excluded from the study (due to the MB-CDI not being completed fully) were then removed from all the Microsoft Excel Spreadsheets.

3.6.6. Data management

Once the parent report data was obtained and the object naming/identification task was administered, I analysed the completed forms separately in three different phases. First, I evaluated findings to ensure that the data were a reflection of the pre-set standards including participant criteria and maintenance of ethical standards. This included re-checking that all participants provided consent for participation in the study, that codes were used instead of participant names, and that all the participants fitted the inclusion criteria. The analysis of the completed forms indicated that the data reflected pre-set standards in terms of participant criteria, and that ethical standards were maintained throughout. Written consent was provided for each participant included in the study, codes were used instead of participant names and

each participant met the inclusion criteria. Codes were derived by first stating the acronym used for the language that the participant speaks (SAE/A), followed by their participant number and then an acronym indicating whether this was a child or an adult participant (C/A). For example, if the participant was SAE-speaking, was the first participant seen and was a child participant, their participant code would be "SAE1C". When matching the responses from the adult participant on the MB-CDI, the adult participant's code would then be "SAE1A". This ensured that I could compare the correct results from the object naming/identification task to the correct results from the MB-CDI, for each participant pair.

The next step was data editing in which I confirmed that the data were free of any errors. The MB-CDI was completed using a computer software program which, once retrieved in the form of a Microsoft Excel document, allowed me to view information including the percentage of completion for each participant, the date and time on which the MB-CDI was started and completed and the age and date of birth of the corresponding child participant. I was then able to work through the MB-CDI results and use this information to ensure that for each child participant there was a corresponding adult participant who completed the MB-CDI, and to ensure that the MB-CDI was fully completed. This was done by using either times of completion provided by the adult participant or alternatively by checking dates of birth and ages. Once this was complete, a few errors were noted. The errors were a partially complete MB-CDI, as indicated by a percentage of progress on the retrieved results. The data from the object naming/identification task for the corresponding child participant were then removed from the data set and excluded from the study. In the case where the MB-CDI was partially completed, the participants were included in the study based on whether or not I was still able to obtain the majority of the results from the list of items included in the object naming/identification task. If most of the responses were missing, the participants were excluded from the study. The last step was to listen to the audio-recordings of the sessions during which the object naming/identification task was administered to the child participants and to transcribe the responses.

3.6.7. Analysis

Content analysis was then used to analyse data presented as text (i.e., the transcribed audio-recordings), and included the categorizing of the data in order for it to be classified, summarised and tabulated (Hsieh & Shannon, 2005). Cross-tabulation was used to compare the results from objectives 2 and 3 according to age and assessment content (naming,

identification and gesture). In addition, statistical analysis was used, which refers to "analysing, drawing meaningful interpretation and reporting" data presented numerically (Ali & Bhaskar, 2016, p. 662). I then used those results to calculate 1) the descriptive statistics, 2) the correlation between the two assessments (MB-CDI and direct assessment) and 3) internal reliability. To do these calculations, I made use of the SPSS software for statistical analysis and the Microsoft Excel spreadsheets. Each set of calculations is described below:

1) The **descriptive statistics** which were calculated included the mean, range and standard deviation of each data set. Descriptive statistics refers to taking the values of different variables in the data set and comparing them in an organised and systematic manner to describe the data collected. Descriptive statistics can further be divided into measures of frequency, central tendency, dispersion or variation, and position. In this study, measures of central tendency and dispersion or variation were described. The mean was used to describe the data as a single measurement, and the range and standard deviation were given as a measure of the dataset's variability (Kaur, Stoltzfus & Yellapu, 2018).

2) The **correlation** between the two assessments was determined through parametric statistics, by calculating Pearson's correlation coefficient. Parametric statistics were chosen for this study as we assumed initially that the results of each assessment were distributed symmetrically (Hoskin, 2012) and Pearson's correlation coefficient gives an indication of whether or not there is a strong correlation between the two assessments (Sedgwick, 2012). The correlation between only the 25 items included in both the object naming/identification task and the MB-CDI was calculated, as well as the correlation between the object naming/identification task's 25 items and the entire sections on vocabulary and gesture (collectively, as one score) in the MB-CDIs.

3) Lastly, internal consistency was determined by calculating Cronbach's alpha. Cronbach's alpha is a measure of **reliability** and was used in this study as a measure of internal consistency, by describing the reliability of the results, in the receptive, expressive and gestural domains, for each of the two assessments (Bonett & Wright, 2015). The internal consistency is an indication of the correlations between items and analyses each individual item that was included in the task. Figure 3 provides an overview of the process followed during data analysis.

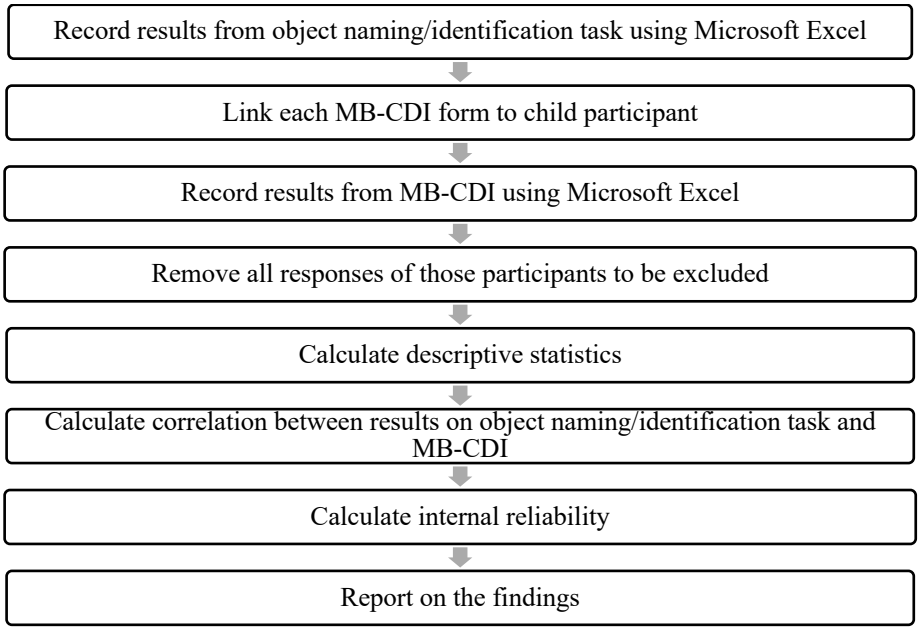

Figure 3. *An overview of the data analysis procedure*

3.7. Risks and benefits

There were few risks to adults and children participating in this study. Precautions taken for COVID-19 included myself and the fieldworker wearing a mask at all times and maintaining a 1 metre distance between myself, the fieldworker and participants at all times. Each adult participant was requested to wear a mask at all times and provision was made for extra masks in the event that a participant required a mask. Additional precautions included sanitizing of hands and all materials used during each session prior to, during and after each session. As stated above, as a result of the challenges faced in participant recruitment due to the COVID-19 pandemic, a fieldworker was employed to assist in participant recruitment. The fieldworker and the participants he recruited received a monetary value as a small token of gratitude for their time. Participating in this study was considered beneficial to parents as they had the opportunity to learn more about the language development of their child. The study as a whole set out to benefit healthcare professionals and more specifically SLPs in South Africa.

3.8. Ethical considerations

Ethical principles were upheld throughout the study with the aim of endorsing "knowledge, truth and avoidance of error" (Resnik, 2011, p.2). These principles further ensured that certain values – moral, social and those that promoted successful co-operation – were reflected in the research (Resnik, 2011). Following the World Medical Association Declaration

of Helsinki (2001), it was of utmost importance to ensure that these principles of ethics were adhered to, to protect the health, well-being and human rights of each participant.

Privacy refers to the right of the participant to have certain information not disclosed to parties other than myself as the researcher (Guraya, London & Guraya, 2014) and was upheld by ensuring each participant consented to the sharing of any information. In addition, each adult participant was given the opportunity to propose a location convenient for them, in which they felt safe and comfortable, thereby giving them the choice to select a location as private as they wished it to be.

Confidentiality refers to the extent to which information pertaining to the participant was revealed to myself and other parties (Guraya et al., 2014) and was maintained by collecting and safely storing relevant information digitally using a password and codes instead of participant names. The written records will be stored for the duration of the larger project for a period of 5 years after the research has taken place. Audio-recordings were either returned to the adult participant after analysis, destroyed or stored in a password protected storage in a way that does not compromise participant confidentiality.

Beneficence is the principle of ensuring that the research acts in the benefit of each participant (Jahn, 2011). It was upheld by protecting participant rights, ensuring no harm to participants and informing participants that the study will provide them with the opportunity to learn more about the language development of their child.

Non-maleficence is the principle of ensuring that no participant is harmed in any way (Jahn, 2011). It was upheld by ensuring no harm to participants and by ensuring participants were comfortable throughout. No harm was anticipated by participating in the study.

Autonomy is the principle of acknowledging that each participant has the right to their own decision-making, which needs to be respected (Jahn, 2011) and was upheld by informing participants of the aim and objectives and by obtaining consent for participation. Participants were informed of their right to withdraw from the study at any stage without penalty.

Justice refers to the principle of ensuring that there is equal and fair treatment of participants (Jahn, 2011). This was ensured by treating each participant equally, fairly and with entitlement to any benefits from the study. Furthermore, distributive justice was ensured as the Southern African MB-CDI project focuses on all 11 languages and the work therefore sets out to improve the lives of all South African children. This particular part of the project focused

on a small subset of children, based in Cape Town and Stellenbosch, speaking official languages of the Western Cape.

According to the International Test Commission (2014), ethical use of any test is important when using a test in research. In this research study, the ethical use of the assessment was upheld by obtaining permission from the authors to use the test, by acting professionally, ethically, and competently. Furthermore, I took responsibility for the assessment by ensuring the safe maintenance of the materials and ensuring confidentiality of the results. In line with autonomy which was upheld, as described above, informed consent was obtained from all participants. Lastly, I am a qualified SLP and am professionally trained to assess and interact with young children and their families.

3.9. Chapter conclusion

This chapter detailed the aim, objectives and methods which were employed throughout this research study. The research design was defined as a mixed-methods, descriptive-linguistic approach, which integrated both qualitative and quantitative research methods. Furthermore, the participants included, materials used, procedures followed, and data analyses were outlined, in conformity with each of the study objectives. For objective 1, I devised a protocol (appendix J) which was used to develop an object naming/identification task for SAE and Afrikaans, and no participants were included. For the second and third objectives of the study, a total of 35 adult and 35 child participants overall were included. Content and statistical analyses were conducted to analyse the findings. The next chapter reports on the outcome of the first objective of the study.

Chapter four: Findings for Objective 1

Objective 1: To devise a protocol for an object naming/identification task for use with six South African languages
(Afrikaans, isiXhosa, SAE, Sesotho, Setswana, and Xitsonga)

4.1. Introduction to the chapter

This chapter presents the study findings and the discussion of those findings for the first objective of the study. The aim of this study was to develop an object naming/identification task that could be used to validate South African Communicative Development Inventories (MB-CDIs). This study was conducted to provide additional information on the language acquisition of young children acquiring South African languages and make a contribution to

the clinical practice and theoretical insights in the field of SLP. Limited research is available on the language acquisition of young children, and SLPs often find it challenging to accurately identify, assess and treat young children who may have difficulty acquiring these languages.

For the first objective of the study, a protocol was devised and used to produce an object naming/identification task used in this study with children acquiring SAE or Afrikaans. This task, along with the South African MB-CDIs, was used to collect information on the language acquisition of 35 child participants in total, 17 SAE-speaking child participants and 18 Afrikaans-speaking child participants, between the ages of 0;8 and 3;6 from the Western Cape province in South Africa. In this chapter, the product arising from the objective – the test protocol – and the implications thereof will be discussed.

4.2. Results

The protocol is presented in appendix J. The protocol was divided into three domains: an expressive domain, a receptive domain, and a gesture domain. Because objectives two and three were to compare the findings from the object naming/identification task with those of the MB-CDI, the decision to include these three domains was based on the domains included in the MB-CDI. The protocol, therefore, states that the object naming/identification task should be divided into these three domains and each domain would include a certain number of items. With assistance from members of the larger MB-CDI project, I concluded that there should be 10 receptive items, 10 expressive items and 5 gesture items selected for the task. This was similar to the number of items included by Alcock et al. (2015) for the validation of the Kigiriama and Kiswahili MB-CDIs, and the reasoning was that fewer than this number of items would not generate sufficient direct-assessment data on each child participant whereas significantly more items would cause fatigue to set in and/or cause the children (infants and toddlers) to lose concentration during testing. The researcher then listed all the aspects which need to be considered for the protocol, and this included how these items should be selected, the number of practice items that should be included in each domain, the materials needed for the task, forms needed, instructions, and how the children's responses to the task will be scored. Based on the literature review, possible answers to these questions were tabulated (see table 7).

Table7. *Summary of MB-CDI validation studies*

Reference	**Selection of test items**	**Selection of practice items**	**Materials**	**Forms**	**Instructions**	**Scoring procedures**
Feldman et al. (2005)	Toys: 1. establish a standard situation 2. familiar 3. attractive.			1. The long and short adaptations of the Galacian MB-CDI-Words and Sentences (IDHC).	1. One parent was given the IDHC to complete, one per day. 2. Mothers were asked to accompany their children to the playroom and play with a standard set of toys	1. Mean length in morphemes of the three longest sentences, lexical diversity and mean length of utterance was calculated. 2. Lexical and grammatical scores from MB-CDI 3. Lexical and grammatical scores from language samples
Marchman & Martínez-Sussmann (2002)	15 common objects	Three items	1. Two parallel sets of toys (real objects)		1. Point out the toy (e.g., look). If the child spontaneously names the toy, put it away and take another one out. If the child does not spontaneously name the toy after some time, ask them what it is (e.g., what's this?). 2. Allow for 30 minutes of free play (15 minutes with parents and 15 minutes with assessor)	1. A point is given for correct naming of item 2. If the child did not name the toy after 3 prompts, put it away and do not give a point 3. The total objects named was then obtained What is accepted as correct: 1. Spontaneous or prompted responses 2. Synonyms were accepted
Mayor & Mani (2019)	1. Randomly selected items from the full MB-CDI.		1. A computer or an iPad	1. The full German MB-CDI 2. Shorter, digital versions of	1. Parents were asked to complete the MB-CDI prior to visiting the lab. 2. During their visit, they were asked to complete	1. For each word that was selected, the histogram of full-MB-CDI scores was extracted for word bank.

				the MB-CDI.	a short version of the questionnaire digitally. 3. Children were entertained by researchers while their parents took the test.	2. This was repeated for each item on the list. 3. The distributions on each histogram are then multiplied and results in a distribution whose mode is measured. 4. A short score was then produced by linear transformation and compared with the full MB-CDI-score.
O'Toole, & Fletcher (2010)			1. Toys 2. Irish picture books		1. Parents were asked to play as they normally do at home for 15 min	1. Lexical and grammatical measurements were calculated 2. Spontaneous language sample: number of different words, type-token ratios, measure of vocabulary diversity, mean length of utterance and number of regular/irregular morphemes
Pérez-Pereira & Resches (2011)	Toys: 1. establish a standard situation for all children 2. familiar 3. attractive for age 4. promote play and verbal interaction		1. Toys: farm house, people, animals, farm accessories 2. Video-recorder	1. Scoring sheet 2. Instruction form 3. Scoring instruction form	1. Instruct mother to go with the child to the play area 2. Show standard set of toys to play with 3. Allow half an hour of free play interaction 4. Video-recorded and transcribed	1. Two scores were obtained from 30min spontaneous language samples 2. The mean, standard deviation and range for each of the language measures were tabulated 3. These results were then compared by

						analysing correlations from the MB-CDI and the spontaneous language measures
Thal et al. (2000)	Objects: 1. Represent concepts that occur frequently in early childhood		1. Objects: hat, car, comb, spoon, flower, cup, airplane, baby doll, dog and telephone 2. 1; 8: foods, plates, cups, utensils, cars, coloured blocks and a baby doll, a crib, bottle, comb, brush, mirror, purse, farm animals, trucks, wooden blocks, tools, puppets 3. 2; 4: a farm, farm animals, a house, dolls and furniture were added.		1. Present 10 objects to the child, one at a time. 2. Allow them to play with each object for 30s and listen for spontaneously naming. If they do not name the object, ask them what it is and give them time to respond 2. Obtain language samples: Allow for 35min of free play with toys (with mother); 10 min with assessor looking at age-appropriate books; 10 minutes for the assessor to ask open-ended questions about the story in each book and play with another set of toys	1. One point is given for every object named 2. The responses were transcribed. 3. A correlation analysis was used. Median, mean and standard deviation scores were derived for each data set and age groups separately according to number of words, mean length of utterance and complexity as well as objects named. Credit is given for: 1. Clearly recognizable production or production which approximated the adult word. 2. A synonym was used or if the child used a different word and the adult stated that the child uses that word to identify that object.

Thordardottir & Weismer (1996)	Formal assessment: "Expressive one-word picture vocabulary test-revised)		1. Toys for eliciting the language samples: miniature people, car, furniture items, a slide, and Mr potato head			1. A conversational language sample of 100 child utterances was collected 2. Vocabulary analysis: total number of words, total number of different words and type-token ratio derived from these two measures 3. An inventory of all vocabulary items that occurred in the samples of each age group was made

Table 7 shows that most studies used toys, although some also used picture representations. Some studies detailed the rationale for these choices (Pérez-Pereira & Resches, 2011; Thal et al., 2000; Mayor & Mani, 2019; Feldman et al., 2005)) and for the selection of practice items, although not all studies did so (Marchman & Martínez-Sussmann, 2002).). Most of the studies included toys, one included only one set of toys (Pérez-Pereira & Resches, 2011; Thordardottir & Weismer, 1996), whereas others included more than one set of toys (Marchman & Martínez-Sussmann, 2002; Thal et al., 2000), one study included toys and books (O'Toole, & Fletcher, 2010) one of them did not include toys at all (Mayor & Mani, 2019). The majority of the studies were similar in the instructions which they provided including clear instructions to parents (Pérez-Pereira & Resches, 2011; O'Toole, & Fletcher, 2010; Feldman et al., 2005) and free play (Pérez-Pereira & Resches, 2011; Marchman & Martínez-Sussmann, 2002; Thal et al., 2000), whereas others included instructions to collect language samples and only presenting certain toys at a time (Marchman & Martínez-Sussmann, 2002; Thal et al., 2000; Pérez-Pereira & Resches, 2011). Scores were then either obtained from language samples (Pérez-Pereira & Resches, 2011; Thordardottir & Weismer, 1996; O'Toole, & Fletcher, 2010; Feldman et al., 2005) or from task in which the child was asked to name the objects (Marchman & Martínez-Sussmann, 2002; Thal et al., 2000).

