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University of the Witwatersrand



School of Literature, Language and Media

A CROSS-LINGUISTIC ANALYSIS OF PREDICATE CONSTRUCTION IN EARLY LANGUAGE DEVELOPMENT

By

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A Masters dissertation submitted in partial fulfilment of the requirements for the degree of Master of Arts in Linguistics

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March 2018

Plagiarism Declaration

This thesis is my own work. All primary and secondary sources have been appropriately acknowledged. This thesis has not been submitted to any other institution as part of an academic qualification.

This thesis is prepared in partial fulfilment of the requirement of the degree of Master of Arts in Linguistics, at the University of Witwatersrand, Johannesburg, South Africa

Date _____

Signed _____

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Abstract

Early language and lexical acquisition is a field within psycholinguistics in which extensive research has been undertaken. In literature it is stated that children acquire their different linguistic categories in various stages during early language acquisition. One debate that has always existed, regarding the phases in which children learn language, involves the verb grammatical construction and other predicate structures. This research explores some of these well-known linguistic theories. In the study these theories are contrasted with empirical evidence from contemporary research on typologically different languages, in other words Italian, Japanese, Canadian English, Italian Sign Language and isiZulu. This report also contains a separate case study on isiZulu.

The assessment tool that was used to assess these languages is called Picture Naming Game (PiNG). It allows one to assess a child's predicate development in comprehension and production at the same time.

The contribution of the current study is to show that most of the above-mentioned languages prove what the universal theory reveals about predicate development. It highlights some language-specific semantic features. Overall, the study seeks to assess predicate development in young children and presents specific aspects of this development for isiZulu.

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1 Chapter One: Introduction

1.1 Background to the Present Study

The purpose of this research is to provide a better understanding of the development of children's speech abilities by looking at early language acquisition across a variety of typologically different languages. Language is the key to all human communication. People use it to learn, understand and convey information and tell stories about the world in which we live. Language is, however, complicated and gradual in that speakers need several years to master it. As a result of biological and cognitive factors not all linguistic constructions are learned at the same time. It is illustrated, in recent literature, that language-specific features may affect how children conceptualise, perceive and develop various grammatical constructions which have a direct impact on numeracy, literacy, conceptual and analytical skills during the course of language development. This research evaluates the grammatical structure, which is known as the predicate, to evaluate existing literature and determine if new studies provide novel insights into how it develops. The intention of this study is to collate and compare recent findings on predicate construction with two overarching aims: to confirm that recent findings correlate with known literature on predicate construction that used the same research tool and to analyse the predicate development of a lesser-studied language (isiZulu). The isiZulu study also used the same research tool to provide detailed knowledge of the predicate construction using cognitive theories of lexical acquisition.

The predicate is a grammatical construction that forms part of both lexical and syntactic categories of linguistics. It is explained that the predicate is the part of a sentence that offers information surrounding the subject of that sentence (Straus, Kaufman & Stern, 2014). The predicate is an important aspect of language to study as it collectively accounts for smaller linguistic elements such as action verbs, adjectives and adverbs which are quite complex as these require the speaker to know the subject as well as its attributes in a phrase (Strawson, 2017). Despite languages not being typologically similar, language-development studies illustrate that languages are universally acquired at different rates and stages. This is in line with features that are typologically related to a particular language (Clark, 2009). Markman (1991) illustrates how the child's lexicon is dependent on the development of semantic or meaning construction and categorisation skills. These affect literacy and numeracy skills. Diagnostic measurements of the predicate and nominal constructions have been developed in

atypical populations to produce assessment tools in interventions for language impairments (Stefanini, Bello, Caselli, Iverson & Volterra, 2009).

1.2 The Predicate Construction

Several researchers of language acquisition suggest that children across all languages acquire nominal structures before all other structures such as action verbs, adjectives and even adverbs (Snow, 1978; Harley, 2013; Gentner, 1978). Without something concrete to attach a lexical element to - one that could be possibly seen, touched or heard - a linguistic structure becomes abstract (Bird, Franklin & Howard, 2001). Clark (2009) further shows that predicate structures would be acquired later than nominal structures. This is because verbs and adjectives do not offer concreteness or iconicity. The predicate construction comprises several categories: action verbs explain an action that could occur, adjectives describe characteristics about an object or person and adverbs allow one to describe the manner in which a verb is enacted or it could describe variables relating to place and time. The predicate can be defined as the part of a sentence or clause that contains a verb or refers to something about the subject and/or object of that sentence (Rothstein, 2012).

Recent empirical evidence shows that language acquisition and the early development of verb constructions may not be as universal as once believed (Kunene Nicolas & Ahmed, 2016; Pettenati, Sekine, Congestrì, & Volterra, 2012). It is very important to revisit theories that universally govern the understanding of this category, such as how the predicate develops, in order to ascertain if there are any developments that could further enhance existing aspects of language acquisition theory.

Research shows that the predicate does not always appear after nominal acquisition has taken place. It may emerge before or at the same time as nominals as a result of the way different language typologies make use of the nominal structure (Kersten & Smith, 2002). At a conceptual level, it appears that predicate structures seem more difficult (than nominal structures) to acquire as these do not refer to concrete entities in the real world but rather link how concrete objects are described. The presence of the verb structure depends on an individual's understanding of what actions and feelings are as well as how the person perceives these actions and feelings. From a structural perspective, in typical English sentences the verb shows the relationship between the subject and the object of a sentence (Straus et al., 2014). Studies also show that one can gain a better understanding of the early conceptualisation of predicate structures through semantic analysis (Saeed, 2009). The predicate falls under the

broader linguistic category of the verb so, in this report, the terms ‘verbal construction’ and ‘predicate’ are used interchangeably unless there is a focus on a specific aspect.

1.3 Rationale

This research explores the way in which the structure and presence of the predicate develops cross-linguistically. The languages that are examined are Canadian English, Italian, Italian Sign Language (LIS), isiZulu and Japanese. This study offers a detailed understanding of early language acquisition using language typology theories drawn upon from semantics and lexical acquisition. All the languages under review in this study use a well-designed Italian lexical assessment tool, called Picture Naming Game (PiNG), which was created by Bello, Giannantoni, Pettenati, Stefanini and Caselli (2012). PiNG is a standardised lexical assessment tool that can be used to test the comprehension and production of nominal and predicate structures. All data inputted is from peer-reviewed journals. A case study from isiZulu is used to highlight specific elements, about the acquisition of the predicate construction, in a quantitative manner. Many theories are developed on the basis of a small collection of widely spoken languages, usually from well-developed countries. Therefore, by conducting a contrastive evaluation of multiple languages which offer similarly related data, this study may be able to reaffirm or challenge some of the foundation theories used today as well as to contribute data from lesser-studied languages, such as LIS, Japanese and isiZulu.

1.4 Lexical Acquisition

In order for a child to learn how to speak they need to transition through many stages of early language and lexical development. According to Harley (2013), children produce their first words between 10 and 12 months. As they continue to develop, they slowly begin to acquire new words depending on what they are perceptually and linguistically exposed to. By the time a child reaches 18 to 24 months of age he or she should know a fair amount of productive words (Ingram, 1989). It is at this point when children experience a language and vocabulary explosion in which they continue to acquire new words at a rapid pace. A child’s first words typically reflect names of people and objects that surround them. Therefore it is a universal understanding that predicate structures - such as action verbs, adjectives and adverbs - only start appearing at a later stage. The words that children acquire represent the semantic concepts of their world (Harley, 2013). As they progress through the various stages of language acquisition language is comprehended before it is produced (Carroll, 2008).

