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The Expressive Semantic Skills of Sesotho-Speaking Toddlers (28 and 30 months): A Comparison using the Sesotho Picture-Naming Vocabulary Task and the Preliminary Version of the Sesotho Communicative Development Inventory

Naidoo, Kerchia

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University of the Witwatersrand

Faculty of Humanities

School of Human and Community Development

The Expressive Semantic Skills of Sesotho-Speaking Toddlers (28 and 30 months): A Comparison using the Sesotho Picture-Naming Vocabulary Task and the Preliminary Version of the Sesotho Communicative Development Inventory.

Kerchia Naidoo

713797

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Masters of the Arts in Speech-Language Pathology

Supervisor: Prof. Frenette Southwood and Dr Anniah Mupawose

Co-Supervisor: Prof. Sharon Moonsamy

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Declaration

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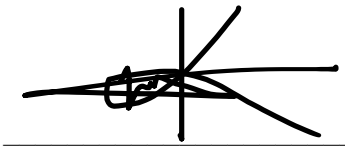
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SENATE PLAGIARISM POLICY

Declaration by Students

I, Kerchia Naidoo (student number: 713797), am a student registered for Masters of the Arts in Speech-Language Pathology in the year 2023. I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that ALL the work submitted for assessment for the above course is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.

Signature:  Date: March 2024

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List of Abbreviations

CDI(s)	-	Communicative Development Inventory (Inventories)
ECD	-	Early Childhood Development
LoLT	-	Language of Learning and Teaching
L1	-	Home / First Language
MB-CDI(s)	-	MacArthur-Bates Communicative Development Inventory (Inventories)
PNVT	-	Picture-Naming Vocabulary Task
SA	-	South Africa
SA-CDI	-	South African Communicative Development Inventory
SAE	-	South African English
SES	-	Socioeconomic Status
SLP(s)	-	Speech-Language Pathologist (Pathologists)
SLT(s)	-	Speech-Language Therapist (Therapists)
ZPD	-	Zone of Proximal Development

Glossary

Basotho: A community of speakers of the Sesotho language who identify with the culture and language (Mokuoane & Moeketsi, 2018).

Bioecological Systems Theory: A series of six concentric environmental systems which impact on a child's process of human development and socialisations (Bronfenbrenner, 2006).

Communicative Development Inventory (CDI): A parent-report tool for assessing communicative skills of infants and toddlers (Fenson et al., 1998).

Communication: The dynamic process of exchanging information and ideas between and among individuals using language (Levey, 2019).

Construct Validity: The inceptive hypothesis or research question that determines which data will be gathered, and the method of data collection (Golafshani, 2003).

Constructionist Approach: Jean Piaget's theory that children learn language from the environmental input (Owens, 2014).

Content Validity: A measure of the extent to which a research instrument measures the construct or hypothesis of a research study (Yaghmaie, 2003).

Criterion Validity: The extent to which a measure is related to an outcome (Hamed et al., 2016).

Critical Period: The years between birth and preschool, nought to six years of age, where the development of all early childhood development domains is exponential (Owens, 2014).

Family Background Questionnaire: A tool developed by the South Africa Communicative Development Inventory team which includes demographic information, medical history, overall development, and speech and language development among others.

Form-Meaning Mapping: A cognitive process in which one conceptual entity provides mental access to another conceptual entity within the same idealised cognitive model (Radden & Kövecses, 1999).

Indigenous: A language that originated in a specified place and was not brought to that place from elsewhere.

Language: A set of arbitrary symbols governed by rules dictated by the language in question (Levey, 2019).

Low Socioeconomic Status: A population/community living below the upper-bound poverty line (The World Bank, 2023).

MacArthur-Bates Communicative Development Inventory (MB-CDI): The original parent-report tool for assessing communicative skills of infants and toddlers (Fenson et al., 1998).

Metonym: A cognitive process in which one conceptual entity provides mental access to another conceptual entity within the same idealised cognitive model (Radden & Kövecses, 1999).

Metonymic Relationships: Overextensions produced by children up to age two years and five months (Norrick, 1981).

Nativist Approach: Noam Chomsky's theory that children acquire language due to innate principles related to the structure of human language (Chomsky, 1957).

Nature vs Nurture: The theoretical debate that social factors shape the way we think, feel, and behave versus heritable individual differences, and are important in shaping human experience (Barlow, 2019).

Pragmatics: The rules that govern the cohesion and coherence of conversations (e.g. turn-taking, or topic maintenance or closure) (Owens, 2014).

Reliability: The extent to which results are consistent over time and are an accurate representation of the total population (Golafshani, 2003).

Semantics: The rules that govern meaning or content of words and word combinations (Singleton & Shulman, 2020).

Sesotho: A southern indigenous language which is spoken in Lesotho and adjacent regions of South Africa (Demuth, 2007).

Sociocultural Factors: Environmental interactions of an individual that will lead to continuous development in children's thoughts, behaviours, and learning (Vygotsky & Cole, 1978).

Sociocultural Theory of Cognitive Development: Lev Vygotsky's theory that social interaction of a child will lead to continuous development in children's thoughts, behaviours, and learning (Vygotsky & Cole, 1978).

Speech: A verbal means of communicating, which consists of speech sound combinations that allow for the following characteristics: phonological processes, voice quality, intonation, and rate etc. (Levey, 2019).

Validation: The rigorous process of ensuring assessment tools measure the aspects intended to prove that the assessment tool is accurate and reliable for future use (Drost, 2011).

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Chapter 1: Introduction

At present, there exists little to no standardised methods of assessing language-related skills which have been normed within the South African population (Dowling & Whitelaw, 2018). This makes it difficult for a Speech-Language Pathologist (SLP) to accurately diagnose language or communication difficulties. The potentially inaccurate conclusions about a child's language abilities, made by an SLP, can result in: (i) inappropriate intervention and information provided to the child and their family (Mdlalo, 2013); and (ii) the stigma of disability associated with a child who has a language impairment (Rohwerder, 2018).

It is therefore imperative that SLPs use assessment tools that are fit for purpose, i.e. culturally appropriate and linguistically relevant for the diverse child populations with which SLPs work.

This underpins the intention for this research study – assisting a larger team in South Africa (SA) to contribute to addressing the concerns of culturally and contextually inappropriate assessment methods.

1.1. Background

SA and its population can be described as a melting pot of culture and languages. As unique and defining as this South African characteristic may be, it also leads to a significant challenge currently facing many fields of study, including the fields where the nucleus centres around language and communication – more specifically language development and use. The discipline of SLP is one such field. Most of the assessments used to diagnose and manage language and communication difficulties worldwide have been developed and standardised (normed) in the Global North. There is an assumption that all children, irrespective of country,

region, race, and culture develop language in the same manner. This reveals a Eurocentric lens and does not hold true – culture strongly influences language development and use (Bennett, 2001).

'Language' is defined as a set of arbitrary symbols governed by rules dictated by the language in question (Levey, 2019). One cannot discuss the use of these arbitrary symbols in SA without referring to the phrase 'mother tongue'. Desai (2012) discusses a multifaceted definition of the *mother tongue*, which The researcher believes that this is how one should define language. Desai (2012) refers to Skutnabb-Kangas's (2000) typology of language that includes the four elements of origin, identification, competence, and function. (i) *Origin* – the language or set of arbitrary symbols one learns first (Skutnabb-Kangas, 2000) which often, within the South African context, is not English but an indigenous language. (ii) *Identification* – the language which a mother tongue indigenous speaker identifies with and is identified with by others (Skutnabb-Kangas, 2000). Identification or identity is linked to the culture that is seeped into a language. Pascoe, Klop, Mdlalo & Ndhambi (2018) make this point regarding South African indigenous languages. Specifically, within the context of this study, identification relates to the Sesotho language by which those belonging to the Sotho culture identify and are identified. (Sesotho will be described in various chapters of this research study.) (iii) *Competence* – the language one knows best (Skutnabb-Kangas, 2000). (iv) *Function* – the language one uses most (Skutnabb-Kangas, 2000). Often within South African contexts, one's mother tongue is not always the language which is used when engaging in language tasks (Sibanda, 2019).

Cultural and contextual aspects which build an understanding of one's mother tongue and its link to identity allow us to begin to learn about communication as a whole. *Communication* has been defined as the dynamic process of exchanging information and ideas between and among individuals using language (Levey, 2019). The language used in communication may or may not be a mother tongue. This dynamic process of exchanging information highlights Skutnabb-Kangas's (2000) criteria of the mother tongue related to function or the use of one's language. It can therefore be understood that language and communication are linked and cannot be viewed as independent of each other – communication is a process of sharing information, and language is the arbitrary symbols/form with which information is shared through this process (Owens, 2014).

As a student studying to be an SLP, I took for granted how imperative language and communication development is for children. I underestimated and oversimplified the intrinsic and complex nature of the expressive and receptive language skills. Language and communication assist with the foundations of: (i) a child's well-being – the child's ability to communicate their emotions and feelings (Law et al., 2017); (ii) the development of cognition – the child's ability to communicate their processing and understanding of information which have links to skills such as memory (Moore, 2014); (iii) using language and communication to engage in literacy and academic tasks, such as beginning to learn to read and write, and engage within a classroom context (Byrnes & Wasik, 2019). Language and communication facilitate the development of play. This is where an individual uses language and communication to engage with and learn from others (Levy, 2006). So, if language and communication are so entrenched in a child's holistic development, shouldn't an SLP have failproof ways in which to determine whether or not these fundamental skills are developing appropriately?

As mentioned previously, there are many challenges facing professionals dealing with the cultural and language diversity of SA. These challenges are corroborated by evidence of SA having innumerable diagnosed communication disorders across all healthcare and educational contexts – both within the private and public paediatric sector (Van der Linde, Swanepoel, Sommerville, et al., 2016). Pascoe et al. (2018) indicate that the exact prevalence of communication difficulties has not yet been recorded. Understanding the prevalence of communication and language difficulties in SA is important for SLPs and other related professionals to identify and support children with these needs (McLeod & McKinnon, 2007). Communication disorders have been identified by Van der Linde et al. (2016), Southwood & Van Dulm (2015), and Dada, Kathard, Tönsing & Harty (2017), to name just a few South African researchers, to be the prevailing impairment in early childhood development (ECD) within SA. Communication disorders can render long-term academic (Byrnes & Wasik, 2019), psychological (Moore, 2014), cognitive (Moore, 2014), and social (Levy, 2006) difficulties that can affect the overall quality of life of a child and its family if not identified and treated early.

Since communication difficulties present such a significant impairment within the South African paediatric population, further investigation is needed of the use and effectiveness of language and communication assessment tools. These assessment tools are used to determine the presence and nature of language and communication disorders. However, the use of these assessment tools has also highlighted the striking number of children being diagnosed with communication difficulties within this South African context. Additionally, we are to ensure educational and contextual relevance in our assessment for communication disorders and in the planning of interventions for each individual (Wium & Louw, 2013). However, the reliability and validity of assessment tools currently used in SA are questionable since they have not been

normed on South African children, but rather children from the Global North (Flack, Pahl & Mdlalo, 2015; Mdlalo, 2013; Naudé et al., 2007). In SA, and across the world, the results obtained from these assessment tools guide the intervention plan created for children with communication difficulties. These results can raise concerns on how efficacious intervention plans are in addressing the needs of the child. The concerns regarding the effectiveness of these assessments are shared by researchers and professionals on language and communication assessments. This has led to the well-documented need for South African SLPs to use culturally appropriate assessments to determine diagnoses and planning interventions (Professional Board for Speech, 2019).

1.2. Purpose of the Study

To help address the issue of limited culturally and contextually relevant assessment measures for communication impairments in children in SA, this study compared the results from two tools designed and adapted specifically for the culture and context of South African Sesotho speakers – the Picture-Naming Vocabulary Task (PNVT) and the new Sesotho Communicative Development Inventory (CDI). Sesotho is one of the major languages used in the South African context, accounting for 7.8% of the total speakers of all the South African official languages (Statistics South Africa, 2022).

The CDIs have recently been developed in 11 official spoken languages in SA. During the initial phase, the South African CDI team adapted six of the official languages – including Sesotho – from the American MacArthur-Bates Communicative Development Inventories (MB-CDIs) (Dowling and Whitelaw, 2018). The CDIs for the other official languages were adapted based on the research for the first phase. These languages shared many foundational similarities with the initial six.

This study specifically focused on identifying communication impairments in children using the Sesotho version of the CDI. Further in-depth discussions and explanations regarding the CDI have been provided in the literature review section of this thesis. As mentioned previously, Wium & Louw (2013) highlighted the dearth of SLP assessment measures developed in and normed for contextually relevant languages in SA. Pascoe & Norman (2011) discuss the need for SLPs to be the advocates and members of the development teams who construct assessments that meet the language needs of the diverse population in SA. Although policy stipulated by the South African national statutory body – the Health Professions Council of South Africa (HPCSA) – states that it is imperative for SLPs to work collaboratively and inter-professionally using an individual's language in order to fulfil the human rights stipulated by the South African Constitution. Kathard et al.'s (2011) study alludes to the small-scale evidence of interdisciplinary collaboration in the assessment practices of SLPs. Kathard et al. go on to mention that the impact of the lack of teamwork during assessments has a knock-on effect on the reliability and validity of assessments, and consequentially, intervention outcomes. Mdladlo, Flack & Joubert (2016) suggest that the reader reflects on the difficulties SLPs experience when assessing children and adults whose indigenous linguistic and cultural backgrounds are different from their own. The SLPs are then further disadvantaged when using standardised tests from the West in a non-Western context.

To focus on the communicative impairments of the intended indigenous language, participants recruited for this study included toddlers and their caregivers who speak Sesotho as their primary language. They were recruited from Tweeling, a small town in the Free State, which is a predominately Sesotho-speaking town. The research context and participants are discussed further in the methodology section of this thesis.

1.3 Research Question

The question which this study set out to answer was the following: Can the results obtained by the South African Sesotho PNVT be compared to those derived from the toddler version of the Sesotho CDI? The answer to this question will provide an indication of the validity of the Sesotho version of the CDI.

Chapter 2: Literature Review

Culturally and contextually relevant assessment measures for communication impairments in children in SA are scarce, and set the foundations of this research study. The theoretical framework provides an understanding of the main rationale behind this research study – which is to assist in the development of South African language norms. Although this research study does not directly develop South African language norms, it is aimed at assisting in its development. The results from this study lend to the SA-CDI team's validation process of a Sesotho language tool. This is a tool which could be used in creating language norms in other developing contexts, and various language and child development studies.

2.1 Theoretical Framework

Vygotsky's Sociocultural Theory of Cognitive Development has been used as the major framework underpinning this ECD study. This thesis then discusses ECD as a whole globally and with specific focus on some South African contexts. Additionally, language acquisition has been discussed in this chapter and analysed using the theories from Owens (2014) research on language development, and list those who support the evidence presented by him. The work of the two teams of researchers in Alcock et al.'s (2015) and Southwood et al.'s (2021) publications assists this literature review's scaffolding and understanding of assessments in SA and CDIs as an assessment tool.

Vygotsky's Sociocultural Theory of Cognitive Development will be discussed further later on in this chapter. This theory suggests that social interactions of an individual will lead to continuous development in children's thoughts, behaviours, and learning (Vygotsky & Cole, 1978). Developed nations have an abundantly growing research base on sociocultural factors and its impact on an individual's holistic and language development. However, it is not in any

way similar to the scarcity of the sociocultural factors and its impact in the South African context. For the purpose of this research study, a specific focus is placed on the Sesotho population in SA's rural and low socioeconomic status (SES). For the purpose of this research study, a specific focus is placed on populations in SA's rural and low socioeconomic status (SES).

2.2. Sociocultural Factors Affecting Language Acquisition

A recent study by Southwood et al. (2021) discussed the microsystem from the Bronfenbrenner's Bioecological Systems Theory. It highlights that there are two main microsystem sociocultural factors in SA: SES and maternal level of education. Hoff (2003) highlights that SES and the consequential parent-child interactions affect children's expressive vocabulary and mediate the length of parental utterances. Given the South African context, almost half (49.6%) of SA's households are led by maternal figures, hence the focus on maternal levels of education (Statistics South Africa, 2022). Statistics South Africa (2022) reported that in 2022, the census showed a higher percentage of females who have no schooling and/or have not completed primary school level schooling across all races recorded within SA. Also recorded in 2022 was a staggeringly high level (62.6%) of low SES in SA. This means that more than half of the South African population is living below the upper-bound poverty line (The World Bank, 2023). This not only exists in SA but in other low- and middle-income countries where it is reported that 43% of children who are under the age of five years do not reach their developmental potential (Black et al., 2017). From the number of female-led households which have been recorded to be more likely not to complete any schooling, the reliance of the Social Relief of Distress Grant is high. This grant, which is intended for individuals living in SA who have insufficient means, is required to get the average household of 3.5 individuals through an entire month of basic needs (Statistics South Africa, 2022).

Around 62% of the South African households are made up of non-nuclear family structures (Statistics South Africa, 2011).

This research study focuses on rural and low SES research, which has been discussed in the methodology section. Consideration must be given to the research showing that children brought up with such sociocultural factors are at risk for poor language development (Hoff, 2003; Hoff-Ginsberg, 1998). Not only is there evidence to suggest that there is a limitation to child-directed speech which has been reported to correlate with the development of a child's vocabulary (Cristià et al., 2019), there also exists the competition of other children within the household for the attention of the primary caregivers. Competing for attention results in reducing the quantity of child-directed language input for a particular child (Havron et al., 2019). Additionally, children are most often provided with language input by adult caregivers until the age of three, after which most of the input is provided by other children in various social contexts (Cristià et al., 2019). Since almost half the population's households have adult caregivers / primary caregivers that are female-led, it is important to note that maternal figures are most often the primary source of a child's language learning experience (Hoff, 2003).

A study conducted by Southwood et al. (2021) showed that there were three main factors contributing to the development of vocabulary in children in SA. A child's age and gender were recorded as the two individual predicting factors. The third factor was geographical area forming part of the exosystem in the Bioecological Systems Theory (Southwood et al., 2021). The effects of a low SES in rural areas go beyond language development, and also impact the child holistically in their functioning in everyday society, such as organising everyday events or engaging in social and physical environments (Flores, 2004). A study in rural Kenya showed evidence that using a simple emergent literacy task such as caregiver-child book-sharing can

directly and positively impact the effects of the abovementioned sociocultural factors in order to stimulate language acquisition and emergent literacy skills in children (Knauer et al., 2020). The studio showed that the lack of access to linguistically stimulating home environments is a reason that children living under the upper-bound poverty line do not reach their full cognitive and language potential (Can & Ginsburg-Block. M, 2016). The creation of linguistically stimulating environments would involve access to storybooks and quantity and quality of any caregiver reading engagements (Knauer et al., 2020). These are all advantageous resources which are commonly known to become challenges for some populations living in Sub-Saharan Africa (Knauer et al., 2020). Further explanation into the context is given by the United Nations Children's Fund. It stated that 97% of the households in Sub-Saharan Africa have access to two or fewer storybooks in each household, and only half the caregivers reported engaging in any cognitively stimulating activities over a period of three days (Keeley & Little, 2017).

The effects of one of the most common and historically overlooked factors is stress (Der Nederlanden et al., 2023). O'Connor et al. (2021) found that there is a higher level of cortisol in populations living in a lower SES due to the variety of complexities experienced. Vliegenthart et al. (2016) stated that the levels of cortisol have now been defined as a chronic condition. The chronic stress has been shown to impact on the two most important foundational skills of a child's language development: memory and executive functioning (Farah et al., 2006). These chronic stress conditions not only impact the development of a child's language directly, but also significantly impact the caregivers or microsystem. Any influences from the microsystem, as we know, directly influences a child's development. The impacts of stress result in a decline of the caregivers' capacity to provide an environment that is stimulating to a child's language development in the early years (Der Nederlanden et al., 2023). As previously mentioned, maternal-headed households are more common in this particular research context

in SA. The author's discussion in the research study was conducted in a developed nation, in which they found that maternal stress impacted negatively on a child's receptive and expressive language skills (Noel et al., 2008). The sociocultural aspects cannot be discussed without the addition of difficulties within the scope of practice of an SLP within the South African context.