In addition to reviewing the literature available for MB-CDI validation studies, I also reviewed literature describing lexical assessment development principles and tabulated the results. Appendix X provides a summary of the literature review that focused on lexical assessment development principles. Major themes emerging from an analysis of Appendix X include context of selected items, specificity of items, degree of difficulty and scoring. Context was cited by several authors as a factor to consider when selecting lexical items. Lexical items may be presented in a decontextualised way (Pearson et al., 2007) or words may appear embedded in larger components of language such as phrases, sentences or longer texts (Read & Chapelle, 2001). This consideration of context is a graded one ranging from context independent to context dependent (Read & Chapelle, 2001) depending on the purposes of the assessment and the age of the participants. Items may also be graded in terms of whether they focus on a specific aspect of the lexicon or aim to evaluate the lexicon in its entirety (Pearson et al., 2007). Degree of difficulty is mentioned by several authors (Pearson et al., 2007) who suggest that items be sorted by their difficulty (Pearson et al., 2007; Prado et al., 2018) and checked to see that they are appropriate for the age of children (Scott et al., 2008). Prado et al. (2018) graded words as easy, moderate or difficult when designing their vocabulary message. The reporting of test scores can either be a single score or multiple scores and is largely dependent on whether test items can be combined in a way relevant to the target audience or whether scores can be considered more meaningful when reported on separately (Pearson et al. 2007; Read & Chapelle, 2001; Scott et al.2008). The findings from reviewing MB-CDI validation studies and literature describing lexical assessment development principles were used to develop a list of requirements that the object naming/identification task would need to meet. To determine whether the responses to questions concerning the aspects that needed to be considered for the protocol, were feasible, the findings from the literature reviews were analysed in conjunction with the MB-CDI data available for the six languages. The literature and MB-CDI data were then used to determine feasible responses with regards to how the object naming task would be developed. These responses were then written up by the researcher in the form of the protocol seen in appendix J. The protocol was aligned with a framework based on interactionist principles which suggest that the object naming/identification task measures vocabulary as an independent construct and forms part of the assessment of a larger construct, which in this case is the assessment of the validity of the MB-CDI (Read & Chapelle, 2001), this is further explored later in this chapter. The protocol includes instructions on how to develop the object naming/identification task (which was done for Afrikaans and for SAE as part of this study, but also has to be done for the other MB-CDIs which form part of the

South African MB-CDI project), pilot the chosen items (again, done for Afrikaans and for SAE as part of this study), how the task should be conducted, and how the responses to the task should be scored. The protocol also includes a template for the preparation of the task, a template for piloting the items, and a scoring sheet.

The guidelines included in the protocol (see separately attached appendix J) reflect its ability to be used with all six languages. Each language-specific task that will be designed using the protocol will include items chosen from the MB-CDI lexicon which is available in each language. This lexicon contains all the words that appear in the various language versions of the South African MB-CDIs, and each word has a difficulty level (Prado et al., 2018) based on the number of children who were reported to be able to say that word during the second piloting of the relevant MB-CDI long-forms. The items which were included in previous tasks for a different language will be given first choice for the next task only if they share the same level of difficulty as the previous language. For example, according to the MB-CDI lexicon for SAE, the word 'ball' is classified as 'easy'. According to the MB-CDI lexicon for Afrikaans, the Afrikaans word 'bal' is also classified as 'easy'. According to the protocol, if the word 'ball' is chosen as one of the items for the SAE object naming/identification task, then the word 'bal' will also be included in the object naming/identification task for Afrikaans under the 'easy' item category. Contrastingly, when looking at the word 'eat', the MB-CDI lexicon for SAE indicated that it is classified as 'difficult' but the MB-CDI lexicon for Afrikaans indicated that the word 'eet' is classified as 'easy'. Therefore, the word 'eet' was not given first choice in the Afrikaans object naming/identification task, although it was included in the object naming/identification task for SAE. The protocol includes suggestions as to where to obtain objects and pictures to represent the items, from shops or websites which are easily accessible and associated with minimal costs.

Once the protocol was finalised (see appendix J), the researcher used it to develop two separate object naming/identification tasks for SAE and Afrikaans. Following the guidelines step-by-step, the researcher started by studying the MB-CDI lexicon for SAE and Afrikaans. The 25 items to be included in the task were then selected from the MB-CDI lexicon. The items which were selected were graded according to three difficulty levels, chosen from different semantic categories, included at least two verbs and could be presented as a picture as well as an object. The verbs which were selected were linked to nouns which could be presented as a picture and an object. The three practice items chosen were all graded as "easy". The items which were chosen for each domain are listed in tables 9 and 10 below.

Table 8. *Items chosen for the SAE object naming/identification task*

	Expressive	**Receptive**	**Gesture**
Practice item	Dog	Flower	Push
1	Ball	Bed	Point
2	Baby	Balloon	Give
3	Truck	Car	Throw
4	Carrot	Tomato	Nods head “yes”
5	Leaf	Neck	Come
6	Build	Drink	
7	Paint	House	
8	Shoulder	Nappy	
9	Glasses	Eat	
10	Gloves	Toothbrush	

Table 9. *Items chosen for the Afrikaans object naming/identification task*

	Expressive	**Receptive**	**Gesture**
Practice item	Kat	Hond	Kyk
1	Maag	Voet	Gee
2	Bal	Ballon	Gooi
3	Doek	Eet	Skud kop “ja”
4	Wortel	Trui	Stoot
5	Trok	Wortel	Kom
6	Bou	Kryt	
7	Bord	Vliegtuig	
8	Klip	Graaf	
9	Verf	Verf	
10	Lamp/lig	Ster	

4.3. Discussion

The research articles reviewed when devising the protocol mainly described research conducted internationally, as South African MB-CDIs have only recently been produced and few validation studies and research on lexical assessment development principles exist in South Africa. There is limited data available on the language acquisition, specifically vocabulary acquisition, of young children in South Africa (Pascoe & Smouse, 2012). The MB-CDI data, which is available for the six South African languages the protocol was devised for, were reviewed in this process and proved to be vital for this study as they provided information

pertaining to the relevant languages. Furthermore, the protocol was devised specifically to be used as a guideline to create an object naming/identification task for each of the six South African languages. This will allow for the cross-linguistic comparison of information derived from the administration of the task, and has the potential to contribute to research on lexical development in South African languages by delivering information pertaining to the differences and/or similarities across the respective languages (Haman et al., 2017).

Understanding the principles of test design is important for SLPs working within a context like South Africa, but these principles are not routinely included as an aspect of our training. The introduction of the ITC, the incorporation of these principles and the further review of literature available on lexical assessment development principles, which was conducted in this research study, provides an opportunity for SLPs to learn more about test design. The ITC outlines principles, which were introduced earlier in chapter 2, that should not only be considered when developing an assessment but also when using an assessment in research. This research study focused on these principles and incorporated those which were relevant to the current research study in the following ways:

1) Permission was obtained to use the South African MB-CDIs in this study.
2) I am a native speaker of the languages which were the focus of this research study. I am a qualified SLP with experience with the content of the test and process of testing (and now informed about assessment development principles).
3) The constructs that were being measured in both the new assessment task and the MB-CDI were being measured in the same linguistic groups.
4) The protocol can be used cross-culturally to create assessments which are still unique to each language but will allow for cross-linguistic comparison.
5) The protocol includes administration guidelines and instructions for the administrator: including an answer sheet, time indications and clear guidelines for participants on the purpose of the test and how it will be scored.
6) A pilot study was conducted with a participant native to the language and culture, which allowed for changes to be made in terms of instructions and other aspects prior to a larger scale administration.
7) Practice items were included and categorised as ‘easy’, and during administration of the practice items, I established rapport and ensured the participant knew what was expected of them.

8) Manual administration was offered to participants who were not familiar with and/or did not have the resources for digital administration/completion of the test.
9) The sample was chosen according to relevant characteristics, and its size was appropriate for a validation study.

Read and Chapelle (2001) discussed the development of vocabulary tests and describe in detail guidelines used and a framework for use in vocabulary test development. They suggest that the purpose of a test is directly related to the design of the test, and clearly outline the questions to be asked and the steps to be followed when designing a test. As mentioned earlier in this chapter, the protocol designed in this research study aligns with this framework described by Read and Chapelle (2001), suggesting that the object naming/identification task measures vocabulary independently, yet it forms part of the assessment of the validity of the MB-CDI. Furthermore, the items included in the object naming/identification task were carefully chosen according to guidelines outlined in the protocol.

Read and Chapelle (2001) and Scott et al. (2008) suggest how test scores are presented – and to whom – plays a vital role in the test design. In this study, the test scores were presented as multiple scores, with scores presented for each domain as well as a percentage for the overall score for each participant, and each component was assessed and results were combined, tabulated and correlated during the analysis process. The audience for the object naming/identification task was identified as young children, and the protocol clearly outlines what is included in the task and what it sets out to measure. In terms of validation, the object naming/identification task can be described as a measure of the expressive language, receptive language and gestural abilities of young children, with each score being relevant in the validation process. The assessment has the ability to contribute to knowledge of language acquisition of young children within the South African contexts (Paradis, Emmerzael & Duncan, 2010; Read & Chapelle, 2001).

The object naming/identification task developed from the protocol as a guide, proves similar to a vocabulary checklist developed by Prado et al. (2018). Their research study aimed to describe a method to develop the vocabulary checklist in new languages and to prove their validity in assessing early language development. The vocabulary checklist was developed based on the MB-CDI and they selected 100 words to be included by interviewing mothers on the expressive language of their children, specifically probing categories of the MB-CDI. Similar to this research study, they then selected a sample of words to represent each category

and arranged them according to the difficulty of each word. To assess concurrent validity, the checklist was then administered to 29 children between the ages of 1; 5 and 2; 1, and results were compared to standardized language measures. Statistical analyses of the results indicated strong correlations between the assessments, proving the method of developing vocabulary checklists to be valid (Prado et al., 2018). This is significant in this study due to the similarities presented in the development of the protocol and the development of the vocabulary checklist.

There are few assessments available to assess the language of South African children and these assessments have often only been developed for use with one language. This makes it very difficult to make comparisons across languages (Potgieter, 2016). With this protocol, my aim was to put forward a theoretically well-founded 'blueprint' that could be used across multiple South African languages. This will contribute to the research on language acquisition within the South African contexts, theoretically and practically, as it will enable researchers from the Southern African MB-CDI team, who are working in the different languages, to follow the steps as set out in the protocol to create an object naming/identification task for each MB-CDI language. This task would then be unique and appropriate to their language of focus but it would be based on similar principles to ensure a level of standardisation across languages. Given the vast differences in the country's official languages, this is an ambitious goal. As introduced earlier in chapter 1, the official languages of South Africa are divided into two groups, the West-Germanic languages and the Bantu languages (Van der Merwe & Le Roux, 2014). These languages have different characteristics, some of which are unique to their group or sub-group (Van der Merwe & Le Roux, 2014; Mdlalo et al., 2019). Mdlalo et al. (2019) conducted a study regarding language differences which are imperative for SLPs to take into consideration, both in research and in clinical practice. In addition to this, authors have written about the pitfalls of simply translating between languages and found that language differences can easily be misinterpreted as errors (Mdlalo et al., 2019). Despite these challenges, it would be helpful, time- and cost effective to be able to make cross-linguistic comparisons without having to 'reinvent the wheel' each time. Therefore, the team of researchers who have been granted permission to develop MB-CDI adaptations for all South Africa's official languages have set out to do so using the same methodology but different content, with each adaptation being tailored to be appropriate for the language of focus (Southwood et al., 2021). It is imperative that, within this research, one is attentive to finding a balance between the individuality of each of the languages and being effective and practical with the allocation of resources.

Contributions by this research to the development of South African MB-CDIs are self-evident. Given that no 'gold standard assessment' is available, the team of researchers working on the MB-CDI needed a measure which can be used for validation purposes. The protocol developed in this research study was developed with that goal in mind. Much like the development of the MB-CDI, this protocol serves to provide the same methodology for each task it is used to create, in a manner which will allow for the development of a unique task for each of the languages. The object naming/identification task, which was developed by following the protocol, would also serve as a useful independent screening tool. The MB-CDI is a very time-consuming measure, evident in the current research study as a number of participants were excluded from the study because they did not complete the MB-CDI fully. This supports existing evidence which suggests that a shorter tool, that is valid and reliable, will be helpful and important (Mayor & Mani, 2019).

4.4. Chapter conclusion

This chapter presented findings and the discussion of those findings based on the first objective of the study. The process of developing the validation protocol (appendix J) and using the protocol to develop an object naming/identification task for SAE and Afrikaans was detailed in this chapter. The protocol was developed by cross-referencing MB-CDI lexicon data, MB-CDI validation studies and lexical assessment development principles and was piloted before use with a wider sample. The development of this protocol, for use with six South African languages, makes a significant contribution to the research and SLP community within South Africa as it enabled the first step to be taken in validating the South African MB-CDIs. Furthermore, the task developed by following the protocol as a guideline has the potential to be used as an independent screening tool. The development of this protocol and its use in the current study as well as in future studies will add to the limited body of knowledge regarding language acquisition within South Africa and will consequently assist SLPs in the early identification, assessment and treatment of children who may have difficulty acquiring these South African languages.

Chapter five: Findings for Objective 2

Objective 2: To describe the expressive and receptive language of children acquiring SAE based on assessment with two different tools/approaches (the object naming/identification task and parent-report MB-CDI)

5.1. Introduction to the chapter

This chapter presents the study findings based on the second objective of the study. This objective describes the expressive and receptive language of children acquiring SAE based on the assessment with the object naming/identification task and parent-report MB-CDI. The protocol (appendix J) devised in the first objective of the study was used to produce an object naming/identification task used in this second objective. This, along with the SAE MB-CDI, was used to collect information on the language acquisition of 17 child participants between the ages of 0;8 and 3;6 from the Western Cape province in South Africa. Furthermore, the results were interpreted by comparing the findings from the object naming/identification task and the MB-CDI. The interpretations and importance thereof are presented in light of the initial literature review.

5.2. Results

5.2.1. Objective 2 a: To describe the expressive and receptive language of children acquiring SAE based on assessment with the object naming/identification task

The results from the administration of the object naming/identification task to SAE-speaking participants are reported in tables 11 (infant data) and 12 (toddler data) below. Participant codes were used throughout, and results for SAE-speaking infants and toddlers are reported separately. For each participant, a score out of 10 was calculated for each of the expressive and receptive domains, and a score out of 5 for the gesture domain. The totals were obtained as the sum of the score on each individual item, and the total score out of 25 was reported as a percentage.

Table 10. *Results from the object naming/identification task for SAE-speaking infants (0;8 – 1;4)*

Participant code	**Age** (years; months)	**Expressive** (Score out of 10)	**Receptive** (Score out of 10)	**Gesture** (Score out of 5)	**Total score out of 25** (%)
SAE21C	0;8	0	0	2	8
SAE18C	0;9	0	0	2	8
SAE2C	0;10	0	2	4	24
SAE20C	0;11	0	0	4	16
SAE8C	1;0	0	4	4	32
SAE3C	1;2	0	4	3	28
SAE19C	1;2	2	6	3	44
SAE15C	1;4	1	7	4	48
Mean/ Standard deviation	1;0	0.38/0.74	2.88/2.80	3.25/0.89	26.00/15.12

The results from the object naming/identification task indicated that all participants obtained a score below 50% (total percentage, based on the score out of 25 for all three domains). The lowest score was 8%, obtained by the youngest infant participant, and the highest score was 48%, obtained by the oldest infant participant. Receptive scores were found to be higher than expressive scores for each participant. The lowest receptive score was 2/10 and the highest was 7/10. The lowest expressive score was 0/10 and the highest score was 2/10. Gesture scores were higher than language scores with the lowest being 2/5 and the highest being 4/5. The total scores for infants tended to increase with age. This is evident when looking at participant SAE21C, who is 0; 8, and SAE15C who is 1; 4. Participant SAE21C obtained an overall score of 8%, whereas participant SAE15C, who is 0; 8 older, obtained 48% overall, viz. 40% more than SAE21C.

Table 11. *Results from the object naming/identification for SAE-speaking toddlers (1;5 – 3;6)*

Participant code	**Age** (years; months)	**Expressive** (Score out of 10)	**Receptive** (Score out of 10)	**Gesture** (Score out of 5)	**Total score out of 25** (%)
SAE13C	1;7	0	3	4	28
SAE9C	1;7	2	4	4	40
SAE1C	1;7	2	8	4	56
SAE14C	1;8	3	7	4	56
SAE10C	2;0	2	9	4	60
SAE11C	2;0	3	9	4	64
SAE5C	2;5	8	8	5	84
SAE7C	2;6	8	10	4	88
SAE12C	3;5	7	10	5	88
Mean/ Standard deviation	2;1	3.89/2.98	7.56/2.51	4.22/0.44	62.67/21.07

Results from the object naming/identification task indicated that the majority of SAE-speaking toddlers obtained scores above 50% (total percentage, based on the score out of 25 for all three domains). The lowest score was 28%, obtained by one of the youngest toddler participants, and the highest score was 88%, obtained by the oldest toddler participants. Receptive scores were found to be higher than or the same as expressive scores for each participant. For expressive, the lowest score was 0/10 and the highest score was 8/10, and for receptive scores the lowest was 3/10 and the highest was 10/10. Gesture scores were found to be higher than or equal to language scores for all participants, with the lowest being 4/5 and the highest being 5/5. Similarly, for SAE-speaking infants, the overall scores for toddlers were also found to increase with age. This can be seen when comparing the scores of participants SAE13C to those of participant SAE7C. Participant SAE13C obtained an overall score of 28%, whereas participant SAE7C, who is 0; 11 older, obtained an overall score of 88%.

In tables 13 and 14, the noun scores and verb scores of the two age groups of SAE-speaking children are given.

Table 12. *Noun and verb scores for SAE-speaking infants (0;8 – 1;4)*

Participant code	**Age** (years; months)	**Nouns- receptive domain** (score out of 8)	**Nouns-expressive domain** (score out of 8)	**Verbs-receptive domain** (score out of 2)	**Verbs-expressive domain** (score out of 2)
SAE21C	0;8	0	0	0	0
SAE18C	0;9	0	0	0	0
SAE2C	0;10	2	0	0	0
SAE20C	0;11	0	0	0	0
SAE8C	1;0	3	0	1	0
SAE3C	1;2	3	0	1	0
SAE19C	1;2	4	2	2	0
SAE15C	1;4	5	1	2	0
Mean/ Standard deviation	1;0	2.13/1.96	0.38/0.74	0.75/0.89	0/0

Table 13. *Noun and verb scores for SAE-speaking toddlers (1;5 – 3;6)*

Participant code	**Age** (years; months)	**Nouns- receptive domain** (score out of 8)	**Nouns-expressive domain** (score out of 8)	**Verbs-receptive domain** (score out of 2)	**Verbs-expressive domain** (score out of 2)
SAE1C	1;7	6	3	2	0
SAE9C	1;7	4	2	0	0
SAE13C	1;7	1	0	2	0
SAE14C	1;8	6	3	1	0
SAE10C	2;0	7	2	2	0
SAE11C	2;0	7	3	2	0
SAE5C	2;5	8	6	0	2
SAE7C	2;6	8	6	2	2
SAE12C	3;5	8	5	2	2
Mean/ Standard deviation	2;1	6.11/2.32	3.33/2.00	1.44/0.88	0.67/1.00

All of the participants obtained higher scores on nouns in the receptive domain than nouns in the expressive domain. Similarly, all participants obtained a score on verbs in the

receptive domain which was either higher than or equal to the score obtained on verbs in the expressive domain. Results further indicate that infants obtained scores which were lower than scores obtained by toddlers overall. Increasing scores were observed with age for infants, for both nouns and verbs in the receptive domain. As shown in table 13 for nouns and verbs in the receptive domain, the youngest participant, SAE21C, scored the lowest and the oldest participant, SAE15C, the highest. A similar trend was not found for toddlers, with overall noun and verb scores varying with increasing age.