1.5 Language Typology

Thus far information attained through conducting cross-linguistic studies has offered invaluable insight into early language development (Kiintay, 2011). One area one can see a significant gap in the research is the fact that a lot of literature on what we know has been a product of studies that have mainly examined the English language. Therefore, it is important to add as many different languages as possible, on an ongoing basis, to understand better the universal features as well as language-specific constraints of language acquisition. Talmy (1985; 2000) highlights the importance of exploring as many varied languages as possible to affirm or disaffirm existing evidence on the universal features of language development. Clark (2009) also states that if languages are structured differently from a typological perspective, one can only assume that those languages would naturally be acquired differently from one another as well.

1.6 Research Questions

This study seeks to confirm if existing literature, on the development of the predicate construction, is applicable to recent studies of typologically unrelated languages. This investigation compares findings from different peer-reviewed published articles on the development of the predicate construction which used one research tool. It will use one of these published articles on isiZulu as a secondary dataset as individuals who speak this language are readily available to the researcher. The following research questions will be answered:

1. How does the predicate structure develop in the early language-acquisition period of children, between the ages of 25 months and 36 months, who speak different languages?

    a. What is the order of the predicate construction in early language development?

2. What role does semantic relation of predicate items play in early development?

1.7 Chapter Outline

Chapter 1: Introduction

This chapter has introduced the aims, rationale and research questions pertaining to the current study. It also introduced some important topics that are explored further throughout the rest of this report.

Chapter 2: Literature Review

This chapter offers an understanding of the current literature that is available on the themes and topics explored in this study. It provides information surrounding what researchers currently know and assume about language acquisition, as well as how some of this literature may not universally apply to all languages.

Chapter 3: Methodology

This chapter explains the tool that was used in gathering the data for the studies which are evaluated, the participants who were involved in the investigations as well as the procedures that were involved in attaining and analysing the relevant data.

Chapter 4: Analysis

This chapter presents a qualitative analysis of the development of the predicate construction of isiZulu-speaking children between the ages of 25 and 36 months in order to answer the research questions posed by this study.

Chapter 5: Discussion and Conclusion

This chapter discusses and draws a conclusion to some of the information that was and, in some cases, was not uncovered in this study. It puts forward observations and comments regarding what results were discovered throughout the analysis in relation to what is currently known about early language and lexical acquisition. This chapter also identifies the limitations of the study as well as future recommendations.

2 Chapter Two: Literature Review

This chapter explores some of the governing theories and models that currently hold an influence over how one sees, understands and approaches lexical acquisition. The purpose of this study is to assess the development of the predicate structure. Therefore, this investigation begins by examining some of the verbal constructions of various languages belonging to different language typologies. It then explores the construction of the verbal structures that qualify as being a part of the predicate as well as how these are acquired in typical populations. Finally, it looks into the field of semantics and explores the Role Conceptualisation and Prototype theories as a theoretical framework to see its effect on lexical development.

2.1 Predicate

One of the emphases of the current study is the notion of the predicate, specifically how it is acquired and how it develops. This section discusses the predicate as a grammatical structure. It explores the underlying elements and components that are evaluated throughout this research.

Grammar is a fundamental component of any language. It is an accumulation of processes that are acquired throughout various stages of early language acquisition. When examining the concept of grammar, one can see the many different parts that each hold a weighted function when constructing acceptable sentences across all languages (Tabbert, 1984). One applies a language's grammatical rules to strings of words and phrases in order to create sentences that are understandable to listeners. Of the multiple linguistic constructs that develop throughout language acquisition, this study seeks to assess predicate development which - as research states - develops later than nominal constructions (Dhillon, 2010). The predicate can be defined as the part of a sentence or clause that contains a verb or refers to something about the subject and/or object of that sentence (Rothstein, 2012). This postulation has been upheld through work done by researchers such as Halliday (2014) and McShane (1980).

2.1.1 Predicate Categories

Sentences are composed of subjects and predicates (Hurford, Heasley & Smith, 2007). However, this statement may vary according to different language typologies. The subject of a sentence refers to the noun, pronoun or set of words that are essentially "doing or experiencing" the verb that is found within the predicate (Straus et al., 2014). The verb in a sentence aids the

listener or reader in identifying the subject of the sentence. The predicate element of a sentence may contain a variety of linguistic properties.

When looking at a complete predicate it can be seen to contain verbs, objects, complements, adverbial modifiers and prepositions (Rapoport, 1999). These functions aid in an individual's understanding of what the subject of the sentence is doing or experiencing. One of the aims of this study is to evaluate the development of this predicate construction and, in order to do so, the following predicate categories have been selected. The reason that these particular categories have been chosen is owing to the fact that the language case studies, which have been reviewed in this research report make use of the PiNG tool, that include these specific categories. Table 1 shows the predicate categories that are considered throughout this study:

Table 1. *Predicate Categories*

Category	Definition
Action Verb	A word referring to an action
Adjective	A word that describes a noun or pronoun
Adverb	A word that modifies an adjective or verb

Adapted from Straus et al, 2014

The verb is the most important element of the predicate within a subject-predicate agreement as it often describes what the subject of a sentence is doing. Verbs can have different functions such as showing an action is taking place. (Actions are essentially types of movements, e.g. swim.) Other functions of the verb may work to represent a feeling (e.g., love) or, alternatively, a state of being e.g., to be (Straus et al., 2014). Adjectives can be found within both the subject and the predicate of a sentence since these explain a noun or a pronoun. For the purpose of this evaluation, the adjective has been included as being a part of the predicate as that is the way it has been presented across all of the published studies that are re-evaluated throughout this study.

The next category in Table 1 is the adverb. Adverbs are typically found in conjunction with the verb that is being described. These parts of speech, therefore, offer extra information surrounding a verb. Adverbs can offer information referring to the location of the verb (e.g., there), the manner of the verb is carried out (e.g., gracefully) as well as the time constraints surrounding the verb (e.g., now) (Straus et al., 2014).

One of the reasons that the predicate was chosen as the focal point of development for the current study is because the structures found within the predicate have not been paid as much

attention in research as compared with structures that fall within the subject, specifically nominal structures. As mentioned, the predicate structures that are considered in the current study are action verbs, adjectives and adverbs. These structures are typically acquired after nominal structures for reasons that are discussed in the next section. These predicate structures play important roles in analytical and cognitive development.

2.1.2 Lexical Acquisition of the Predicate

One of the purposes of this research is to evaluate the acquisition and development of the predicate structure across different language typologies and families. Thus far, the notions of general language acquisition and the predicate have been discussed. This section discusses literature that has examined the acquisition of the predicate as well as the important role that underlying predicate structures play in general cognitive functioning. These ideas are thereafter applied and compared to the results which were found in other studies that used PiNG.

According to Gentner (1978), acquiring the meaning of a verb is very different to acquiring the meaning of a nominal structure. A significant amount of literature states that children acquire nominals before verbs. In this context, nominals are simple concrete objects. This universal trend is not surprising. In fact, it makes sense seeing that the lexical item for a nominal structure is a relatively easy construct to acquire as it relates directly to a physical thing or object that is tangible for a child to see and touch.

A child's first words are usually based on items that are commonly found within their immediate environment (Clark, 2009). Once a child has acquired a certain number of lexical items, they move on to more complex stages where they begin to combine two or more words. It is at these stages where predicate structures are acquired. Literature states that these structures are more difficult for children to acquire and are thus gained later than nominal structures because, depending on the organisation and structure of the language being acquired, the predicate needs certain nominal concepts to be already in place in the lexicon. To explain what is meant by this statement, the verb construct is used. In order for an action verb to be present in a sentence, it needs to be positioned in relation to a nominal construct. For example, the concept "kick" is abstract unless it is attached to a relative nominal such as "a ball". When a child is acquiring a language, abstract concepts are too cognitively advanced for them to fathom.