2.3. The Scope of Practice for an SLP in SA

As mentioned, the role of the SLP in SA presents a significant challenge. This is due to the lack of culturally and linguistically appropriate assessment materials for this population. With so many indigenous languages, South African citizens have cause to celebrate the legitimization of so many of these languages and cultures. However, SLPs face a notable challenge in translating South African constitutional values into practice with such a diverse population (Professional Board for Speech, 2019). Human rights are an essential underpinning of the guidelines provided by the HPCSA. McPherson (2008) states that SLPs would benefit from recognising peoples' human rights in the setting and context in which their services are offered. Despite existing policy frameworks for practice in a culturally and linguistically diverse South Africa (Department of Arts and Culture, 2003, 2012; Department of Health, 1974; Department of Social Development, 2016; Health Professions Council of South Africa, 2016), SLPs are responsible for devising speech, language, and communication/language tools to address the needs of a diverse population (HPCSA, 2019).

At present, SLPs deliver their services without the necessary developmental norms and contextually relevant assessments and intervention programmes. This is motivation for the development of culturally and linguistically appropriate language assessment tools in SA (Khoza-Shangase & Mophosho, 2018). Responsibility can however not fall on the qualified SLP alone; as mentioned in Khoza-Shangase and Mophosho (2018), the institutions

responsible for training SLPs need to be accountable and assist in the transformation of the SLP profession. Transformation of the SLP scope of practice should introduce political consciousness and critical literacy diversity (Khoza-Shangase & Mophosho, 2018). Concerns of diversity cannot be ignored when attempting to implement the goals of the South African Government's Universal Health Coverage through implementation of National Health Insurance. However, there are many SLPs who have already qualified and are working within this multicultural context. Van der Linde et al. (2016) discuss some of the challenges facing these already qualified SLPs in the South African context including the triple threat of poverty, inequality, and unemployment. These further influence access to already limited resources for this population facing poverty and inequality such as basic housing, clean running water, electricity, and transportation (Van der Linde et al., 2016). The access to limited resources is compounded by the geographical distance of households from resources, which is one of the sociocultural factors listed by Southwood et al. (2021). The superfluity of injustices facing the South African population raises various ethical debates and discussions.

Unfortunately, the hegemony of English is not the only construct for disadvantaged indigenous L1 speakers, and is underestimated within the training and scope of practice of SLPs in SA. Although there are laws and policies which play a role in helping to avoid or remedy harmful cultural beliefs or practices and prevent discrimination against people with disabilities, they still go up against substantial drivers of social stigma against individuals with any disorder/disability (Rohwerder, 2018). The stigma of individuals diagnosed with language and communication disorders cannot be underestimated and must be considered by SLPs and the assessments used when determining diagnoses. The causes of the stigma include cultural and religious beliefs, the nature of the disability, gender, ethnicity, and socioeconomic status which have been reported within cultures in SA, a developing country (Rohwerder, 2018). These

stigmas have the ability to follow individuals throughout their adulthood (Van der Heijden, Harries & Abrahams, 2019). However, the responsibilities of the SLP are not only limited to advocating against stigma or culturally appropriate assessment tools. The advocation role of the SLP extends into early childhood development (ECD). It is widely researched that early intervention supports the language and literacy skills of children in ECD centres which improves literacy acquisition and future scholastic progress (Moonsamy & Carolus, 2019) An SLP's role in emergent literacy, a skill required in order to develop literacy and academic skills, cannot be understated. Neither can the direct and positive impact of stimulating emergent literacy skills have on any sociocultural factors (Knauer et al., 2020). The stimulation of any language or emergent literacy skills are as a result of ECD and the factors that assist or hinder this. The next section will discuss ECD in relation to the South African context.

2.4. Early Childhood Development (ECD)

The discussion related to ECD within this research study is situated in theoretical frameworks which allows for the understanding of a child's development in a holistic manner. Ramsammy (2019) conducted a study which highlighted the relationship between the South African home environment and ECD. He found that the stimulation in the home environment can impact a child's associated and co-morbid developmental areas or domains, which include cognitive, socio-emotional, motor, and language (Eccles & Roeser, 2011). Owens (2014) lists the years between birth and preschool (0 to 6 years of age) as the critical period of ECD for all domains of development and the coordination of the domains with respect to each other. However, the development and coordination of these domains are not mutually exclusive of their biological pre-determiners. These include neural development, environment, and experiences within all the environments a child is exposed to (Ramsammy, 2019). This relates to the classic and long-standing academic debate of nature versus nurture coined by Francis Galton in 1869. The

debate has led to recent research which includes both sets of philosophies, considering the contribution of both nature and nurture to a child's overall development (Barlow, 2019).

It has been noted that a child, from a global context, exists in multiple environments such as their home, community, religious affiliations, school, and political settings (Ramsammy, 2019). These environments are representative of the Ecological Systems Theory developed by Bronfenbrenner. Bronfenbrenner highlighted the impact of a child's environment on the process of human development and socialisation (Bronfenbrenner, 2005) . Bronfenbrenner's five concentric environmental systems were added later, and the theory was termed the "Bioecological Systems Theory" in 1994 (Guy-Evans, 2024). This adapted theory includes the child's own biology as the primary microenvironment fuelling his/her development (Bronfenbrenner, 2005).

However, the research by Bronfenbrenner and most recently by Ramsammy lends itself to the following statement made by Eccles and Roeser (2011) – the school and home context of the microsystem have the largest impact on a child's overall development. This inner microsystem, consisting of the home and school environments, is influenced by various outer system factors in SA. Some of the outer layers of the bioecological model include factors including socio-political dynamics, culture, communal practices, density of living environment, the beliefs of caregivers, and family structure (Ramsammy, 2019; Madhavan et al., 2012). The socio-political dynamics refer to the national wealth and economic state of SA – such as the high unemployment rate and poverty etc., which impact the process and progress of ECD (Maggi et al., 2010).

Given that Bronfenbrenner's Bioecological Systems Theory is critical to this study, it has

already been highlighted that the microsystem has the largest impact on the child. However, we cannot ignore the effects on a child from factors in the outer layers of the model, such as the culture of a community. Maggi et al. (2010) discuss how embedded the fundamental causes are for a lack of attention on ECD. Given the focus of this research study, the caregiver and child interaction in the context of the Sesotho culture and belief systems is highlighted. Ramsammy (2014) reports on the Sesotho community taking collective responsibility for a child's safety and well-being. Furthermore, Ramsammy (2019) indicates that the reported day-to-day cultural practices of mothers in SA help promote and support ECD. Examples of these practices include mothers and their children who sleep next to each other, carrying the child on the mother's back, and the exposure of their child to a social network of family within their community (Van Heerden et al., 2017). The various factors in their larger bioecological systems related to ECD form the foundation for the acquisition of language for any child.

2.5. Language Acquisition

A fundamental understanding of language development in general must be highlighted as language acquisition remains a key theoretical area underpinning this thesis. There are many theories that exist regarding the acquisition of language. Vygotsky's Sociocultural Theory of Cognitive Development provides the main theoretical framework of ECD for this study. This theory suggests that social interaction of a child will lead to continuous development in children's thoughts, behaviours, and learning (Vygotsky & Cole, 1978). A child's development can depend on interactions with their community members and the tools provided by their culture, which helps to form their own view of the world. The zone of proximal development (ZPD) helps us to understand the learning processes and sequence (Vygotsky & Cole, 1978). Following the process and sequence of learning (gaining new knowledge) and overall development (applying newly gained knowledge) of (1) communication; (2) language; and (3)

speech skills can be completed (Owens, 2014).

2.5.1. Communication

Levey (2019) describes communication as the dynamic process of exchanging information and ideas between and among individuals involving the following skills: Encoding, decoding, and transmitting. Owens (2014) states that overall communication includes speech and language as well as paralinguistic codes, non-linguistic, and metalinguistic cues. Paralinguistic codes are defined as intonation, stress, and rate of delivery which are superimposed onto speech (Owens, 2014). Non-linguistic cues refer to gestures, body posture, facial expression, eye contact, head and body movement, as well as the physical distance between speakers (Owens, 2014). Singleton and Shulman (2020) further describe metalinguistic cues as the monitoring and evaluation of the success of the communication, the message conveyed, and how it was transmitted. Owens (2014) states that communication development begins at birth and that early communication does not depend on the use of language or speech but rather sequential development which will be discussed further.

The early communication skills in the next few months of development of an infant up to 24 months of age include: discriminating between contrasting phonemes; differentiating between intonation patterns; recognising different voices; distinguishing verbal from nonverbal sounds; and coordinating eye gaze, gesture, and various pre-linguist skills such as imitation and joint attention (Owens, 2014). As this study does not include participants younger than 28 months, these communication skills will not be analysed in the dataset collected. However, the skills analysed will be inclusive of Owen's (2014) Stage III – Words used to convey intention, as intentional, verbal, and conventional communication is reported to develop by a child's second birthday (Owens, 2014).

2.4.2. Language

Language can be described by its primary purpose – to code the transmissions between and among communicative partners (Levey, 2019). Language is a social tool composed of arbitrary symbols and uses rules to govern its usage. Owens (2014) states that there are three major components that encompass language: form (syntax, morphology, phonology); content (semantics); and use (pragmatics). Singleton and Shulman (2020) describe content as it relates to semantics, which are the rules that govern meaning or content of words and word combinations. Although all components of language are distinctive and interrelated within language; only aspects of content will be discussed in this research study.

These aspects of language are instrumental in understanding the development of the language of a toddler – after 24 months of age – for the purposes of this research study. Toddlers are said to progress from the use of single-word utterances to simple multi-word combinations, and produce words that contain one or two syllables (Owens, 2014).

Toddlers are able to provide simple words and use language to obtain information, give information, and engage in discourse (Levey, 2019). Their receptive vocabulary extends beyond 200 words and is reported to be able to produce some two- to three-word utterances by age two for those who are developing typically. Owens (2014) states that a toddler's narrative development typically begins at age two, with further maturation of narratives, as evidenced by being able to sequence events around three years of age.

2.5.3. Speech

Speech is defined as a verbal means of communicating, which consists of speech sound combinations that allow for the following characteristics: phonological processes, voice quality, intonation, and rate etc. (Levey, 2019). Owens (2014) provides a full sequence of the development of English speech and phonological processes from birth to eight years old. However, for the purpose of this research study, there are two significant rationales for the exclusion of speech development from data collection: (1) the main purpose of this study is to compare the results from two South African development language assessment tools to assist with the hope to add its conclusions to the future development of language norms in SA; and (2) to ensure that this research study remains within the scope of a master's thesis in terms of length and content requirements.

Understanding each aspect of the described communication, language, and speech skills assists in the inclusion of various aspects related to ECD of these aforementioned skills. However, an unfavourable point to consider when attempting to fulfil the purpose of this study is the limited nature of research on children's communication, language, and speech acquisition in SA. Although it is vital for any early identification, assessment, and management of children who are not developing language in a 'typical' manner (Pascoe & Smouse, 2012). The literature review looks at different concepts that underpin this study within the South African context. Additionally, the literature review used other South African language-related research studies to support the purpose of the study and its assistance in the long-term goal of developing vernacular language norms in SA.

2.6. Sesotho Language Development

The intention of the SA-CDI team is the future development of culturally and linguistically appropriate language norms. This study has chosen to focus on that intention and provide

evidence-based research towards assisting in the initial validation of the Sesotho tool. The study will use a comparison for the results from both the CDI and the PNVT to fulfil the aim of assisting in this team's validation.

Currently, 7.8% of SA's population uses Sesotho as their L1, the seventh most spoken language in a population of just more than 62 million in 2022 (Statistics South Africa, 2022). Sesotho is a southern indigenous language which is spoken in Lesotho and adjacent regions of SA (Demuth, 2007). Alcock and Alibhai (2013) indicate that babbling is recorded within the same early speech and language development when compared to more well-documented Western languages. Following the development of babbling mimicking the same patterns as those produced by Sesotho (Alcock & Alibhai, 2013), Demuth (2007) provides a summary of the overall Sesotho early speech and language acquisition. She states that Sesotho is one of the indigenous languages with a simple syllable structure (no consonant clusters are found before or after a vowel). Due to this simple syllable structure, most consonants and vowels are acquired by two years of age (Demuth, 2007). There is continued development of the labial glides, affricates, and clicks up until three years of age (Demuth, 2007). The place of articulation and voicing are reported to be unremarkable in ECD (Demuth, 2007). Interestingly, the consonant /h/ is sometimes reduced and aspiration missing even in adult Sesotho speech (Mahura & Pascoe, 2016). However, lexical tone and prosody is acquired early on in Sesotho words with stable tone at two years of age which adjust the meanings of words used – different to the changes in tone which do not change the meaning of words in a language such as English (Demuth, 2007). Like other indigenous languages in SA, Sesotho has been reported to have a rich noun class system (De Vos & Mitchley, 2012). Many of the monosyllabic morphemes in the reportedly extensive morphology are missing or reduced at two years of age, but are generally noted to be well formed by three years of age (Demuth, 2007). However, there

appears to be limited research in the area of phonological awareness in Sesotho-speaking children, and this links to literacy and academic performance (Wilsenach, 2013). Although Demuth (2007) reports research stating that three-year-old Sesotho children shift to different speech registers when playing games such as "house", when talking to their newborn siblings, or when interacting with non-native speakers. Mokuoane and Moeketsi (2018) help their readers understand the depths of language and culture which shape the identities of Sesotho-speaking children. They state that the way in which the Basotho indigenous speakers think is strongly influenced by their language (Mokuoane & Moeketsi, 2018). They present a spotlight on the concept that the language one speaks determines the way one interprets the world around them (Mokuoane & Moeketsi, 2018). Therefore, if one's language has such a significant impact on the way one understands the world around them and expresses what they understand, then the development of culturally appropriate assessment materials becomes that much more crucial. Assessment materials should represent the individual with which one is attempting to engage in, understanding their language and communication ability.

2.7. Language Assessments Conducted in SA

The global research related to the appropriateness of language assessments for indigenous languages is growing, from developed nations such as Australia to developing nations such as India and many African nations. Stansfield et al. (2010) argued that the language assessment tool administered on all of Australia's school children did not cater for the context, culture, and language of the indigenous and remote communities. Much like SA, the indigenous and remote/rural communities in Australia expose their children to a complex language environment of various codes when compared to urban, monolingual, English language speakers (Stansfield et al., 2010). These complexities are not catered for in various, and sometimes national, language assessments in schools and by SLPs as seen in the forementioned

study. Although developed nationals may argue that the assessments are catered for their official language, not even developing nations have an abundance of appropriate assessments standardised for their own official languages. Such examples can be found in the context of this study (SA), as well other developing countries such as Ecuador (Limerick, 2019), Mexico (Solano-Flores et al., 2015) for languages such as Spanish and Mexican, and in the United States for the native American Indian, native Alaskan, and Hawaiian communities (Trumbull & Nelson-Barber, 2019). A research study conducted by Mdlalo (2013) across the South African province of KwaZulu-Natal found that assessment methods of SLPs using standardised tests/assessments were deemed to be inappropriate within the context for the following reasons: the practice of SLPs in its entirety is highly Westernised and predominantly normed on United Kingdom or United States populations. The assessments chosen by an SLP do not meet the characteristics of languages used within SA (Mdlalo, 2013) along with several other reasons which are explained further below.

The dearth of contextually appropriate resources within SA is a consequence of one overarching factor: the challenges facing the development of favourable resources in official languages within the country as a whole (Pascoe & Norman, 2011). Pascoe and Norman (2011) explain that this shortfall in the development of resources in local languages is made more complex by two identifiable difficulties. The first relates to South African culture with regard to a participant and their family's level of formal education and/or the participant's familiarity with the testing/assessing environment (Pascoe & Norman, 2011). Second, and equally complex within the South African context, is the population from which the norms are derived. These populations do not relate to the South African context as they are more often than not developed from first world, Western culture contexts (Pascoe & Norman, 2011). Lastly, the presentation of vocabulary or other items used within the resource is also mentioned by Pascoe

& Norman (2011) as an obstacle to the use of these resources with the South African population. These challenges further highlight the insufficient assessment materials that exist and the support required in the SLPs' use of appropriate assessment measures when working with the multilingual and multicultural South African population (Professional Board for Speech, 2019). Mdlalo (2013) states that despite the growing awareness of and research into bilingualism, cultural pluralism, and multiculturalism within the South African context, the need for culturally and linguistically sensitive materials for language assessments and further intervention continues to present a major challenge to SLPs in SA. Flack et al. (2015) indicate that unless the SLP seeks to gain an understanding of the cultural backgrounds of clients within the South African context, the responses, and therefore recording of the results, will continue to guide an emic view by the SLP as he/she misinterprets or confuses the data during assessments and intervention.

2.8. CDI Development

The argument presented above regarding limitations to the clients and scope of practice of SLPs within SA lends itself to a recent project conducted within this context, which has resulted in the development of Communicative Development Inventories (CDIs). The MB-CDI is now a widely used parent-report tool for assessing communicative skills of infants and toddlers (Fenson et al., 1998). The CDIs were initially developed in order to fulfil the need for effective and cost-efficient instruments for assessing a range of receptive and expressive communicative skills expected in infants and toddlers (Fenson et al., 1998). The MB-CDI consists of a pair of forms, one for infants (8-18 months) and the other for toddlers (16-30 months). The rationale for using the MB-CDIs as a method for assessment of language within SA relates to its successful adaptations from English into nearly 100 other languages within developed and developing countries (Vogt et al., 2015). A license was granted to the SA-CDI team for the

adaptation of the MB-CDI into Southern African languages (Whitelaw, 2018). The SA-CDI team comprises of various professionals and support members from across most major South African universities and internationally (South African Communicative Development Inventories, 2024). One of the team's primary investigators is the co-supervisor of this research study – Prof. Frenette Southwood. The team's focus is to collaborate on the development of CDIs for all South African languages.

The CDIs have been developed in various South African languages by the SA-CDI team in accordance with the international CDI guidelines and regulations. There are two age versions of each language version of the CDIs developed thus far for South African languages, namely an infant version (for children 8 to 18 months) assessing the knowledge of gestures, comprehension, and production of lexical items; and a toddler version (for children 16 to 30 months) assessing production of lexical items and grammatical constructions. The age range specifically chosen for this study is 28 to 30 months, which has been discussed further in the methodology section of this thesis. Vygotsky's Sociocultural Theory of Cognitive Development indicates a significant language learning age from birth up to three years of age, which overlaps with the age range selected for this study.

The validation of a CDI in a South African language, such as Sesotho for the purpose of this study, would involve different tasks depending on the age version of the CDI, as per the protocol set up by the SA-CDI team post discussion with other teams and after reviewing their data. As mentioned above, the toddler version was brought forward as the focus of this study contributing to the SA-CDI team. The use of three separate assessment methods: (1) PNVT; (2) language sample from the child participant; and (3) the Sesotho caregiver report was required for the SA-CDI team's validation study for the toddler version. This is explained in

the methodology section.

This study used the data collected from the administration of these assessment methods to compare the information between two assessment methods – the PNVT and the CDI. A study conducted by Libertus et al. (2015) developed a similar picture-naming task to validate the vocabulary predicted by various standardised tests and the CDI. Four hundred and fifty-four participants were recruited within this American-based study where they found that their picture-naming task – termed the Developmental Vocabulary Assessment for Parents (DVAP) – provided a rapid, cost-effective alternative to the other standardised vocabulary tests for children. Similarly, this research study attempted to add to the research by the SA-CDI team to validate the Sesotho PNVT for future use.

This CDI project intended to address the lack of appropriate early child language tests within the South African population by validating the CDI which can be used as an accurate assessment tool for South African languages (Alcock et al., 2015). The process of adaptation of the MB-CDI which calls for amendments as a mere translation of the original instrument will not be adequate when developing a new CDI language version. The nature of messages from indigenous language vocabularies are ever-changing within the context they are used (Vogt et al., 2015). Gjersing et al. (2010) stipulated that the adaptation process for some of the indigenous languages, where appropriate, involves multiple cross-cultural adaptations which ensure reliability and validity. Gjersing et al. (2010) conducted a study which used adaptations made to an original Australian-English research instrument for an instrument for the local Norwegian population. The conclusion from their study highlighted that, in cross-cultural adaptations, aspects such as language, time, and setting must be considered to avoid potential

bias in a research study using adapted CDIs and consequential assessment results (Gjersing et al., 2010).