5.2.2. Objective 2 b: To describe the expressive and receptive language of children acquiring SAE based on assessment with the MB-CDI

The results from the administration of the MB-CDI to SAE-speaking participants are reported in tables 15 and 16 below. Participant codes were used throughout and results for SAE-speaking infants and toddlers are reported separately. For each participant, a score out of 10 was calculated for each of the expressive and receptive domains, and a score out of 5 for the gesture domain. The totals were obtained as the sum of the score on each individual item and the total score out of 25 was reported as a percentage. Although the entire MB-CDI was administered, this section focuses only on the items in the MB-CDI that also appeared in the object naming/identification task.

Table 14. *Results from the selected MB-CDI items for SAE-speaking infants (0;8 – 1;4)*

Participant code	**Age** (years; months)	**Expressive** (Score out of 10)	**Receptive** (Score out of 10)	**Gesture** (Score out of 5)	**Total score out of 25** (%)
SAE21A	0;8	0	0	1	4
SAE18A	0;9	0	0	1	4
SAE2A	0;10	0	4	4	32
SAE20A	0;11	0	0	3	12
SAE8A	1;0	1	5	4	40
SAE3A	1;2	0	7	3	40
SAE19A	1;2	0	6	4	40
SAE15A	1;4	0	2	5	28
Mean/ Standard deviation	1;0	0.13/0.35	3.00/2.88	3.13/1.46	25.00/15.97

The results from the MB-CDI indicated that all participants obtained scores below 50% (total percentage, based on the score out of 25 for all three domains). The lowest score was 4%,

obtained by the youngest infant participant, and the highest score was 40%. Receptive scores were found to be higher than expressive scores for each participant. For expressive language, the lowest score was 0/10 and the highest was 1/10, and for receptive scores the lowest score was 0/10 and the highest score was 7/10. Gesture scores were found to be higher than language scores, with the lowest being 1/5 and the highest being 5/5. Based on the MB-CDI, there was no clear pattern of scores increasing with an increase in age: Although the two youngest infants, participants SAE21A and SAE18A, scored the lowest (4%), the oldest infant, participant SAE15A, did not score the highest (28%). This shows that the scores varied significantly with increasing age.

Table 15. *Results from the selected MB-CDI items for SAE-speaking toddlers (1;5 – 3;6)*

Participant code	**Age**	**Expressive** (Score out of 10)	**Receptive** (Score out of 10)	**Gesture** (Score out of 5)	**Total score out of 25** (%)
SAE1A	1;7	4	2	1	28
SAE9A	1;7	2	2	3	28
SAE13A	1;7	3	2	1	24
SAE14A	1;8	3	6	3	48
SAE10A	2;0	3	7	5	60
SAE11CA	2;0	7	9	4	80
SAE5A	2;5	8	10	5	92
SAE7A	2;6	10	10	5	100
SAE12A	3;5	10	10	5	100
Mean/ Standard deviation	2;1	5.56/3.21	6.44/3.61	3.56/1.67	62.22/31.76

Results from the MB-CDI indicated that the majority of SAE-speaking toddlers obtained a score above 50% (total percentage, based on the score out of 25 for all three domains). The lowest score was 24%, obtained by the youngest toddler participant, and the highest score was 100%, obtained by the oldest participant. Receptive scores were higher than or the same as expressive scores for each participant. For expressive, the lowest score was 2/10 and the highest was 10/10, and for receptive scores, the lowest was 2/10 and the highest 10/10. For the majority of the participants, gesture scores were found to be higher than language scores, with the lowest being 1/5 and the highest being 5/5. The results indicated that for toddlers, the scores obtained on the MB-CDI increased with age.

The total vocabulary and gesture scores from the administration of the entire MB-CDI are reported in tables 17 and 18 below. Participant codes were used throughout. A score out of 101 was calculated for the gesture section, and a total score out of 1546 for the vocabulary section (expressive + receptive). The totals were obtained as the sum of the score on each individual item in each category and the total score reported as a percentage of each category.

Table 16. *Total vocabulary and gesture scores from the entire MB-CDI for SAE-speaking infants (0;8 – 1;4)*

Participant code	**Age** (years; months)	**Expressive** (Score out of 773)	**Receptive** (Score out of 773)	**Total vocabulary** (Score out of 1546; %)	**Gesture** (Score out of 101) (%)
SAE21A	0;8	0	0	0.00	41.58
SAE18A	0;9	0	10	0.65	21.78
SAE2A	0;10	0	93	6.02	32.67
SAE20A	0;11	1	12	0.84	33.66
SAE8A	1;0	13	76	5.76	55.45
SAE3A	1;2	16	200	13.97	76.24
SAE19A	1;2	33	145	11.51	84.16
SAE15A	1;4	18	773	51.16	71.29
Mean/ Standard deviation	1;0	10.13/12.06	163.63/256.08	11.24/16.92	52.10/23.11

Total MB-CDI vocabulary scores for SAE-speaking infants varied greatly, with the majority of the scores obtained being below 50%. The lowest score was 0,00%, obtained by the youngest infant participant, SAE21A aged 0;8, which can be an accurate reflection of the vocabulary of a young baby below the age of 1;0 year (Bowen, 1998; Fenson et al., 1994; McLeod & Bleile, 2003). The highest score was 51,16%, obtained by the oldest infant participant, SAE15A aged 1;4. Receptive scores were found to be higher than expressive scores for all participants. Half of the gesture scores obtained were below 50% and the remaining half were above 50%. The lowest score for gesture was 21,78% and the highest score was 84,16%. Scores tended to increase with age in terms of vocabulary but not necessarily in terms of gesture.

Table 17. *Total vocabulary scores from the entire MB-CDI for SAE-speaking toddlers (1;5 – 3;6)*

Participant code	**Age** (years; months)	**Expressive** (Score out of 773)	**Receptive** (Score out of 773)	**Total vocabulary** (Score out of 1546; %)
SAE1A	1;7	117	117	15.14
SAE9A	1;7	94	94	12.16
SAE13A	1;7	122	122	15.78
SAE14A	1;8	134	134	17.34
SAE10A	2;0	307	307	39.72
SAE11A	2;0	340	340	43.98
SAE5A	2;5	605	605	78.27
SAE7A	2;6	743	743	96.12
SAE12A	3;5	677	677	87.58
Mean/ Standard deviation	2;1	348.78/261.44	3348.78/261.44	33.82

Results from the entire MB-CDI indicated that the total vocabulary scores for SAE-speaking toddlers varied greatly, with the majority of the scores obtained being below 50%. The lowest score was 12,16%, obtained by one of the youngest toddlers' participants, and the highest score was 96,12%, obtained by one of the oldest participants, indicating that scores exponentially increased with age. Receptive scores were equal to expressive scores.

5.3. Data analysis

5.3.1. Descriptive statistics

The tables below summarise the descriptive statistics for both assessments (object naming/identification task, and MB-CDI) which includes the mean, range and standard deviation. These statistics were calculated with only the results of the 25 items included in the object naming/identification task and the same 25 items from the MB-CDI. Table 18 outlines the descriptive statistics for each assessment overall (infants and toddlers together). Table 19 outlines the descriptive statistics for infants only in both assessments, and table 20 outlines the descriptive statistics for toddlers only in both assessments.

Table 18. *Mean, range and standard deviation of object naming/identification task results compared to MB-CDI results for both SAE-speaking infants (0;8 – 1;4) and toddlers (1;5 – 3;6)*

Assessment	Total number of participants (n)	Mean ($\bar{x}$)	Range	Standard deviation (σ)
Object naming/identification task (/25)	17	11.412	2-22	6.539
MB-CDI (/25)	17	11.177	1-25	7.836

Table 19. *Mean, range and standard deviation of object naming/identification task results compared to MB-CDI results for SAE-speaking infants (0;8 – 1;4)*

Assessment	Total number of participants (n)	Mean ($\bar{x}$)	Range	Standard deviation (σ)
Object naming/identification task (/25)	8	6.50	2-12	3.780
MB-CDI (/25)	8	6.25	1-10	3.991

Table 20. *Mean, range and standard deviation of object naming/identification task results compared to MB-CDI results for SAE-speaking toddlers (1;5 – 3;6)*

Assessment	Total number of participants (n)	Mean ($\bar{x}$)	Range	Standard deviation (σ)
Object naming/identification task (/25)	9	15.67	7-22	5.268
MB-CDI (/25)	9	15.56	6-25	7.939

The mean of the MB-CDI scores, for SAE-speaking infants and toddlers overall, was relatively similar to that of the object naming/identification task, with a standard deviation which was greater than that of the object naming/identification task. The standard deviations for both assessments were relatively large, in relation to the mean. The standard deviation of the object naming/identification task was slightly smaller than the standard deviation for the MB-CDI. This indicates that the mean for the object naming/identification task is a slightly better descriptor of the data in comparison to the mean for the MB-CDI. The descriptive statistics for infants only indicated that the mean of the scores for both assessments were similar. The standard deviation for the object naming/identification task was relatively high in relation to the mean, even though it was slightly smaller in relation to the mean in comparison to the standard deviation of the MB-CDI. This indicates that the mean of the scores for both assessments are a relatively poor descriptor of the data, in the sense that participants scores varied widely. Similar to the mean of the scores for infants, the mean of the scores for toddlers, for both assessments, were almost the same. The MB-CDI had a greater standard deviation relative to the mean, in comparison to the object naming/identification task. This indicates that the mean for the object naming/identification task is a better descriptor of the data, in comparison to that of the MB-CDI.

5.3.2. Correlation between the object naming/identification task and the MB-CDI

The first correlation between the two assessments was calculated based on the results from the 25 items included in the object naming/identification task and only the same 25 items included in the MB-CDI. Overall, the two assessments had a strong correlation with a Pearson correlation coefficient of r=0.928 and a p-value of less than 0.01 (p=.000). This suggests a significant correlation between the two assessments overall. For infants only, the object naming/identification task and the MB-CDI indicated a strong correlation with a Pearson correlation coefficient of r=0.786 and a significance value of more than 0.05 (p=.21) indicating no correlation between the two assessments for infants. For toddlers, the object naming/identification task and the MB-CDI indicated a strong correlation with a Pearson correlation coefficient of r=0.935 and a significance value of less than 0.01 (p=.000), indicating a significant relationship between the two assessments for toddlers.

Second, the correlation between the two assessments was calculated by comparing the total scores, as a percentage, from the 25 items included in the object naming/identification task and the results obtained from the entire sections on gesture and vocabulary in the MB-

CDI. A strong correlation was indicated for overall vocabulary scores, with a Pearson correlation coefficient of r=0.901 and a significance value of less than 0.01 (p=.000). This suggested a significant correlation between both assessments in terms of vocabulary. In terms of vocabulary for infants only, the object naming/identification task and the MB-CDI indicated no correlation with a Pearson correlation coefficient of r=0.178 and an insignificant correlation (p=.673). Unlike the correlation for infants, the results for toddlers indicated a significant correlation, between the object naming/identification task and the MB-CDI, with a Pearson correlation coefficient of r=0.911 and a significance value of less than 0.01 (p=.001), indicating a significant correlation between the two assessments for toddlers. The gesture scores for infants indicate a significant correlation between the two assessments, r=0. 786, but with a significance value of more than 0.05 (p=.21), the correlation is insignificant.

5.3.3. Internal reliability

Initially, Cronbach's alpha values were calculated from the results from the 25 items included in the object naming/identification task and the same 25 items included in the MB-CDI only. The values and the interpretation thereof are outlined in table 21 below.

Table 21. *Cronbach's alpha values for the object naming/identification task and only the 25 items from the SAE MB-CDI*

	Receptive	**Expressive**	**Language** (Receptive + Expressive)	**Gesture**
Cronbach's alpha	0.886	0.941	0.911	0.673
Interpretation (Taber, 2018)	Reliable	Excellent	Strong	Reasonable

High internal consistency was found for the language domains (receptive and expressive collectively), with an alpha value of 0.911. When analysed separately, high internal consistency was found for the expressive domain as well, with an alpha value of >0.94. An alpha value of 0.886 for the receptive domain indicated a reliable internal consistency. For the gesture domain, an alpha value of 0.673 indicated a reasonable but lower internal consistency than the receptive and expressive domains.

In addition, Cronbach's alpha values were calculated from the results from the 25 items included in the object naming/identification task and the entire vocabulary and gesture sections included in the MB-CDI. The values and the interpretation thereof are outlined in table 22.

Table 22. *Cronbach's alpha values for the object naming/identification task and the entire vocabulary and gesture sections of the SAE MB-CDI*

	Receptive	**Expressive**	**Language** (Receptive + Expressive)	**Gesture** (infants only)
Cronbach's alpha	0.854	0.968	0.947	0.293
Interpretation (Taber, 2018)	Reliable	Excellent	Excellent	Not satisfactory

High internal consistency was found for the language domains (receptive and expressive collectively), with an alpha value of >0.94. Similarly, a high internal consistency was found for the expressive domain as well, with an alpha value of 0.968. An alpha value of 0.886 for the receptive domain indicated a reliable internal consistency. Contrary to the values for the language domains, a low alpha value of 0.293 indicated an internal consistency which is not satisfactory for the gesture domain.

5.4. Chapter conclusion

In this chapter, the protocol that was devised as a framework for the development of a new naming/identification task was used to create a new assessment of SAE language development, and comparisons between the new assessment and the MB-CDI results took place. Results from the administration of the MB-CDI and object naming/identification task to SAE-speaking participants were tabulated, and comparisons were made. The analyses included the calculation of descriptive statistics, the correlation between the object naming/identification task and the MB-CDI, and internal reliability.

Based on the results from the object naming/identification task, all infants scored below 50% and the majority of toddlers scored above 50%. Scores for infants and toddlers generally increased with age. The scores obtained by infants on both nouns and verbs in the receptive domain increased with age. Contrastingly, scores obtained by toddlers varied with increasing age. The MB-CDI results indicated that all infants obtained a score below 50% and the majority of toddlers obtained a score higher than 50%. Scores for infants varied with age, whereas scores

for toddlers increased with age. In terms of total vocabulary on the MB-CDI, infants scores tended to generally increase with age, despite variation.

A significant correlation was found between the object naming/identification task and the MB-CDI (r=0.928; p<0.01) when considering infant and toddler data together. No correlation between the assessments was found for infants (r=0.786; p>0.05) and a significant correlation between the assessments was found for toddlers (r=0.935; p<0.01). Based on the correlations with the entire MB-CDI, a significant correlation was found for the vocabulary domain (r=0.901; p<0.01) and an insignificant correlation was found for the gesture domain (r=0.786; p>0.05). A high internal consistency was found for the language domains when calculating the correlations between only the 25 items on both assessments (α=0.911) and correlations between the object naming/identification task and the entire MB-CDI (α=>0.94). For the gesture domain, correlations between only the 25 items on both assessments indicated a reasonable internal consistency (α=0.673) and correlations between the object naming/identification task and the entire MB-CDI indicated an unsatisfactory internal consistency (α=0.293).

Chapter 6: Findings for Objective 3

Objective 3: To describe the expressive and receptive language of children acquiring Afrikaans based on assessment with two different tools/approaches (the object naming/identification task and parent-report MB-CDI)

6.1. Introduction to the chapter

The third objective aims to provide a description of the language of 18 child participants between the ages 0;8 and 3;6, who are acquiring Afrikaans. This description is based on an assessment of their language using two different measures. The two assessments which were used to achieve this objective were the object naming/identification task, which was devised using the protocol devised in objective 1 as a guide, and the Afrikaans MB-CDI. The findings based on these assessments are presented in this chapter. Initially, the receptive and expressive language of these 18 participants is described based on the scores they obtained on each assessment. Thereafter, the findings based on statistical analysis are presented in order of descriptive statistics, correlations between the object naming/identification task and the MB-CDI, and internal reliability.

6.2. Results

6.2.1. Objective 3 a: To describe the expressive and receptive language of children acquiring Afrikaans based on assessment with the object naming/identification task

In terms of the object naming/identification task, a total score was calculated for each participant out of 25 and reported as a percentage. The total score was comprised of the sum of the scores obtained in each domain, namely the expressive domain, the receptive domain and the gesture domain. The results are reported in tables 24 and 25 below. Participant codes were used throughout and results for Afrikaans-speaking infants and toddlers are reported separately.

Table 23. *Results from the object naming/identification task for Afrikaans-speaking infants (0;8 – 1;4)*

Participant code	**Age** (years; months)	**Expressive** (Score out of 10)	**Receptive** (Score out of 10)	**Gesture** (Score out of 5)	**Total score out of 25** (%)
A19C	0;8	0	0	0	0
A5C	0;10	0	2	2	16
A7C	0;10	0	0	0	0
A16C	0;11	0	1	1	8
A1C	1;2	0	2	2	16
A9C	1;2	0	2	2	16
A15C	1;3	0	2	2	16
A17C	1;4	0	2	2	16
A18C	1;4	0	2	2	16
A20C	1;4	0	1	1	8
Mean / Standard deviation	0;11	0.00/0.00	1.40/0.84	1.40/0.84	11.20/6.74

As seen in table 24, all Afrikaans-speaking infants scored below 50% overall on the object naming/identification task. Participant A19C, who was the youngest participant at age 0;8, obtained the lowest score overall, 0%, and the highest score, 16%, was obtained by six of the 10 participants. Based on the above, it is clear that there is variation in scores, and they did not increase with age for infants. Overall, receptive scores were higher than expressive scores. All the participants obtained 0/10 for the expressive domain. Participants A19C and A7C, ages

0;8 and 0;10 respectively, obtained the lowest score for the receptive domain, which was 0/10. The majority of the participants obtained 2/0 for the receptive domain. Gesture scores were found to be fairly equal to/slightly higher than language receptive language scores with the lowest score being 0/5, obtained by participants A19C at 0;8 and participant A7C at 0;10. The highest score was 2/5 and was obtained by the majority (six) of the participants.