Adverbs are predicate constructs that are acquired even later. Owing to the fact that as an adverb is a word that describes a verb in order for a child to complicate their notion of a verb by describing it in a certain way that child must already have a grounded understanding of verbs, which only comes after nominal acquisition has taken place (Gentner, 1978). Linguistically, this idea of relationships and appropriate attachments between words and grammatical constructs is referred to as agreements (Straus et al., 2014). The boundaries that guide these agreements are language specific. This opens the idea that different languages following different typologies may acquire the predicate in different ways.

It has already been stated that the predicate consists of many sub-categories such as verbs, adjectives and adverbs. One of the research questions guiding the current study asks whether the predicate develops differently in a cross-linguistic situation. Therefore, in order to understand the development of such constructs first understanding their modes of acquisition is vital. One motivation in support of studying the development of predicate structures is the fact that constructs such as the verb play a very important role in the progression of cognitive skills, such as analytical thinking and arithmetic.

Whilst examining the acquisition of predicate structures, Tardif, Gelman, and Xu (1999) conducted a study where the authors sought to investigate universal language acquisition with two typologically different languages. The authors accomplished this by assessing the different proportions of nominal and verb structures known across 48 toddlers, 24 children acquiring English and 24 children acquiring Mandarin. Three different methodological approaches were used to elicit the various lexical items: toy play, mechanical toy play and the reading of books. The results of the elicitation tasks were compared against the McArthur Bates CDI which is a global index that offers normative information about infants and toddlers' lexical abilities. This test takes in the form of parent questionnaires, one for infant-related information and the other for toddlers. The age range is 16 – 18 months for the infants and 18 to 30 months for the toddlers (Dale & Fenson, 1996). The results found that the Mandarin-speaking children knew more verbs than the English-speaking children. The former group of children knew fewer nominals than the English-speaking children did. This is interesting as it is one of the few studies that has documented predicate structures being acquired before nominal structures.

2.1.3 The Cognitive Function of the Predicate

In order to display the important role that verb understanding plays in cognitive development, this study refers briefly to Bloom's Taxonomy (Santana, 2014). This taxonomy provides a

breakdown of the types of questions which can be used at different levels of development to assess and evaluate students. The taxonomy offers examples of questions as well as all the linguistic elements involved that make certain questions more difficult and complex than others. The structures found within the predicate contribute towards an individual's cognitive ability to understand, consolidate, and react appropriately to certain types of questions, especially those that require a higher level of analytical processing.

Bloom's taxonomy divides assessment questions into different categories to test different levels of understanding and analytical ability. This would depend on the age and academic stage of a learner. The categories range from simple question words related to relative material to complicated questions that require very specified types of responses. The differentiating factor is the language and word choices that have been chosen to construct the relevant questions.

Predicate structures are grammatical elements that allow one to view and understand language from an actionable perspective. By understanding the underlying concept of a verb, it is indicated that some form of an action is taking place. As an individual cognitively develops, the ability to differentiate between different types of actions and requirements is learned. Specific lexical items are chosen according to this ability. An example which displays how predicate structures play an important cognitive role is the fact that as adults, the ability to differentiate between the term "name" and "define" as "action-dependent verbs" may come naturally. Both verb constructs are similar on a semantic level as these both touch on connotations of relaying required information. However, functionally, to name something is to state the word that something is most commonly referred to by. To define something is to take that reference to a deeper cognitive level and offer an explanation relating to the phenomenon a definition is required of. These skills are developed over time as language and lexical acquisition continues and are attained as the cognitive mind grows and develops. The way in which these cognitive and conceptual skills are communicated is through the lexical items one begins to acquire at approximately the age of 12 months.

2.1.4 Lexicon

This section discusses the lexicon as it plays a vital role in both early language and lexical acquisition. Slobin (2014) postulates that a child first acquires a language through words and it is through these words that all forms of verbal communication take place. According to Clark (1995), all of these words are centrally stored in the lexicon. Some refer to this lexicon as the

"mental dictionary" owing to the fact that all of one's semantic understanding of lexical items stem from this cognitive structure (Harley, 2013). It is through the lexicon that individuals can identify and semantically recognise words. It is suggested that once children have acquired a certain number of words, they begin to generalise terms such as objects and places. This generalisation is a form of syntactic categorisation where words are stored and identified through means of different construction categories and commonalities (Clark, 1995).

As mentioned, the lexicon is a cognitive structure from which one draws all of one's words (Clark, 1995). Markman (1991) suggests that when one is investigating how items are categorised on a cognitive level one must look beyond the obvious features of the items and rather examine how inferences may be constructed in relation to other semantically similar items and environments. The lexicon operates in conjunction with both comprehension and production. These processes can be examined to test a toddler's vocabulary inventory. This approach has been said to assist therapists as a diagnostic mean in order to detect possible language delays and atypical language development at a young age (Stefanini, Bello, Caselli, Iverson & Volterra, 2009). As children acquire different linguistic structures such as nominals, verbs and adjectives, they begin to develop semantic meaning. However, within the lexicon, children are often confronted with conflicting scenarios where they begin to acquires simple adjectives to describe the state of objects. However, as they progress in their lexical development they are introduced to different types of adjectives that - in effect - describe the same object in a more specific and detailed manner (MacWhinney, 1987). An individual's lexicon are therefore highly complex as these do not only "store" the linguistic labels one uses to communicate daily but also contain all of one's cognitive concepts as a reference to what these lexical items actually refer to on a practical and functional level.

2.2 Language Typology

This section discusses the theory of language typology which is very important to the current study considering it incorporates several different languages which each follow different typologies. The term "typology" has different uses and this varies depending on the context in which it is being considered (Croft, 1990).

Within the scope of linguistics, 'typology' refers to the structural characteristics found across different languages. It allows one to classify languages according to features that these may or may not share with other languages. According to Croft (1990), one of the biggest problems that researchers have faced when dealing with the study of language typology is that many

theories and universal assumptions have been based on one or a few related languages. In numerous cases, standard English plays a predominant role. However, in light of this, it is acknowledged that universal factors must exhaust all language types in order to be considered as truly universal. In order to check this, one can conduct cross-linguistic evaluations of languages that have not been as widely studied as standard English. Typology is a multifaceted field of study which draws upon information relating to pragmatics, syntax, morphology, semantics as well as phonology. It seeks to discover and evaluate the similarities and differences found between languages (Croft, 1990).

Language typology is often viewed in accordance with cross-linguistic analysis and comparison. Languages undergo exclusive modes of analysis and, thereafter, generalisations are made. An example to display how these generalisations are arranged would be the fact that literature states the passive construction is a construction that is acquired in a child's life. However, it is now known it is actually acquired at a much earlier stage in Sesotho as shown by conducted research (Demuth, 1989). It is at this point where cross-linguistic comparison becomes a necessity before these generalisations are made and classified as universal attributes. This means that these are assumed to apply to all languages, however, they must first be contrasted and critiqued against all of the languages found throughout the world. Only after this is done does it become apparent that some things, such as vowel and consonant structures, become universal and other qualities such as SVO (subject, verb, object) word order often become categorically applicable and language specific (Harley, 2013).