The literature review has discussed the hegemony of English within the South African context, and highlighted the requirement for resources within vernacular languages. The research study acknowledges that isiZulu has the largest mother tongue speaker base of the official languages of SA (Statistics South Africa, 2011). The development of the CDI for this language is, however, currently ongoing, and the isiZulu version of the CDI has not yet been made available for validation. This research project will therefore be conducted within the Free State province to validate the Sesotho CDI, as 64.2% of the population of this province has been reported to use this L1 (Statistics South Africa, 2011). A sample of the South African English CDI is available for perusal in Appendix E.

2.9. Validation of CDIs

This literature review has discussed the South African context and its relevance to this study in relation to language and the foundations of language. The literature review also noted the challenges experienced in SA such as the training of SLPs, SLPs using standardised assessment tools, and culturally appropriate assessment tools. Furthermore, the literature review highlighted and provided a means to overcome the two aspects which form the fundamental historic and present challenges facing professionals related to the field of language within SA: the hegemony of English and the stigma of disability. These two aspects were investigated and further highlighted within the Alcock et al. (2015) study using the CDI in Kenya. At the time of this East African study, the SA-CDI studies were not yet conceptualised, and therefore CDIs were not readily available for comparative purposes in SA. However, the South African CDI team has been established since then and versions of the CDI have been developed for 11 of

the 12 official languages of SA. As a means to attend to the challenges facing the development of the CDI for all official languages in SA, the rigorous process of ensuring assessment tools measure the aspects intended must happen to prove that this means is accurate and reliable for future use (Drost, 2011). This is termed validation. Hamed et al. (2016) state that there are several types of research validation methods, including but not limited to, criterion, face, content, and construct validity. Criterion validity is described as the extent to which a measure is related to an outcome (Hamed et al., 2016). Criterion validity is the most important and relevant to this research study as it is most useful in predicting performance/behaviours in a situation (Hamed et al., 2016). The research study aims to compare and describe the results obtained from the caregiver-questionnaire (i.e. the child's performance as recorded on the CDI) to the child's performance on a PNVT. This comparison will determine the similarity between the CDI score and the test scores on the PNVT to determine the validity of the CDIs in the focus language of this study – Sesotho. These measures will be compared to the words selected on the CDI and the child's recently uttered three longest sentences as reported on the CDI by the parent/caregiver. As previously noted, the potential challenge faced when using the CDIs within a context such as SA is the lack of validation of the CDIs in the local context (Alcock et al., 2015). Furthermore, being able to ensure the validity of adaptations of CDIs for purposes of assessments is vital. It will assist with further linguistic information from the educational and clinical practice perspective (Alcock et al., 2015).

When considering the theoretical framework and literature review, the purpose of this research study is reiterated. The provision of a tool which is valid, reliable, and culturally appropriate for assessing skills within vernacular languages in SA will positively contribute to the significant and highly prominent dearth of language norms within this context.

Chapter 3: Methodology

3.1. Aim

Main Aim: To describe the expressive semantic abilities of Sesotho-speaking toddlers using the South African Communicative Development Inventory (CDI) – Sesotho.

3.2. Objectives

1. Describe the demographic factors which may have influenced child participants' communication development.
2. Describe the child participants' expressive semantic abilities using the CDI.
3. Describe the child participants' expressive semantic abilities using the PNVT.
4. Determine whether there was a significant correlation between the adult responses on the CDI and child participants on the PNVT.

3.3. Research Design

A case study research design using a mixed methods approach was implemented in this research study. Wasti et al. (2022) motivate the use of a mixed methods approach as it builds a greater understanding in the holistic research study from meanings obtained from assessment methods to the prevalence of traits in a population which add depth and breadth to a research study. Stronger inference regarding the comparison between the CDI and the PNVT is made possible when combining both qualitative and quantitative research methods.

A case study has been defined as an intensive and systematic investigation of a single individual, group, or community in which the researcher examines data relating to several variables (Heale & Twycross, 2018). In this research study, it will be using multiple case studies comprising of caregiver-child dyads. Although multiple case studies are known to be more time consuming, they provide a larger representation of information to be analysed, which enhances the data so that relationships between the data can be richly investigated (Gustafsson & Gustafsson, 2017). The combination of quantitative and qualitative paradigms assists in achieving the standards met when using a mixed methods approach. The mixed methods approach in this research study has encompassed descriptive, correlational, and cross-sectional research methods. The descriptive research approach was most suitable for this research study as it is designed to assist in systemically describing events or relationships between variables as they naturally occur (Irwin et al., 2019). Correlational research allows for the assessment of the relationships using the data collected, and is not aimed at providing any determining causation (Creswell, 2014). Lastly, the cross-sectional research method was appropriate for this research study as the participants were studied within, and not over, a period (Levin, 2006). Due to the versatile nature of the quantitative research method, its focus on data collection allowed for generalisation and explanation of findings on a particular participant group (Labaree, 2009). In order to analyse the PNVT and the caregiver-report CDI, a quantitative research method has been implemented. Qualitative research methods allowed for an in-depth understanding of the data that was collected within this research (Blackston, 2018). Such qualitative research methods have been achieved through the use of form-meaning mapping or metonymic relationships of data. Triangulation of data methods was used to fulfil the qualitative aspects of the research study in order to validate all conclusions made (Polit & Beck, 2008). Triangulation makes use of multiple references to draw conclusions regarding the results, and also assisted in obtaining a complete understanding of the context of the research

study by viewing it from various perspectives (Polit & Beck, 2008). Triangulation was implemented in this research study by comparing the expressive and receptive language results of the child participant obtained with the CDI to the expressive language abilities recorded from the PNVT.

Each individual objective required specific methodologies. The first and main objective involved the comparison of the CDI data and the picture-naming data. A descriptive research analysis within a quantitative approach was employed in order to analyse the data collected to achieve the primary aim of this research study. The objectives related to the description of the language skills obtained by the PNVT, and the CDI methods of assessment followed a mixed methods approach of both quantitative and qualitative analysis.

3.4. Research Context

This research study was conducted in a town in the province which has the largest monolingual Sesotho-speaking population – Tweeling in the Free State province in SA. Tweeling can be described as a semi-rural area surrounded by dairy farms. The population is tallied at under 6,500 as per the national census in 2011 (Statistics South Africa, 2018). The population of this town is predominantly Sesotho-speaking (76.1%) which made this an ideal geographical location within the target province of the Free State.

3.5. Participants

3.5.1. Participant Description

This study's population consisted of a sample size of 20 (twenty) child and adult Sesotho-speaking participants: 10 (ten) children and their adult caregiver. The age range intentionally

chosen for this study is 28 (twenty-eight) to 30 (thirty) months of age. This aspect of the participant inclusion criteria was specified in the SA-CDI team's validation guidelines in order to fulfil two major objectives: (1) targeting toddlers and their specific language abilities; and (2) having child participants who are old enough to complete a PNVT. This is supported by evidence which indicates that the age range chosen for this study falls within the most vital period of communication acquisition between eight months and two years of age (Van der Linde et al., 2016). The CDI was completed for and the picture-naming task administered to 10 child participants who met the inclusion criteria. One caregiver of each child participant completed the CDI with the research assistant's assistance, and the research assistant administered the picture-naming task to the child. There was an equal number of male and female children participating in this research study. Lehohla & Statistics South Africa (2011) stated that the latest percentage from the census of male to females in the paediatric population is 51.88% to 48.12% respectfully. Therefore, the equal weighting of male to female child participants was selected within this sample size to accurately reflect the gender statistics of SA. However, the data was interpreted with the understanding that an individual's gender has an influence on early language skills – where male children often lag in their early language development skills when compared to their same aged female counterpart (Kovas et al., 2005).

3.5.2. Sample Technique

This research study employed a non-probability, purposive sampling method which assisted in selecting its participants according to the stated inclusion and exclusion criteria mentioned below (Acharya et al., 2013). This rationale of non-probability sampling related to the research assistant using his subjective judgement and expertise in selecting participants within his community while ensuring the selection criteria was met (Vehovar et al., 2016). Purposive sampling was used to assist with achieving the aims of this research study and facilitating rigour

and credibility of the data collected (Campbell et al., 2020). This sampling method was applicable for this research study as it is based on the premise that a phenomenon can be studied within non-random samples (Ary et al., 2019). It should be noted that as per the adjusted guidelines provided by Alcock et al. (2015), the age range requirements for child participants within the SA-CDI research study on validation was limited to 28 to 30 months for toddlers. The CDI team identified and trained a young black male Sesotho-speaking research assistant living in the area who was dedicated to recruiting participants with the provided inclusion and exclusion criteria. It is important to highlight that this research study worked with secondary data to which it was provided access by the CDI team. Therefore, the overall sample of 20 dyads was equally balanced in males and females; however, the child participants recruited by the research assistant at the time of data analysis were not balanced.

3.5.3. Inclusion Criteria

The adult participants for this research study were selected according to the following criteria:

- Adult participants who speak Sesotho as an L1 to accommodate for the validation of the Sesotho version of the CDI as one of SA's predominate languages (Statistics South Africa, 2022).
- Adult participants are required to be older than 18 years of age. This criteria is listed in order to ensure that consent can be provided by legal adults/caregivers, and not by legal minors from child-headed households who are unable to act independently without the assistance of an individual who is the age of the majority (Children's Act No 38 of 2005).
- Adult participants who have a child, or who are the primary caregiver of a child, and who speak Sesotho as their L1. This criteria is imperative to conduct the validation study of the Sesotho version of the CDI used with Sesotho-speaking child participants.
- The adult participant's child should fall between the age ranges of 28 (twenty-eight) months

to 30 (thirty) months.

Table 3.1: Frequency statistics related to adult participant demographic variables (N=10)

Variables:	Number of Adults: n	Percentage of Adults: %
Primary caregiver:		
Yes	6	60%
No	4	40%
Gender:		
Female	10	100%
Male		0%
Relationship to child:		
Mother	6	60%
Father	-	0%
Grandmother	3	30%
Grandfather	-	0%
Aunt	1	10%
Uncle	-	0%
Sibling	-	0%
Nanny	-	0%
Other	-	0%
Primary language:		
Sesotho	10	100%
Race:		
Black African	10	100%
Age:		
Above 18	10	100%
Below 18	-	0%

Table 3.1 shows that all the adult participants were black and mainly females who were primarily Sesotho L1 speakers.

The child participants for this research study were selected according to the following criteria:

- Child participants who speak Sesotho as an L1 and who are not exposed to other languages for more than four hours per day.
- Child participants should fall between the age ranges of 28 (twenty-eight) to 30 (thirty) months. The age range was deliberately chosen by the CDI team in its validation guidelines in targeting toddlers who were old enough to complete the PNVT.
- A child participant who has only lived and been raised in SA. Ramsammy (2019) stated that there are significantly noteworthy impacts of an environment and context on a child's development. Therefore, limiting this context to SA aids in reducing other contextual and cultural factors which may have altered a participant's language development.
- Equal male to female ratios were chosen for this research study to ensure that the sample accurately reflects the gender statistics of the South African child population. However, due to the secondary nature of the data this research study had access to, this criteria was not met.
- Children were only included in the study if their parents/legal guardians signed informed consent forms which allowed their children's participation in the study. These consent forms cannot be signed by any legal minor or individual who is not registered as the child participant's parent or legal guardian as per the Children's Act No 38 of 2005.

The following were the participant exclusion criteria for this research study:

- Child participants who have any diagnosed language difficulties or other co-morbid diagnoses were excluded from this research study as the intention was to collect a sample which reflected the normative population with no such difficulties.
- Child participants who have previously received SLP intervention as this would relate to the rationale provided above regarding normative population data collection.

Table 3.2: Frequency statistics related to the child participants' demographic variables (N=10)

Variables:	Number of children (n)	Percentage of children (%)
Gender:		
Male	6	60%
Female	4	40%
Primary language:		
Sesotho	10	100%
Other languages exposed to at home:		
Afrikaans	-	0%
English	-	0%
isiNdebele	-	0%
isiXhosa	-	0%
isiZulu	1	10%
Sepedi	-	0%
Setswana	-	0%
siSwati	-	0%
Tshivenda	-	0%
Xitsonga	-	0%
Other	-	0%
Exposure to other languages during the day:		
<1 hour	1	10%
>1 hour	-	
Race:	-	
Black African	10	100%

Table 3.2 shows that all the child participants were black and mainly males who were primarily exposed to Sesotho.

Table 3.3: Descriptive statistics related to child participant demographic variables (N=10)

Variables	Mean (μ)	Range	Standard Deviation (σ)
Child Age:	29.2 months	28-30 months	0.6

Table 3.3 shows that the child participants' average age was 2.4 years, which fits into the toddler age range stated in the inclusion criteria.

3.6. Data Collection

3.6.1. Materials and Assessment Instruments

Three data collection instruments were used for the purposes of this masters study, namely a Case History / Family Background Questionnaire, a Sesotho PNVT, and the Sesotho CDI. Each of these will be discussed below.

3.6.1.a. Family Background Questionnaire

The family background questionnaire or case history, as per the sample found in Appendix D, was developed by the South African CDI team, and includes information pertinent to the child such as demographic information, medical history, overall development, and speech and language development, which are not limited to the scope of practice of an SLP. According to ASHA (2014), in order to accurately assess and interpret an individual's communication ability, a case history needs to be collected. A case history provides a variety of information to assist with the evaluation process and gain a holistic understanding of the child being assessed. The family background questionnaire / case history was conducted by the research assistant who was trained specifically to assist the CDI team. The research assistant assisted the caregivers in completing the questionnaire in their homes where the remainder of the data was collected with the child participant. The caregivers were informed that the questionnaire would

take up to an hour to complete and was not time sensitive. This meant that the caregivers were not required to complete the family background questionnaire in one session. The questionnaire provided background on the research study and stipulated the requirements and expectations by the caregiver after which the caregiver may or may not consent to participating. Following consent, the questionnaire leads the caregivers through various sections which are separated into categories listed in Table 3.4.

Table 3.4: A table showing the rationale for the categories of questions asked in the family background questionnaire

Question sections	Question numbers	Rationale
Demographic information	Q7 – Q14	The provision of demographic information assists in understanding the child participant using Bronfenbrenner's Bioecological Systems Theory from which demographic information forms part of the individual and innermost layer of the theory (Guy-Evans, 2024).
Medical history	Q26 – Q31 Q33 – Q40	According to O'Connor et al. (2021), there are various health variables which significantly impact on a child's overall development. As this research study focuses specifically on language development, it is imperative to consider the medical history of the participants.
Overall development	Q24 – Q40	The correlation of developmental difficulties or strengths which impact on a child's language development are highlighted by Farah et al. (2006). The inclusion of information on the overall development of a child is crucial for this research study.
Speech and language development	Q19 – Q23 Q31	The meeting of predicted speech and language milestones assists any SLP in expecting any further difficulties and building a holistic understanding of the

		child (Wium & Louw, 2013). Once this information is processed, an SLP can determine an intervention plan to assist the child.
Socioeconomic factors	Q45 – Q58 Q70 – Q71	As previously mentioned, the role of socioeconomic factors has an effect and can predict a child's development (Hoff-Ginsberg, 1998), specifically with reference to a child's language development as intended by this research study.
Family structure and cohesion	Q15 – Q18 Q41 – Q69	Further investigation on all levels of Bronfenbrenner's Bioecological Systems Theory is mandatory for the holistic understanding of any individual and their development (Härkönen, 2007). This research study requires these exo, meso, and microsystem factors to develop this holistic understanding of the child participants and rationalise their performance on the research tools.

3.6.1.b. Picture-Naming Vocabulary Task (PNVT)

As previously stated, this research study is part of a bigger research project related to the validation of CDIs across all of the South African official languages. The PNVT has therefore already been developed in Sesotho by the CDI team. The aim of developing a PNVT was that no child participant completed the PNVT without the consent provided by the adult caregiver in the abovementioned research tools. The 24-picture stimuli chosen for the PNVT were based on items that are commonly found in South African homes. The CDI team conducted a typicality rating test to ensure that members of the Sesotho-speaking community deemed that the picture stimuli chosen accurately represented the target item. The PNVT was administered by the research assistant. Caregivers were informed that they were welcome to remain in the same environment with the child during this process. However, they were asked by the research assistant not to engage in assisting the child to participate with the PNVT. The child participant

was provided with 24 picture stimuli, one after the other. The research assistant requested the child participant to provide a name for the picture stimuli and recorded their response on Qualtrics (Qualtrics, Provo, UT). The administration of the PNVT was time sensitive and was to be completed in the same session. Unfortunately, a sample of the Sesotho PNVT is not available due to the permissions from the SA-CDI team.

3.6.1.c. Communicative Development Inventories (CDIs)

The CDIs comprise of a two-part form. In the infant version, the initial part predominantly focuses on words and gestures which can only be used for stated age ranges of 0:8 to 1:6 years (eight months to one year and six months) (CDI Advisory Board, 2015), whereas the second version is an assessment pertaining to toddlers with a focus on words and sentences that relate to participants with an age range of 1:4 to 2:6 years (one year and four months to two years and six months) (CDI Advisory Board, 2015). As previously mentioned, the infant CDI form consists of two parts: words and gestures. The 'Early Word' section assesses signs of a child's understanding, imitation, labelling skills, and capacity of receptive and expressive vocabulary skills. Consequently, the 'Actions and Gestures' section centres on a child's communicative actions and gestures (CDI Advisory Board, 2015). However, for the purpose of this research study, infants were not targeted and therefore data related to gestures within the former part of the CDI were not collected. Although, the infant word version of the CDI is limited to the skills of an infant, all the words in the infant version of the CDI are included in the toddler version.

Furthermore, the validation of the toddler version of the caregiver-report CDI was used to assess a child's vocabulary and grammar development from 28 to 30 months of age (Vogt et al., 2015). During a home visit, the adult participants were asked if the child participant could name the item on the CDI in communication interactions. If so, the adult was required to state

what the child participant would name the item as. The answers were recorded on the digital CDI provided to the adult participant. The completion of the CDI typically took an hour.

3.6.2. Procedures

The research study was conducted in two separate phases which are presented in Figure 1 and described thereafter:

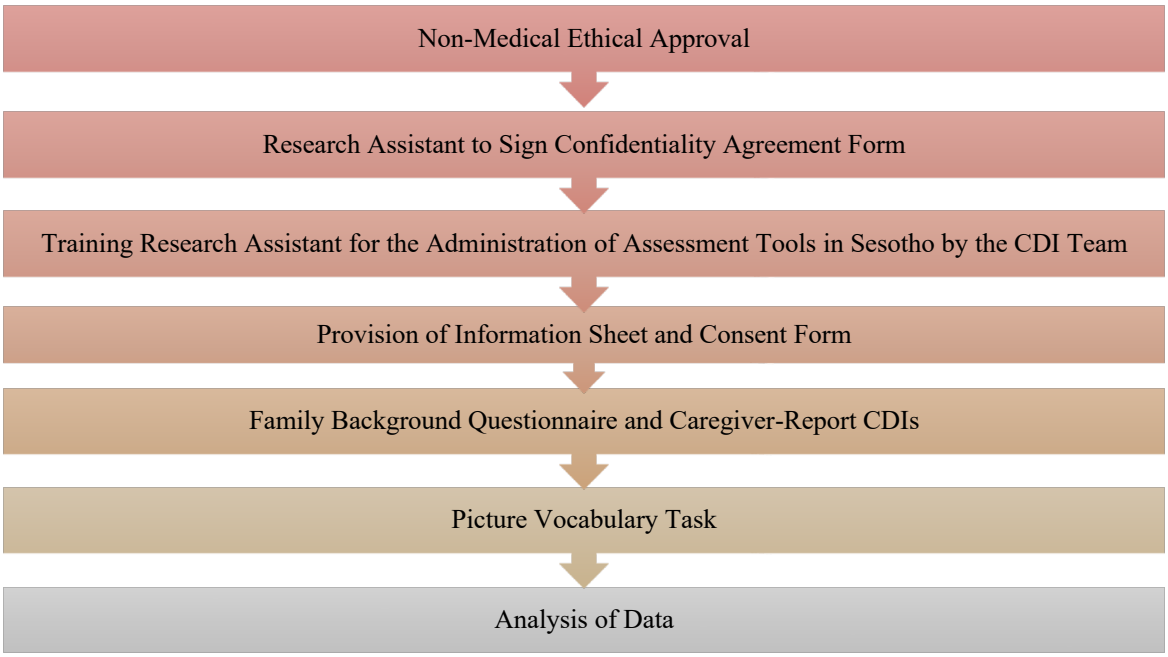


Figure 1: Major stages of data collection imperative for the successful completion of this research study

Phase one of the research study's data collection includes the following:

- Information Sheet
- Consent Form
- Family Background Questionnaire / Case History

Phase two of the research study's data collection includes the following:

- Caregiver Report CDI

- PNVT
- Language Sample

Non-Medical Ethics approval was obtained prior to the initiation of this research study. A research assistant had already consented to assist the CDI team with data collection. The tools used within this study were compiled by the SA-CDI team. The research assistant was provided with a 'Research Assistant Confidentiality Agreement' that he was required to read and sign to continue with the research process and fulfil the ethical requirements of consent provided by a research assistant. Thereafter, the completion of the first objective was the next phase within this process. This phase included two separate and simultaneous tasks. The first task within this phase involved the CDI team providing the research instruments to the research assistant and training him on the administration requirements of the vocabulary task and CDI in Sesotho. The research assistant has been part of the South African CDI team from the inception of this national research project. He has been trained by the CDI team in CDI completion, and was reported to have been vital in the completion of the two pilot studies conducted during the development of the Sesotho version of the CDI. He was subsequently trained in administering the picture-naming task, which did not form part of the two pilot studies. As was the case for the pilot studies, the research assistant assisted in identifying participants in his community for the research study, which allowed for the initiation of the first phase of data collection. See 'Research Assistant Confidentiality Agreement' in Appendix A.