Table 24. *Results from the object naming/identification task for Afrikaans-speaking toddlers (1;5 – 3;6)*

Participant code	**Age** (years; months)	**Expressive** (Score out of 10)	**Receptive** (Score out of 10)	**Gesture** (Score out of 5)	**Total score out of 25** (Percentage)
A10C	1;6	1	2	3	24
A13C	1;7	0	3	4	28
A3C	1;8	0	3	4	28
A11C	1;9	2	4	4	40
A14C	2;1	4	7	4	60
A8C	2;8	6	8	5	76
A12C	2;9	1	9	5	60
A6C	3;6	9	10	5	96
Mean/ Standard deviation	2;2	2.89/3.23	5.75/3.12	4.25/0.71	51.5/25.96

Results from the object naming/identification task indicated that half of the Afrikaans-speaking toddlers obtained an overall score above 50% and the remaining half obtained an overall score below 50%. The youngest toddler, participant A10C who was 1;6, obtained 24%, which was the lowest score. Participant A6C, who was the oldest toddler at the age of 3;6, obtained 96%, which was the highest score. Receptive scores were higher than expressive scores for each participant. For the expressive domain, participants A13C and A3C, the second and third youngest participants respectively, obtained 0/10, which was the lowest score, and participant A6C, the oldest participant, obtained 9/10, which was the highest score. For the receptive domain, participant A10C, the youngest participant, obtained the lowest score (2/10) and participant A6C, the oldest participant, obtained 10/10, which was the highest score.

Gesture scores were found to be greater than language scores for all participants, with the lowest being 3/5, obtained by participant A10C who was the youngest, and the highest being 5/5, obtained by participants A8C, A12C, and A6C who were three of the oldest participants. Scores for toddlers were found to increase with age. This is evident when looking at the overall scores for participants; for example, participant A10C who was 1;6 obtained an overall score of 24%, participant A14 who was 2;1 obtained an overall score of 60%, and participant A6C who was 3;6 obtained an overall score of 96%.

All participants obtained higher scores on nouns in the receptive domain than in the expressive domain (see tables 26 and 27). Scores obtained for verbs in the receptive domain were either higher than or equal to scores obtained on verbs in the expressive domain. Furthermore, scores obtained by infants were either lower than or equal to scores obtained by toddlers overall. For infants, overall scores for nouns and verbs did not show any trends with increasing age. For toddlers, overall scores for nouns showed an increase with age, but not for verbs.

Table 25. *Noun and verb scores for Afrikaans-speaking infants (0;8 – 1;4)*

Participant code	**Age** (years; months)	**Nouns- receptive domain** (score out of 8)	**Nouns-expressive domain** (score out of 8)	**Verbs-receptive domain** (score out of 2)	**Verbs-expressive domain** (score out of 2)
A19C	0;8	0	0	0	0
A5C	0;10	1	0	1	0
A7C	0;10	0	0	0	0
A16C	0;11	1	0	0	0
A1C	1;2	1	0	1	0
A9C	1;2	1	0	1	0
A15C	1;3	2	0	0	0
A17C	1;4	1	0	1	0
A18C	1;4	1	0	1	0
A20C	1;4	0	0	1	0
Mean/ Standard deviation	0;11	0.8/0.63	0/0	0.6/0.52	0/0

Table 26. *Noun and verb scores for Afrikaans-speaking toddlers (1;5 – 3;6)*

Participant code	**Age** (years, months)	**Nouns- receptive domain** (score out of 8)	**Nouns-expressive domain** (score out of 8)	**Verbs-receptive domain** (score out of 2)	**Verbs-expressive domain** (score out of 2)
A10C	1;6	1	1	1	0
A13C	1;7	2	0	1	0
A3C	1;8	2	0	1	0
A11C	1;9	3	2	1	0
A14C	2;1	6	4	1	0
A8C	2;8	7	6	1	0
A12C	2;9	8	1	1	0
A6C	3;6	8	7	2	2
Mean/ Standard deviation	2;2	4.63/2.92	2.63/2.72	1.13/0.35	0.25/0.71

6.2.2 Objective 3 b: To describe the expressive and receptive language of children acquiring Afrikaans based on assessment with the MB-CDI

The Afrikaans MB-CDI was completed by parents/caregivers of Afrikaans-speaking participants, and the results are reported separately for infants and toddlers below. The scores are presented for each participant as an expressive score out of 10, a receptive score out of 10 and a gesture score out of 5. The scores were tallied to present a total score out of 25 which is reported as a percentage. The findings are presented in tables 28 and 29.

Table 27. *Results from the MB-CDI for Afrikaans-speaking infants (0;8 – 1;4)*

Participant code	**Age** (years; months)	**Expressive** (Score out of 10)	**Receptive** (Score out of 10)	**Gesture** (Score out of 5)	**Total score out of 25** (%)
A19C	0;8	0	0	3	12
A5C	0;10	0	0	3	12
A7C	0;10	0	1	2	12
A16C	0;11	0	1	3	16
A1C	1;2	1	2	4	28
A9C	1;2	0	3	2	20
A15C	1;3	0	3	5	32
A17C	1;4	1	2	5	28
A18C	1;4	0	3	5	32
A20C	1;4	0	0	5	20
Mean/ Standard deviation	0;11	0.2/0.42	1.5/1.27	3.7/1.25	21.2/8.23

Results from the MB-CDI indicated that all Afrikaans-speaking infants obtained an overall score which was below 50%. The lowest score was 12%, obtained by participants A19C at age 0;8, A5C at age 0;10 and A7C at 0;10. The highest score was 32%, obtained by participants A15C at age 1;3 and participant A18C at age 1;4. Receptive scores were found to be higher than or equal to expressive scores for each participant. For the expressive domain, the lowest score was 0/10, obtained by the majority of participants, and the highest score was 1/10, obtained by participant A1C at age 1;2 and participant A17C at age 1;4. For the receptive domain, the lowest score was 0/10, obtained by participant A19C at age 0;8, A5C at age 0;10, and participant A20C at 1;4. The highest score was 3/10, obtained by participant A9C at age 1;2, participant A15C at age 1;3 and participant A18C at age 1;4. Gesture scores were found to be greater than language (receptive and expressive combined) scores, with the lowest being 2/5, obtained by participant A7C at age 0;10 and participant A9C at age 1;2, and the highest being 5/5, obtained by the four oldest participants at ages 1;3 and 1;4. The results do not indicate increasing scores with an increase in age for infant participants.

Table 28. *Results from the MB-CDI for Afrikaans-speaking toddlers (1;5 – 3;6)*

Participant code	**Age** (years; months)	**Expressive** (Score out of 10)	**Receptive** (Score out of 10)	**Gesture** (Score out of 5)	**Total score out of 25 (**Percentage)
A10C	1;6	0	0	2	8
A13C	1;7	4	3	3	40
A3C	1;8	1	0	1	8
A11C	1;9	4	5	3	48
A14C	2;1	5	6	2	52
A8C	2;8	10	8	5	92
A12C	2;9	9	8	5	88
A6C	3;6	10	9	5	96
Mean/ Standard deviation	2;2	5.38/3.93	4.89/3.56	3.25/1.58	54/35.52

Based on the results from the MB-CDI, half of the Afrikaans-speaking toddlers obtained an overall score above 50% and the remaining half obtained an overall score below 50%. The lowest score was 8% and was obtained by participant A10C at age 1;6 and by participant A3C at age 1;8. The highest score was 96% and was obtained by participant A6C, the oldest participant, at age 3;6. Receptive scores compared to expressive scores varied for each participant, with some participants having obtained a higher score for the receptive domain than for the expressive domain, for example participant A14C, and others having obtained a lower score for the receptive domain than for the expressive domain, for example participant A8C, and participant A10C having obtained an equal score for both domains. For the expressive domain, the lowest score was 0/10, obtained by participant A10C at age 1;6, and the highest score was 10/10, obtained by participant A8C at age 2;8 and participant A6C at age 3;6. For the receptive domain, the lowest score was 0/10, obtained by participant A10C at age 1;6 and participant A3C at age 1;8, and the highest score was 9/10, obtained by participant A6C at age 3;6. Gesture scores were higher than language scores for the majority of the participants. The lowest was 1/5, obtained by participant A3C at age 1;8, and the highest score was 5/5 obtained by the three oldest participants. The results do not indicate a definite increase in scores with age, because the scores vary. However, the older toddler participants generally obtained higher scores.

The total vocabulary and gesture scores from the administration of the entire MB-CDI are reported in tables 30 and 31 below. Results for Afrikaans-speaking infants and toddlers are reported separately. A score out of 101 was calculated for gesture, and a total score out of 1546 for vocabulary (expressive and receptive collectively). The totals were obtained as the sum of the score on each individual item in each category and the total score reported as a percentage of each category.

Table 29. *Total vocabulary and gesture scores from the entire MB-CDI for Afrikaans-speaking infants (0;8 – 1;4)*

Participant code	**Age** (years; months)	**Expressive** (Score out of 773)	**Receptive** (Score out of 773)	**Total vocabulary** (Score out of 1546) (%)	**Gesture** (Score out of 101) (%)
A19A	0;8	1	11	0.78	28.71
A5A	0;10	0	0	0.00	43.56
A7A	0;10	1	238	15.46	23.76
A16A	0;11	4	25	1.88	35.64
A1A	1;2	2	96	6.34	64.36
A9A	1;2	1	233	15.14	58.42
A15A	1;3	7	76	5.37	59.41
A17A	1;4	5	66	4.59	54.46
A18A	1;4	7	74	5.24	58.42
A20A	1;4	0	52	3.36	56.44
Median/ Standard deviation	0;11	2.8/2.74	87.1/83.89	5.82/5.41	48.32/14.37

The total vocabulary scores obtained by Afrikaans-speaking infants on the entire vocabulary section of the MB-CDI were all lower than 50%. The lowest score was 0,00%, obtained by participant A5A at age 0;10, and the highest score was 15,46%, obtained by A7A also at the age of 0;10. Receptive scores were more than or equal to expressive scores for all participants. The majority of the gesture scores obtained on the entire gesture section of the MB-CDI were higher than 50%. The lowest score was 23,76%, obtained by participant A7A at 0;10, and the highest score was 64,36%, obtained by participant A1A at 1;2. The results do not indicate a trend of increasing scores with age in terms of neither vocabulary nor gesture.

Table 30. *Total vocabulary scores from the entire MB-CDI for Afrikaans-speaking toddlers (1;5 – 3;6)*

Participant code	**Age** (years; months)	**Expressive** (Score out of 773)	**Receptive** (Score out of 773)	**Total vocabulary** (Score out of 1546) (%)
A10A	1;6	20	20	2.59
A13A	1;7	101	101	13.07
A3A	1;8	21	21	2.72
A11A	1;9	267	267	34.54
A14A	2;1	193	193	24.97
A8A	2;8	666	666	86.16
A12A	2;9	568	568	73.48
A6A	3;6	658	658	85.12
Median/ Standard deviation	2;2	311.75/278.06	311.75/278.06	40.33/35.97

The total vocabulary scores obtained by Afrikaans-speaking toddlers on the entire vocabulary section of the MB-CDI varied greatly, with the majority of the scores being less than 50%. The lowest score was 2,59%, obtained A10A at age 1;6, and the highest score was 86,16%, obtained by participant A8A at age 2;8. The results do not indicate a trend of increasing scores with age.

6.3. Data analysis

6.3.1. Descriptive statistics

The descriptive statistics reported below were calculated based on the results obtained from the administration of the 25 items in the object naming/identification task and the MB-CDI only. The statistics which were calculated included the mean, range and standard deviation. The findings based on these calculations are reported in tables 32, 33 and 34 below.

Table 31. *Mean, range and standard deviation of object naming/identification task results compared to MB-CDI results for Afrikaans-speaking infants (0;8 – 1;4) and toddlers (1;5 – 3;6)*

Assessment	Total number of participants (n)	Mean ($\bar{x}$)	Range	Standard deviation (σ)
Object naming/identification task (/25)	18	7.278	0-24	6.737
MB-CDI (/25)	18	9.000	3-24	7.219

Table 32. *Mean, range and standard deviation of object naming/identification task results compared to MB-CDI results for Afrikaans-speaking infants (0;8 – 1;4)*

Assessment	Total number of participants (n)	Mean ($\bar{x}$)	Range	Standard deviation (σ)
Object naming/identif0ication task (/25)	10	2.80	0-4	1.687
MB-CDI (/25)	10	5.40	6-24	2.171

Table 33. *Mean, range and standard deviation of object naming/identification task results compared to MB-CDI results for Afrikaans-speaking toddlers (1;5 – 3;6)*

Assessment	Total number of participants (n)	Mean ($\bar{x}$)	Range	Standard deviation (σ)
Object naming/identification task (/25)	8	12.88	3-8	6.490
MB-CDI (/25)	8	13.50	2-24	8.880

The statistics indicated that the mean of the scores calculated for the MB-CDI was significantly higher than that of the object naming/identification task. The standard deviation for the object naming/identification task was very high in relation to the mean, indicating that the mean may be a poor descriptor of the data. Similarly, the standard deviation for the MB-

CDI was also relatively high in relation to the mean, also indicating variability in the scores and a mean which is a poor descriptor of the data. The statistics for infants only indicate a much higher mean for the scores on the MB-CDI than on the object naming/identification task. The standard deviation for the object naming/identification task is relatively high in relation to the mean, indicating that the mean is a poor descriptor of the data. The standard deviation of the MB-CDI was not as high in relation to the mean. The mean of the scores, for toddlers only, were not as significantly different as that for infants. The standard deviation for the object naming/identification task was not as high, in relation to the mean, as the standard deviation for the MB-CDI.

6.3.2. Correlation between the object naming/identification task and the MB-CDI

The first correlations which are reported on below, were based on only the 25 items included in the object naming/identification task and the MB-CDI only. Overall, the two assessments indicated a significant correlation with a Pearson correlation coefficient of r=0.906 and a significance value of less than 0.01 (p=.000). This suggested a significant correlation between the two assessments. For infants only, the object naming/identification task and the MB-CDI indicated a significant correlation with a Pearson correlation coefficient of r=0.692 and a significance value of more than 0.05 (p=.27) indicating that there is no correlation between the two assessments for infants. For toddlers, the object naming/identification task and the MB-CDI indicated a significant correlation with a Pearson correlation coefficient of r=0.901 and a significance value of less than 0.01 (p=.002), indicating a significant correlation between the two assessments for toddlers.

In addition to the correlation between the 25 items in each assessment only, the correlation between the object naming/identification task and the entire vocabulary and gesture sections of the MB-CDI were also calculated. Similar to the initial correlation, the two assessments indicated a significant correlation for overall vocabulary scores, with a Pearson correlation coefficient of r=0.909 and a significance value of less than 0.01 (p=.000). This suggested a significant correlation between the two assessments in terms of overall vocabulary. For infants only, a negative Pearson correlation co-efficient and no significance value (p=.850) for vocabulary scores, indicated no correlation between the two assessments infants. The gesture scores for infants indicated a significant correlation between the two assessments, with a Pearson correlation coefficient of r=0.852 and a significance value of less than 0.01 (p=.002).

This suggested a significant correlation. For toddlers, the object naming/identification task and the MB-CDI indicated a positive relationship with a Pearson correlation coefficient of r=0. 880 and a significance value of less than 0.01 (p=.004), indicating a significant relationship between the two assessments for toddlers.

6.3.3. Internal reliability

The Cronbach's alpha values were calculated based on the 25 items in the object naming/identification task and only the scores from the same 25 items included in the MB-CDI. The alpha values for each of the domains, and the interpretation thereof, is outlined in table 34 below.

Table 34. *Cronbach's alpha values for the object naming/identification task and only the 25 items included in the Afrikaans MB-CDI*

	Receptive	**Expressive**	**Language** (Receptive + Expressive)	**Gesture**
Cronbach's alpha	0.960	0.868	0.957	0.226
Interpretation (Taber, 2018)	Excellent	Reliable	Excellent	Low

High internal consistency was found for the language domains, with an alpha value of >0.94. When analysed separately, high internal consistency was found for the receptive domain as well, with an alpha value of >0.94. For the expressive domain, an alpha value of 0.868, although lower than that for the receptive domain, still indicates a reliable internal consistency. An alpha value of <0.4 was found for the gesture domain, indicating an internal consistency which is not satisfactory.

Second, Cronbach's alpha values for each domain were calculated from the scores on the 25 items included in the object naming/identification task and the entire vocabulary and gesture sections included in the MB-CDI. These values and their interpretation are outlined in table 35 below.

***Table 35**. Cronbach's alpha values for the object naming/identification task and the entire vocabulary and gesture sections of the Afrikaans MB-CDI*

	Receptive	**Expressive**	**Language** (Receptive + Expressive)	**Gesture** (infants only)
Cronbach's alpha	0.921	0.901	0.950	0.914
Interpretation (Taber, 2018)	Strong	Strong	Excellent	Strong

High internal consistency was found for the language domains, with an alpha value of >0.94. In line with the above, a high internal consistency was found for the receptive and expressive domains when analysed together, with an alpha value of >0.94. Similarly, for the gesture domain, an alpha value of 0.914 indicated a strong internal consistency.

6.4. Chapter conclusion

In this chapter, the expressive and receptive language of Afrikaans-speaking participants are described. This description is based on the results from the completion of the MB-CDI and the administration of the object naming/identification task, and were tabulated and correlated. The analyses included the calculation of descriptive statistics, the correlation between the object naming/identification task and the MB-CDI, and internal reliability.

The results from the administration of the object naming/identification task indicated that all infant participants scored lower than 50% overall, with no trend of increasing scores with an increase in age. Half of the toddlers obtained a score less than 50% and the remaining half obtained a score above 50%, with scores found to increase with age. The results from the MB-CDI also indicated that all infants also obtained a score lower than 50% and that scores did not increase with age. Half of the toddlers obtained a score higher than 50% and the remaining half obtained less than 50% overall, with varying scores and no definite trend of increasing scores with age. Both infants and toddlers obtained higher scores in the receptive domain than the expressive domain, on both assessments overall and for nouns and verbs.

The correlations between the 25 items included in both assessments indicated a significant correlation overall (r=0.906; p<.01), no correlation for infants (r=0.692; p>.05) and a significant correlation for toddlers (r=0.901; p<.01). The correlations between the object naming/identification task and the entire vocabulary and gesture sections of the MB-CDI

indicated a significant correlation overall (r=0.909; p<.01), no correlation in terms of vocabulary for infants, a significant correlation in terms of gesture for infants (r=0.852; p<.01), and a significant correlation in terms of vocabulary for toddlers (r=0.880; p<.01). A high internal consistency was found when comparing only the 25 items in both assessments (α = >0.94) and when comparing the object naming/identification task with the entire vocabulary and gesture sections of the MB-CDI (α = >0.94).

Chapter seven

Discussion

7.1. Introduction to the chapter

This chapter presents a discussion of the findings for SAE and Afrikaans. The findings for both languages are discussed together here because of the many similarities between the languages. First, the language acquisition of SAE and Afrikaans is discussed in relation to other studies in these and other languages. Second, the factors which may influence the language acquisition of both these languages are discussed. Lastly, the validity of the SAE and Afrikaans MB-CDIs is discussed in relation to the new measure devised for this study – along with discussion pertaining to the value and use of this new measure.