One prolific scholar who has conducted extensive research on typology is Talmy (1985; 2000). The author's work investigates the relationship between certain syntactic and semantic constructs that differ cross-linguistically. The research conducted by the author, on lexicalisation patterns, examines the concepts of motion, path and manner, and how different languages express these concepts according to relative grammatical constraints. Talmy (1985; 2000) argues that languages are classified as being either verb framed or satellite framed based on the study of a substantial volume of different unrelated languages. These two framing categories refer to how a language expresses motion, manner and path. A verb-framed language expresses the semantic concepts of motion and path through the structure of the verb, and the manner is expressed separately. An example of a verb-framed language would be French. Verb-framed languages also express the notion of manner in a stronger way opposed to satellite-framed languages (Kotroni, 2014). The latter type of languages express the motion and manner of an event in the verb whilst the path of the motion is expressed in the satellite, which is a

grammatical construct such as an adverb. The satellite is a separate structure to the verb. An example of a satellite-framed language is English (Talmy, 1985, 2000). Satellite-framed languages have a wider variety of manner verbs within the lexicon (Kotroni, 2014)

Understanding how different languages encode verb structures is very important to the current study since one of the focus points is cross-linguistic predicate development. Research shows how children are very sensitive to the encoding used in their language (Kita & Özyürek, 2003). As mentioned, the predicate involves grammatical structures such as the verb, adverb and adjective. When examining early language development cross-linguistically, it is important to examine how these constructions differ. When conducting a cross-linguistic analysis it is very important to take this into account as some predicate structures may have different syntactic outcomes opposed to others (Kotroni, 2014). This would depend on how - for example - the verb, motion and manner are encoded in a particular language. These syntactic differences may affect how a speaker of a particular language may acquire and develop those predicate structures.

It is also critical to find comparable data as some linguistic analyses may look at phonological acquisition whereas others may focus on morphological constructions. The very nature of language acquisition is challenged by the multitude of different methods that are used to study theories (Snow & Hoefnagel-Hohle, 1978). Several languages have been assessed through the use of a particular assessment tool in order to look at the same constructions which allow for contrastive and systematic analysis. The languages under investigation throughout this dissertation made use of the same lexical assessment tool: PiNG. The various languages that PiNG was used for are now briefly introduced to offer some background information regarding the different languages.

2.2.1 Canadian English

The Canadian English language originates from West-Germanic roots (Hawkins, 1986). From a structural perspective, Canadian English follows the same structure as standard English, however it makes use of a varied dialect. The reason that the term ‘Canadian English’ is used is because this is how it is referred to in one of the the original published PiNG articles. It must be noted that there is no structural difference between Canadian English and Standard English. Canadian English follows the resulting word order:

Subject + Verb + Object

An example of a typical Canadian English sentence would be: ***"He loves the team"***. Canadian English is a satellite-framed language. Verb structures in English are considered to be monomorphemic, which means that the verb root word can stand alone as a single morpheme in a sentence or utterance (Levy, 2013). An example of a typical action verb in English is "play". In English, adjective structures are considered to be pre-modifiers of nominal constructs (Giegerich, 2005). English is the most widely spoken language across the world (Hussey, 1995) and as a result of this, it makes sense that many linguistic studies have either been conducted mainly on English or have incorporated rules or theories derived from English data.

2.2.2 Japanese

The next language that also explores the development of the predicate construction through the use of the PiNG tool is Japanese (Pettenati, Sekine, Congestrì & Volterra, 2012). Japanese is a language that is predominantly spoken in certain areas in East Asia, namely in Japan. The Japanese language follows a specified word order structure:

Subject + Object + Verb

A verb in Japanese consists of a base word and an ending. Japanese is an agglutinative language and a verb-framed language. Therefore manner and path are encoded within the verb (Beavers, 2007). Verbs in Japanese are considered to be impersonal and these merely imply that an action is occurring with no morphological reference as to who is performing the action (Miller, 1970). The verb structures in Japanese are inflectional, however, unlike other languages they do not inflect according to person or number but rather inflect based on tense and other features (Kuno, 1973). An example of a Japanese action verb would be; **"学**". The phonetic translation of this action verb is "gaku" and in English this translates to "learn" (Daniels, 1996). In Japanese, adjective structures inflect in a similar manner to the verb structures. There are different adjectival classes and these classes determine the inflection.

2.2.3 Italian

Italian is a Romance Language (Lepschy & Lepschy, 1992). It is a language that is comprised of many different regionally based dialects. Italian is spoken predominantly in Italy, Europe. It is known to be a verb-framed language which follows the following word order structure:

Subject + Verb + Object

An example of a typical sentence in Italian would be; ***"Sarah beve cafe"*** which translated into English means ***"Sarah drinks coffee"***. The Italian language makes use of grammatical gender. This requires nominal and predicate structures to be in gender-based agreement with each other. This agreement is attained through the modification of suffixes (Lepschy & Lepschy, 1992).

Italian is known to have inflectional verbs. This means that verb structures can be modified according to a variety of different grammatical categories such as tense, person or gender (Levy, 2013). An example of an Italian action verb is "chiam" which translates into English as "call". The way in which an Italian verb functions requires a word to have a root stem. This stem is merged with various inflections depending on the gender and tense surrounding that verb. In Italian, the adjective structures morphologically adapt according to the gender of the nominal structure they are being used to describe. The morphological change occurs through the modification of the suffix of a word (Pei, 1941). Italian is a verb-framed language (Verkerk, 2015).

2.2.4 LIS

The next language that has been included in the current study is LIS (Rinaldi, Caselli, Di Renzo, Gulli, & Volterra, 2014). LIS is spoken amongst the deaf community in Italy. This language is different from the above-mentioned languages as it does not involve verbal speech but signing. Sign languages, in general, have not been studied in as much detail as spoken languages in typology research. However, the studies that have been conducted have stated that sign languages follow a very different structure and organisation to spoken languages, especially with regard to the way that LIS treats predicate structures (Rinaldi et al., 2014). This is therefore of great interest to the researcher. In terms of the utterance structure, LIS begins an utterance with a verb. In terms of formal sentence construction, LIS uses the following structure (Fischer, 2014);

Subject + Object + Verb

Up until approximately 30 years ago, LIS was an informal means of communication within the Italian deaf community (Fontana, Corazza, Braem, & Volterra 2015). The reason that an actual example has not been included for LIS is because the way that the words are signed requires a lot of movement, which cannot be captured in one image and there are not a lot of images available on action verbs being produced in LIS that could be referentially supported.

2.2.5 isiZulu

The next language that is discussed in this research report is IsiZulu. This is a Bantu language that is spoken throughout South Africa (Kunene Nicolas & Ahmed, 2016). The Bantu language family can be viewed in terms of "clusters" which are essentially collections of different dialects which contribute to a common and mutually understandable form (Doke, 2017). isiZulu is a part of the Nguni cluster of Bantu languages (Demuth, 1998; Kunene Nicolas, 2015). It follows the following structure:

Subject + Verb + Object

An example of a typical isiZulu sentence would be; ***"USipho uthanda ukudla"*** which translates into English as ***"Sipho loves food"***. Nguni languages are configurational, which means these have a rigid word structure and order (Van der Spuy, 1993). isiZulu is an agglutinative language which makes the morphological structure of the words very long and complex. isiZulu is also a verb-framed language which means that the information regarding manner and path are encoded within the verb (Talmy, 1985). isiZulu verb structures are constructed by adding different prefixes and suffixes to a root word. In isiZulu, the adjective - like many other isiZulu words - is comprised of a stem and a concord (Poulos & Msimang, 1988). The concord that is typically attached to the stem is always in agreement with the noun class that the adjective is offering information about. In the above example, the verb stem would be "*thand*".

2.3 Language Acquisition

This section discusses the notion of early language and lexical acquisition. Previous research has displayed that a universal consensus exists as to the process that children go through when they begin to acquire their first languages. Understanding language acquisition is important to the current study as it acts as a foundation for understanding the development of predicate structures. Before the notion of predicate acquisition can be fully understood, the notion of general language acquisition must be clearly defined and clarified. By acknowledging what is typical and universal across a variety of languages, one can then identify what is atypical or, alternatively, specific to a certain language typology.