3.6.2.a. Pilot Study

A pilot study is defined by Hassan, Schattner and Mazza (2006) as a 'small' study which is used to test research protocols, data collection instruments, sample recruitment strategies, and other research techniques in preparation for the full/larger study. Abu Hassan et al. (2006)

argue that a pilot study is one of the most important stages within a research study. The CDI team had already conducted pilot studies using the Sesotho CDI. Various aspects from the pilot study protocols, instruments, recruitment, and other aspects learned from the two pilot studies were implemented within the Sesotho validation and will be reported on later by their dedicated researchers. The various pilot studies fall under the national project which centres around the adaptation the MacArthur-Bates CDI into 11 languages in two phases. In the first phase, the CDI was adapted for six Southern African languages, some of which include: isiXhosa, Sesotho, Setswana, Afrikaans, Xitsonga, and South African English (SAE). As such, Whitelaw (2018) states that the pre-pilot research was conducted to inform both the infant and toddler versions of 11 South African languages of the CDI. The initial workshops in the pre-pilot phase were key in planning the focus groups and interviews which formed part of the pre-pilot. Participants involved in the pre-pilot included L1 Sesotho adults and child participants between eight and 37 months of age. The pre-pilot was necessary to gauge the types of gestures, words, and sentences that the Sesotho-speaking toddlers use, before creating a list that could be piloted (Whitelaw, 2018). The focus groups discussed word selection, addition, and deletion into the CDI. Whitelaw states that in order to obtain the most comprehensive picture of the skills presented by toddlers in the CDI, some of the participants within the pre-pilot phase were marginally older than the upper limit of the population sample selected for this study. The focus groups were tasked with the mandate of identifying culturally inappropriate items within the American CDI. These inappropriate items were removed or adapted according to the evidence from the focus groups. The second pilot study allowed for the administration of the adapted and longer preliminary CDI to the caregivers, teachers, and childcare workers at various sites such as ECD centres and primary healthcare clinics. The pilot studies implemented statistical analysis for word ceilings, among other measures within the preliminary CDI in order to facilitate more concise and culturally appropriate items used within the South African CDIs.

The piloted CDIs were consequentially administered to the caregivers of child participants who shared the targeted South African L1. The administration of these CDIs to caregivers was conducted in the second pilot study to ensure that the newly adapted and completed language version of the CDI was appropriate for the final process – validation. Assisting in the validation process of a South African vernacular CDI was the aim of this current research study.

The development of the PNVT by the SA-CDI team was also completed in the pilot study. The picture items of real-life objects have been vigorously piloted with various departmental members within this study, as well as 20 individual adults. Furthermore, the data collected from the vocabulary task has been translated from Sesotho into English by a translator to assist the researcher in analysing the data into the quantitative and qualitative aspects. There are multiple factors which were considered when creating the PNVT by the CDI team. Such factors included the data obtained by the terciles (one-third of the data) of their second pilot study. In the second pilot study, CDI data was obtained from 100 toddlers, including toddlers 28-30 months of age. The data for the words section of the CDI was ordered as a list. The words were ordered from least to most understood and produced. This was taken as an indication of word difficulty. Hereafter, the list was divided into terciles, and there was representation of each tercile on the final list of words to be included in the PNVT. To allow for later crosslinguistic comparisons, the CDI team attempted to include the same items in the picture-vocabulary tasks of all languages as far as possible. Some words were not depictable and were therefore not considered for inclusion in the PNVT. These included words such as “tomorrow”, “may”, and “in”. Other words could not be depicted clearly, for example a picture of “excited” had the potential to be labelled by the toddlers as “nervous” or “scared”. Words for inclusion were selected from several semantic domains represented in the CDI: verbs, food, clothing, toys, colours, and body parts etc. The CDI team then sourced royalty-free pictures with a white

background for each selected word. In some cases, several pictures were selected – for example, for the word "candle", a slim white candle that would require a candle holder as well as a thick red stand-alone candle were sourced. Lastly, a typicality rating task was set up for adult raters who had to indicate for each picture on a 1 to 7 Likert scale how typical the picture was of what it had to represent. The rater would see the colour photograph of the object, for example the red candle mentioned above, together with the word (so "candle" would be printed under the picture) and would then have to indicate how typical a candle this red candle is. For the Sesotho part of the study, all raters were adult speakers of Sesotho from Tweeling. Based on the responses of the raters, the CDI team selected the final word and corresponding picture items. Additionally, the following aspects were also taken into account by the SA-CDI team when developing these tools: how test items were selected to be used within this task, the forms, the instructions, and the procedures to be followed.

3.6.2.b. Phase One

Information Sheet and Consent Forms

The particulars within the information sheet were explained in terms of requirements, expectations, purpose of the study, and participant rights. The adult participants were requested to indicate whether they provided consent for the inclusion of both themselves and their child in the research study. The research assistant did the face-to-face contact data collection with the participants. Those participants who did not provide consent were excluded from the following process to comply with ethical procedures.

3.6.2.c. Phase Two

Caregiver-Report CDI

Once the participants had given consent, they were provided with the family background questionnaire and the CDI. Both the family background questionnaire and the CDI were placed as one questionnaire on the online data collection platform Qualtrics, and were administered face-to-face from a tablet by the research assistant. The data captured from these two tasks was inputted online on the tablet, streamlining the data collection and entry process into one. The adult participants completed the CDI with the assistance of the research assistant, and those participants who were sufficiently literate and/or computer literate did so independently. Thereafter, the research assistant conducted the PNVT with the child participant.

Picture-Naming Vocabulary Task (PNVT)

The PNVT required the research assistant to carry out the data collection for this instrument due to his Sesotho language proficiency. The research assistant completed the vocabulary assessment with all Sesotho-speaking child participants. The PNVT used simple, colourful images of everyday items/actions which was curated following the Sesotho pilot study held by the SA-CDI team as discussed earlier in 3.6.2.a). The PNVT was only administered to the child participant if and when he/she displayed the willingness to participate. The researcher was aware that rapport is imperative, especially when dealing with toddlers within this age range. The research assistant therefore ensured that a caregiver was present during the administration of this task with the child participant, and/or required another session in which to administer the task if the child participant presented with difficulties in the initial testing environment. The naming task and the CDI were both completed within the same seven-day period.

Due to the recommendations provided by the SA-CDI team, the data from the background questionnaire and the CDI was stored by the research assistant using Qualtrics (Qualtrics, Provo, UT). The responses were then downloaded from the Qualtrics server as an Excel

spreadsheet. Each item on the background questionnaire and CDI had its own unique back code, which is listed in a separate document termed the variable dictionary for the CDI items. The variable dictionary facilitated the representation of each Sesotho label to the English translation thereof. The researcher used this method of data entry to analyse the data within this research study. The presentation of the items within this PNVT used a face-to-face methodology which facilitates the presentation order for each child according to the semantic domains. The responses to the PNVT were written down on a predetermined record sheet by the research assistant, which was accompanied by the audio recorded (allowing verification of the fieldworker's real-time transcription).

3.7. Data Analysis

The following chapter discusses the data analysis of each tool used within the research study. The data used within this research study has been provided as secondary data from the SA-CDI team. There was no data collected specifically for the use of this research study. The data provided to the research by the SA-CDI team was used by the researcher and statistician to derive the results in this research study. The researcher was able to contact Prof. Frenette Southwood (a member of the SA-CDI team and co-supervisor for this research study) following any questions or queries regarding the data provided.

The family background questionnaire comprised of closed-ended questions, and these were analysed using descriptive statistics. Following data collection by the SA-CDI research assistant, he then cleaned the data for errors and omissions. The potential foreseen errors included omission of biographical information such as gender or inaccurate chronological age – which have been cross referenced from the case history tool used within data collection. The information from the questionnaire was tabulated by the researcher into the following

contextual background categories of the adult and child participants: child participants' activities of daily living, overall health and well-being, home and family structure, and maternal and paternal figures. All of this has been represented in the results chapter of this research study.

The PNVT comprised of closed-ended questions because the child was asked by the research assistant to state what a picture was. The responses from the PNVT were analysed using semantic analysis and descriptive statistics for the purpose of this research study. A suggestion was made by the SA-CDI team to use content analysis, which was employed onto the dataset collected by means of categorising the data from the PNVT into appropriate categories. Content analysis has been defined by Stemler (2000) as a systematic, replicable technique for compressing many words of text into fewer content categories. To assist the researcher in analysing and accurately organising the data from the PNVT into sematic categories, a researcher-appointed translator was requested to translate the child participants' answers on the naming task to SAE. Phase two of this research study applied a combined use of both descriptive and inferential statistics which was used within the data analysis of the datasets from both the CDI (using the data captured on Qualtrics) and the PNVT (tabulated on a pre-existing Excel spreadsheet).

The CDI comprised of 20 semantic categories with multiple target stimuli in each category. The CDI data was analysed using descriptive and inferential statistics once the data was inputted into Qualtrics by the research assistant. The close-ended CDI questions were analysed using descriptive statistics by utilising the raw scores and determining frequency statistics such as range, mean, and standard deviation. Inferential statistics were only implemented on the CDI data as the assumptions of Levene were not met. These statistical procedures showed that there

was an unequal variance of the populations from which different samples were drawn. As the homogeneity of variance was not met, and compounded by the 20-participant sample size, the use of the non-parametric Chi-squared test was employed as a non-parametric statistic for this research study (Marshall & Jonker, 2011).

Quantitative Research

Descriptive statistics were used in order to analyse the PNVT and the caregiver-report CDI. Descriptive statistics can be defined as the numerical procedures and/or the graphical techniques that are used to order and describe the characteristics of a given sample within a research study (Fisher & Marshall, 2009). The responses recorded from the two assessments were tallied into raw scores. The researcher computed the expressive vocabulary raw score for each child as the total number of items a child was reported to produce. The close-ended CDI questions and the PNVT were analysed by getting the raw scores and determining frequency statistics such as range, mean, and standard deviation. The raw score was divided by the total number of items on the CDI and vocabulary task accordingly, and then converted to percentages. The percentage total of words produced was employed in an ordinary least squares multiple linear regression method of analysis. The percentages were tabulated to assist in the cross-tabulation or comparisons of the results to be made without any difficulties. The study computed, tabulated, and compared the results between the caregiver-report CDI and the PNVT. By comparing the results from the two assessment tools, relationships can be determined between the expressive vocabulary skills reported by the caregivers and that elicited from the child participants. Tabulating the expressive vocabulary percentages of the PNVT and the CDI enable this research study's likelihood to accurately fulfil the descriptive analysis. The data collection by both these assessment instruments allows the research study to obtain the mean, range, and standard deviation scores of descriptive statistics. The aim of

descriptive statistics within this research study was therefore to describe the average of a spread of scores from the vocabulary task and the CDI (Fisher & Marshall, 2009). The average within the spread of scores is a measure of central tendency, which is identified as the mean, and the average difference between the mean and result is classified by Fisher and Marshall (2009) as the standard deviation. Another measure of dispersion within the descriptive analysis is range. The range is described by Fisher and Marshall (2009) as the difference between the highest and lowest results. Including range and standard deviations as measures of dispersion within this data analysis assisted in capturing the variability within the dataset (Kaur, Stoltzfus and Yellapu, 2018). The measure of central tendency and dispersion within the analysis of the PNVT and the CDI was calculated in order to add to the results for the CDI team in its goal to fulfil the validation for this instrument.

Inferential statistics was utilised when analysing the datasets from the PNVT and the CDI. Inferential statistics is defined as deducing conclusions which have been drawn from a representational sample of Sesotho L1 population in SA, and the samples' application to a more generalised Sesotho-speaking population within SA (Marshall & Jonker, 2011). The inferences made relating to sample and wider populations allowed the researcher to detect any differences in variables or within this research study, and to determine correlations between variables that are relevant to the research question (Marshall & Jonker, 2011). Employing both descriptive and inferential statistics permits not only the description of the data with regards to expressive language skills and the inferences made on receptive language skills, but also enables conclusions regarding language skills of Sesotho-speaking children to be drawn (Marshall & Jonker, 2011). These statistical procedures showed that the assumption of equal variances of the populations from which different samples are drawn were not met. As homogeneity of variance was not met, compounded by the 20-participant sample size, the assumptions of

Levene were not met (Dean & Crifo, 2013), resulting in the use of the Chi-squared test.

The Chi-squared test ($\chi 2$) is used in order to determine any significant relationship among nonnumeric variables (Luna-Romera, Martínez-Ballesteros, García-Gutiérrez & Riquelme, 2019). Nihan (2020) states that the two purposes of Chi-squared tests are: (i) to test a research study's hypothesis of any correlation among two or more criteria; and (ii) to test to what extent the collected data fits the expected data distribution.

Qualitative Research

As a qualitative research design, both content and thematic analysis were implemented in this research study when reporting on the sociocultural results from the caregiver report CDI (Stemler, 2000). Form-meaning mapping or metonymic relationships is a form of data analysis that was implemented with the PNVT to fulfil the qualitative aspects of this research design. The forefathers of metonymy (Radden & Kövecses, 1999) describe it as a "cognitive process in which one conceptual entity provides mental access to another conceptual entity within the same idealised cognitive model". Norrick (1981) states that metonymic relations are overextensions produced by children up to age two years and five months, which Norrick (1981) termed the use of "compelled metonymic overextensions". During the developmental stages, a child's vocabulary is growing exponentially; however, it is still relatively small. This forces the child to extend on already known words to manage with the increasing communicative needs experienced by the child from other communication partners (Brink, 2023). Patterns or associative relations to these overextensions can be made for the concepts referred to (e.g. causation, containment, actions, possession etc). Refer to Appendix F for a consolidated list of the overextensions as created by Brink (2022) using the foundations from Norrick (1981) and Radden & Kövecses (1999). Brink uses commonly referred to idealised

cognative models (ICMs) within this list, which assist in creating a conventionalised pattern of communication. The belief is that ICMs are a cognitive linguistic method of organising semantic knowledge (Brink, 2023). In her study of infants and toddlers speaking Afrikaans (between six months and two years of age), she found that there were four predominantly used metonymic relationships: causation, acts-major parts, category-member, and category-property (Brink, 2022).

All hard copy forms related to the data collection process were scanned, transferred to the researcher's password-protected computer, and duplicated to a secured password-protected Google Drive folder. The data was labelled appropriately using a standard, systematic filing approach while omitting any identifying information of any participants. Caregiver-child pairs were each assigned a unique code. This code was written on all paper documents and was typed into the Excel spreadsheets containing the Qualtrics data and then transferred to the PNVT data. The Qualtrics data, which is fully POPIA compliant, was collected anonymously, i.e., without participant names or surnames; telephone numbers; email, physical or postal addresses; or identity numbers. The CDI data was assigned the correct participant code in the Excel spreadsheet by identifying the child by the time stamp on the completed CDI and the child's date of birth. Qualtrics stores data in a secure manner; it is ISO 27001 certified and FedRAMP authorised, and has passed the Privacy Impact Assessment by an independent third-party assessor (Qualtrics, 2023). Data on Qualtrics is password-protected.

3.8. Reliability and Validity

3.8.1. Pilot Study

A successful CDI validation pilot study has already been completed using another vernacular

indigenous language. It had various aims: (1) to test the feasibility of the research study's protocol and identify any weaknesses; (2) to determine whether the research study's instruments are valid and appropriate tools for the target population; (3) to test the appropriateness of data collection technique (face-to-face or online); and (4) to test the data collection process – the time taken to complete the questionnaire and the subjects' willingness to participate in the study (Abu Hassan et al., 2006). Hasnida and Ghazali (2016) state that a pilot study contributes to the validity and reliability of the assessment instruments in question within a wider research study. Therefore, each of the knowledge points gained from the previous language pilot studies mentioned previously were used to guide this research study.

3.8.2. Reliability

Golafshani (2003) defines reliability as the extent to which results are consistent over time and is an accurate representation of the total population. He goes on to mention that if the results of a research study can be reproduced with a similar methodology, then the research instruments in question are considered to be reliable (Golafshani, 2003). The reliability of instruments within a study can be assessed using the test-retest method, which requires each assessment tool to be re-administered at two different times specifically to fulfil aspects of a quantitative research study (Golafshani, 2003).

Three methods of reliability were implemented within this research study to further establish reliability. (1) Internal consistency refers to the consistency of the measurement instrument, such as the PNVT and THE CDI, and queries how this set of chosen items measure the particular language skills targeted in these tools using Cronbach's alpha (Drost, 2011). (2) Instrumentation was applied within this research study as both assessment tools analysed the intended target – expressive language skills. (3) Qualitative rigour of the PNVT, the CDI,

instructions, procedure, and scoring in the chosen language was conducted by the same research assistant during its administration to improve consistency (Jackson, 2015).

3.8.3. Validity

Although the researcher may be able to prove that the research instruments in this study were repeatability and internal consistency, and are therefore reliable, the instrument itself may not be valid (Golafshani, 2003). Validity can be defined within this research study as a measurement of whether the research truly measures that which it was intended to measure, or how accurate the research results are (Golafshani, 2003). The research study aimed to achieve all consequential methods of validity which include construct, face/content, and criterion validity.

Golafshani (2003) describes validity in quantitative research design as construct validity. The 'construct' is the inceptive hypothesis or research question that determines which data will be gathered and the method of data collection (Golafshani, 2003). Golafshani (2003) also advocates that quantitative research actively prompts the interaction between construct within the research study and data in order to validate their investigation. This is usually done by the application of a test or other process. Therefore, the hypothesis within this research study – a picture-naming assessment can be used to validate Sesotho CDI within South Africa – was tested by the use of both the CDI and vocabulary test by comparing the language skills recorded within both assessments.

Content validity measures the extent to which a research instrument measures the construct or hypothesis of a research study, which help to prompt confidence to the readers and researchers about these assessment instruments (Yaghmaie, 2003). It can be used to measure the

appropriate sampling of the content within an instrument such as a CDI (Yaghmaie, 2003). Yaghmaie (2003) says that content validity is representative of the 'content'. Therefore, content validity of research instruments depends on the adequacy of the content that is sampled within a research study. In this research study, that would be the expressive receptive language skills of child participants in Sesotho. Yaghmaie (2003) argues that content validity refers to the degree to which research instruments – CDI and PNVT – measure the research study's intended content of receptive and expressive language skills from the child participants. As an SLP can be considered one of the subject matter experts on receptive and expressive language, these two assessment tools do indeed measure these language skills.