7.2. Language acquisition of SAE and Afrikaans

The current research study yielded information on the early lexical development of children acquiring SAE and Afrikaans, which adds to the information available on these populations within South Africa. Like other studies of lexical acquisition in other languages, language varieties, and language contexts (Dewaele, 2012; Fenson et al., 1994; McLeod & Bleile, 2003; Southwood et al., 2021), these findings show that children acquiring SAE and Afrikaans often take different paths of acquisition, and that the path is not always the same for every child. The findings add to the body of knowledge regarding the language acquisition of SAE and Afrikaans by young children, in terms of the general path of lexical development and the socio-cultural factors which play a role in language development.

For SAE, the results of this study concur with research findings by Gonasillan et al. (2013) who reported on the vocabulary of 2-year-old South African children from diverse backgrounds, and yielded information regarding vocabulary acquisition, including nouns and verbs. Like the present study, they used a parent-report measure, the Language Development Survey (LDS), that proved to be an appropriate screening tool within the South African

contexts. Furthermore, the findings fit with research conducted by Hamilton, Plunkett and Schafer (2000), which aimed to explore the vocabulary of British children between the ages of 1;0 and 2;1 using the British MB-CDI. Their findings suggest that although there is a considerable amount of variation in vocabulary skills in this age group, the development is similar which fits with data from the current research study which also found that development is, partly, linear (Hamilton et al., 2000). Recently, a study has been conducted to investigate the socio-cultural factors affecting the vocabulary development of young South African children and showed that these factors may account for 25% of the variation which occurs in vocabulary development (Southwood et al., 2021). There remains a need for further and larger scale research on the lexical development of SAE by young children in different cultural and socio-economic contexts, particularly for children younger than 3 years.

For Afrikaans, the overall findings from this study fall in line with research conducted by Potgieter (2016) which found that comprehension scores exceeded production scores and that scores on nouns exceeded scores on verbs. Chapter 2 described a study by Breed and Brink (2017) on how young Afrikaans-speaking children connect form and meaning, which may account for the results from this study. They reported that children can either combine form and meaning in simple or complex ways, in other words, at this age many children will use conventional words although they may not yet be phonologically correct or they will use a lexical item for which the connection is not yet clear and calls for further analysis and interpretation (Breed & Brink, 2017). Many of the studies reveal contrasting findings in terms of the language acquisition of Afrikaans. Therefore, there is still a gap in the research for young children, including research on the development of gesture as a pre-linguistic skill in young children.

The limited research which is available within the South African contexts, pertaining to the lexical development of children acquiring SAE and Afrikaans, presented a challenge in terms of attaining normative data to compare the results of the current research study to (Pascoe & Smouse, 2012). From the administration of the object naming/identification task to SAE- and Afrikaans-speaking infants and toddlers (which rendered a score out of 25) and the MB-CDI (considering specifically the 25 items which also appeared in the naming/identification task), a total percentage was calculated for all participants and included scores obtained for the receptive, expressive and gesture domains. The results indicated that scores obtained by SAE-speaking and Afrikaans-speaking infants on both assessments were all below 50%. For SAE, the majority of the scores obtained by toddlers on both assessments were above 50%. This is

similar to research by Haman et al. (2017), which investigated word-learning differences in terms of vocabulary size and found that as SAE-speaking children get older, the size of their vocabulary increases. Similarly, the study by Southwood et al. (2021) found that age was the most accurate predictor of vocabulary size. For Afrikaans, the scores obtained by half of the Afrikaans-speaking toddlers on both assessments were above 50%. This partially contrasts with the results from Haman et al. (2017), which investigated word-learning differences in terms of vocabulary size, and found that the vocabulary size of Afrikaans-speaking children did not increase with age. They reported that certain factors, including a small sample size, may have accounted for or contributed to this finding (Haman et al., 2017). Similar to the research done by Haman et al. (2017), the overall scores obtained by SAE- and Afrikaans-speaking toddlers which were below 50% could be as a result of the fact that language acquisition may differ between children and languages in general, with the differences potentially being due to reasons including amount and quality of exposure, sex and geographic location (Fenson et al., 1994; McLeod & Bleile, 2003; Hoff, 2003; Southwood, 2013; Gonasillan et al., 2013). Although it holds true that vocabulary size increased when comparing the results obtained by infants versus toddlers for both languages, the total scores for infants on both the SAE and Afrikaans MB-CDI did not increase with age. This was expected for this age group as research suggests that there is a considerable amount of variability in the language development of young children (Fenson et al., 1994) and the sample in the present study was limited.

Receptive and expressive scores were reported on separately for the administration of the object-naming/identification task, the 25 items included in the SAE and Afrikaans MB-CDI and the entire vocabulary section of both MB-CDIs. Overall, for both SAE-speaking infants and toddlers on only the 25 items included in the object naming/identification task and the same 25 items included in the MB-CDI, receptive scores obtained in both assessments were found to be higher than expressive scores. Results for Afrikaans-speaking infants on only the 25 items included in the object naming/identification task and the same 25 items included in the MB-CDI, indicated that the majority of receptive scores obtained on both assessments were higher than expressive scores, with a few being equal to the expressive score. Results for Afrikaans-speaking toddlers on only the 25 items included in the object naming/identification task and the same 25 items included in the MB-CDI indicated that the receptive scores obtained on the object naming/identification task were higher than expressive scores. This concurs with numerous other studies that describe lexical development, and was largely anticipated as there is a multitude of evidence in the literature stating that the understanding of language typically

precedes spoken language (Haman et al., 2017; Potgieter, 2016; Visser-Bochane et al., 2020). The scores obtained by Afrikaans-speaking toddlers on the MB-CDI varied greatly; however, this was anticipated due to research which found that there is a significant amount of variability in early lexical development of young children (Fenson et al., 1994). The receptive and expressive scores for SAE- and Afrikaans-speaking toddlers on the entire MB-CDI were equal, as the MB-CDI instructs parents to only indicate the items which their child "understands + says".

The total vocabulary scores obtained by SAE-speaking infants and toddlers after administration of the entire MB-CDI indicated that even though the scores varied considerably, which was expected due to their age (Fenson et al., 1994), the majority of participants scored below 50%. The total vocabulary scores obtained by Afrikaans-speaking infants and toddlers after administration of the entire MB-CDI indicated that all the scores obtained were also below 50%. These results could be accounted for by a variety of different factors that can influence language development (Fenson et al., 1994; McLeod & Bleile, 2003; Hoff, 2003; Southwood, 2013; Gonasillan et al., 2013) or by general variability in early lexical development of young children (Fenson et al., 1994), which was anticipated.

Both SAE- and Afrikaans-speaking infants and toddlers appear to develop gesture prior to language. Gesture scores obtained on both the object naming/identification task and the MB-CDI were found to be higher than language scores for the majority of SAE- and Afrikaans-speaking infants and toddlers. This was predicted by research which investigated the development of gesture as a pre-linguistic skill which plays a vital role in predicting the future language development of young children (Capone & McGregor, 2004; Crais et al., 2009). The majority of gesture scores obtained from the administration of the entire gesture section of the MB-CDI to SAE-speaking infants were found to be lower than those obtained only from the administration of the object naming/identification task. The majority of gesture scores obtained from the administration of the entire gesture section of the MB-CDI to Afrikaans-speaking infants was found to be above 50%. This suggests that certain gestural skills may be developed earlier in Afrikaans-speaking infants than SAE-speaking infants although further studies with larger sample sizes are needed before conclusions can be drawn on the matter.

When presenting the results obtained by participants on the object naming/identification task by SAE-speaking infants and toddlers in terms of the parts of speech, findings indicated that both infants and toddlers obtained higher receptive scores than

expressive scores for nouns, equal to and/or higher receptive scores than expressive scores for verbs, and that toddlers obtained higher scores than infants. This is supported by findings from Gonasillan et al. (2013) who found that 2;0-year-old SAE-speaking children typically use more nouns than verbs, suggesting that nouns are acquired before verbs. Furthermore, Haman et al. (2017) reported that for SAE, young children typically acquire nouns before verbs. Although this was presented in their findings, it should be noted that they also reported that the pictures used in their research study were selected to represent a noun and verbs were facilitated through the picture (Haman et al., 2017). This is important in this research study because the protocol used to guide the production part of the object naming/identification task instructs the user to select pictures and objects to represent the nouns, and that the verbs need to be represented/facilitated through a picture and object of a noun. This suggests that it could potentially have been easier for participants to identify the noun rather than the facilitated verb, which could in turn account for the higher scores obtained for nouns in comparison to verbs. It should also be taken into consideration that the number of nouns included in the object naming/identification task largely exceeded the number of verbs which were included, suggesting that the scores obtained for verbs could be a less accurate representation in comparison to that of the nouns included.

In terms of parts of speech, the results obtained by participants on the object naming/identification task by Afrikaans-speaking infants and toddlers indicated that both infants and toddlers obtained higher receptive scores than expressive scores for nouns, and equal to and/or higher receptive scores than expressive scores for verbs, and that infants obtained scores which were either lower than or equal to scores obtained by toddlers. This contradicts findings from Haman et al. (2017) which reported that for Afrikaans, young children do not typically acquire nouns before verbs. In contrast, Potgieter (2016) found that 4;0-year-olds do acquire nouns before verbs. Although the findings from this study suggest that nouns are not acquired before verbs for Afrikaans-speaking children, and as described in objective 2, it should be taken into consideration that the number of nouns included in the object naming/identification task largely exceeded the number of verbs which were included, suggesting that the scores obtained for verbs could be a less accurate representation in comparison to that of the nouns which were included.

The findings based on analysis of descriptive statistics indicated that there was a slight variability in the overall scores on both the object naming/identification task and the MB-CDI, for both SAE-speaking infants and toddlers. Furthermore, the results for SAE-speaking infants

and toddlers were analysed separately. Results also indicated that there was more variability in scores among infants on both assessments, whereas for toddlers, less variability was indicated in scores on the object naming/identification task and more variability in scores on the MB-CDI. The variability in scores overall, and more specifically in infants, is typical (Fenson et al., 1994) and was therefore anticipated in this research study. Language acquisition is not the same for any two children and is largely dependent on various external factors (Fenson et al., 1994; McLeod & Bleile, 2003; Hoff, 2003; Southwood, 2013; Gonasillan et al., 2013). In addition, internal factors may also play a role, where certain personality traits of the children could potentially have an effect on the outcomes of the assessment (Dewaele, 2012). In the case of this research study, it is important to note the potential effects which the COVID-19 pandemic could have had on the language acquisition of young children. Many young children may have been deprived of an increased exposure to language and learning opportunities due to closure of day-care centres, and research suggests that masks can "degrade the speech signal" (Charney, Camarata & Chern, 2021, p. 1), making it difficult for children to hear accurately in addition to the loss of being able to perceive what the other person is saying based on articulatory gestures (Charney et al., 2021). This could reduce the quality and quantity of language input received by young children, which would affect their gesture and vocabulary acquisition.

7.3. Factors influencing language acquisition

The findings suggest that maternal level of education may not be a factor that influences the language acquisition of SAE. For SAE-speaking infants, the majority of adult participants reported having studied beyond high school, with the parent of the youngest participant (who scored the lowest on both assessments) having reported only completing primary school. For SAE-speaking toddlers, the participants who scored the lowest on both assessments reported a maternal education level of beyond high school and the participant who scored the highest reported only having completed high school. Again, the findings should be interpreted with caution due to a small sample size. Similarly, for Afrikaans-speaking participants, no correlation was found between maternal level of education and scores obtained on either assessment in the current study. For Afrikaans-speaking infants, the parent of the participant who obtained the lowest scores reported having completed high school, whereas the parent of the participant who obtained the highest scores reported having completed primary school. For Afrikaans-speaking toddlers, the scores varied in terms of maternal level of education. This is in line with findings which suggest that there is no correlation between maternal level of

education as a predictor of vocabulary size in young SAE-speaking nor Afrikaans-speaking children (Southwood et al., 2021).

In terms of factors predicting vocabulary size, for the younger Afrikaans-speaking children, the infants, it was found that their age could not predict their vocabulary size; however, the scores for toddlers increased with age. This suggests that age could be a better predictor of vocabulary size for Afrikaans-speaking toddlers, between the ages of 1;5 and 3;6, than for Afrikaans-speaking infants, 1;4 and younger. When looking at sex as a predictor of vocabulary size, the findings from this study suggest that this might be true for SAE-speaking toddlers but not for SAE-speaking infants, and untrue for all Afrikaans-speaking children. Of all the participants who took part in the current research study, 13 of the SAE-speaking participants were female and 4 were male, and half of the Afrikaans-speaking participants were female. For SAE-speaking infants, the findings indicated no trend in terms of overall performance depending on their sex. For SAE-speaking toddlers, the only male toddler was the youngest toddler, who scored the lowest on the MB-CDI. For Afrikaans, the results indicate that scores obtained by both females and males varied for both assessments, in terms of sex, indicating no correlation between sex and vocabulary for Afrikaans-speaking infants and toddlers. Southwood et al. (2021) found that sex was the second largest indicator of vocabulary size for both SAE-speaking and Afrikaans-speaking children. This fits with the findings for SAE-speaking toddlers but not for SAE-speaking infants, nor for Afrikaans-speaking infants and toddlers. These findings should, however, be interpreted with caution as there were more female participants than male participants, in addition to a small sample size.

7.4. Validity of the South African MB-CDIs

7.4.1. SAE

When calculating the correlation between only the 25 items included in both assessments, a significant correlation (r=0.928) was noted. When analysed separately, no correlation was indicated between the two assessments for infants but a significant correlation was indicated for toddlers. This suggests that if a participant performs well on the object naming/identification task, they are likely to do well on the same 25 items included in the MB-CDI and that if a participant obtains low scores on the object naming/identification task, they are likely to obtain low scores on the MB-CDI as well; however, this might hold truer for SAE-speaking toddlers than infants.

The correlation between the object naming/identification task and the scores from the entire vocabulary section of the MB-CDI also demonstrated a significant correlation (r=0.901), although Pearson's correlation co-efficient was lower than for only the 25 items included in both assessments. Separate analysis of infants only indicated that there is no correlation and an insignificant correlation in terms of vocabulary and a significant correlation in terms of gesture. Contrary to this, the results for toddlers indicated a significant correlation between the two assessments in terms of vocabulary. This suggests that if a participant performs well on the language sections of the object naming/identification task, they are likely to perform well on the entire vocabulary section of the MB-CDI and if a participant obtains low scores on the language sections of the object naming/identification task, they are likely to obtain low scores on the entire vocabulary section of the MB-CDI as well. This may be truer for toddlers than for infants.

In addition, it suggests that if an infant performs well on the gesture section of the object naming/identification task, they are likely to perform well on the entire gesture section of the MB-CDI. This correlation could not be calculated for toddlers as there is no gesture section included for toddlers in the SAE MB-CDI. A significant correlation between any two variables would be indicative of a significant correlation between the two variables and indicated by a correlation co-efficient which is closer to one for a small sample size, which is the case in this research study (Sedgwick, 2012). This is important in this study as the study aims to work towards demonstrating the validity of the South African MB-CDIs, and a significant correlation between the assessments suggests a high level of concurrent validity between them (Sedgwick, 2012) and is in line with previously conducted research which also set out to prove the concurrent validity of different language adaptations of the MB-CDI for American Sign Language (Caselli et al. 2020 for American Sign Language; Deckers et al., 2016 for Dutch; O'Toole & Fletcher, 2010 for Irish; Perez-Pereira & Resches, 2011 for Galacia; Prado et al., 2018; Thordardottir & Weismer, 1996 for Icelandic).

Evaluating the internal consistency between items is vital as it may indicate whether items measure the same characteristic well in the assessments. An excellent internal consistency is dictated by a Cronbach's alpha value of above .70 (Bonnet & Wright, 2015). Comparing the results from only the 25 items included in both the object naming/identification task and the MB-CDI, a high internal consistency was found for the language domains, with an alpha value of >0.94. The alpha values for each language domain respectively indicated that a high internal consistency was found for the expressive domain and only a reliable internal

consistency was found for the receptive domain. This suggests that the 25 items included in both assessments are measured well, but the items in the expressive domain are measured slightly better than the items in the receptive domain. The internal consistency found for the gesture domain was lower than that for the language domains but still classified as reasonable. This suggests that the 25 items included in both assessments are closely related, that the items in the gesture domain are a good measurement of gesture.

Furthermore, the items in the expressive, receptive and gesture domains separately can also be considered reliable, especially for the expressive domain. Following a similar trend, the comparison of the results from the object naming/identification task and entire vocabulary and gesture sections of the MB-CDI indicated a high internal consistency for the language domains. When analysed separately, a high internal consistency was found for the expressive domain and a reasonable internal consistency for the receptive domain. This further proves reliability for both assessments and the language domains when analysed separately. This suggests that the items used to measure language are a good prediction of language, although better in the expressive domain than the receptive domain.

Contrary to the results from the 25 items on both assessments only, an internal consistency which is not satisfactory was indicated for the gesture domain. The gesture scores for infants only indicates an insignificant correlation. An unsatisfactory internal consistency for the gesture domain suggests that it is unreliable in comparison to the language domains and that the items in the gesture domain are not measured well. Research conducted by O'Toole and Fletcher (2010) supports the reliability of the language domains, as the vocabulary scales in their study also demonstrated a high internal consistency, with an alpha value of 0.97. An important aspect to consider within this research study is an effect described by O'Toole and Fletcher (2010), known as the "halo effect" (p.212), which suggests that the alpha values obtained on parent report measure may be unrealistically high due to parents over-estimating their children's language abilities. Judging by direct assessment, this appears to not have been the case in terms of the language part of the assessment but may well have been the case in terms of gesture, however, this remains an aspect which requires further investigation in future research.

7.4.2. Afrikaans

When correlating the results obtained from the object naming/identification task and the MB-CDI, a significant correlation between the two is the desired outcome as this research

study aims to work towards proving the validity of the South African MB-CDIs by setting up a task that can be used when validating these MB-CDIs. The correlation between the 25 items included in the object naming/identification task and the 25 items included in the MB-CDI only, indicated a significant correlation between the two assessments overall. The correlations for infants only indicated no correlation between the two assessments and the correlations for toddlers indicated a significant correlation between the two assessments. This suggests that if a participant performs well on the object naming/identification task, they are likely to perform well on the MB-CDI, and if a participant obtains low scores on the object naming/identification task they are likely to obtain low scores on the MB-CDI as well. This is truer for toddlers than for infants. Furthermore, the correlation between the language domains of the object naming/identification task and the entire vocabulary section of the MB-CDI indicated a significant correlation between the two assessments in terms of vocabulary. Upon analysing the correlation for infants and toddlers separately, results indicated no correlation between the assessments in terms of vocabulary for infants, and a significant correlation between the assessments in terms of vocabulary for toddlers. However, the results indicated a significant correlation between the two assessments in terms of gesture for infants only. This further suggests that if a participant is likely to perform well on the language domains of the object naming/identification task, they are likely to perform well on the entire vocabulary section of the MB-CDI. This is truer for toddlers than for infants. In addition, the findings suggest that if an infant performs well on the gesture section of the object naming/identification task, they are likely to perform well on the entire gesture section of the MB-CDI. Again, this correlation could not be made for toddlers as no gesture section is included for toddlers in the Afrikaans MB-CDI. The outcome of a significant correlation between the assessments is important in this research study as it suggests a high level of concurrent validity (Sedgwick, 2012) and is in line with previously conducted research which also set out to prove the validity of different adaptations of the MB-CDI (Thordardottir & Weismer, 1996; O'Toole & Fletcher, 2010; Perez-Pereira & Resches, 2011; Prado et al., 2018).