According to Clark (2009), not all languages are the same. Therefore, one can assume that not all processes of language acquisition will be the same. Language is a multi-layered paradigm and, as a result, there are many cognitively subtle and substantial elements to consider when

understanding exactly what processes occur in a child's mind when they develop through acquisition. Languages contrast in their phonology, in other words what sounds and sound combinations are permitted or if a syllable can have more than one consonant at the onset. Languages contrast in their grammar and syntax. Can a predicate function on its own or must it be collocated with a subject? How are nominals semantically recognised? Are prepositions or postpositions used? Does the language employ an SVO or SOV clause structure? Languages can also contrast in their meaning construction. Can a certain meaning be attained by a single word or a combination of lexical words? These elements, plus more, must be considered when investigating the deeply structured composition of a language. After considering just a few of the plausibility's above, theoretically, the way in which a child acquires a language must differ depending on the language that is being acquired.

Slobin (1973) claims that children learn their language across two different stages: conceptual and formal. Clark (2009) explains this theory: the conceptual stage involves meaning construction and conceptual variations. It is assumed that despite children all over the world learning and speaking different languages, on a biological and cognitive level these typically developing children should progress and conceptualise information in a similar fashion. Therefore, similar ideas would be grasped at similar times. These ideas are ones which can be communicated through language. However, since the languages around the world do differ in various ways, the rate at which a child formally learns language will also differ as a result of the rules and constraints a specific language requires (Slobin, 1973).

When examining language acquisition, one must consider the social element of language. The interaction that a child has with the language that surrounds him or her has a vital effect on linguistic development. Children are exposed to language whilst they are in the womb and from the moment that they are born, the developmental process begins. The language to which children are exposed is referred to as "input". Traditionally, the main source of such input comes from the child's primary caregivers. Conversations take place every day all over the world and across all different languages (Clark, 2009). In order to take part functionally in these conversations and communicate with others, an individual has to have learned - at some point - how to do so in accordance with both their language and cultural expectations on a social scale.

An example to illustrate this can be seen in a study conducted by Bornstein, Tal and Rahn (1992). This was a cross-cultural study conducted with the aim of observing the speech

interaction that children had with their surroundings in a natural home setting. The study was conducted across four different languages spoken in four different countries: Argentina, France, Japan and America. The results showed that across all four languages and cultures, the mothers displayed similar patterns of speech input towards their babies between the ages of 5 and 13 months.

Across all of the languages, as the children progressed through their 5- to 13-month-old stage of development, there was a distinct change in the content of the speech. More direction was given to the children and the questions that were posed by the mothers indicated that the children had a better understanding of their particular language than they had had before (Bornstein et al., 1992). However, amongst these similarities, differences were also found. The variations between the different results were owing to the contrasting beliefs found across the different cultures which, in effect, reflected on the input style used by the caregivers. The most distinct contrast was found between the three Western cultures (Argentina, France and America) and the one Eastern culture: Japan.

The Western languages mainly used "information-based speech" directed towards their children. This means that content was more formal and factual. The speech of the children offered concrete meaning and understanding. On the other hand, the Japanese culture used more "baby-talk" in their speech, incorporating lots of onomatopoeia and nonsense words when they spoke to their children. This evidence about Eastern cultures has been documented before in other studies (Bornstein et al., 1992). In light of this information, it is necessary to say that social surroundings and contexts in which children begin to develop their language does play an important role in linguistic development as this process differs depending on the culture and language typology being considered.

The current study evaluates and analyses the development of the predicate throughout the early stages of language acquisition in isiZulu. In order to do so, an important phenomenon must be explored. This is "general question asking": how do humans, in fact, acquire a language? Clark (2009) states some researchers believe that a child is born as a "tabula rasa", which means a "blank slate". This is a metaphor that has been used in support of many language acquisition arguments. It states that a child is born without any pre-existing knowledge of language or language structure. Other researchers believe that a child is born with language being present as an internal tool which is waiting to be engaged (Palmer, 1986). Finally, further theories attribute language acquisition to cognitive range and development which allows children to

acquire a particular language easily at a particular stage of their general cognitive advances (Piaget, 2002). These different approaches to understanding how children begin to develop their language is important as it helps one understand why certain studies are performed in terms of their investigations and aims. This particular study does not take a stand with regard to which theory is correct as opposed to another as it deals with the processes of language acquisition that come at a slightly later stage.

2.3.1 Early Language Acquisition

Before children are able to produce their first lexical words, certain stages of cognitive and physical development have to take place first (Clark, 2009). Children are not born with the immediate ability to speak. Communication and speech production is an ability that derives from both cognitive and physical growth and development. Therefore, the process leading up to a child's very first words takes some time. It is known that language is produced through the use of speech articulators (Kuhl, 1994). These are physical elements which take time to advance and strengthen. It also takes time for an individual to learn how to manipulate these articulators in order to speak. This ability is learnt through various stages and early milestones of acquisition, evidently before the process of acquiring the first words begins.

The following table has been adapted by information offered in Harley (2013). It displays the labels given to the various stages of early language development, which lead up to lexical development. (This is one of the focus points of the current study.) These stages begin at a very young age and progress in a scaffolding manner until a child is cognitively and physically ready to produce lexical items. Table 2 shows the above-mentioned stages:

Table 2. *Stages of Early Language Development*

Age	Stage
Birth	Vegetative sounds
6 weeks	Cooing
16 weeks	Laughing
16 weeks to 6 months	Vocal Play
6 to 9 months	Babbling
10 to 11 months	First Words
18 months	Vocabulary explosion

Adapted from Harley (2013)

These are some of the biological and physical developmental stages that a child experiences leading up to their ability to produce their first words around the age of 10 to 11 months. As

can be seen in Table 2, it is evident that once a child starts to produce lexical items, they continue to develop their lexical inventories at a slow and steady pace. However, this often depends on the linguistic environment they are in. Around the age of 18 months, a child experiences a language and vocabulary explosion where they are able to acquire new words at a far more rapid pace than before.

It is very important to state, however, that even though much research has been conducted on early language acquisition it is very possible that not all children fit into these exact cohorts of development. It is also possible that not all children go through every stage that has been presented in Table 2. Language acquisition can vary according to a number of different contextual factors.

2.3.2 Lexical Acquisition

It has now been established that, after the age of 18 months, a child is able to learn many new words at a satisfactory pace. The process by which a child learns new words is called lexical acquisition and this section of the chapter discusses some of the information and learnings about the early words that children acquire. This is important to the current study since this study is in essence assessing the development of early lexical items that are categorised as being part of the predicate construction.

Clark (2009) states that a child's range of early lexical words are produced under restricted conditions. This is owing to the fact that before children can learn a new word, they first need to establish a clear cognitive concept representing something they have encountered or experienced. Therefore, the restricting conditions can also be referred to as the limitations of the child's early environment and are often contextually based. Once concepts are formed, lexical words are used and applied as labels for these concepts. Research suggests that by the age of 24 months, a child should have approximately 100 to 600 words in their vocabulary (Harley, 2013).

Masur (1995) published a report on a longitudinal study that the author conducted. The aim of the study was to create a lexical inventory of the first and early words children learn. The study occurred over a period of two years. Over that time, different children aged between 10 to 21 months were assessed. The method used for the study conducted by Masur (1995) made use of parental interviews where caregivers would notify the researcher about the words their child knew. The researcher then administered an imitation task to receive more direct feedback from

the child to corroborate the parent's observations. The results towards the end of the study reflect the lexical development of the children. As they developed further, their lexical words became more prominent. (This was around the age of 21 months.) By the age of 21 months, the children had acquired more than 50 productive lexical items (Masur, 1995).

The parental interviews also uncovered that around the age of 17 months, the children had already begun to form between one and 12 semantic relations between the words they had, at that point, acquired. This statistic doubled by the age the children had reached 21 months of age. With regard to the content of the lexical items, the most commonly produced words were nominal structures referring to things that were present in their immediate environment. These results emphasise that a child's vocabulary is actively growing around the second year of age and development.