Criterion validity is also known as concrete validity, which is classified as the extent to which a measure is related to an outcome (Taherdoost, 2016). In other words, it measures how well one measure, such as the caregiver-report CDI, predicts an outcome for another measure, as in the results from the PNVT. Criterion validity between the CDI and how well it predicted the outcomes for the PNVT has been reported on in the results and discussion chapter of this research study. A research study that implements this type of validity is useful within the CDI context as it can be used for predicting the performance of children in SA being assessed using South African language CDIs in the future (Taherdoost, 2016). Furthermore, criterion validity encompasses concurrent validity (Taherdoost, 2016) which is appropriate within the measurement of validity in the CDI context of this research study (Pérez-Pereira & Resches, 2011). Concurrent validity refers to evidence/results that can be gathered in order to endorse the use of a test, such as the picture-naming task, for predicting dissimilar outcomes (Pérez-Pereira & Resches, 2011). It refers to the extent to which the results of the previously established measurement – the CDI – correspond to the results of the PNVT measuring the same construct (Pérez -Pereira & Resches, 2011).

3.9. Ethical Considerations

This research study aimed to fulfil the ethical principles stated by the University of the Witwatersrand Human Research Ethics Committee (Non-Medical), Faculty of Humanities.

Below is a list of ethical considerations, which were met by this research study:

- Informed Consent – Initial letters of permission were submitted to the caregivers. All participants were provided with the opportunity to choose whether they would like to participate or not. The consent entailed an informed decision to participate. The researcher and research assistant ensured informed consent by providing information letters attached to the consent forms, in the potential participants' L1, Sesotho. The content of the information form has already been discussed earlier in the methodology chapter.
- Anonymity and Right to Withdrawal – Each participant was provided with the knowledge that their identity would not be disclosed during the reporting of the results of this research study. All participants were informed of their freedom to choose, at any point, to no longer participate in this study without having to explain their reasons for withdrawing. Their withdrawal would have no negative consequences on the participants in any manner.
- Privacy – The participants had the right to determine whether or not information was disclosed to the researcher and the SA-CDI team. This right was upheld by all parties.
- Confidentiality – Through non-disclosure of any participant's information to any party and using password-protected standard systematic filing approaches.
- Beneficence – The research study acted in the benefit of each participant. Beneficence was ensured by protecting participant rights, ensuring no harm to participants, and informing them that there was no direct individual benefits or monetary compensation for their participation. The participating dyads received a supermarket voucher of R400 to thank

them for their time. The research assistant provided this to each of the caregivers once the entire dataset from the adult and child participant was completed.

- Non-maleficence – No participant was harmed in any way as the researcher ensured that the participants were comfortable throughout the study. No harm was inflicted on any participant as a consequence of participating in this research study.

3.10. Summary

The instruments used to obtain targeted responses in this research study included: (i) Family Questionnaire; (ii) CDI; and (iii) PNVT. The quantitative aspect of the study was addressed by using descriptive and inferential statistics. The descriptive statistics utilised for analysis were frequencies, mean, range, and standard deviation The inferential statistics used in this study were non-parametric statistics – Chi-squared test. This non-parametric statistic was used because the researcher wanted to determine whether there were any significant relationships between the results from the PNVT and the CDI.

The qualitative aspect of this research employed both thematic and content analysis in order to analyse the sociocultural factors reported on by the CDI. Additionally, this study entailed an analysis of the form-meaning mapping present in the responses on the PNVT, which also fulfils the qualitative research design. This analysis allows the researcher to note any patterns of correspondence between elements of form (language) and any elements of meaning intended by the child participants in their results from the PNVT.

A total of 10 child and 10 adult participants were included in this research study. All 20 participants met the inclusion and exclusion criteria set out by the researcher and the CDI team. Fortunately, no attrition occurred during this research study as all participants who were

initially selected completed all measures of assessment within the duration of the allocated data collection time period.

Chapter 4: Results

This chapter aims to present the findings obtained from the data collection instruments which were analysed using quantitative and qualitative methods. The study aimed to reply to the research question: Can the results obtained by the South African Sesotho PNVT be compared to the results derived from the toddler version of the Sesotho CDI? The primary objective of this research study was to then compare the results of a child's language skills using both the Sesotho CDI and Sesotho PNVT. The primary objective is further categorised into four research objectives discussed in this chapter.

Objective 1: Contextual Background of Adult and Child Participants

Responses of the caregiver report questionnaire/CDI were analysed using descriptive statistics. The following results were the adult participant responses on the CDI.

4.1. Child Participants' Activities of Daily Living

Responses from caregivers revealed that mothers (n=6) were primary caregivers of the toddler participants. The children (n=8) attended a preschool or crèche environment where they were exposed to Sesotho. Additionally, the children (n=6) spent an average of five to eight hours per weekday at crèche. Lastly, (n=9) of toddlers were not exposed to another language at home other than Sesotho.

4.2. Child Participants' Overall Health and Well-Being

As reported by the adult participants in the CDI, all toddler participants were born full term; without any developmental health challenges such as development disabilities (Autism

Spectrum Disorder, Foetal Alcohol Syndrome etc) and hearing and visual difficulties.

4.3. Child Participants' Home and Family

Responses from the caregivers revealed that the toddlers (n=4) were living with their grandmothers as their primary caregiver. Additionally, there were more children than adults living in the homes of caregivers. The caregivers (n=6) lived in RDP houses whereas the remainder (n=4) lived in informal dwellings. Furthermore, the (n=4) adult participants who lived in informal dwellings survived on an income of R1417 a month. This is the recorded monthly income of the upper-bound poverty line in SA.

4.4. Child Participants' Mothers

The age range of the mothers was 19-24 years old. Additionally, the mothers (n=5) did not complete any formal schooling beyond Grade 9. About half the mothers (n=5) reported being unemployed. Lastly, more than half the mothers (n=7) reported not living with the father of the children, and that they were also not receiving any child support from the fathers.

4.5. Child Participants' Fathers

The fathers' (n=6) ages ranged from 20-29 years old, and the rest (n=4) were older than 30 years old. Just under half of the fathers (n=4) completed Grade 9, two of fathers matriculated from high school, while four fathers obtained qualifications post-high school. Half of the fathers (n=5) reported being unemployed.

Objective 2: Expressive Semantic Language Skills from the Communicative Development Inventory (CDI)

Responses below are recorded from the caregivers of child participants on the CDIs. The CDI provided information on what the caregivers predicted their children's expressive vocabulary abilities were in Sesotho. The responses were analysed using descriptive statistics in this research study. The following table (Table 4.1) show the variability statistics for the current expressive semantic language skills reported by the adult participants on the Sesotho CDI.

Table 4.1: Variability statistics regarding the semantic categories reported on in the CDI by adult participants (N=10)

Semantic Category	Maximum Score	Mean (μ)	Range (-)	Standard Deviation (σ)	Percentage (%)
Places	14	7.30	1 – 14	4.95	36.50%
Verbs	107	63.30	22 – 107	24.32	45.87%
Number Concepts	10	1.90	0 – 10	3.21	15.83%
Animals	14	9.40	3 – 14	3.89	32.41%
Body Parts	15	9.70	6 – 15	2.91	37.31%
Conjunctions	3	0.80	0 – 3	0.92	16.00%
Adjectives	44	18.30	4 – 44	13.83	31.02%
Food and Drink	43	30.20	21 – 43	9.11	44.77%
Furniture	18	11.80	6 – 18	4.08	44,70%
Games and Routines	24	17.50	7 – 24	4.70	53.03%
Household Items	22	15.70	7 – 22	5.81	50.65%
Outside	11	7.40	2 – 11	2.46	37.00%
People and Things	14	6.00	1 – 14	4.27	35.29%
People	12	6.10	0 – 12	3.76	29.05%
Clothes	9	6.10	1 – 9	2.28	46.92%
Questions	7	3.60	0 – 7	2.32	51.43%
Sounds	14	9.60	3 – 14	3.20	56.47%
Time	3	1.00	0 – 3	1.33	16.67%
Toys	7	4.90	1 – 7	1.97	35.00%
Vehicles	9	4.80	1 – 9	2.62	43.64%
Composite Score	400	40.94	24 – 67	14.65	-

The results in Table 4.1 derived by the researcher using variability statistics show that approximately 50% of the caregivers believed that their toddlers would be able to name vocabulary related to the following semantic categories: games and routines, household items, questions, and sounds. Interestingly, less than 20% of the caregivers thought that their Sesotho-speaking toddlers would struggle to say words related to conjunctions and time and number concepts.

Figure 2: CDI raw scores for each child participant for each consolidated semantic category

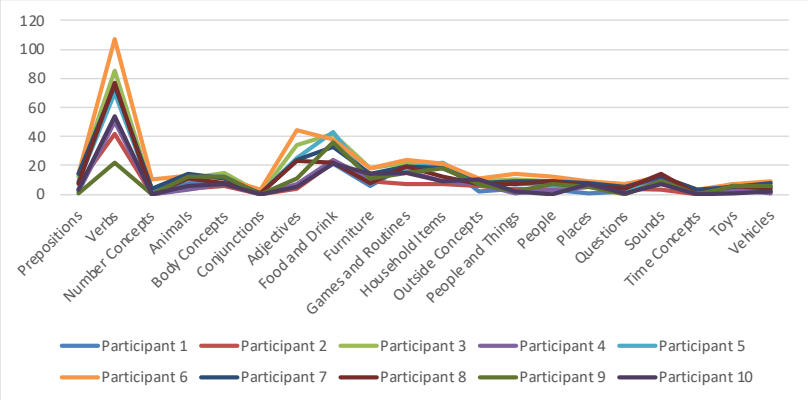


Figure 2 shows that toddler participants were predicted to have larger expressive vocabulary in Sesotho in the following semantic categories: verbs, food and drinks, adjectives, household items, and games and routines.

The results presented in Table 4.1 and Figure 2 show a general trend of caregivers not thinking that their children would be able to name lexical items in a variety of semantic categories in Sesotho.

Objective 3: Expressive Semantic Language Skills from the PNVT

The child responses to the PNVT were analysed using descriptive statistics within this research study. The following figures show descriptive and variability statistics conducted by the researcher to depict the child participants' expressive Sesotho semantic language skills using the PNVT.

Figure 3: Number of correct responses from the child participants on the PNVT (N=10)

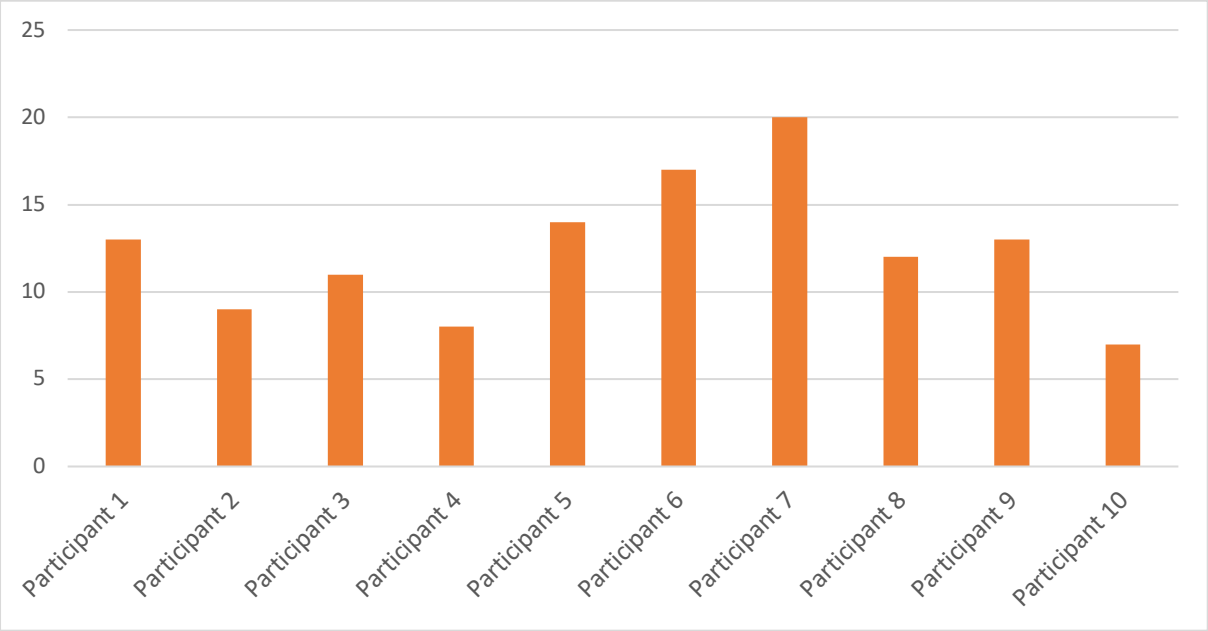


Figure 3 shows that six (60%) children were able to get 12 (50%) or more correct items on the PNVT.

Figure 4: Stacked column graph related to the child participant responses on the PNVT (N=24)

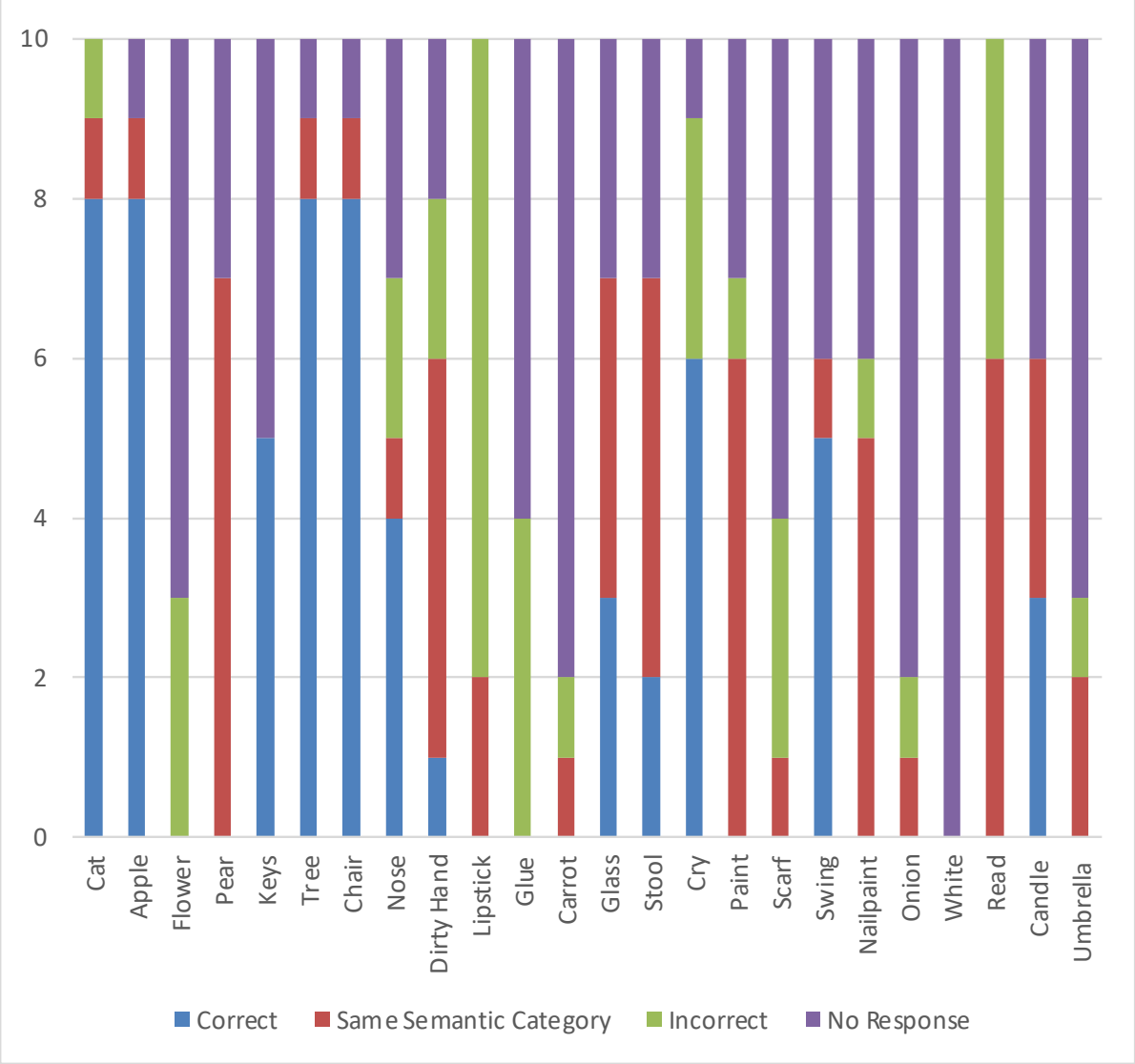


Figure 4 shows that the toddlers were able to identify and name most of the target items correctly; however, the Sesotho-speaking toddlers used semantically-related lexical items to identify an item in the PNVT. It seems that most of the toddlers were able to get cat, apple, tree, chair, and cry correct. Words such as flower, glue, carrot, scarf, onion, white, and umbrella were words that the toddlers struggled to produce. In fact, two PNVT items, flower and white, were the only targets that all child participants were unable to provide any response to.

The results from Figure 4 were collated by the researcher. They highlight the lexical items which were easily named by the Sesotho-speaking toddlers in the PNVT: indicating that the child participants named and scored 50% or higher on the semantic categories of food and drink, outside items and furniture.

Metonymic relationships were used by the researcher as a method of analysing the data from a qualitative paradigm. The metonymic relationships refer to the patterns seen in a child's cognitive ability to overgeneralise lexical items into various themes – known as metonymic relationships. Refer to Appendix G for a table showing each child participant's individual responses.

Figure 5: Child participants' responses on the PNVT using metonymic relationships (N=10)

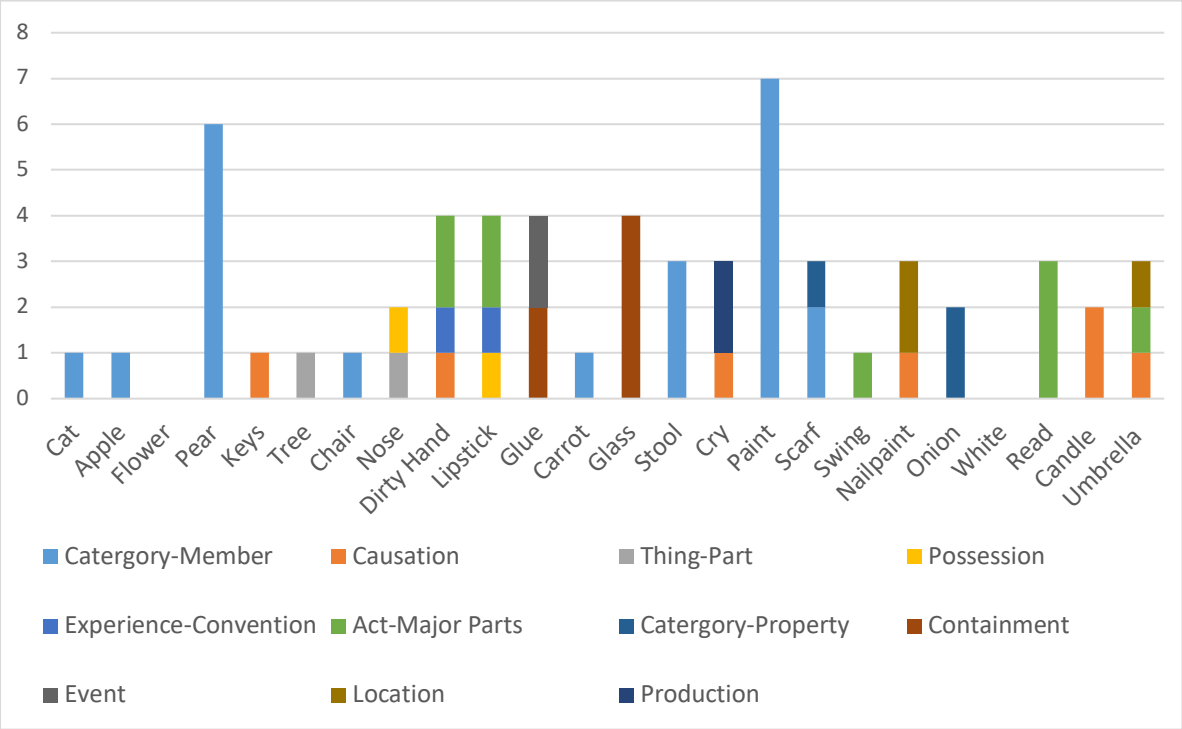


Figure 5 shows that a variety of metonymic relationships (11) were used by the child participants to name each item. The three most frequently used metonymic relationships applied by child participants were: acts-major parts, causation, and category-member; and the

least frequently used were possession and experience-convention.