Furthermore, assessing the internal consistency between items plays a vital role as it may indicate whether or not the items are measuring the domains well in the assessments and an excellent internal consistency is dictated by a Cronbach's alpha value of above .70 (Bonnet & Wright, 2015). A comparison of the results from the 25 items in the object naming/identification task and the 25 items in the MB-CDI only, indicated a high internal consistency for the language domains. When analysed separately, high internal consistency

was found for the receptive domain, a reliable internal consistency for the expressive domain and an internal consistency which is not satisfactory for the gesture domain. This suggests that overall, the 25 items are measured well, and that items in the receptive domain are measured better in comparison to items in the expressive domain. It further suggests that the items in the gesture domain are not measured well. Comparing the results from the object naming/ identification task and the entire vocabulary and gesture sections from the MB-CDI indicated a high internal consistency for the language domains as well. When analysed separately, a high internal consistency was found for each of the receptive, expressive and gesture domains as well. This suggests that the items are measured well overall, and for each of the domains separately. Overall, the high internal consistencies found is an indication of reliability, not only between the 25 items included in both assessments and between the object naming/identification task and the entire vocabulary and gesture sections, but always between items in the domains. However, an unsatisfactory internal consistency for the gesture domain, when analysing only the 25 items included in both assessments, is not an indication for reliability in terms of gesture. Research conducted by O'Toole and Fletcher in 2010 supports the reliability of the language domains, as the vocabulary scales in their study also demonstrated a high internal consistency, with an alpha value of 0.97. As mentioned earlier for SAE, the high scores obtained on the language domains might be accounted for by an over-estimation of language abilities by parents (O'Toole & Fletcher, 2010, p.212).

Limitations

The limitations of this study are discussed in terms of the ongoing COVID-19 pandemic, the limited research available within the South African contexts on the language acquisition of young children, and that it did not account for certain factors which may influence language acquisition.

The ongoing pandemic presented an array of challenges during the research process. Due to the nature of the research, I was required to include human beings and to come into close physical contact with them. This accounted for a short delay in obtaining ethical approval from the Faculty of Health Sciences' Human Research Ethics Committee at UCT. Once ethical approval was granted, I was allowed to commence participant recruitment. This was challenging as the population was generally reluctant to participate in any event, including research studies, given the risk of exposure to COVID-19. In addition, many younger children were at home during this time and were not exposed to as many unfamiliar people as they might

have been pre-COVID. This could have resulted in more hesitation than usual and reluctance in getting to know an unfamiliar person. It could also have resulted in them being shy and more withdrawn, which in turn leads to not performing well on the assessment with me in comparison to how they would in circumstances which are normal to them and in which they are surrounded by only familiar people.

Another limitation was the limited research available on language acquisition of South African languages. This meant that not only was there little to none normative data to compare the results obtained in the study to, but in addition there are no assessments available within South Africa which were standardized on the South African population. This meant that there was no assessment readily available to include in the validation of other assessments, in this case the validation of the South African MB-CDIs. Research has reported that there are numerous factors which may account for potential differences in the lexical development of young children, including but not limited to exposure, input, general surroundings and socio-economic status (Fenson et al., 1994; McLeod & Bleile, 2003; Hoff, 2003; Southwood, 2013; Gonasillan et al., 2013). These factors as listed above were not accounted for in this research study.

Clinical recommendations

This research study which aimed to devise a protocol for use in the validation of South African MB-CDIs opens up numerous opportunities for future research. The recommendations are discussed below.

This research study produced a protocol which was used to devise an object naming/identification task to be used for six South African languages. The protocol was used in this research study to devise tasks for use with SAE and with Afrikaans. It is suggested that future research focus on adapting this protocol and further utilizing it in studies focusing on the validation of the South African MB-CDIs of the remaining four languages. In addition to this, it is suggested that future research is focused on including larger sample sizes, and that participant inclusion is refined in terms of, and takes into consideration, factors which may have an effect on the language development of young children. The large gap in the literature in terms of language acquisition of young children within South Africa was evident in this research study, as little to no normative data, to be used during the analyses process, was available for SAE and Afrikaans. The research which is available on SAE and Afrikaans was conducted on small scales and largely focuses on speech acquisition rather than language

acquisition. Speech acquisition specifically "involves … the perception and production of consonants, vowels, consonant clusters, tones, prosodic features, and phonological rules of the language(s) they speak, with the outcome of intelligible speech" (McLeod & Crowe, 2018, pg 1546), whereas language acquisition involves the ability to use these speech sounds in combination for communication purposes, which further leads to the development of vocabulary knowledge (Hoff, E. (2013). It is recommended that future research focuses on the language acquisition of young children, and that it is refined to focus on infants and toddlers separately. Given that South African is a country with 11 official languages (Government Communication and Information System, 2018/19), it is imperative that future research not only focuses on the language acquisition of monolingual speakers but also on bi- and multilingual speakers.

7.5. Chapter conclusion

7.5.1. Objective 1

A protocol for an object naming/identification task for use with six South African languages (Afrikaans, isiXhosa, SAE, Sesotho, Setswana, and Xitsonga) was successfully devised (Appendix J). It was devised by conducting a literature review on CDI validity and lexical assessment development principles, and further correlated with the available CDI data. The protocol was successfully used to devise an object naming/identification task for Afrikaans and English, and was used to assess the expressive and receptive language of young children acquiring Afrikaans and SAE within South Africa.

7.5.2 Objective 2

Following assessment with the object naming/identification task and the SAE MB-CDI, the results were reported, analysed, and used to successfully describe the expressive and receptive language of children acquiring SAE. Descriptive statistics indicated some variability but significant correlations, and thus concurrent validity overall between the two assessments for toddlers only. In addition to the findings which suggest overall validity of the object naming/identification task as an independent tool and the validity of the MB-CDI, the findings suggested that age might be a better predictor of vocabulary size for SAE-speaking toddlers than for SAE-speaking infants, nouns were found to be acquired prior to verbs and that more variability can be anticipated for SAE-speaking infants than for toddlers.

7.5.3. Objective 3

Following assessment with the object naming/identification task and the Afrikaans MB-CDI, the results were reported, analysed, and used to successfully describe the expressive and receptive language of children acquiring Afrikaans. Similarly to SAE, descriptive statistics also indicated some variability but significant correlations, and thus concurrent validity overall between the two assessments for toddlers only.

These findings have contributed largely to the literature which is available within the South African contexts pertaining to the language development of SAE and Afrikaans by young children, and will be largely beneficial to the SLP community, and further SAE and Afrikaans communities, as it has been an important first step in the validation of the Afrikaans MB-CDI by proving concurrent validity. It has also yielded a protocol which can be used as an independent screening tool and which has paved the way for working towards validation of the MB-CDIs in the remaining South African languages.

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Appendices:

Appendix A1: Information letter for adult participants (Objectives 2 and 3; English version)

Dear _____

RE: Research Study Information

My name is Nicole Husselmann and I am a speech therapist. I am currently completing my Master's Degree at the University of Cape Town. The primary investigator, and my supervisor, for this study is Prof. Michelle Pascoe. The purpose of this research study is to prove that certain tests which have been created to measure language development of young children in South Africa are valid, in other words that it really measures what it has been developed to measure. As part of my research, I need adult participants to help me achieve my goal. I am inviting you as an adult to participate in this study, only if you wish to do so.

Why is the study important?

Speech therapists help all children communicate, but currently in South Africa we do not know a lot about how children learn all of the languages. Speech therapists have difficulty knowing which children have difficulties learning South African English (SAE) and Afrikaans and we do not have tests which can help us identify these children. In order to help speech therapists, a team of researchers created a test which can be used to measure how many words young children learning language know, focusing on 6 different languages including SAE and Afrikaans. Proving that these tests measure what they were created to measure is an important step before the tests can be officially used in South Africa. The tests which have been created are called Communicative Development Inventories (MB-CDIs) and can be used for children between the ages of 8 months to 3; 6.

What does the study require from participants?

For this study I will need 40 participants in total. 20 of the participants need to be adult participants each with a child, between the ages of 8 months and 3;6. 20 participants need to be SAE-speaking and the remaining 20 participants need to be Afrikaans-speaking.

A convenient time and location will then be arranged with each adult participant. Each adult participant will be required to complete a "Family Background Questionnaire". One session will be required of which the duration will be approximately 1 hour. During this hour the adult participant will be asked to complete the relevant MB-CDI.

What are the risks and benefits of participating in this study?

This is a safe study as it does not involve anything that may pose danger to any participants. There will be no payment for taking part in this study, but travel costs can be reimbursed.

How will participants personal information be kept confidential and private?

Code names will be used to identify participants and all personal/identifying information will be securely stored for the duration of the larger funded project which will be running over the next five years. All personal information will be shared with the researcher only and will not be disclosed to other parties without the consent of the participant.

How will this study help speech therapists?

The information you provide will be used to help speech therapists eventually be able to use the test developed to test children who speak SAE and Afrikaans. This will help identify children who need extra help with talking, learning and participating in their community so that they receive the necessary help earlier which can ultimately improve their quality of life.

Please feel free to ask me or the Primary investigator any questions that you may have about this study, you will find our contact details below

Nicole Husselmann

Name of Primary Investigator: Prof. Michelle Pascoe

Cell phone number: 0833798746

Office telephone number: 0214066043

Email of primary investigator: michelle.pascoe@uct.ac.za

Name of Researcher: Nicole Husselmann

Cell phone number: 0729391012

Email of researcher: hssnic006@myuct.ac.za

You may contact the Faculty of Health Sciences Human Research Ethics Committee on 021 406 6338 if you have any queries about you or your child's rights and welfare as a participant in this study.

Appendix A2: Information letter for adult participants (Objectives 2 and 3; Afrikaans version)

Geagte_____

Aangaande: Inligting vir navorsingstudie

My naam is Nicole Husselmann en ek is ‘n spraakterapeut. Ek is tans besig met ‘n meestersgraad aan die Universiteit van Kaapstad. Die primêre ondersoeker, en ook my toesighouer, vir die studie is Prof. Michelle Pascoe. Die doel van hierdie studie is om sekere toetse wat opgestel is om taalontwikkeling van jong kinders in Suid-Afrika te meet te bekragtig, met ander woorde om te bewys dat die toetse werklik meet wat hulle gemaak was om te meet. As deel van my navorsing, benodig ek volwassene en kinders om deel te neem en my te help om my doel te bereik. Ek nooi u uit om aan die studie deel te neem, slegs as u so wou.

Waarom is die studie belangrik?

Spraakterapeute help kinders om te kommunikeer, maar tans in Suid-Afrika weet ons nie veel oor hoe jong kinders al die tale aanleer nie. Spraakterapeute vind dit moelik om te weet watter kinders sukkel om Suid-Afrikaanse Engels en Afrikaans te leer en ons het nie toetse wat ons kan help om uit te vind watter kinders daarmee sukkel nie. Om spraakterapeute te help, het ‘n span navorsers ‘n toets gemaak wat gebruik kan word om te meet hoeveel woorde jong kinders wat ‘n taal aanleer, ken. Die toetse fokus op 6 verskillende tale, insluitend Suid-Afrikaanse Engels en Afrikaans. Om te bewys dat die toetse regtig meet wat hulle gemaak was om te meet, is ‘n baie belangrike stap voor die toetse amptelik in Suid-Afrika gebruik kan word. Die toetse wat hulle gemaak het, word “Communicative Development Inventories (MB-CDIs)” genoem en kan met kinders tussen die ouderdom van 8 maande en 3; 6 jaar gebruik word.

Wat vereis die studie van deelnemers?

Vir die studie het ek 40 deelnemers nodig in total. 20 deelnemers moet volwassenes wees, elk een met ‘n kind tussen die ouderdom van 8 maande en 3; 6 jaar. 20 van die deelnemers moet Suid-Afrikaanse Engels as huistaal praat en die ander 20 moet Afrikaans as huistaal praat.

‘n Gerieflike tyd en plek sal gereël word met elke volwasse deelnemer. Elke volwasse deelnemer sal gevra word om ‘n “Family Background Questionnaire” in te vul. Een sessie sal vereis word en dit sal om en by een uur lank duur. Tydens die uur sal die volwasse deelnemer gevra word om die relevante MB-CDI in te vul.

Wat is die moontlike risiko’s en voordele verbonde aan deelname aan hierdie studie?

Hierdie is ‘n veilige studie omdat dit niks behels was enige deelnemer in gevaar kan stel nie. Daar is geen betaling vir die deelname nie, maar reiskoste kan vergoed word.

Hoe sal deelnemers se persoonlike inligting privaat en vertroulik gehou word?

Kodes in plaas van name sal gebruik word om deelnemers te identifiseer en alle persoonlike/ identifiserende inligting sal veilig gestoor word terwyl die groter studie aangaan vir die volgende 5 jaar. Alle persoonlike inligting sal net met die navorser gedeel word en sal nie sonder die toestemming van die deelnemer aan ander partye bekend gemaak word nie.

Hoe sal die studie spraakterapeute help?

Die inligting wat u verskaf, sal gebruik word om spraakterapeute te help - om uiteindelik die instrument te bekragtig wat gebruik sal word om kinders te toets wat Suid-Afrikaanse Engels en Afrikaans praat. Hierdie hulpmiddel sal help om kinders te identifiseer wat ekstra hulp nodig het met praat, leer en gemeenskapsdeelname. Sodoende kan hulle vroeër die nodige hulp ontvang wat uiteindelik hul lewensgehalte kan verbeter.

Voel welkom om vir my, Nicole Husselmann, of die primêre ondersoeker, Prof. Michelle Pascoe, enige vrae aangaande die studie te vra. Vind ons kontakbesonderhede hieronder.

Nicole Husselmann

Naam van primêre ondersoeker: Prof. Michelle Pascoe

Selfoonnommer: 0833798746

Kantoortelefoonnommer: 0214066043

E-pos van primêre ondersoeker: michelle.pascoe@uct.ac.za

Naam van navorser; Nicole Husselmann

Selfoon nommer: 0729391012

E-pos van navorser: hssnic006@myuct.ac.za

U kan die Fakulteit Gesondheidswetenskappe se Etiekkomitee vir Menslike Navorsing kontak by 021 406 6338 indien u vrae het oor u of u kind se regte en welstand as deelnemer aan hierdie studie.

Appendix B1: Information letter for child participants (Objectives 2 and 3; English version)

Dear _____

RE: Research Study Information

My name is Nicole Husselmann and I am a speech therapist. I am currently completing my Master's Degree at the University of Cape Town. The primary investigator, and my supervisor, for this study is Dr Michelle Pascoe. The purpose of this research study is to prove that certain tests which have been created to measure language development of young children in South Africa are valid, in other words that it really measures what it has been developed to measure. As part of my research, I need child participants to help me achieve my goal. I am inviting you to allow your child to participate in this study, only if you wish to do so.

Why is the study important?

Speech therapists help all children communicate, but currently in South Africa we do not know a lot about how children learn all of the languages. Speech therapists have difficulty knowing which children have difficulties learning South African English (SAE) and Afrikaans and we do not have tests which can help us identify these children. In order to help speech therapists, a team of researchers created a test which can be used to measure how many words young children learning language know, focusing on 6 different languages including SAE and Afrikaans. Proving that these tests measure what they were created to measure is an important step before the tests can be officially used in South Africa. The tests which have been created are called Communicative Development Inventories (MB-CDIs) and can be used for children between the ages of 8 months to 3; 6.

What does the study require from participants?

For this study I will need 40 participants in total. 20 needs to be child participants, each between the ages of 8 months and 3;6. 20 participants need to be SAE-speaking and the remaining 20 participants need to be Afrikaans-speaking. All child participants should not have a history of delayed language or language intervention.

A convenient time and location will then be arranged with each adult participant who will accompany their child. One session will be required of which the duration will be approximately 1 hour. During this hour I will administer the object naming/identification tool to the child participant and an adult participant will need to be present during this time. Audio-recordings will be made of responses during the test. These recordings will be destroyed after analysis, returned to the participant or stored in password protected storage in a way that does not identify you as participant nor your family.

What are the risks and benefits of participating in this study?

This is a safe study as it does not involve anything that may pose danger to any participants. Adult participants will be present while the test is administered to the child participant. There will be no payment for taking part in this study, but travel costs can be reimbursed.

How will participants personal information be kept confidential and private?

Code names will be used to identify participants and all personal/identifying information will be securely stored for the duration of the larger funded project which will be running over the next five years. All personal information will be shared with the researcher only and will not be disclosed to other parties without the consent of the participant.

How will this study help speech therapists?

The information you provide will be used to help speech therapists eventually be able to use the test developed to test children who speak SAE and Afrikaans. This will help identify children who need extra help with talking, learning and participating in their community so that they receive the necessary help earlier which can ultimately improve their quality of life.

Please feel free to ask me or the Primary investigator any questions that you may have about this study, you will find our contact details below

Nicole Husselmann

Name of Primary Investigator: Prof Michelle Pascoe

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You may contact the Faculty of Health Sciences Human Research Ethics Committee on 021 406 6338 if you have any queries about you or your child's rights and welfare as a participant in this study.

Appendix B2: Information letter for child participants (Objectives 2 and 3; Afrikaans version)

Geagte_____

Aangaande: Inligting vir navorsing studie

My naam is Nicole Husselmann en ek is ‘n spraakterapeut. Ek is tans besig met ‘n meestersgraad aan die Universiteit van Kaapstad. Die primêre ondersoeker, en ook my toesighouer, vir die studie is Prof Michelle Pascoe. Die doel van hierdie studie is om sekere toetse wat opgestel is om taalontwikkeling van jong kinders in SuidAfrika te meet te bekragtig, met ander woorde om te bewys dat die toetse werklik meet wat hulle gemaak was om te meet. As deel van my navorsing, benodig ek volwassene en kinders om deel te neem en my te help om my doel te bereik. Ek nooi u kind uit om aan die studie deel te neem, slegs as u so wou.

Waarom is die studie belangrik?