Clark (2009) offers more information in support of what the study conducted by Masur (1995) found by stating that a child's first 50 lexical items are typically food, people, household objects, body parts and toys. All of the cross-linguistic articles that have been considered in this study assessed children who were at a similar age.

2.3.3 Production and Comprehension

This section discusses the notions of language production and language comprehension. These concepts are important to the current study because both these processes are assessed simultaneously with the aid of the PiNG lexical assessment tool. It is also important to highlight that children begin their language acquisition by understanding (language perception) before they can produce words. So even if a child may not know a lexical item by its name, they may actually know the concept of the word (Harley, 2013; Carroll, 2008). Carroll (2008) further states that language production can be assumed to be the reverse process of language comprehension. This is because it is easier process to recognise words one may have encountered at some stage of one's linguistic lives than to reproduce words one knows and sometimes does not know the meaning or function of.

In saying this, it is therefore easier to study and understand how one comprehends a language opposed to how one produces a language. It is understood that not all language production sub-categorised processes have reverse procedures. Some of them work within their own contexts and are non-related to contrary structures. A strong argument that is present throughout reviewed literature is that the field of studying language production has evolved drastically

(Carroll, 2008). After many years of both successful and failed experimentation, researchers from a variety of fields are slowly reaching conclusive and satisfactory results, in the context of trying to understand exactly what is neurologically and psycholinguistically involved in order to produce a spoken language.

As mentioned in section 2.3.1, early language acquisition involves both production as well as comprehension. 'Language comprehension' can be defined as the decoding of information and messages that were previously encoded in a linguistically understandable format (Sharwood-Smith, 1986). This linguistically understandable information is perceived by a listener and thereafter undergoes cognitive interpretation. The lexical items chosen by the person producing the speech, in accordance with a particular grammatical structure, allows the listener to understand what the speaker is saying by extracting semantic meaning from the above linguistic structures. It is important to state that auditory speech is not entirely necessary and exclusive with this process.

Meaning is extracted from all words and sentences regardless of the form or mode the input comes in. Once semantic meaning is derived from the linguistic input the perceiver perceives, the listener comprehends what the speaker has said. Understanding both language production and language comprehension is important to the current study as these both play an important role in language acquisition.

In a child's early years of acquisition, they will often receive commands from their caregiver such as "give" or "eat". These are all lexical items that a child will perceive and store within their lexicons. These words are verbs in terms of their linguistic structure, which in turn fall within the paradigm of the predicate. Throughout these early years, children also attribute and understand names and labels referring to concrete objects within their environments. These names and labels would also be stored categorically within the lexicon and in turn would fall within the paradigm of nominal structures. Therefore, as a part of a child's early items of comprehension it is highly probable that elements of the predicate will be within the lexical inventory of input, which emphasises the importance of understanding the notion of comprehension in order to understand the development of the predicate. The current study focuses on predicate production.

2.3.4 Cross-Linguistic Language Acquisition

Many studies have been conducted on early language acquisition and investigate the different ways in which speakers of different languages develop. As a result of these studies, many theories have been developed and are sometimes deemed as being a universal rule. Talmy (1985; 2000) reminds us that owing to the different typological structures that comprise languages, one cannot claim a theory as being universal until it has been tested against all known and practised languages.

Goldfield and Reznick (1990) conducted a study that examined the early lexical acquisition of English. It was a longitudinal study, which is a common methodological approach in understanding early lexical development. The study made use of parental diary entries which is one methodological approach of attaining such data. However the problem with this approach that has been identified in the past is that it can be unreliable and biased. This is because the parents are in charge of the data collection. The results of the study showed that the content of a child's early vocabulary will depend on the strategy that the child unconsciously used to start acquiring lexical items (Goldfield & Reznick, 1990). If they focused their attention on naming as many things as possible, their lexicon was dominated by nominal structures. However, if they gradually acquired lexical items, often at a slower pace, they were able to perceive a broader range of words and those children's lexicons were comprised of a wider variety of nominals, verbs and function words.

With regard to early Italian lexical development, a study was conducted by Caselli, M.C., Bates, E., Casadio, P., Fenson, J., Fenson, L., Sanderl, L., & Weir, J. (1995). This was done with the aim of investigating the concept that, in some cases, verb structures could be acquired well before nominals. The hypothesis of this particular study stated that the researchers did not believe that verbs could be acquired before nominals in the context of Italian and English. The reason that English was involved was owing to the fact that the study was a crosslinguistic one as well as that all of the data and results which were attained were examined crosslinguistically between the two languages to see whether any occurrences were language specific or possibly occurred across both of the languages that were involved in the study. The researchers tested the early make-up of a child's lexicon between the ages of 8 to 16 months. They used the Italian version of the MB-CDI tool which assesses the children's lexical vocabulary. This required the parents to collect the data surrounding their child's acquisition. The study tested what lexical items are known by children between the ages of 8 to 16 months. The researchers found

that the first 50 to 100 words these children had - at that stage - already acquired were predominantly nominals, with few to no verbs being present. Therefore, from this study, it can be seen that nominal constructions dominate a child's first few lexical items in Italian.

LIS is a language that follows a very different typological structure from the other languages that are explored throughout this research report. The most obvious difference between LIS and the other languages is the fact that it is perceived and produced in a different manner than spoken languages. It is important to note here that even though these structural and biological differences exist, LIS is as much of a formal language as any of the other languages mentioned in this study. However, in saying this, by acknowledging the obvious differences it is very important to take this opportunity to shed some light on certain elements of the language's acquisition that may not be common knowledge.

There is no doubt that LIS would be acquired in a different manner as opposed to other spoken languages seeing as different physical and anatomical features play more important roles than others. Literature states that deaf children may lag in their comprehension abilities seeing as their linguistic input requires their visual attention (Pizzuto, 2002). This means that the process of passive comprehension does not play as prominent a role in signed languages as it does in spoken ones. A cross-linguistic study was conducted comparing Italian and LIS with one of the goals being to find comparable variables between the two languages for further studies to be conducted. Therefore, when dealing with signed languages and how these are acquired, it is very important to take into account the concentration and awareness abilities of the child as the lack of passive input - where the child is not focused on a signer of LIS - may have a certain effect on their comprehension abilities. This too may affect their sign production abilities.

Studies have been conducted on the early acquisition of Bantu languages. "Bantu Languages" is a term used to describe a family of languages found throughout Africa. Some of these languages are mutually intelligible. isiZulu falls within the Bantu language family under the larger Niger-Congo. One study aimed at investigating the early lexical development of children residing in Kenya and Nigeria, where the Bantu languages Kiswahili, Kigiriama and Ngas are spoken (Alcock & Alibhai, 2013). In many cases, the children had a better comprehension of the verb structure opposed to the nominal structure. They however performed better in their production of the nominal construction. The researchers suggested that the verb structures may have appeared earlier than usual because of either linguistic structuring or certain aspects of the way the child was being brought up. In a separate study conducted on Luo in Kenya, the

results concluded that, of the children's first set of words, nominals dominated the lexicon and the children knew how to produce very few verb structures and function words (Alcock & Alibhai, 2013).

When referring to the language acquisition of Japanese it can be seen that there are certain typological variations opposed to the other languages that have been included in this study. Ogura and Murase (2016) conducted a cross-linguistic early language acquisition study with the aim of investigating how Japanese is acquired in contrast with a different language. In the case of this example, the different language was English. The researchers made use of a Japanese version of a CDI where parental reports guided what should typically be known by a child at certain ages and stages of acquisition. This was compared to items found in the English CDI and once comparisons were made, the researchers found that when Japanese children had progressed in their language development, and their vocabulary size had grown, they were able to comprehend and produce more predicate structures than nominal structures. However, at much earlier stages of their linguistic development they seemed to have preferred concrete nominals over verbs and other predicate structures.