Refer to Appendix G for examples of the aforementioned metonymic relationships used by the child participants for each target item on the PNVT.

Objective 4: To determine whether there was a significant correlation between the adult responses on the CDI and child participants on the PNVT

The last objective of this research study was to determine whether there is a relationship between what adult caregivers (CDI) predicted their children would name and what their children were able to name on the PNVT.

Table 4.2: Frequency statistics for the total raw scores for each caregiver-child dyad from the CDI and PNVT

	Maximum CDI Score	Adult participant CDI Scores	Predicted percentage correct (%)	Maximum PNVT Score	Child Participant PNVT Scores	Percentage correct (%)
Dyad 1	575	178	31%	24	13	62%
Dyad 2	575	137	24%	24	9	43%
Dyad 3	575	331	58%	24	11	52%
Dyad 4	575	161	28%	24	8	38%
Dyad 5	575	276	48%	24	14	67%
Dyad 6	575	387	67%	24	17	81%
Dyad 7	575	294	51%	24	20	95%
Dyad 8	575	246	43%	24	12	57%
Dyad 9	575	180	31%	24	13	62%
Dyad 10	575	164	29%	24	7	33%
Total Score	**575**	**575**	**41%**	**24**	**24**	**59%**

Table 4.2 shows that all but one of the adult participants on the CDI reported the expressive vocabulary skills of the child participant lower than their language skills recorded from the child participant in the PNVT.

Descriptive Statistics

The majority of the scores achieved by the child participants in the PNVT are above 50%, whereas the majority of the scores given by the adult participants on their child's expressive vocabulary were below 50%. There appeared to be a mismatch between what caregivers thought about their children's expressive vocabulary abilities and their children's actual abilities.

Inferential Statistics

The assumptions of Levene were not met and compounded with the 20-participant sample size, the use of the Chi-squared test was employed as a non-parametric statistic for this research study (Marshall & Jonker, 2011). Significance was established at the two tailed level (p=0.05)

Table 4.3: Non-parametric statistics showing Spearman's Rho correlation coefficient (r) for each semantic category in the CDI and PNVT

	Places	Verb	Number Concepts	Animals	Body Concepts	Conjunction	Adjectives	Food and Drink	Furniture	Games and Routines	Household Items	Outside Items	People and Things	People	Places	Question Words	Sounds	Time Concepts	Toys	Vehicles	Picture-Naming Task
Adjective	.713	.782**	.847**	.750*	.798**	.784**	1.000	.823**	-	.750*	.697*	-	.815**	.864**	.759*	-	-	.826**	.842**	.752*	.638*
Animals	.632*	-	.749*	1.000	.719*	.657*	.750*	-	-	-	.637*	-	.706*	.775**	-	-	-	.775**	.713*	.908**	.902**
Body Parts	-	-	-	.719*	1.000	-	.798**	.806**	-	-	.743*	-	-	.635*		-	-	-	.774**	.749*	-
Conjunctions	.799**	.844**	.747*	.657*	-	1.000	.784**	-	-	.910**	.761*	-	.907**	.742*	-	.649*	.700*	.730*	.719*	.700*	.716*
Food and Drink	-	-	.694*	-	.806**	-	.823**	1.000	-	-	-	-	-	-	-	-	-	.692*	.766**	-	-
Furniture	-	-	.710*	-	-	-	-	-	1.000	-	-	.909**	-	-	.829**	-	-	.667*	-	-	-
Games and Routines	.644*	.817**	.670*	-	-	.910**	.750*	-	-	1.000	.692*	-	.795**	.688*	-	-	.775**	-	-	.646*	-
Household Items	-	-	-	.637*	.743*	.761*	.697*	-	-	.692*	1.000	-	.644*	-	-	-	-	-	.788**	.676*	.718*
Number Concepts	.886**	.751*	1.000	.749*	-	.747*	.847**	.694*	.710*	.670*	-	.638*	.877**	.735*	.873**	.748*	-	.992**	-	.792**	.678*
Outside Items	-	.657*	.638*	-	-	-	-	-	.909**	0.359	-	1.000	-	-	.882**	-	-	-	-	-	-
People	.706*	.715*	.735*	.775**	.635*	.742*	.864**	-	-	.688*	-	-	.798**	1.000	.652*	.715*	.740*	.705*	.756*	.796**	.673*
People and Things	.933**	.857**	.877**	.706*	-	.907**	.815**	-	-	.795**	.644*	-	1.000	.798**	.759*	.804**	-	.856**	.683*	.773**	.668*
Places	1.000	.848**	.886**	.632*	-	.799**	.713*	-	-	.644*	-	-	.933**	.706*	.832**	.865**	-	.886**	-	-	-
Places	.832**	.827**	.873**	-	-	-	.759*	-	.829**	-	-	.882**	.759*	.652*	1.000	.685*	-	.855**	-	-	-
Question Words	.865**	.765*	.748*	-	-	.649*	-	-	-	-	-	-	.804**	.715*	.685*	1.000	-	.708*	-	-	-
Sounds	-	.673*	-	-	-	.700*	-	-	-	.775**	-	-	-	.740*	-	-	1.000	-	-	-	-
Time Concept	.886**	.716*	.992**	.775**	-	.730*	.826**	.692*	.667*	-	-	-	.856**	.705*	.855**	.708*	-	1.000	-	.778**	.718*
Toys	-	-	-	.713*	.774**	.719*	.842**	.766**	-	-	.788**	-	.683*	.756*	-	-	-	-	1.000	.678*	.686*
Vehicles	-	-	.792**	.908**	.749*	.700*	.752*	-	-	.646*	.676*	-	.773**	.796**	-	-	-	.778**	.678*	1.000	.834**
Verbs	.848**	1.000	.751*	-	-	.844**	.782**	-	-	.817**	-	.657*	.857**	.715*	.827**	.765*	.673*	.716*	-	-	-
Total CDI	-	-	.678*	.902**		.716*	.638*				.718*		.668*	.673*				.718*	.686*	.834**	.705*

**. 2-Tailed Correlation is highly significant at the 0.01 level = blue fill

*. 2-Tailed Correlation is significant at the 0.05 level = orange fill

In Table 4.3, the results by the statistician in this research study are provided as the Spearman's Rho correlation coefficient. This showed that there was a significant correlation between the total composite score of the CDI and the total composite score of the PNVT (r=0.705). The results show that parents are able to say what vocabulary their children are able to name. This meets the requirement for concurrent and criterion validity in this research study.

Summary of Results

Objective One

The caregiver report CDI highlighted various factors regarding the child participants' activities of daily living. It was reported that in most households (n=6), mothers were the primary caregivers of the toddler participants. More children were reported to live in these maternal-headed homes than adults. Most child participants in this research study (n=8) attended a preschool or crèche environment where they were exposed to Sesotho.

As reported by the adult participants in the CDI, all toddler participants presented with no overall health and well-being difficulties in the past or currently. A total of four adult participants who lived in informal dwellings survived on an income of R1417 a month – the recorded monthly income of the upper-bound poverty line in SA. Mothers were between 19 and 24 years of age at the child participant's birth, five of whom did not complete any formal schooling beyond Grade 9. This is contrary to the fathers who were between 20 and 29 years of age at the child participant's birth, four of whom had completed their schooling up until Grade 9. Half of the mothers and fathers within this study were unemployed. The majority of the mothers were not living with or receiving support from the father of the children.

Objective Two

The variability and descriptive statistics run on the results presented for the CDI show a general trend of caregivers not thinking that their children would be able to name lexical items in a variety of semantic categories in Sesotho.

Objective Three

The majority of the child participants (60%) were able to get 50% or more correct items on the PNVT. Their scores were highest in semantic categories related to content: food and drink, outside items, and furniture. Where the toddlers were unable to name the target item correctly, a variety of 11 metonymic relationships were used in an over legalisation attempt to name the target item. The most commonly used metonymic relationships applied by the Sesotho child participants were acts-major parts, causation and category-member; and the least was possession and experience-convention.

Objective Four

Descriptive statistics within this research study showed that the child participants in the PNVT scored above 50%. The mismatch occurs with the majority of scores given by the adult participants on their child's expressive vocabulary being below 50%. The inferential statistics run on the results from the cohort sample of this study indicated that there exists a relationship between the Sesotho CDI and the Sesotho PNVT created by the SA-CDI team.

The primary objective of this research study was to compare the results of a child's language skills using the CDI and the PNVT. In doing so, this chapter has taken the reader through four objectives which assist in the comparison of the results from these two assessment instruments. The results from this research study are discussed in detail in the following chapter.

Chapter 5: Discussion

The primary aim of this research study was to compare the scores on the South African Sesotho CDI with those on the PNVT. This comparison would assist in describing the Sesotho expressive semantic skills of the participants included in this study. The results obtained supported the hypothesis that there are similarities between the Sesotho CDI and the PNVT. Moreover, non-parametric statistics revealed a significant correlation between these two South African assessment tools. Although this research study proved that, from the sample size, both assessments produced the same results, the noteworthiness belongs to the larger intention for this and other research studies in the field of language and language development norms – to assist a larger team in SA to address the concerns of culturally and contextually inappropriate assessment methods. The results from this study are discussed according to the research aims.

1. Describe the demographic factors which may have influenced child participants' communication development.
2. Describe the child participants' expressive semantic language abilities using the CDI.
3. Describe the child participants' expressive semantic language abilities using the PNVT.
4. Determine whether there was a significant correlation between the adult responses on the CDI and child participants on the PNVT.

5.1. Objective One: The Contextual Factors

Activities of Daily Living

The CDI reported that eight children attended a preschool or crèche environment where they were exposed to Sesotho. Additionally, nine of the toddlers were not exposed to another language at home other than Sesotho. These factors are supported by the sequential systems of Bronfenbrenner's Bioecological Systems Theory. Eccles and Roeser (2011) stated that the

school and home context, which make up the child's micro and mesosystem, have the largest impact on a child's overall development. This research study focuses on the Sesotho language, and in turn, its culture (Mokuoane & Moeketsi, 2018). The Sesotho language and its cultural practices are modelled and taught through the use of the indigenous language in such ECD centres (Ramsammy, 2019). The CDI results indicated that eight of the child participants spent five to eight hours at preschool per day. This is aligned with the reports regarding South African children in ECD centres. The research shows that 3.4 million South African children aged 0 to 4 years attended ECD programmes, of which 2.5 million attended a crèche or nursery school (Statistics South Africa, 2022). The Sesotho community has been known to take collective responsibility for a child's safety and well-being, which impacts one's overall development (Ramsammy, 2019). This links to the above statement where the exposure and the use of family and community networks facilitate and support ECD. The collective responsibility for children in the Sesotho community can be linked to the reports from the CDI on the number of extended family living in the same household as the child participant. It is, however, understood that living in the same dwelling does not always necessarily equate to taking responsibility for a child. The discussion around ECD cannot be complete without further understanding of language acquisition.

Overall Health, Well-Being, and Individual Factors

All 10 dyads included child participants between the ages of 28 and 30 months. The age range of the children was in the critical age of ECD. According to Owens (2014), the years between birth and preschool (0 to 6 years of age) is the critical period for ECD. The caregivers indicated that there were no health challenges that would have impacted the toddlers' language development (O'Conner et al., 2021). From this information, the researcher can infer that all

children were not at risk of developing language deficits that could impact their vocabulary/semantic development based on organic causes.

Home and Family

The results from the CDI showed that all of the child participants live in a maternal-headed household where the primary caregivers were either their mother (60%) or their grandmother (40%). This is in alignment with the consensus completed in 2022 which reported that 42% of South African households are female-headed (Statistics South Africa, 2022). The microsystem factor highlighted in this paragraph is the caregiver-child interaction, particularly the caregiver as a maternal figure in this research study. All child participants living in maternal-headed households are in alignment with the daily cultural practices of primary maternal figures in SA and have been reported to promote and support ECD (Mokuoane & Moeketsi, 2018). Van Heerden et al. (2017) reported on the caregiver-child interaction in SA, where maternal figures sleep next to the children in the household and carry children on their back. Maternal figures expose their child to a social network of family within their community (van Heerden et al., 2017). As suggested by the results from the CDI, 90% of the caregiver-child interactions are from female adult caregivers. The background questionnaire indicated that child participants lived in homes that comprised of more children than adults, and primarily no parental figures in the household (70%). These results are similar to the findings by Statistics South Africa which reported that an average nuclear household will have 2.3 children (Statistics South Africa, 2022). It can also be added that the Sesotho culture facilitates the caregiver-child interaction by increasing time spent with the child (Mokuoane & Moeketsi, 2018). The increase in time spent can be linked to the cultural practices of sleeping next to the child and carrying the child on their back. Using family and community networks also facilitates time spent by maternal figures with the child, which facilitates language development, as almost half (49.6%)

of SA's community households were led by maternal figures. The researcher can infer that the Sesotho maternal figure has the most impact on a child's language development.

A total of 40% of the research participants live in informal dwellings, whereas 60% live in formal RDP housing. This is supported by reports on the subsidised housing programme which has been set up across SA to allow beneficiaries to acquire formal housing. RDP housing is more affordable than acquiring a bond on a property as it is built and subsidised by the South African government. This region of Tweeling and the township of Mafahlaneng was the beneficiary of 100 hectares of land used to build these government-subsidised homes in 2014 to improve the standard of living of the township residents (NSVT Consultants, 2014). However, this was only for those who could afford the subsidised homes.

Caregivers' Information

The results from the CDI showed that half the mothers in this research study were unemployed and did not finish schooling up to Grade 12. These findings are supported by Statistics South Africa (2022). It is reported that within the South African context, 49.6% of the households were led by maternal figures (Statistics South Africa, 2022). However, the statistics show that a total of 55% of the South African population who did not complete their schooling are in fact women (Farrell, 2021). Statistics South Africa (2022) reported a higher percentage of females across all races who have no schooling and/or have not completed primary school level schooling. This highlights the two main microsystem sociocultural factors in SA which are interconnected: maternal level of education and SES. Hoff (2003) highlights that SES and the consequential parent-child interactions affect children's expressive vocabulary and mediated the length of parental utterances (Libertus et al., 2015). This is aligned to this research study's findings as the CDI indicated that 70% of the mothers did not receive any financial support

from the fathers of the child participants. When compared to the mothers of the child participants, the majority of fathers were older and had an overall higher level of education. Therefore, the following understanding can be drawn from the data: from the known current employment status of fathers – the child participants' households cannot always rely on income from their fathers to assist. This is because the unemployed fathers are most likely living on a South African social security agency social relief or distress grant – commonly known as the unemployment grant (R350 per month). SES has been reported by Southwood et al. (2021) as one of the leading microsystem sociocultural factors within the context of SA. The average income of the maternal-led households was below R5000 which was used to support the majority of families who had more than three individuals living together in one dwelling. Furthermore, 40% of adult participants who lived in informal dwellings recorded that they live with less than R1417 a month. This is the recorded monthly income of the upper-bound poverty line in SA The links to poverty and child development are discussed by Black et al. (2017). They state that 43% of children worldwide, who are under five years old, do not reach their development potential due to factors associated with living in poverty. SA has reported an average household size of 3.5, which correlates to the reports from the background questionnaire. Therefore, 40% of these households living in poverty need to support the needs of three to four people on average who are reported to be a combination of nuclear and non-nuclear family members. As discussed in the literature review, competition in the household for the attention of primary caregivers impacts a child's vocabulary development. Although 60% of the participants live above the upper-bound poverty line, the research site is a rural settlement with low SES. These two sociocultural factors (rural communities with a low SES) are risk factors for poor language development (Hoff, 2003). The literature review reported on the effects of a low SES in rural areas on language development and the child's functioning in everyday society – such as organising everyday events or engaging in social and physical

environments (Flores, 2004). It can therefore be said that maternal levels of education and SES play a role in a child's language development.

The literature review highlights the impact of the stress experienced in contexts such as SA and the population targeted within this research study. The chronic stress experienced by communities to combat factors associated with living in rural and low SES contexts such as Tweeling cannot be underestimated (O'Connor et al., 2021). It has been reported that the stress experienced by individuals, such as the research participants who live in rural and low SES communities, impact memory and executive functioning of a child. Both executive functioning and memory are foundational skills which directly impact language development (Farah et al., 2006). Furthermore, any positive impact on language development by South African Sesotho-speaking maternal figures discussed earlier is diminished by the negative impacts of stress. The impacts of stress result in a decline in the caregivers' capacity to provide an environment that is stimulating to a child's language development in the early years (Der Nederlanden et al., 2023).

Despite the fact that this section highlights many sociocultural factors which impact language development and results obtained from the participants, the exact impact of the sociocultural factors on the expressive language skills recorded in this research study cannot be fully reported on without further research and data collection.

5.2. Objective Two: CDI Expressive Semantic Language Abilities

Predictions Made by Adult Participants

According to the responses given for the CDI, there was a general trend of caregivers not thinking that their children would be able to know the words. These findings are similar to a study done by Libertus et al. (2015) which involved the validation of the parental report in relation to vocabulary size in toddlers and children. Libertus et al. (2015) found that caregivers of English-speaking children underestimated the child's expressive semantic knowledge. Roberts et al. (1999) looked at the child and family factors that affect individual differences in language development of African American children from low SES backgrounds (Roberts et al., 1999). These child participants were between 18 and 30 months of age, which overlaps the age range within this research study. Their findings highlighted the caregivers' underestimation of the noticeable skills of child participants when caregiver-child dyads come from low SES backgrounds. Their study also found that there was a high proportion of parents reporting toddlers' vocabulary and grammatical development as being at or below the American CDI norms (Roberts et al., 1999).

Vocabulary

Approximately 50% of the adult caregivers predicted that their toddlers would be able to say more functional words that are classed into content vocabulary. These findings are similar to the literature from Owens (2014) who states that the use of such functional communication can be attributed to toddlers' vocabulary consisting predominantly of concrete lexical items such as nouns and verbs (Owens, 2014; Ogura et al., 2006). Being able to request water (food and drink) indicates that the water may be finished (adjective) or that the child would like to drink their water from a bottle (household items) or wash their hands or bath (games and routines). All of this forms part of a child's ability to communicate their basic wants and needs (Owens,

2014). The use of abstract language by toddlers is highlighted by Choi et al. (2017) as occurring only after more concrete and functional vocabulary. Vygotsky and Cole (1978) explain that a child's language, and particularly vocabulary development, depends on interaction with community and tools provided to them by their culture – in the case of this research, the Sesotho community and culture.

The parts of the Sesotho language reported on in this study are the rich noun classes (De Vos & Mitchley, 2012), which is correlated to the language skills reported on by Owens (2014). Together with question words and verbs are categories that adult participants highlighted to be areas of strength for the child participants in the Sesotho CDI (Rants'o, 2009 & Demuth, 1990). It is noted that verbs and other concrete lexical items which assist in functional communication are developed earlier in toddlers than abstract vocabulary (Owens, 2014; Ogura et al., 2006).

Predictions on Vocabulary by Adult Participants

When the average was calculated for the vocabulary the caregivers predicted their toddlers say, it was found that the toddlers would know about 50% or less of the items in each semantic category. Additionally, the adult participants predicted that each child participant would be able to name at least one item in every sematic category presented in the CDI. Interestingly, one in three of the adult participants reported that their child participants' language skills would not allow them to score higher than 30% on the CDI. However, it is known that caregivers under or overestimate their children's vocabulary skills (Libertus et al., 2015).

5.3. Objective Three: PNVT Expressive Language Ability

The data collected from the PNVT shows that 60% of the child participants scored above 50% which was consolidated into three of the top semantic categories – food and drink, outside items, and furniture. The results revealed that the toddlers' language skills of adjectives and

clothing semantic categories were lower compared to the other semantic categories. The higher performance of the child participants was in the three abovementioned categories (food and drink, outside items, and furniture).