Spraakterapeute help kinders om te kommunikeer, maar tans in Suid-Afrika weet ons nie veel oor hoe jong kinders al die tale aanleer nie. Spraakterapeute vind dit moelik om te weet watter kinders sukkel om Suid-Afrikaanse Engels en Afrikaans te leer en ons het nie toetse wat ons kan help om uit te vind watter kinders daarmee sukkel nie. Om spraakterapeute te help, het ‘n span navorsers ‘n toets gemaak wat gebruik kan word om te meet hoeveel woorde jong kinders wat ‘n taal aanleer ken. Die toetse fokus op 6 verskillende taale, insluitend Suid-Afrikaanse Engels en Afrikaans. Om te bewys dat die toetse regtig meet wat hulle gemaak was om te meet is ‘n baie belangrike stap voor die toetse amptelik in Suid-Afrika gebruik kan word. Die toetse wat hulle gemaak het word “Communicative Development Inventories (MB-CDIs)” genoem en kan met kinders tussen die ouderdom van 8 maande en 3; 6 jaar gebruik word.

Wat vereis die studie van deelnemers?

Vir die studie het ek 40 deelnemers nodig in total. 20 deelnemers moet kinders wees elk een tussen die ouderdom van 8 maande en 3 jaar. 20 van die deelnemers moet Suid-Afrikaanse Engels as huistaal praat en die ander 20 moet Afrikaans as huistaal praat. Al die deelnemers wat kinders is, moet nie ‘n geskiedenis van vertraagde taal of taalintervensie hê nie.

‘n Gerieflike tyd en plek sal gereël word met elke volwasse deelnemer. Een sessie sal vereis word en dit sal om en by een uur lank duur. Tydens die uur sal ek ‘n voorwerpsbenoemings-/-identifikasie-toets saam met die kinderdeelnemer doen en die volwasse deelnemer sal moet tydens die toets daar wees. Klankopnames van die antwoorde sal gemaak word tydens die toets. Die opnames sal vernietig word ná analise, of aan die deelnemer teruggegee word of in ‘n veilige plek gestoor word op ‘n manier wat nie u of u familie identifiseerbaar sal maak nie.

Wat is die moontlike risiko’s en voordele verbonde aan deelname aan hierdie studie?

Die is ‘n veilige studie omdat dit niks behels was enige deelnemer in gevaar kan stel nie. ‘N volwasse deelnemer sal tydens die toets met die kind deelnemer teenwoordig wees. Daar is geen betaling vir die deelname nie, maar reiskoste kan vergoed word.

Hoe sal deelnemers se persoonlike inligting privaat en vertroulik gehou word?

Kodes in plaas van name sal gebruik word om deelnemers te identifiseer en alle persoonlike/ identifiserende inligting sal veilig gestoor word terwyl die groter studie aangan vir die volgende 5 jaar. Alle persoonlike inligting sal net met die navorser gedeel word en sal nie sonder die toestemming van die deelnemer aan ander partye bekend gemaak word nie.

Hoe sal die studie spraakterapeute help?

Die inligting wat u verskaf, sal gebruik word om spraakterapeute te help - om uiteindelik die instrument te bekragtig wat gebruik sal word om kinders te toets wat Suid-Afrikaanse Engels en Afrikaans praat. Hierdie hulpmiddel sal help om kinders te identifiseer wat ekstra hulp nodig het met praat, leer en gemeenskapsdeelname. Sodoende kan hulle vroeër die nodige hulp ontvang wat uiteindelik hul lewensgehalte kan verbeter.

Voel welkom om vir my, Nicole Husselmann, of die primêre ondersoeker, Dr Michelle Pascoe, enige vrae aangaande die studie te vra. Vind ons kontakbesonderhede hieronder.

Nicole Husselmann

Naam van primêre ondersoeker: Prof Michelle Pascoe

Selfoonnommer: 0833798746

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Naam van navorser; Nicole Husselmann

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U kan die Fakulteit Gesondheidswetenskappe se Etiekkomitee vir Menslike Navorsing, kontak by 021 406 6338 indien u vrae het oor u of u kind se regte en welstand as deelnemer aan hierdie studie

Appendix C1: Consent form for adults participating in the study (Objectives 2 and 3; English version)

Consent form

I, _____, hereby give permission to participate in the above research study. I completely understand the purpose of this study and what it entails has been thoroughly explained to me.

I understand that:

I understand that my participation is voluntary and that I may choose to withdraw at any time without giving a reason.

Any information I give will be kept strictly confidential and that no names will be used to identify me with this study without my approval.

My child will be invited to participate in the study if I agree, and should the child be willing, their speech will be recorded using an audio device.

Any information I give will be kept strictly confidential and that no names will be used to identify me or my child without my approval.

Audio-recordings will be destroyed after analysis or returned to me if I chose; or stored in password protected storage in a way that does not identify my child or family.

Participation is completely voluntary and I may withdraw from participating in the study at any time without penalty, punishment and without giving a reason

_____ _____

Name of adult participant Name of researcher

_____ _____

Adult participant signature Researcher signature

Date: _____

Appendix C2: Consent form for adults participating in the study (Objectives 2 and 3; Afrikaans version)

Vrywaringsvorm

Ek, _____, gee hiermee toestemming om aan bogenoemde navorsingstudie deel te neem. Ek verstaan die doel van hierdie studie ten volle, en wat dit behels, is deeglik aan my verduidelik.

Ek verstaan die volgende:

My deelname is vrywillig en ek kan kies te enige tyd om te onttrek sonder om 'n rede daarvoor te gee.

Enige inligting wat ek gee, sal streng vertroulik gehou word en geen name gebruik sal word om my met hierdie studie te identifiseer sonder my goedkeuring nie.

My kind sal uitgenooi word om aan die studie deel te neem as ek daartoe instem, en as die kind gewillig is, sal hul spraak met 'n klanktoestel opgeneem word.

Enige inligting wat ek gee sal streng vertroulik gehou word en geen name sal gebruik word om my of my kind te identifiseer sonder my goedkeuring nie.

Klankopnames sal ná ontleding vernietig word of aan my terugbesorg word as ek sou kies; of in 'n wagwoordbeskermde stoorspasie gestoor word op 'n manier wat nie my kind of familie identifiseerbaak maak nie.

Deelname is heeltemal vrywillig en ek kan te eniger tyd van die studie onttrek, sonder boete of benadeling en sonder om 'n rede te gee.

_____	_____
Naam van volwassene deelnemer	Naam van navorser
_____	_____
Handtekening van volwassene deelnemer	Navorser se handtekening

Datum: _____

Appendix D1: Consent form for children participating in the study (Objectives 2 and 3; English version)

Consent form

I, _____, hereby give permission for my child, _____ (child's name) to participate in the above research study. I completely understand the purpose of this study and what it entails has been thoroughly explained to me.

I understand that:

This study will require me to complete a form about my child and his/her language development.

Any information I give will be kept strictly confidential and that no names will be used to identify me with this study without my approval.

Should my child be willing, their speech will be recorded using an audio device.

Any information I give will be kept strictly confidential and that no names will be used to identify me or my child without my approval.

Audio-recordings will be destroyed after analysis or returned to me if I chose; or stored in password protected storage in a way that does not identify my child or family.

Participation is completely voluntary and I may stop my child from continuing with the study at any time without penalty, punishment and without giving a reason

_____ _____

Name of adult participant Name of researcher

_____ _____

Adult participant signature Researcher signature

Date: _____

Appendix D2: Consent form for children participating in the study (Objectives 2 and 3; Afrikaans version)

Vrywaringsvorm

Ek, _____, gee hiermee toestemming dat my kind, _____ (kind se naam), aan die bogenoemde navorsingstudie kan deelneem. Ek verstaan die doel van hierdie studie ten volle, en wat dit behels, is deeglik aan my verduidelik.

Ek verstaan die volgende:

Hierdie studie vereis dat ek 'n vorm oor my kind en sy / haar taalontwikkeling moet voltooi.

Enige inligting wat ek gee, sal streng vertroulik gehou word en geen name sal gebruik word om my met hierdie studie te identifiseer sonder my goedkeuring nie.

As my kind gewillig is, sal hul spraak met ‘n klanktoestel opgeneem word.

Enige inligting wat ek gee, sal streng vertroulik gehou word en geen name sal gebruik word om my of my kind te identifiseer sonder my goedkeuring nie.

Klankopnames sal ná ontleding vernietig word of aan my terugbesorg word as ek sou kies; of in 'n wagwoordbeskermde stoorspasie gestoor word op 'n manier wat nie my kind of familie identifiseerbaar maak nie.

Deelname is heeltemal vrywillig en ek kan my kind te eniger tyd weerhou om voort te gaan met die studie, sonder boete of benadeling en sonder om 'n rede te gee.

_____	_____
Naam van deelnemer	Naam van navorser
_____	_____
Deelnemer handtekening	Navorser handtekening

Datum: _____

Appendix E: South African English (SAE) Communicative Development Inventory (MB-CDI)

Note: The following are sample pages of the SAE MB-CDI for infants

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Q73

Instructions

Please note: Make sure you click on the right button, as you cannot change your selection.

1. If the child does not yet understand or say the word, leave the circles blank - so do not click on any of the two boxes next to the word.

Q74 2. If the child understands a word but doesn't say the word, click on the box in the UNDERSTANDS column.

Q75 3. If the child understands a word and can say the word, click on the box in the UNDERSTANDS+SAYS column. Please only click on words the child can say on his/her own (e.g., not when you ask them to "say shoe.")

Q76 4. If the child has a different word from the one on the list, click the UNDERSTANDS+SAYS box next to that word on the list and then type the word that the child uses in the space provided.

Q77
These different or other words could include

• Local or dialect words (e.g., "sarmie" for "sandwich")
• Family names (e.g., “nan” for “grandma”)
• Baby-talk words (e.g., “goggy” for “dog” or "nana" for "banana")

Page Break

Q78 **SECTION ONE: PHRASES**

Q79 ***First signs of understanding***

Before a child starts to speak, they show understanding of words or phrases by responding when they hear words that are well known.

Q80 Does the child:

	Yes	No
Respond when his/her name is called (e.g., by turning and looking in the direction from which the name was called)?	○	○
Respond to "no no" (by stopping what he/she is doing, at least for a moment)?	○	○
React to "there's mummy/daddy" by looking around for them?	○	○

Note: The following are sample pages of the SAE MB-CDI for toddlers

Q73 **Instructions**

1. If the child does not yet say the word, leave the circle blank - so do not click on the box next to the word.

Q74 2. If the child can say a word, click on the box in the UNDERSTANDS+SAYS column. Please only click on words the child can say on his/her own (e.g., not when you ask them to "say shoe.")

Q75 3. If the child has a different or another word with the same meaning as a word on the list, click the UNDERSTANDS+SAYS box next to that word on the list and then type the word that the child

uses in the space provided.

Q76
These different or other words could include

• Local or dialect words (e.g., "sarmie" for "sandwich")
• Family names (e.g., “nan” for “grandma”)
• Baby-talk words (e.g., “goggy” for “dog” or "nana" for "banana")

End of Block: Instructions

Start of Block: Lexical Items SAE with variable names

Q1
SECTION ONE: LEXICAL ITEMS

1. SOUNDS

Below are words for some common sounds which children may know. Mark which of these the child already understands+says.

	The child ...	If you use a different word, write it here
	understands + says	Other word

baa baa	○	
beep	○	
brr	○	
cheep cheep	○	
choo choo	○	
cockadoodledoo	○	
grr / aaarrr	○	

meow

APPENDIX F: Family Background Questionnaire

See separately attached PDF labelled “Appendix F”

APPENDIX G: Approval from the Human Research Ethics Committee

UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee

Room G50- Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 406 6492
Email: hrec-enquiries@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

08 February 2021

HREC REF: 778/2020

A/Prof M Pascoe
Department of Health & Rehab Sciences
Division of CSD
F-Floor, OMB
Email: michelle.pascoe@uct.ac.za
Student: hssnic006@myuct.ac.za

Dear A/Prof Pascoe

PROJECT TITLE: TOWARDS VALIDATION OF SOUTH AFRICAN COMMUNICATIVE DEVELOPMENT INVENTORIES: AN OBJECT NAMING TASK FOR SOUTH AFRICAN ENGLISH AND AFRIKAANS (SUB-STUDY LINKED TO: 328/2019) (MSC CANDIDATE: MS N HUSSELMANN)

Thank you for your response letter, addressing the issues raised by the Faculty of Health Sciences Human Research Ethics Committee (HREC).

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

This approval is subject to strict adherence to the HREC recommendations regarding research involving human participants during COVID -19, dated 17 March 2020 & 06 July 2020.

Approval is granted for one year until the 28 February 2022.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.
(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

The HREC acknowledge that the student: - Ms Nicole Husselmann will also be involved in this study.

Please quote the HREC REF 778/2020 in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

Yours sincerely

AP ZBurgess

PROFESSOR M BLOCKMAN
CHAIRPERSON, FACULTY OF HEALTH SCIENCES HUMAN RESEARCH ETHICS COMMITTEE
Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938
NHREC-registration number: REC-210208-007

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use: Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DoH 2006), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI), and Declaration of Helsinki (2013) guidelines. The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

APPENDIX H: Summary of literature review on lexical assessment development principles

Reference	**Principles**
Pearson, Hiebert & Kamil (2007)	○ As stated in Read (2000) in an analysis of vocabulary assessments, three continua for designing and evaluating vocabulary assessments: 1. Discrete-embedded: whether vocabulary is regarded as a separate construct with its own separate set of test items and its own score report or whether vocabulary is an embedded construct that contributes to, but it is not regarded as separate from, the larger construct of text comprehension. 2. Selective-comprehensive: refers to the relationship between the sample of items in a test and the hypothetical population of vocabulary items that the sample represents. The smaller the set of words about which we wish to make a claim, the more selective the assessment. Parallel words were chosen by matching the word frequency and decodability of the target words in the actual items… words are sorted by their difficulty. Words were selected by using a pre-test that tested each word directly, by selecting words with a low percent correct from a reliable source and by asking teachers/researchers to select words not likely to be known by the population. 3. Contextualized-decontextualized (context-specific/ context-nonspecific): refers to the degree that textual context is required to determine the meaning of a word. In order to meet the standard of assessing student's ability to use context to identify word meaning, context must actually be used in completing the item. ○ Many vocabulary assessments present words in a decontextualized context.
Read & Chapelle (2001)	○ Consider whether the vocabulary being assessed is: 1. Discrete- a measure of vocabulary knowledge or use as an independent construct 1.1. Embedded – a measure of vocabulary which forms part of the assessment of some other, larger construct 2. Selective- a measure in which specific vocabulary items are the focus of the assessment (conventional, target words) 2.1. Comprehensive- a measure which takes account of the whole vocabulary content of the material (reading/listening tasks) or the test-takers response (writing/speaking tasks) 3. Context-independent- A vocabulary measure in which the test-taker can produce the expected response without referring to any context 3.1. Context-dependent- a vocabulary measure which assesses the test-takers ability to take account of contextual information in order to produce the expected response ○ In language testing, construct definition is recognized as having a central role in the validation of tests because at least a working conception of an underlying construct is needed for test results to be meaningfully interpreted 1. A trait definition- person characteristics must be specified independent of context 2. Behaviourist definition- person characteristics cannot be specified; context must be specified. 3. Interactionalist definition- person characteristics must be specified relative to a particular context. ○ Insert from article: **Table 4 The implications of construct definition, score reporting, and test presentation for test design** **If the construct definition is based on . . .Then. . .** trait principles = design a discrete test with randomly selected vocabulary items. behaviourist principles = design a test comprised of tasks with characteristics sufficiently similar to those in the context of interest. interactionalist principles = design a discrete or embedded test with carefully chosen vocabulary items and tasks with characteristics similar to those in the context of interest. **If test scores are reported as . . . Then. . .** a single score = ensure that the various items/parts of the test can be meaningfully combined for reporting to the test users.

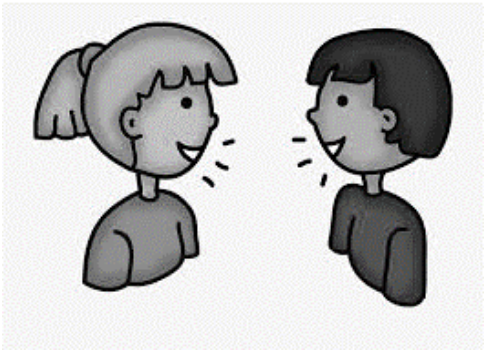
	multiple scores = ensure that each element of the profile can be reliably assessed and the overall profile meets the users' needs. **If the audience for test presentation is. . .then be sure to include . . .** students/teachers = a statement of how the test is intended to help the teaching/learning process. administrators/the public = an explanation of the relevance of the test for making decisions. applied linguists = evidence concerning what the test does and does not measure.
	○ Insert table from article:
	Table 5 The implications of construct definition, score reporting, and test presentation for validation **If construct definition is based on . . .Then the central construct validity question is. . .** trait principles does the test measure the defined underlying characteristics without any influence from the test context? behaviourist principles does the test sample performance in a test context which has characteristics sufficiently similar to the context of interest? interactionalist principles does the test measure the defined underlying characteristics with appropriate influence from the test context? **If test scores are reported as . . . Then the central validity questions about relevance and utility are. . .** a single score is the test score relevant and useful for the intended selection or placement decisions? multiple scores are the multiple scores relevant and useful for informing instructional decisions or a theory of L2 lexical development? **If the audience for test presentation is . . . Then the central consequential validity question is. . .** students/teachers does the test help to focus on the relevant aspects of vocabulary development? administrators/the public does the test play a positive role in program decisions? applied linguists does a sounder theory of L2 vocabulary development result from test use?
Scott, Hoover, Flinspach & Vevea (2008)	○ Understanding the role of syntax or part of speech in word learning is implicit, where a correct guess depends on the understanding the part of speech needed to fill in a blank, that are often included in traditional vocabulary assessments. ○ Vocabulary items tested should relate to grade/age ○ A script was followed to introduce the assessment and including items for two sample words ○ Traditional vocabulary scales typically rely on classical test theory: they sum each item and report the summed score as an index of vocabulary knowledge.
Golinkoff et al. 1994 as stated in Mervis & Bertrand (1994)	○ Lexical principles provide a means by which children may concentrate on the most likely possibilities for the reference of a particular word ○ Lexical principles in vocabulary development (framework): i) Reference: words are mapped onto representations of objects, events, actions or attributes in the environment (non-verbal communicative expression) ii) Extendibility: words may be used to label similar referents (extension of a word) iii) Object scope: words label (whole) objects (prosodic cues provided by adults when speaking to toddlers)

	iv) Categorial scope: primary basis for extension of an object word is basic level category assignment v) Novel Name-Nameless Category: novel words map to objects for which the child does not yet have a name (determine referent based on implicit input) vi) Conventionality: meanings should be expressed by the form that is conventional for the linguistic community, rather than simply by any consistent phonological form chosen by the child
Prado et al. (2018)	• Assessing language development can be challenging in low- and middle-income countries, where it is common for multiple languages to be spoken and standardized language assessments do not usually exist in the local languages. • The aim of this study is to evaluate the validity of a method to develop vocabulary checklists in new languages to assess early language development, based on the MB-CDIs (In Ghana and Malawi) • This formed part of an ongoing study which trialled nutrient supplements, for which vocabulary checklists have been developed. • How they developed the vocabulary checklists: 1. The checklists consisted of 100 words in local languages based on the MBMB-CDI. 2. Interviews were conducted with Mothers, probing specific categories of the MB-CDI. 3. The results were then used to develop a list of 352 words in Malawi and 240 words in Ghana. 4. Additional interviews with Mothers were conducted to find out if their children said these words. 5. This data was then used to select 100 words with a range of item difficulty (easy, moderate, advanced). 6. From these words, they then selected a representative sample of words from each semantic category.