It was very interesting to see the English-speaking participants did not experience that same rapid increase in predicate development and instead their lexicon continued to comprise of mainly nominal structures until a much later stage (Ogura & Murase, 2016). One of the speculations the researchers offered on this finding is that the input the child received from a parent or caregiver was largely focused on predicate structures. Therefore, from a young age they had begun the conceptualisation process of acquiring these predicate structures as opposed to other culturally and typologically different languages.

2.3.5 Gesture

In order to gain a full understanding of early language development, the role of gesture is pivotal in early child language as children first use the gestural modality before they move onto speech (Capirci, Iverson, Pizzuto, & Volterra, 1996; Goldin-Meadow & Alibali, 2013). As children become competent in speech, the gesture modality also evolves either to aid, supplement or even substitute speech (Kendon, 2004, McNeill, 1992; Goldin-Meadow & Alibabli, 2013) The recent literature that forms the backdrop to this study predominantly analyses the gesture modality in the early lexical production of young children. Thus this section serves to provide the rationale of why the several authors have included, or focused on, it in their research.

Gesture is an aspect that has been considered across some of the language case studies that have been consulted with for the current study. When one examines predicate development through gesture, this can also be done through co-speech gesture as sometimes children have the concept but not the production label. This section of the chapter briefly explores the field of gesture studies and the key role that it plays in early lexical development. Communication is multimodal and involves both verbal and non-verbal elements (McNeill, 1992; Kendon, 2004). These non-verbal elements are referred to as gesture. Gesture can be defined as "an equivalence class of coordinated movements that achieve some end" (McNeill, 2000, p. 47). Gestures have been considered to be a scientifically recognised medium of communication and these tend to appear pre-linguistically (Gullberg et al., 2008).

Gesture is embedded in speech and its functions vary from enforcing a point a speaker is making to assisting in general expression. As a child progresses through their early language development, gesture is undoubtedly present throughout the process. A pre-linguistic gesture is a movement that a child may make before they are able to vocalise audible speech sounds physically. According to Wetherby, Cain, Yonclas and Walker (1988), pre-linguistic gestures are employed by a child in order to communicate their wants and needs intentionally to whomever surrounds them at the time. Examples of pre-linguistic gestures are pointing, reaching and grabbing (Wetherby, et al., 1988).

The purpose of these early gestures may either be for social interaction, behavioural regulation or joint attention. Many studies have been done on investigating pre-linguistic gestures and these studies are often conducted across a multitude of different fields and areas of research. One example to show this can be seen in a study conducted by Brady, Marquis, Fleming and Mclean (2004) where the goal was to see whether there is a way to predict how a child would perform linguistically as they develop and grow older. This was examined particularly with atypical populations in mind as these were some of the questions that concerned parents were asking their therapists.

Therefore, the researchers who conducted the study set out to measure the developmental rate at which children with such disabilities would develop. This study is relevant to the current research and the topic of pre-linguistic gestures because the researchers used the child's pre-linguistic tendencies and gestures in order to create a baseline in relation to the children's language development. The researchers decided that in order to predict and monitor a child's

communication abilities over time, they need to be fully assessed and the current communication abilities of the mentioned child must be well understood.

Therefore seeing that the children who were involved in the study were already displaying signs of communication and developmental deficits, the age cohort of the participants involved in the study was between three and six years (Brady, Marquis, Fleming & Mclean, 2004). The only way these participants were able to communicate was through pre-linguistic gestures. Eighteen children took part in this study. It is longitudinal in nature and it therefore follows the development of the eighteen participants who were pre-linguistically assessed for a set period of time. The results showed that the more advanced a child's pre-linguistic gestures were, the better they developed linguistically going forward. Pre-linguistic gestures are a window into a child's current cognitive status as well as their current ability to communicate a message and/or intention.

As a child progresses in their language development, their usage of gesture experiences a decline. Pre-linguistic gestures are useful for a child to use when they have no other means of communicating with the outside world. However once a child's articulatory organs begin to develop and the child undergoes the various stages needed leading up to comprehension and speech eligibility, they tend to favour speech production over their gesture production (Capirci & Volterra, 2008). Research suggests that between the ages of 12 – 18 months, gesture may be responsible for more communicative intentions as opposed to early speech. A child's tendency to favour gesture over words peaks at around the age of 16 months, yet by the age of 20 months, there is a clear shift from the predominant use of gesture to the predominant use of words.

2.3.6 Types of Gesture

People use gesture in combination with their speech for many different reasons. As a result of this, certain labels and categories have been formulated to describe the different styles, techniques and uses of gesture together with speech. Table 3 presents some common types of gestures as well as a definition explaining what qualifies as each gesture type:

Table 3. *Types of Gestures*

Gesture Type	Definition
Representational	A movement that represents an object, place or symbol
Discursive	A gesture in the form of a brief beat to highlight and emphasise certain linguistic units
Deictic	A gesture that points to something that is physically present within the vicinity

Adapted from Colletta et al. (2009, p. 25)

These types of gesture have been used in many different gesture studies: cross-linguistic, atypical, narrative elicitation as well as early lexical assessment studies. These have therefore been explained as if they were to be used and identified in an experimental context.

When looking at the above types of gestures, it can be seen that some are more commonly used than others. With prior knowledge of the types of gestures that have been used and incorporated into some of the case studies that are presented in the analysis chapter of this research report, it is necessary to explore the representational and deictic gesture types.

As mentioned in Table 3, a representational gesture is a gesture that physically represents an object, action or thing. A deictic gesture is a physical reference that a person can make which refers to something their close vicinity. An example of a representational co-speech gesture could be if a person were to be talking about a ball they would make the shape of a ball with their hands. An example of a deictic gesture could be if someone were to be speaking about a table, they would point to or touch a table within close proximity to them.

Literature states that gesture can be a visible marker assisting with the observation and assessment of lexical development seeing that gesture and speech development are so closely connected (Pettenati, et al., 2012). Studies have also documented that gesture can differ cross-linguistically and cross-culturally. Huttunen, Pine, Thurnham and Kahn (2012) examined cross-cultural co-speech behaviour and compared gestural behaviour amongst young children. The one group of children was from Britain whilst the comparative group was from Finland. Their aim was to see whether gestures would vary across different ages, language competency and cultures. The reason that they focused their research on children and not adults was because the researchers believed that the immediate environment of the child is where most of his/her learning and mimicking observation takes place. Therefore, if a child were brought up in a "high frequency gesture environment" (Huttunen, Pine, Thurnham, & Khan, 2012) they would

most likely incorporate and make use of many gestures throughout their speaking lives. This also controls the effect of external social influences of various environments in which adults may consistently find themselves.

The researchers took note of the fact that the Finnish language and culture is stereotypically almost gesture silent whilst the British language and culture makes more use of co-speech gestures. They wanted to see whether this differentiation was owing to the language itself or the culture that made use of the language. The materials used for this experiment were picture-naming cards and the analysis was limited only to deictic and iconic gesture movements. The results showed that the older children in the study tended to gesture less than the younger children and the British children produced more gestures than the Finnish children. Their conclusive reasoning for this difference was the social and cultural rules of speech found across Finnish communities: it is considered respectful to speak at a slow pace, long pauses are invited and time is allocated for one to gather one's thoughts cautiously (Huttunen, Pine, Thurnham, & Khan, 2012).