This is similar to the information provided by Owens et al. which states that acquisition of vocabulary development comprises of functional lexical items / content words (Owens, 2014; Levey, 2019; and Ogura et al., 2006). The content words are initially noun-based (Ogura et al., 2006). Most of the items in these three semantic categories are nouns, further supporting De Vos and Mitchley's (2012) theory of the development of rich noun classes in Sesotho. This link can be made to the type of language used in and around the child from various maternal figures and communication partners in the micro and mesosystem. The development of language related to one's exposure within all environments is argued by Vygotsky's Sociocultural Theory of Cognitive Development and Bronfenbrenner's Bioecological Systems Theory (Vygotsky & Cole, 1978; Guy-Evans, 2024).

Vocabulary Difficulties on the PNVT

The PNVT showed that the child participants had difficulty with their expressive semantic skills to name the target items such as flower, glue, carrot, scarf, onion, white, and umbrella. The difficulties experienced by the toddlers in the PNVT regarding the previously stated target items is supported by the research. Research from Oruga et al. shows that vocabulary based in nouns and verbs is acquired by toddlers before any other lexical items such as adjectives (Ogura et al., 2006; Owens, 2014; and Levey, 2019).

Additionally, the target items in the PNVT where toddlers presented with difficulties in naming may not be items used within the toddlers' functional language. Consequentially, as these

lexical items may not form part of the toddlers' functional vocabulary, they may not be exposed to their use within their environment when communicating in the home, school, and community environment. The research supports the theory that a child cannot acquire vocabulary if they are not exposed to that language in their various environmental systems and socialisation (Vygotsky & Cole, 1978; Guy-Evans, 2024). Ramsammy (2019) supports this narrative as he found that the stimulation in the home environment impacts a child's developmental areas, which include cognitive, socio-emotional, motor, and language (Eccles & Roeser, 2011).

Two PNVT items – flower and white – were the only targets that all child participants were unable to provide any response to. Therefore, the qualitative aspect of metonymy or form-meaning mapping could not be reported on. However, caregivers reported that all child participants would be able to name at least one item in each semantic category, which is not seen in the PNVT in these two target items. It has been stated that caregivers under or overestimate their children's vocabulary skills (Libertus et al., 2015). However, Roberts et al. (1999) presented similar findings as they argue that caregivers are more likely to underestimate their children's language abilities when coming from a low SES background (Roberts et al., 1999).

Metonymic Relationships

A total of 59 metonymic relationships/overextensions were used in the PNVT by the child participants. The supporting theory and research for the use of ICMs is discussed below. Owens (2014) states that overall communication includes speech and language as well as paralinguistic codes, non-linguistic, and metalinguistic cues. The evaluation of the message and how it was transmitted during one's communication can be seen in the toddlers' attempt to use various metonymic relationships/overgeneralisations to describe/name items in the PNVT as an

alternative to the target word. These relationships provide a pattern by which a child extends on already known words to manage the increasing communicative needs. In the case of the PNVT, the increasing communicative need is to identify the intended target stimuli presented to the toddler. It is understood that the use of these metonymic relations occurs as a coping strategy during the developmental stages (Brink, 2023). This occurs as the child's vocabulary is growing exponentially, but it is still relatively small for some environmental and communicative needs (Brink, 2023).

The PNVT showed that the L1 Sesotho-speaking child participants predominantly used three of the ICMs as a coping mechanism to name the target stimuli Category-Member (used 22 times), Acts-Major Parts (used nine times), and Causation (used seven times). This is similar to the findings conducted by Brink (2023) which found that their participants used all three of these ICMs most commonly in addition to Category-Property. Her study looked at the metonymic relations used by 18 Afrikaans-speaking toddlers (between six months and two years). This indicates that the Sesotho child's ability to access and make semantic association of a part to its larger group or semantic category is higher. Secondly, the child's ability to access semantic knowledge regarding an action seen in their language environment to the manner, object, or result of the action is much higher.

5.4. Objective Four: Determining the Relationship Between the CDI and the PNVT

The descriptive statistics showed that all but one of the adult participants on the CDI reported the expressive vocabulary skills of the child participant lower than their language skills recorded from the child participant in the PNVT. These findings are similar to a study by Robert et al. (1999). Robert et al. (1999) investigated the factors affecting language developing in 87 African American children (24 to 30 months). They found that caregivers from lower SES are

more likely to underestimate their children's language abilities. Another study was conducted by Pace et al. (2017), which explored why American children from low-income backgrounds consistently performed below their "more advantaged peers" on language abilities using standardised measures.

Inferential statistics using Spearman's Rho correlation coefficient found that there was a significant correlation between the adult responses on the CDI and the children's abilities on the PNVT (r=0.705). The similarities between the results from the CDI and the PNVT show that parents are able to state the expressive vocabulary abilities of their children. Libertus et al. (2013) had similar findings to this study. Their study invented the DVAP from a list of 212 words originating from the standardised Peabody Picture Vocabulary Test-Fourth Edition (PPVT-4). They found that their caregivers' reports were a reliable measure of the children's vocabulary (Libertus et al., 2013).

Table 4.4.2 shows that there was a significant correlation using Spearman's Rho correlation coefficient between the CDI and the PNVT (r=0.705). As in the Libertus et al. (2013) study, the PNVT like the DVAP are recently constructed tools by research teams in the study. The SA-CDI team is pioneering the use of its recently generated PNVT. The validation of the PNVT for the translated CDI in South African indigenous languages is currently underway.

Chapter 6: Conclusion

In terms of the development of culturally and linguistically appropriate assessment materials, SA finds itself in a similar position to developing and some developed countries, specifically those with a multitude of indigenous languages. SA has just recently added a 12th official language to its internationally known progressive Constitution. However, SA has the mammoth task of having to develop appropriate assessment tools for every indigenous language.

The SA-CDI team has taken on the collective responsibility to assist in addressing the country's dearth of appropriate child language assessment materials. By focusing on the MacArthur-Bates CDI (MB-CDI), the SA-CDI team joins the internal drive of adding to the already growing number of CDI adaptations in various developed and developing nations. The MB-CDI is aimed at providing an efficient and cost-efficient language assessment tool for indigenous languages. This tool relies on the adult caregivers, of children using indigenous languages, to report on the child's language skills. The SA-CDI team has been progressively adapting CDIs for 11 of SA's official languages. However, like in the development of any language assessment tool, the tool must be validated before it can be published for use by professionals working in the language development scope of practice. This includes SLPs, linguists, and others.

The primary objective of this study was to describe children's expressive semantic language skills as reported by their caregivers on the CDI and as measured by a PNVT. The development of the PNVT was to assist the SA-CDI team in validating each adapted CDI. The results concluded that the adapted Sesotho CDI measures what is intended, as a significant correlation was found to exist between the Sesotho CDI and the Sesotho PNVT scores.

6.1. Limitations

There may be a level of social desirability bias introduced during the data collection process, as the caregivers may not provide accurate reports of their child's language skills and rather provide answers that they think are more acceptable because they are participating in a research study. This aspect has been accounted for by the CDI team. The team has designed and structured the information sheet in a way that attempts to elicit accurate reports provided by caregivers on their child's skills.

This research study accounted for the following two aspects during data collection as these may have an impact on the rigour of this research study: Attrition (participant drop out throughout the study) and the Hawthorne effect, where the adult participants change their responses on the CDI due to the awareness of being observed by another individual or due to the knowledge of participating in a research study (Jackson, 2011). Although this was not required to be implemented during the data collection process, the research assistant was trained to managed attrition. The research assistant could source other caregivers – child dyads within the chosen research context – to achieve the 10-dyad goal in terms of sample size.

This study also only prioritises the seventh most commonly spoken languages in SA (Statistics South Africa, 2011). However, there are several other languages spoken in each province, and one overarching dominant language nationally, isiZulu (Statistics South Africa, 2011), for which MB-CDIs have been developed and validation studies have been started by the CDI team. The validation of a CDI for the variety of commonly spoken vernacular language in SA provides consequential contributions to research regarding the Sesotho language. The validation also provides contributions to the use of the CDI by SLPs for the assessment of language for individuals who use vernacular languages as their L1.

Furthermore, this research study focused on a single province/location, the Free State, and excludes many others due to geographical feasibility and access to research assistants and participants who meet the inclusion and exclusion criteria. Even though the findings cannot be generalised, the information contributes to the bigger picture of validating the CDIs and other assessment instruments in indigenous languages across SA.

The research study included a relatively small sample size, compounded by a single validation measurement which had a limited number of items from which the scores were considered. The relatively small sample size is not representative of the larger Basotho population within SA. These factors had the potential to make aspects of the data analysis more difficult with regard to the reliability and validity aspects discussed in previous chapters. A larger sample size would have been beneficial to the SA-CDI team and this research study. Employing a larger sample size would assist more significantly in the validation of the assessment tool. The access granted at the request of the researcher to the data from the SA-CDI team included a sample size of only 10 dyads. The study used non-parametric statistics to achieve its primary aim. Through the use of a larger sample size, the statistics would allow for generalisation to the Sesotho population, and the researcher would be able to draw larger and more meaningful conclusions.

Despite the limitations of this research study, the primary aim was met, which was to assist in contributions made to the validation of an assessment method by the SA-CDI team. The CDI was used to measure language skills within the study population, especially expressive semantic skills in this research study. Therefore, the ability of this study, and the larger SA-CDI team, to achieve this primary aim successfully not only has significant implications for

SLPs within SA, but any professional within the early communication development scope of practice with Sesotho-speaking toddlers in their caseload. The research aimed to provide evidence for which the information recorded within the CDIs related to a child's communicative development is accurate, language specific, and contextually relevant, leading to the adapted indigenous CDI being used as future assessments by the relevant professionals. This will allow professionals to accurately determine the language skills of young indigenous Sesotho language speakers using a culturally and linguistically appropriate tool.

Moreover, the results obtained by this research study further some contribution to evidence-based theoretical information regarding language acquisition within SA. In addition, the results support future research being conducted in terms of South African languages, cross linguistic research, and fundamental knowledge regarding specifically indigenous language development.

6.2. Implications

South African SLPs are delivering their services in all communities without the necessary developmental norms and contextually relevant assessments and intervention programmes. Although the SA-CDI team has not yet completed the validation of the Sesotho CDI, the validation is underway. A validated CDI can be administered by SLPs to more accurately assess Sesotho-speaking children's early language development. Stigma of individuals diagnosed with language and communication disorders cannot be underestimated and must be considered by SLPs and assessments used when making diagnoses. The responsibility of the institutions and professionals in the language and communication professions as recommended by Khoza-Shangase and Mophosho (2018) has been taken up by the SA-CDI team. The SA-CDI team comprises of many of the tertiary education facilities in SA, as well as language and

communication experts across fields such as SLPs and linguists. The development of CDIs helps address the limited culturally appropriate language resources administered to populations such as those in SA, thereby limiting the potential use of highly Westernised language assessments in the future (Pascoe & Norman, 2011). The SA-CDI team has taken into account the three main areas of improvement for any assessment tool developed for SA laid out by research from members of its team (Pascoe & Norman, 2011).

The first factor relates to the average South African family's level of formal education and/or the participants' familiarity with the testing/assessing environment (Pascoe & Norman, 2011). The second is that the population from which the norms of assessment instruments are derived is typically first world, Westernised populations. The populations used to adapt the CDI into the indigenous languages found in SA were the speakers of these languages themselves. Lastly, the presentation of vocabulary or other items used within the resource should not be an obstacle to the use of these resources with the South African population. The CDI is developed as an effective and cost-efficient instrument for assessing language skills, and has now been adapted for the entire South African population.

6.3. Future Research Suggestions

It is recommended that the information obtained from this study should contribute towards assisting researchers and SLPs working in SA to better understand language development of children acquiring indigenous languages. This will ultimately guide all professionals within the scope of language development, such as SLPs, to more accurately identify language disorders in children they work with. A language professional's ability to correctly identify language difficulties has an impact on children and families requiring intervention. This impact ranges

from finding the appropriate intervention to advocating for what the child and their caregivers need.

It is also recommended that SLPs drive the needs within the profession and self-evaluate by asking crucial questions. Pascoe and Norman (2011) ask what it is that is needed to maximise our role as SLPs. How can an SLP add more value and relevance to the work they do with individuals with communication difficulties? Once self-growth within one's scope of practice no longer occurs, SLPs risk their profession becoming outdated as others become more relevant in addressing the needs of the service population.

It is recommended that researchers continue to aim to increase access to appropriate, meaningful, and realistic tools in the fields of language development. By using larger sample sizes, individuals contributing to the SA-CDI team's research can assist in accelerating the validation of indigenous language assessment tools. The SA-CDI team is currently attending to the challenge facing the development of the CDI for all official languages in SA. This challenge is the validation of the CDIs, and the rigorous process of ensuring that assessment tools measure the aspects intended must continue in order to prove that the means is accurate and reliable for future use (Drost, 2011). This research study aimed to assist in this validation process by comparing the results obtained by the Sesotho CDI and the PNVT. The significant correlation drawn from the non-parametric statistics between the Sesotho CDI and the PNVT in this research study in part determined the validity of the recently developed Sesotho CDI.

Fundamentally, the research question posed within this study was regarding the similarity of the results between the two assessment measures – the CDI and the PNVT. The discussion above highlighted all aspects which impacted and led to the language skills recorded by these

two assessments, in which it was shown that the results are indeed comparable. That these two tools provide the significantly correlated results adds to ongoing research to validate the CDI by the SA-CDI team. Once the validation process is completed, the team can then go on to use this culturally and linguistically appropriate language assessment to drive the long-term goal within the language research community – collecting language data using an appropriate tool to derive language norms in each indigenous language. It is the goal that the CDI adaptations in all indigenous languages give professionals an accurate assessment tool to use with the unique population. It is recommended that once adaptations are made to the CDI, future research must focus on the acquisition of data using the CDI to develop indigenous language norms within SA.

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Appendices

Appendix A – Research Assistant Confidentiality Agreement

Research Assistant Confidentiality Agreement

Child language project

A. CONFIDENTIALITY OF A RESEARCH STUDY

Confidentiality is the treatment and maintenance of information that an individual has disclosed in a relationship of trust and with the expectation that it will not be divulged to others in ways that are inconsistent with the understanding of the original disclosure (the consent form) without permission. Confidential information relating to human subjects in a research study may include, but is not limited to:

- Name, date of birth, age, sex, address, and contact information;
- Current contact details of family, guardian etc.;
- Developmental, medical or educational history and/or records;
- Personal care issues;
- Child rearing or child socialisation practices;
- Assessments or reports;
- Ethnic or racial origin.

As a research assistant you will have access to confidential information pertaining to the research study. Many participants will only reveal information to investigators because principal investigators have assured participants that every effort will be made to maintain confidentiality. That is why it is of the upmost importance to maintain full confidentiality when conducting a research study. *Below is a list of expectations you will be required to adhere to as a research assistant. Please carefully review these expectations before signing this form.*

B. EXPECTATIONS FOR A RESEARCH ASSISTANT

In order to maintain confidentiality, I agree to:

1. Keep all research information that is shared with me (e.g. observations, notes, transcripts, data, online forms, etc.) confidential by not discussing or sharing this information verbally or in any format with anyone other than the principal investigator of this study;
2. Hold in strictest confidence the identification of any individual that may be revealed during the course of performing the research tasks;
3. Ensure the security of research information while it is in my possession. This may include:

- Keeping all documents and/or data related to the research study on a password-protected device;
- Closing any programmes, documents, or data files related to the research study when away from the computer;
- Keeping any printed documents and/or data related to the research study in a secure location such as a locked filing cabinet;

4. Not make copies of documents and/or data related to the research study unless specifically instructed to do so by the principal investigator;
5. Give all research information/data and research participant information/data back to the principal investigator upon completion of my duties as a research assistant;
6. After discussing it with the principal investigator, erase or destroy all research information that cannot be returned to the principal investigator upon completion of my duties as a research assistant.

By signing this form I acknowledge that I have reviewed, understand, and agree to adhere to the expectations for a research assistant described above. I agree to maintain confidentiality while performing my duties as a research assistant and recognise that failure to comply with these expectations may result in disciplinary action.

_____ _____

Signature of Research Assistant Date

_____

Print Name

_____ _____

Signature of Principal Investigator Date

_____

Print Name

Appendix B – Background Information and Qualtrics Consent Form for Child Participant

(Online Version)

Background Questionnaire

Welcome to the South African Child Language Project

We want to know what young South African children between 0 and 3 years typically understand and say in their languages.
We need parents or other caregivers to tell us about the gestures, words, and phrases that their children know.

Who may take part?
Parents or caregivers of a child who know the child well. The child must hear English most of the time.
The child must be 8 to 18 months.
If the child is older than 18 months (but not yet 33 months), you can fill in this questionnaire https://clinicallingustic.fra1.qualtrics.com/jfe/form/SV_eLOdNeAEoYna19j

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What you should know before you take part in the study
Your participation is voluntary.
You can stop completing the questionnaire if you no longer wish to continue.
It will take about an hour to complete the questionnaire. You do not have to complete the questionnaire in one session. You can stop and return to it later.
This is an anonymous questionnaire. We do not ask for any information that can identify your or your child.
We need you to answer the questions truthfully, without thinking what answer we would like to hear. Please don't worry if the child is not yet talking all that much. Young children will not know many words yet. Each child is different.
You are welcome to ask us questions about any part of this project that you do not fully understand. (Our contact details are given below.)
You will not benefit personally by taking part in this study. You will be helping us to finalise a questionnaire with which researchers, speech-language therapists, and other people who work with young children can measure children's language development.
There are no risks involved in taking part in this study.

Q3
Our contact details are:

Frenette Southwood Email: fs@sun.ac.za
Phone number: 021 808 2010

Helena Oosthuizen Email: oosthe@sun.ac.za
Phone number: 021 938 9494

Nina Brink Email: nina.brink@nwu.ac.za
Phone number: 018 299 1486

The Child Language Project is a joint initiative of researchers at the University of Cape Town, North West University, Sefako Makgatho Health Sciences University, and Stellenbosch University.

Q4 Would you like to take part?

Please agree to the following by clicking on each statement below.

- ○ I have read the information in this page
- ○ I agree to take part in the study that was described here
- ○ I am aware that if I have any questions, I can ask for information at any stage
- ○ I understand that I can withdraw from the study at any time
- ○ I understand that all data will be anonymous and will be treated as confidential
- ○ I understand that the child and I will not be identifiable

Appendix C – Information Sheet and Consent Form for Adult Participant

PARTICIPANT INFORMATION AND CONSENT FORM

TITLE OF THE RESEARCH PROJECT: Adaptation of the MacArthur Communicative Development Inventory (CDI)

REFERENCE NUMBER: SU-HSD-004080

PRINCIPAL INVESTIGATOR: Dr Frenette Southwood ADDRESS: Private Bag X1, Matieland,

7602, South Africa CONTACT NUMBER: 021 808 2010

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the researchers any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is entirely voluntary and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you did agree to take part.

This study has been approved by the Humanities Research Ethics Committee at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice, and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study all about?

- *We are doing research to find out which gestures, words and sentences young children in South Africa understand and say. We are doing this so that we can develop a new language questionnaire known as the Communicative Development Inventory (CDI) for languages spoken in South Africa. Our study is specifically on how South African children learn English.*
- *This is the first questionnaire of its kind in South Africa and will help us to better understand how children learn early words, gestures and sentences. This in turn will help professionals (such as speech-language therapists and paediatricians) to identify language acquisition problems more easily and earlier in future by comparing a child's progress against that of other children his/her age. We are asking parents of English-speaking children aged 8 to 18 months to tell us about the words and gestures their children understand and say, as they know the most about their children.*

Why have you been invited to participate?

- *You are a mother-tongue speaker of English and the parent/legal guardian of an English-speaking child between the ages of 8 and 18 months.*
- *We would like you to tell us about the gestures, words and sentences that your child understands and uses now.*

What will your responsibilities be?

- *If you decide that you want to get involved, we will ask you to do two things:*

  First, we ask you to fill in our new language development questionnaire, the Communicative Development Inventory (CDI) for South African English. This has been specially created by a team of parents and other language development experts. You can do this on your own or with an interviewer. Please do not worry if your child is not yet talking well. We know that at this age, many children have not yet begun to talk, but often they can point, nod or wave to get their message across. We are interested in these forms of communication as well.

  Second, we ask you to fill in a Family Questionnaire. You can do this on your own or with an interviewer. This asks questions about your education, occupation and home circumstances, as well as about any difficulties your child may have experienced. We are asking these questions because researchers are interested in how different circumstances might affect language learning. If you do not wish to answer one or more of these questions, you can simply leave the question blank. Also, please let us reassure you that we will never reveal your or your child's name or any other identifying information in any publications that we produce and that all our data are stored securely.