APPENDIX I: Flyer for participant recruitment

Would you be interested in being part of a Research Study along with your child?

If yes, here is your chance!



My name is Nicole Husselmann and I am a speech therapist and postgraduate student at the University of Cape Town. As part of my Master's Degree, I am doing research on how children develop language.

If you:

- Speak South African English or Afrikaans as a main language in your home
- Are 18 years and older
- Have a child between the ages of 8 months – 3;6 years, that speaks South African English or Afrikaans and has no history of delayed language development or intervention

Then I would like to invite to you to participate.

If the points stated above apply to you and you would like more information about the study, please feel free to contact me, Nicole Husselmann, or the primary investigator for the study, Dr Michelle Pascoe. Please find our contact details below:

Name of Researcher; Nicole Husselmann

Cell phone number: 0729391012

Email of researcher: hssnic006@myuct.ac.za

Name of Primary Investigator: Prof. Michelle Pascoe

Cell phone number: 0833798746/ Office telephone number: 0214066043

Email of primary investigator: michelle.pascoe@uct.ac.za

APPENDIX J: Protocol (Objective 1)

Protocol for an object naming/identification task used in validation studies for South African MacArthur-Bates Communication Development Inventories (MB-CDIs)

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How to develop the object naming/identification task

- Study the Communicative Development Inventory (CDI) lexicon for the language of focus
- Select 25 testing items and 3 practice items using the template in Appendix A[1]
- The 25 testing items will be divided as follows: 10 receptive, 10 expressive, and 5 gesture[2]
- The 3 practice items will be divided as follows: 1 receptive, 1 expressive, and 1 gesture
- The 25 testing items must:
  - Be part of the Southern African Communicative Development Inventory (CDI) project[9]
  - Be graded according to difficulty based on tertiles for the CDI study data[8]: 3 easy; 4 moderates; 3 difficult
  - Consist of 10 different semantic categories[4,8] for the expressive and receptive domains
  - Include at least 2 verbs for the expressive and receptive domains[10]. The verb can be linked to a noun which will be used to show the verb.
  - Be chosen with items used in previous versions as the first choice, where possible. It will be good to have the same items across languages as it will not only help practically but also for later analysis.
- The 3 practice items must:
  - Be graded as “easy” as these items are only necessary to model the expectations of the task for the participant
- Obtain objects of each of the items chosen

- For this task, objects of the items may mostly refer to toy objects rather than the real object. You will decide on whether to use either the real object or a toy based on the item itself. For example: item = ‘dog’; use toy dog instead of real dog.
- For easy replication of items across the country, items can be obtained for example from PEP stores or Shoprite

- Obtain a clear picture of each of the items chosen
  - This may be an actual picture of the item or a cartoon drawing of the item
  - The item of focus must be clearly seen on the picture
  - Pictures of items may be obtained for example from Pixabay, if possible
- Items for the gesture domain should be chosen according to the following verifying criteria:
  1. A phrase which allows the child to indicate an understanding by taking an action in response
  2. An object which allows the child to react with an action
  3. Performing a gesture

Piloting the chosen items with adults

- Once you have selected all items and gathered all the objects/pictures, these items will be piloted with adults
- You will need to select the adults according to the following criteria:
  - 3 adult speakers per language of focus
  - Each adult must be a first language speaker of the language of focus

  - Each adult must be someone with whom you have not discussed the project prior to this
- Once you have selected three adult speakers, ask each of them to name the objects and pictures one by one
- Record their responses in the template provided, see appendix B
- An item will then be considered to either have passed or failed according to the following criteria:
  - An item will pass if all three adults' responses are exactly the same (for example: dog, dog, dog)
  - An item will fail if all three adults' responses are not the same (for example: dog, dog, poodle)
- If an item has passed the test with adults, it may remain in the task
- If an item has failed the test with adults, it must be removed from the task, replaced with a different item and be tested with three adults again

How to conduct the object naming/identification task [4]

- Ensure that both participants are comfortable in the environment
- Ensure that the environment is quiet

For child participants between the ages of 0;8 and 1;4:

- Place the objects of the items in the play area[5,7]
- Ask the adult participant to accompany the child in the play area
- Start voice recording
- Allow for 15 minutes of free play
- Encourage sibling involvement if needed and provide support as needed

- Encourage the adult participant to do the following for each domain and provide support as needed

Expressive:

- Listen for spontaneous naming
- Present items to the child one at a time
- Allow 30 seconds of free play and continue to listen for spontaneous naming
- If the child names the toy set it aside
- If the child does not name the toy after some time, provide a verbal prompt (e.g., “What is this called”? or “What are they doing?”) and wait for a response.
- If the child does not respond after 3 prompts, move on to the next item[1]

Receptive:

- Listen for indications of understanding
- Ask questions which indicate understanding (e.g., “Show me the … / Give me the … / Where is the …)
- Wait for a response
- If the child does not respond after 3 prompts, move on to the next item[1]

Gesture:

- According to the items chosen, instruct parent/caregiver to either ask the question, give the instruction, give the child the object or make a gesture
- Wait and look out for the targeted responses

For child participants between the ages of 1;5 and 3;6:

- Place the pictures of the items in the play area[6,7]

- Ask the adult participant to accompany the child in the play area
- Start voice recording
- Allow for 15 minutes of free play
- Encourage sibling involvement and provide support when needed
- Encourage the adult participant to do the following for each domain:

Expressive:

- Listen for spontaneous naming
- Look at the pictures one at a time
- Allow 30 seconds of looking at the picture while waiting for spontaneous naming
- If the child names the item then set it aside
- If the child does not name the item after some time, provide a verbal prompt (e.g., “What is this called”? or “What are they doing?”) and wait for a response.
- If the child does not respond after 3 prompts, move on to the next item[1]

Receptive:

- Listen for indications of understanding
- Ask questions which indicate understanding (e.g., “Show me the … / Give me the … / Where is the …)
- Wait for a response
- If the child does not respond after 3 prompts, move on to the next item[1]

Gesture:

- According to the items chosen, instruct parent/caregiver to either ask the question, give the instruction, give the child the object or make a gesture
- Wait and look out for the targeted responses

How to score the object naming/identification task [4]

- ☐ See attached Appendix A
- ☐ Transcribe the response for each item
- ☐ Score each item with either 1 or 0

  (1 = for each correct response)

  (0 = for each incorrect / no response)
- ☐ The following responses will be accepted as correct [4]:
  - Spontaneous responses
  - Prompted responses
  - Synonyms
  - If the child uses a different word and the adult participant stated that the child uses that specific word to identify the item
  - If the child responds in a certain way, specifically for gesture, and the adult participant stated that the child responds with specific gesture to identify the item
- ☐ Calculate the total score for each domain by adding up the score recorded for each item and record it in the 'score' column write after the domain
- ☐ Calculate the total overall score for the object-naming task by adding up the total score for each domain and record it in the 'score' column at the end of the scoring sheet
- ☐ This will provide a total score out of 30
- ☐ See Appendix C
- ☐ Determine the descriptive statistics of the data by calculating and tabulating the following:[4]
  - Median
  - Mean
  - Standard deviation

Appendices

Appendix A: Template for preparation of object naming/identification task

Receptive

Item	Difficulty level (state either easy, moderate or difficult)	Word length (state number of syllables: 1/2, 2 /3, 4+)	Semantic category	Can be represented as an object	Can be represented as a picture
Practice item					
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Do you have:

- ☐ 3 'easy' items
- ☐ 4 'moderate' items
- ☐ 3 'difficult' items
- ☐ Not more than 2 recurring semantic categories
- ☐ At least 1 practice item
- ☐ At least 2 verbs

Expressive

Item	Difficulty level (state either easy, moderate or difficult)	Word length (state number of syllables: 1/2, 2 /3, 4+)	Semantic category	Can be represented as an object	Can be represented as a picture

Practice item					
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Do you have:

- ☐ 3 'easy' items
- ☐ 4 'moderate' items
- ☐ 3 'difficult' items
- ☐ Not more than 2 recurring semantic categories
- ☐ At least 1 practice item
- ☐ At least 2 verbs

Gesture

Item	**Difficulty level** (state either easy, moderate or difficult)	**Is the item one of the 3 verifying criteria for gesture (1,2 or 3)**
Practice item		
1.		
2.		
3.		
4.		
5.		

Do you have:

- ☐ 2 'easy' items
- ☐ 2 'moderate' items
- ☐ 1 'difficult' item
- ☐ At least 1 practice item
- ☐ At least 1 item per verifying criteria

Appendix B: Object/picture pilot

Language:

Item	Adult 1 response	Adult 2 response	Adult 3 response	Pass / Fail

Language:

Item	Adult 1 response	Adult 2 response	Adult 3 response	Pass / Fail

Appendix C: Scoring Sheet

Domain	Participant code:	Age:	Transcription	Comments
	Items	Score		
Expressive	1.			
	2.			
	3.			
	4.			
	5.			
	6.			
	7.			
	8.			
	9.			
	10.			
Total				
Receptive	1.			
	2.			
	3.			
	4.			
	5.			
	6.			
	7.			
	8.			
	9.			
	10.			
Total				
Gesture	1.			
	2.			
	3.			
	4.			
	5.			
Total				
Total				

References

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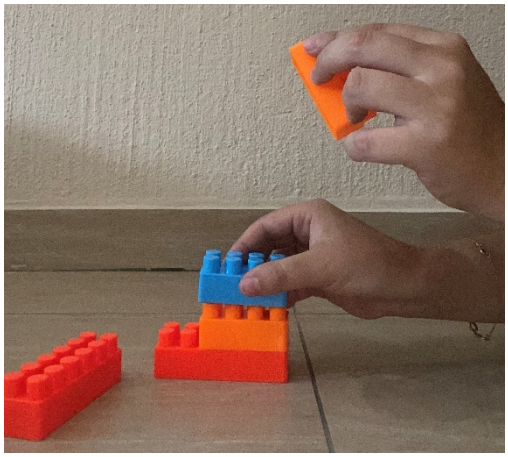
Appendix K: Administration of the object naming/identification task

(Objectives 2 and 3)

Example 1:

Example 2:

Example 3:



Appendix F

FAMILY QUESTIONNAIRE

A baby's health and family life can have a big influence on the words and gestures they learn. The following questions ask about the child's family. Please feel free to leave out any questions that you don't want to answer.

To keep your information confidential, please do not enter your name or address on any part of this questionnaire.

Please remember to fill in this questionnaire for the same child you are filling in the CDI for.

- ○ I agree to taking part in this study

What is your child's sex?

- ○ Male
- ○ Female

What is today's date?

	Month	Day	Year
Please Select:	▼	▼	▼

What is the child's date of birth?

	Month	Day	Year
Please Select:	▼	▼	▼

What is the child's age?

...years and .... months old

	...years	and .... months old
The child is...		

Your relationship to the child (mother, grandmother, etc.):

Province where you live:

City/Town/Village where you live:

Suburb or township where you live:

ALL ABOUT THE CHILD'S DAY

Who looks after the child from day to day/in a typical week? (You can choose more than one)

- [ ] Child's mother
- [ ] Child's father
- [ ] Other carer or carers

If there are other carers, who are they: (You can choose more than one)

- [ ] Family
- [ ] Nursery/Creche

- [ ] Domestic worker / Nanny
- [ ] Other

If other carers, how many hours in total do these other carers look after the child in a typical week?

- ○ Less than a day
- ○ 1-3 days
- ○ 4 or more days

Who are the child's caregivers, excluding mother/father?

	Relationship to child	Age of Caregiver
i.		
ii. (if applicable)		
iii. (if applicable)		
iv. (if applicable)		

What is the main language spoken in the child's home?

Does the child regularly hear another language or languages at home?

- ○ Yes
- ○ No

What other language(s) does the child hear at home?

For how many hours does the child hear this other language or these other languages at home in a typical day? (Please specify)

Does the child attend a day-care, crèche, play group or preschool?

- ○ Yes
- ○ No

What is the main language or languages spoken to the children in the day-care, crèche, play group or preschool?

How many hours a day does the child attend day-care, crèche, play group or preschool?

THE CHILD'S HEALTH AND DEVELOPMENT

For how long were you/the birth mother pregnant with the child?

- ○ full 9 months (37+ weeks)
- ○ less than 9 months or 8 months (34-36 weeks)
- ○ less than 8 months (less than 33 weeks)
- ○ Don't know

How much did the child weigh at birth?

- ○ less than 2.5kg
- ○ 2.5kg to 4kg
- ○ more than 4kg
- ○ Don't know

Has the child ever had an ear infection?

- ○ Yes
- ○ No

Please give details here:

Did the ear infection last for 3 months or more?

- ○ Yes
- ○ No

Did the ear infection occur 4 or more times within a 6-month period?

- ○ Yes
- ○ No

Is there anyone in the child's immediate family (parents and siblings only) with a speech / language difficulty (e.g. dyslexia)?

- ○ Yes
- ○ No

Please give details here:

Does the child have a developmental disability (e.g. cerebral palsy, Autism Spectrum Disorder, Down syndrome, Foetal Alcohol Syndrome)?

- Yes
- No

Please give details here:

Does the child have a hearing impairment?

- Yes
- No

Please give details here:

Does the child have a visual impairment?

- Yes
- No

Please give details here:

Have you or anyone else had any concerns about the child's hearing or communication?

- ○ Yes
- ○ No

Please give details here:

THE CHILD'S FAMILY

Is this child the first born child of their mother?

- ○ Yes
- ○ No

How many older children does mom have?

- ○ 1
- ○ 2
- ○ 3
- ○ 4+

Is the child a twin/multiple birth?

- ○ Yes
- ○ No

How long does the child spend at your home every year?

- ○ less than half the year
- ○ about half the year
- ○ More than half of the year (or the whole year)

How many people over 18 years old live in your home with the child?

How many of these people are family members of the child?

Please indicate who the adult family members are (You can choose more than one)

- ☐ Mom
- ☐ Dad
- ☐ Grandparent(s)
- ☐ Other

How many of the adult family members in your home are male?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4+

How many of the adult family members in your home are female?

- ○ 0

- ○ 1
- ○ 2
- ○ 3
- ○ 4+

How many of the other adults (those who are not family members) in your home are male?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4+

How many of the other adults (those who are not family members) in your home are female?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4+

How many other children (both family and non-family) live in your home with the child? (Please give details below)

	1 child	2 children	3 children	4+ children
Children younger than 2 years	○	○	○	○
Children 2–3 years	○	○	○	○
Children 4–11 years	○	○	○	○
Children 12–17 years	○	○	○	○

How many rooms are in your home?

- ○ 1
- ○ 2
- ○ 3
- ○ _____ more (specify)

How many rooms are used for sleeping?

- ○ 1
- ○ 2
- ○ 3
- ○ _____ more (specify)

How long does the child spend at the other home address?

- ○ less than half of the year
- ○ about half of the year
- ○ more than half of the year

Which other people over 18 years old live in the other home with the child?

- ○ Mom
- ○ Dad
- ○ Grandparent/s
- ○ Other

How many of the adult family members in the other home are male?

- ○ 0
- ○ 1

- ○ 2
- ○ 3
- ○ 4+

How many of the adult family members in the other home are female?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4+

How many of the other adults (those who are not family members) in the other home are male?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4+

How many of the other adults (those who are not family members) in the other home are female?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4+

How many other children live in the other home? (Please say how many in each age range)

	1	2	3	4+
Children younger than 2 years	○	○	○	○
Children 2–3 years	○	○	○	○
Children 4–11 years	○	○	○	○
Children 12–17 years	○	○	○	○

How many rooms are in the other home?

- ○ 1
- ○ 2
- ○ 3
- ○ _____ more (specify)

How many rooms are used for sleeping?

- ○ 1
- ○ 2
- ○ 3
- ○ _____ more (specify)

THE CHILD'S MOTHER

Child’s mom’s age is….

- ○ 20 years old or younger
- ○ 21-25 years old
- ○ 26-30 years old
- ○ 31-35 years old

- ○ 36+ years old

How old was child's mom when her oldest child was born?

- ○ 20 years old or younger
- ○ 21-25 years old
- ○ 26-30 years old
- ○ 31-35 years old
- ○ 36+ years old

Does the mother of the child live with her husband or partner at home?

- ○ Yes
- ○ No

If yes, is he the father of the child?

- ○ Yes
- ○ No

Mom's highest education is…

- ○ No formal education
- ○ Primary school incomplete
- ○ Completed primary school
- ○ High school incomplete
- ○ Completed high school
- ○ Studied beyond high school

Mom's work status is… (current job or last paid job)

- ○ Not working
- ○ Employed
- ○ Self-employed (with employees)
- ○ Self-employed (without employees)

Mom’s current/last job title: (please be specific)

THE CHILD'S FATHER

Child’s dad’s age is….

- ○ 20 years old or younger
- ○ 21-25 years old
- ○ 26-30 years old
- ○ 31-35 years old
- ○ 36+ years old
- ○ Don't know

Dad’s highest education is…

- ○ No formal education
- ○ Primary school incomplete
- ○ Completed primary school
- ○ High school incomplete
- ○ Completed high school
- ○ Studied beyond high school
- ○ Don't know

Dad’s work status is… (current job or last paid job)

- ○ Not working
- ○ Employed
- ○ Self-employed (with employees)
- ○ Self-employed (without employees)
- ○ Don't know

Dad’s current/last job title: (please be specific)

THE HOUSEHOLD

How much money does your household get in a month? (Choose one)

- ○ no income
- ○ R1 – R600
- ○ R601 – R1,200
- ○ R1,201 – R2,400
- ○ R2,401 – R5,000
- ○ R5,001 – R10,000
- ○ R10,001 – R20,000
- ○ R20,001 – R40,000
- ○ R40,001 – R80,000
- ○ R80,001 – R150,000
- ○ R150,001 – R300,000
- ○ R300,001 or more
- ○ Don't know

How much do you spend on food in in a month? (choose one)

- ○ none
- ○ R1 – R600
- ○ R601 – R1,200
- ○ R1,201 – R2,000
- ○ R2,001 – R3,000
- ○ R3,001 – R5,000
- ○ R3,001 – R5,000
- ○ R5,001 – R8,000
- ○ R8,001 – R12,000
- ○ R12,001 or more
- ○ Don't know