Will you benefit from taking part in this research?

- *You will not benefit personally by taking part in this study. If you would like, we can however send you a summary of your child's checklist to keep. By taking part in this research, you will help us to develop a new questionnaire that can be used in future to assess the language development of young children.*

Are there in risks involved in your taking part in this research?

- *There are no risks involved in your taking part in this study. This task involves filling out a language list and a background questionnaire that you can do on your own or with the interviewer. It should not take more than one hour of your time and will be done at a time and place that is convenient for you. You can complete the questionnaire in your own time within a one-week period.*

If you do not agree to take part, what alternatives do you have?

- *If you do not wish to take part in the study now, you might still be able to do so at a later stage, depending on the age of your child at the time. Note that even if you do agree to take part in the study, you are free to withdraw at any time without having to give us any explanation. If you change your mind about participating, please let us know.*

Who will have access to your information?

- *You will be providing all information anonymously. Nowhere in the questionnaire are you asked to fill in your name, surname of any contact details. Your information will be placed in a database with those of the other persons taking part in the study, and this database will be shared with the South African Centre for Digital Language Resources, to make the information we collect available to other researchers as well. We will use the data for the purposes of scientific research (theses, dissertations, articles, books and scientific papers) and for the purpose of university education (courses and seminars given to students). For all these scientific uses, we will use pseudonyms (i.e., using a fake name or a codename if we refer to any specific person's information).*

Will you be paid to take part in this study and are there any costs involved?

- *No, you will not be paid to take part in the study, and there will be no costs involved if you do take part.*

Is there anything else that you should know or do?

- *You can contact Dr Frenette Southwood at tel. 021 808 2010 if you have any further queries or encounter any problems.*

- *You can contact the Humanities Research Ethics Committee at 021 808 9183 if you have any concerns or complaints that have not been adequately addressed by the researcher.*

- *You will receive a copy of this information and consent form for your own records.*

Please turn over to the next page.

Declaration by participant

By signing below, I ……..……. agree to take part in a research study entitled "*Adaptation of the MacArthur Communicative Development Inventory (CDI) for Afrikaans and South African English*".

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is voluntary and I have not been pressurised to take part.
- I understand that I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) .....…..…….. on (*date*) ……...…….. 20.....

....

Signature of participant Signature of witness

Declaration by investigator

I *(name)* .....declare that:

- I have explained the information in this document to ……..
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.
- I did not make use of the services of an interpreter.

Signed at (*place*) .....…..…….. on (*date*) ……...…….. 20.....

....

Signature of investigator Signature of witness

Appendix D – Qualtrics Family Background Questionnaire (Online Version)

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.

Q6 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.

- o I agree to take part in this study (please click the box)

Q7 What is the child's sex?

- o Male
- o Female

End of Block: FAMILY QUESTIONNAIRE

Start of Block: ALL ABOUT THE CHILD'S DAY

Q15
ALL ABOUT THE CHILD'S DAY

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

- ○ Child's mother
- ○ Child's father
- ○ Other caregiver or caregivers (If the other caregiver is at crèche, do not answer the next three questions)

End of Block: ALL ABOUT THE CHILD'S DAY

Start of Block: THE CHILD'S HEALTH AND DEVELOPMENT

Q26
THE CHILD'S HEALTH AND DEVELOPMENT

How long was the birth mother pregnant with the child?

- O full 9 months (38+ weeks)
- o 8 months instead of 9 months (34-37 weeks)
- o less than 8 months (less than 33 weeks)
- o Don't know

End of Block: THE CHILD'S HEALTH AND DEVELOPMENT

Start of Block: THE CHILD'S FAMILY

Q41
THE CHILD'S FAMILY

Is this child the first-born child of their mother?

- o Yes
- o No

End of Block: THE CHILD'S FAMILY

Start of Block: THE CHILD'S MOTHER

Q59
THE CHILD'S MOTHER

Child's mom's age is….

- o 20 years old or younger
- o 21 – 25 years old
- o 26 – 30 years old
- o 31 – 35 years old
- o 36 – 39 years old
- o 40+ years old
- o Don't know

End of Block: THE CHILD'S MOTHER

Start of Block: THE CHILD'S FATHER

Q66
THE CHILD'S FATHER

Child's dad's age is….

- o 20 years old or younger
- o 21 – 25 years old
- o 26 – 30 years old
- o 31 – 35 years old
- o 36 – 39 years old
- o 40+ years old
- o Don't know

End of Block: THE CHILD'S FATHER

Start of Block: THE HOUSEHOLD

Q70
THE HOUSEHOLD

How much money does the child's main household get in a month? (choose one)

Q71 How much does the child's main household spend on food in a month? (choose one)

Appendix E – Published Exemplar of the SAE CDI

Start of Block: PHRASES

Q72

**Not applicable for this research study.

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)?	o	o
Respond to "no no" (by stopping what he/she is doing, at least for a moment)?	o	o

PHRASES

Does the child understand any of the phrases below?

Are you hungry?	☐	☐
Are you tired/sleepy?	☐	☐

End of Block: PHRASES

Start of Block: GESTURES

SECTION TWO: ACTIONS AND GESTURES

**Not applicable to this research study

End of Block: ACTIONS AND GESTURES

Start of Block: LEXICAL ITEMS SAE

SECTION ONE: LEXICAL ITEMS

Q1.1. SOUNDS

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

	The child ... understands + says	If you use a different word write it here Other word
Exemplar: baa baa	o	
beep	o	

Q2 2. ANIMAL WORDS

In the list below are words for real or toy animals. Mark which words the child already understands + says.

The child ...	If you use a different word write it here
understands + says	Other word
Exemplar: animal	o
ant	o

Q3 3. VEHICLE WORDS

Here are some word for vehicles or transport. Please mark which of these words the child can understand + say.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar: aeroplane	o	
ambulance	o	

Q4 4. WORDS FOR TOYS

The following is a list of words for common toys. Which of these words does the child understand + say? Please mark them off in the list.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar: ball	o	
balloon	o	

Q5 5. FOOD AND DRINK WORDS

Here is a list of words for food stuff. Please mark which of these words the child understands + says.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar:		
apple	o	
avo / avocado / avocado pear	o	

Q6 6. WORDS FOR CLOTHES

Below is a list of words for clothing and jewellery. Please mark each word that the child understands + says.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar: bangle	o	
beads	o	

Q7 7. WORDS FOR BODY PARTS

Below we list words for body parts. Which of these words does the child understand + say?

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar: ankle	o	
arm	o	

Q8 8. WORDS FOR SMALL HOUSEHOLD ITEMS

Here is a list of objects found in many homes. Please mark which of these words the child understands + says.

	The child ... understands + says	If you use a different word write it here: Other word
Exemplar: alarm (system/box)	o	
basket	o	

Q9 9. FURNITURE WORDS

The list below has words for furniture and rooms found in many homes. Please mark each word the child understands + says.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar: bath / bath tub / “kommetjie”	o	
bathroom / toilet (the room)	o	

Q10 10. OUTSIDE WORDS

Here we have a list of words for things found outside the home. Please mark each word the child already understands + says.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar: backyard / yard	o	
branch	o	

Q11 11. PLACES TO GO

Below are words for places one can go. Please mark which of these words the child already understands + says.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar: beach	o	
church / mosque (or the word you use)	o	

Q12 12. WORDS FOR PEOPLE

Below is a list of words for people (family members and other people). Please mark each word the child already understands + says.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar:		
aunt / aunty	o	
baby	o	

Q13 13. WORDS FOR GAMES AND ROUTINES

Here we have a list of words for common routines. Which of these words does the child already understand or understand + say? Please mark each word that the child can understand + say.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar:		
aah / shh / shush / hush	o	
bath / bath time	o	

Q14 14. ACTION WORDS

The list below contains action words. Which of these words does the child understand + say? Please mark them.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar:		
arrive	o	
begin	o	

Q15 15. DESCRIBING WORDS

Here is a list of descriptive words. Please mark which words the child understands + says.

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

Exemplar:

all gone / finished	o	
angry	o	

Q16 16. WORDS ABOUT TIME

Below are some words that we use to refer to time. Please mark each word that the child understands + says.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar:		
after	o	
before	o	

Q17 17. WORDS ABOUT PEOPLE AND THINGS

We sometimes use pronouns instead of a person's or thing's name. Please mark which of these pronouns the child understands + says.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar:		
he	o	
her	o	

Q18 18. QUESTION WORDS

Here is a list of question words. Please mark each word that the child understands + says.

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

Exemplar:

how	o	
what	o	

Q19 19. WORDS ABOUT PLACES

Below is a list of words to describe position. Which of these words does the child understand + say? Please mark each one that the child understands + says.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar:		
above	o	
around	o	

Q20 20. WORDS ABOUT AMOUNTS

Here are words that we use to show which object/person or how many objects/people we are talking about. Please mark the words that the child understands + says.

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar:		
a(n)	o	
all	o	

Q21 21. HELPING VERBS

In the list below are small words that we often use with action words. Which of these small words does the child understand + say?

	The child ...	If you use a different word write it here
	understands + says	Other word
Exemplar:		
am	o	
are	o	

Q22 22. CONNECTING WORDS

Here is a short list of joining words. Please mark which of these words the child understands + says.

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

Exemplar:

and	o	
because	o	

End of Block: Lexical Items SAE with variable names

Start of Block: Grammar SAE

Appendix F – A list of various types of metonymic relations for the analysis of early child language (Brink, 2022)

Category/ICM	Type of metonymic relation	Examples
Causation	CAUSE–EFFECT	FIRE and HEAT
		WRITING INVITATIONS and INVITING GUESTS
		slow road for "slow traffic resulting from the poor state of the road"
Production	PRODUCER–PRODUCT	BAKER and BREAD
		BOOK and AUTHOR
		She took out the *hoover.*
	NATURAL SOURCE–NATURAL PRODUCT	ACORN and an OAK
		RYE and BREAD
	INSTRUMENT–PRODUCT	WINE PRESS and WINE
		OVEN and BREAD
	PLACE–PRODUCT MADE THERE	*china, mocha, camembert*
Scale	ENDS–WHOLE SCALE	*How old are you?* for "What is your age?"
Constitution	MATERIAL CONSTITUTING AN OBJECT–OBJECT	*wood* for "forest"
Acts and major participants/agents	OBJECT–ACT	FOOD and EATING
		CIGARETTE and SMOKING
		to blanket the bed
	INSTRUMENT–ACT	CUP and DRINKING
		GUN and SHOOTING
		to ski; to hammer
	AGENT–ACT	BAKER and BAKING
		TAILOR and SEWING
		to author a new book
	AGENT–INSTRUMENT	DRIVER and CAR
		SAILOR and SHIP
		the pen for "writer"
	RESULT–ACT(ION)	*to landscape* the garden
	MANNER–ACT(ION)	*to tiptoe* into the room
	MEANS–ACT(ION)	He *sneezed* the tissue off the table.
	TIME–ACT(ION)	*to summer* in Paris
	DESTINATION–MOTION	*to porch* the newspaper
Category and member(s)	CATEGORY–MEMBER/INDIVIDUAL OF THE CATEGORY	FOOD and APPLE
		aspirin for any pain-relieving tablet
		Every *Tom, Dick* and *Harry*
Category and property	SALIENT/DEFINING PROPERTY–CATEGORY	The brothers needed *some muscle*
Thing and part	(PHYSICAL) WHOLE–PART	WHEELS and CAR
		America for "United States"
		The *hired hands* are here
Event	ACT–COMPLEX ACT/SUB-EVENT–WHOLE EVENT	DRIVING and TURNING A STEERING WHEEL (and other processes involved in driving)
		Jay and Denise are to *walk up the aisle.*
Institution	CENTRAL FACTOR–INSTITUTION	CHURCH BUILDING and CHURCH AS INSTITUTION
		MEDICINE and HOSPITALS, DOCTORS, NURSES, etc. (the whole institution)
Containment	CONTAINER–CONTENT	MILK BOTTLE and MILK
		CHIPS PACKET and CHIPS
		The bottle is sour
	COSTUME–WEARER	CASSOCK and CLERGYMAN
		CROWN and MONARCH
Location	LOCALITY–OCCUPANT/PLACE–INHABITANTS	HOUSE and HOUSE OCCUPANT(S)
		The whole town is on the verge of starvation
	PLACE–INSTITUTION	*Cambridge* will not publish the book.
	PLACE–EVENT	*Waterloo* for "battle fought at Waterloo"
Experience and convention	PHENOMENON–MEASUREMENT/THING PERCEIVED–PERCEPTION	BULKY OBJECTS AS HEAVY and COMPACT OBJECTS AS LIGHT (even if they are the same weight)
		sight for the "thing seen"
	MANIFESTATION–DEFINITION	LUNCH AS A COLLECTION OF FOOD and LUNCH AS A CULTURALLY DETERMINED HABIT OR INSTITUTION
Possession	POSSESSOR–POSSESSION	HARRY and HARRY'S COAT
		He married *money* and became an MP
	CONTROLLED–CONTROLLER	*The Mercedes* has arrived

Appendix G – The list of metonymic relationships used by each child participant for each PNVT target item

Vocabulary item	Child participant response(s)	Number of responses (n)	Metonymic relationship
Item 1 – Cat	Dog	n=1	CATEGORY-MEMBER A child participant identified one member of the semantic category small household animals, dog, to name the picture of the cat, thereby making use of the metonymic relationship category-member.
Item 2 – Apple	Banana	n=1	CATEGORY-MEMBER A child participant used the category-member metonymic relationship when overextending banana to include the target, apple, in the fruit category. This extension of the word banana shows that the child participant used a category within the same conceptual domain.
Item 3 – Flower	No responses		N/A
Item 4 – Pear	Apple Banana	n=4 n=2	CATEGORY-MEMBER All responses provided to this picture stimuli entailed the use of category-member metonymic relationships. The children provided apple as their response to this perceptually similar category. Child participants provided responses such as banana to identify an item in the same fruit category.
Item 5 – Key	Lock Up / Lock	n=2	CAUSE-EFFECT The key picture stimuli and responses from the child participant showed how children draw conceptual connections between the cause and effect of certain processes. Two child participants' responses described what the key does by means of locking a door or gate.

Item 6 – Tree	**Stick**	**n=1**	**THING-PART** **Although the majority of the child participants labelled this item correctly, a participant used the thing and part category. The child participant identified this picture stimuli as a *stick*.**
Item 7 – Chair	Table	n=1	CATEGORY-MEMBER A child participant in the PNVT used this ICM to link their response of table to the furniture category belonging to the target picture stimuli of chair.
Item 8 – Nose	Head	n=1	THING-PART The thing and part metonymic relationship is used by a child participant by the response, head, to this target picture stimuli as the nose is a part that belongs to a whole body part of the head. Body concepts can be identified as the conceptual domain.
	Grandfather	n=1	POSSESSION A child participant's response was grandfather, which relates to the possession category. The child has chosen the possessor as their grandfather and the nose as the object in possession of their grandfather.
Item 9 – Dirty	Dirty Hand	n=1	CAUSATION The causation metonymic relationship was also seen in the picture stimuli dirty hand, where a child participant linked the concept of her hand being dirty to be the result after she had fallen.
	Black Hands	n=1	EXPERIENCE – CONVENTION *Black hands* was used by a child participant which indicates the experience and convention ICM as the child participant links the experience of falling and the convention that one's hands become dirty in the process of breaking the impact of a fall.
	Hand / Hands	n=2	OBJECT-ACT The child participants' use of the response hand or hands illustrates the metonymic relationship of object-act as the child is

			associating the hand as an object which gets dirty.
Item 10 – Lipstick	Pen	n=1	SALIENT PROPERTY A child participant used the salient property category in their response, pen, when shown the lipstick picture stimuli.
	Grows Up	n=1	EXPERIENCE AND CONVENTION Another child used the experience and convention category when providing the answer that one grows up. This child participant is linking her association between being an adult and wearing make-up to the picture stimuli.
	Mouth / Points to Mouth	n=2	OBJECT-ACT Lastly, two child participants used the Object-act metonymic relationship when they provided the answer of mouth to show that they made the relationship between the mouth as the object and the act of using the lipstick.
Item 11 – Glue	Write	n=2	EVENT The event ICM is depicted in the child participants' use of the word write when shown the glue picture stimuli. The child is associating the use of glue with the task of writing.
	Roll-On	n=1	CONTAINER-CONTENT Alternatively, one could interpret this as the child participants' associating the shape / container of the glue to the similar shape of that of a pen – therefore making an association to the container-content relationship of metonymy. Similarly, the argument towards the use of the containment metonymic relationship can also be made when a child participant provided the answer of roll-on when presented with the picture stimuli.
Item 12 – Carrot	Apple	n=1	CATEGORY-MEMBER A child participant used the category-member metonymic relationship to illustrate their overextension of apple to the target carrot, both in the fruit and vegetable category. This extension of the word apple shows that the

			child participant used a category within the same or an adjacent conceptual domain.
Item 13 – Glass	Tea Water	n = 1 n = 3	CONTAINMENT Containment was used by many child participants when shown the picture stimuli of a glass. By using the recorded words, the child refers to the typical content of a drinking utensil such as a glass with the specific contents such as the fluids water or tea.
Item 14 – Table	Stool Sofa	n = 2 n = 1	CATEGORY-MEMBER The child participant identified one category-member – stool and sofa – to access the furniture category-member for the target response table.
Item 15 – Cry	Go to Sleep Baby	n = 1 n = 2	CAUSATION Another example of causation is with the cry picture stimuli – the child participant referred to a child needing to go to sleep as the reason why they were crying or a way to manage the crying. PRODUCTION Baby was used by one child participant from the production category, in which the thing producing the causation action becomes the intended target.
Item 16 – Paint	Write Play	n = 6 n = 1	EVENT CATEGORY All child participants used one metonymic relationship when providing their responses to this picture stimuli. These responses refer to a set of acts/events that the children associate with painting in the event category.
Item 17 – Scarf	Clothes Towel Blanket	n = 1 n = 1 n = 1	CATEGORY AND MEMBER The use of the category and member metonymic relationship is used by the child participant by the response, clothes, to this target picture stimuli. Clothing can be identified as the conceptual domain. CATEGORY AND PROPERTY However, participants who used towel and blanket made use of the category and property ICM.

Item 18 – Swing	Ride	n=1	MANNER-ACTION The single metonymic relationship used within this target item was manner-action. The use of the word ride shows that the relationships between an action of riding and an instrument of a swing used in the action by the child participant.
Item 19 – Nail paint	Points to Hand / Nails Explains Nail Painting	n = 2 n = 1	LOCATION The location ICM is used by two child participants when shown this picture stimuli. Hands and nails as shown by the child participant is used to illustrate the location on which the nail paint will be applied to. ACTION The action metonymic relationship was used by majority of the child participants by their explanation of how to use nail paint. The child participants indicated that the nail paint was something to apply on one's nails.
Item 20 – Onion	Apple Cake	n = 1 n = 1	SALIENT PROPERTY One may look at the answers provided by both child participants who used other semantic categories to identify the picture stimuli as utilising the salient property relationship. However, by providing answers such as cake and apple, it could also be possible that there may be no metonymic relationship intended by the participants.
Item 21 – White	No response		N/A
Item 22 – Read	Writing	n = 3	MANNER-ACTION None of the child participants were able to identify and express the target word for this item. The application of the manner-action semantic category was depicted in explaining what to do with the picture stimuli or instrument – writing.
Item 23 – Candle	Fire Hot	n = 1 n = 1	CAUSATION This example uses the fire and hot used by the child participants as an association of the causation relationship whereby they

			understand that the candle can burn you or is hot if you touch the flame.
Item 24 – Umbrella	Explains the Use of the Umbrella	n = 1	MANNER-ACTION The explanation of using the umbrella shows that the child participant understands that there is a relationships between the manner of using an umbrella and an umbrella as an instrument.
	Water	n = 1	CAUSATION Causation is used by another child participant to link water to cause the use of an umbrella.
	Outside	n = 1	LOCATION A child participant used the LOCATION ICM when providing their association with the outside as their response to the target stimuli umbrella.