An interesting element that can be extracted from such a study is the methodology that was used. Asking very young children to identify a number of different pictures and actions offers a wide window into what the child actually knows and can draw conceptual inferences from. This too may offer insight into whether different cultures are linguistically exposed to a higher or lesser variety of lexical items. Through an experiment as such, it can be seen whether different cultures apply more emphasis and pressure to different objects and actions. From this possible cultural difference, a more holistic understanding of the linguistic level that child is on in that particular cultural community can be gained. Therefore accommodations can be awarded in accordance with the respective level.

This section of gesture has been included as it is an important aspect of the PiNG tool. However, in the qualitative analysis this perspective will not be analysed for two reasons: 1) the speech data of isiZulu provides a detailed dataset against which to address this study's research questions unlike the other related studies, and 2) there was an infrequent gesture production other than deictic gestures pointing to pictures in this particular lexical task. This qualitative study focuses on the speech modality produced with the predicate items.

2.4 Theoretical Framework

When looking at early lexical acquisition it can be seen that children go through various stages where their knowledge and understanding of the world improves. One way in which this is possible is through the process of conceptualisation. This allows a child to attain cognitive meaning and understanding of something they have encountered in the real world that surrounds them (Hurford et al., 2007). They use this newly developed concept to refer to whatever was present in that encounter and as they biologically and cognitively continue to develop, they are able to attach lexical items to those concepts. These concepts develop according to certain strategies based upon shared characteristics that one is able to observe and identify as commonalities across things they perceive. This is an important theoretical approach to take when examining the development of the different constructions within the predicate structure. The next section of this chapter will discuss some cognitive theories of language acquisition.

2.4.1 Cognitive Theories of Lexical Acquisition

There are many theories that offer insight into the cognitive processes that allow speech production to take place. One of these theories is "Levelt's Four Stages of Production" (Carroll, 2008). The four stages that support this theory are conceptualising, formulating, articulating and self-monitoring. It is through these stages that one can question whether speech production is a random and personal ability, or whether it follows a deeply structured sequence of processes that are present across all typically developing populations. It is very difficult to analyse the conceptualising stage of language production, This is owing to the fact that people do think differently, and different ideas are formed according to a variety of different contexts. However, it is possible to speak about and analyse the stage of formulating linguistic plans as this seems to be a more concrete structure to work within (Carroll, 2008). After a thought or idea has been conceptualised, it must be organised and transformed into linguistic units and segments, which can again thereafter be produced and articulated.

There are two broad models of linguistic planning that one can look at. These both offer slightly different views to each other, according to Carroll (2008). The first group consists of "Serial Models of Linguistic Planning" and this broad category offers progressions such as working memory, linguistic processes such as meaning and syntactic structure. It thereafter follows a variety of editing processes. Working memory is considered to be a valued resource within

language development and proposes various stages that store and transfer brief moments of information. This is relevant within the early stages of lexical development.

It can be argued that there is a process found in between planning and articulation. This process is called "Editing" (Carroll, 2008). It is at this stage where an individual evaluates what it is that they are about to say in order to make sure it is contextually applicable to the conversation at hand.

As mentioned, there are two broad models that can account for and explain linguistic planning. The second is noted as "Parallel Models of Linguistic Planning" (Carroll; 2008. p. 204). This model takes the stance in stating that there are multiple levels of processing occurring when one begins to formulate a linguistic plan and all of these processes therefore occur simultaneously. This model is deemed to be very similar to the "TRACE Model" found within language production parameters. This parallel model incorporates permanent memory rather than working memory, like the serial model, and it focuses on four nodal elements of permanent memory. These are semantic, syntactic, morphological and phonological elements (Carroll, 2008; Harley 2013). These theories are relevant to the current study as they briefly showcase some ideas of the underlying cognitive processes that occur when language is being acquired and, more importantly, how language is used once it has been acquired.

One other theory that has guided studies on early language acquisition is the Noun Bias Theory (Dhillon, 2010). This theory is not cognitively based but more functionally based. It suggests that nominal structures are universally acquired before predicate structures. One of the supporting reasons for this is that nominal structures refer to concrete referents within one's surroundings thus making lexicalisation easy. As a result of this, many studies have been conducted with the focus being on nominal structures as there is often a lot of data available from children at such a young age. This is one of the reasons that the current study has chosen to focus on the predicate structure as there is not a lot of information available about it in contrast to how much is available on the nominal structure.

2.4.2 Semantic Theories of Language Development

This section of the chapter discusses the notion of semantics. Semantics is a broad and diverse field that can be applied to a multitude of different disciplines and areas of study. This field of study essentially refers to and studies meaning that is communicated through language (Saeed,

2009). One can view linguistics as a discipline that allows various different levels of analysis to take place. Semantics can be considered as one of those levels. It assists researchers by offering theories and processes to assist in understanding and studying the underlying meanings of words and sentences. The meaning that one derives from words and sentences is often contextually dependant. When examining semantic relations as an example, it is very important to acknowledge who is cognitively forming the relevant semantic connections and what possible life experiences they may have encountered in their lives up to that point via examining what they have essentially been exposed to and could have possibly perceived.

When exploring early lexical acquisition, one cannot ignore the role that semantic theory plays. All of the lexical items that one productively uses and knows were merely cognitive concepts before one began to apply lexical labels to these across various stages throughout life. This idea offers an explanation and theoretical support as to why children's first words are often in reference to things that surround them and things that they come into contact with on a frequent basis.

2.4.2.1 Prototype Theory

One prominent theory that exists within the field of cognitive semantics is the "Prototype Theory" which was developed by Eleanor Rosch in the 1970s. This theory suggests that concepts are developed as a result of structured membership within a semantic category (Kuczaj, 1982). People therefore, according to this theory, build ideas of membership based on what things "more typically" fit into a category in comparison to other things that may not qualify as obviously. All abstract concepts traditionally fit into their categories according to the different types of characteristics that they share with one another.

Prototype Theory offers various levels of semantic understanding and categorisation (MacLaury, 1991). Lexical references that are most commonly referred to and used in a more everyday type of context are classified as being a part of the "basic level". An example of a basic level lexical item would be "a dog". These particular lexical items are below the superordinate level.

The superordinate level refers to collective categories that refer to many things which share certain features and characteristics. An example of a superordinate level lexical item would be "animal". The level below the basic level is the "subordinate level". This level specifies more detailed characteristics about something. An example of a subordinate level lexical item would be "a golden retriever". Therefore, one can semantically associate a particular breed of a dog

as being a dog. Even if it may look different to other dogs, it would still have certain similarly shared features. That specific breed of dog can also be semantically associated as being an animal. Our ability to associate features semantically can be widely stretched: a dog and a lion do not have many features in common however, because of the few features that they do have in common with each other, they both therefore qualify equally as animals.

One can clearly identify that Prototype Theory works on the structure of a semantic hierarchy which is determined by commonly shared features and characteristics. These semantic relations between objects and actions take time to be acquired throughout the early stages of lexical development. This is because a child needs to be exposed to many similarly categorised things in order to conceptually and semantically identify those similarities. This theory is interesting for the current study as it may guide one in understanding how it is possible to draw semantic similarities and inferences between cognitive concepts.

2.4.2.2 Overextension

When dealing with the notions of semantics one cannot ignore certain behaviours that children tend to present as they develop their semantic relationships. One behaviour that children present is overextending conceptual meanings (Saeed, 2009; Harley, 2013; Carroll, 2008). This term refers to when children acquire a lexical label for a particular concept in their mind and they apply that lexical label to all things which semantically relate to that concept. An example could be a child learns the term "Daddy" to represent the concept of their father. However, overextending this term would mean that the child would refer to all older and bigger men as "Daddy". Children transition through this stage as they learn to identify specific features about things and actions surrounding them and they acquire new terms to differentiate these features.

A study conducted by Kuczaj (1982) sought to see whether children overextend differently when they are producing language opposed to when they comprehend language. The theories of over- and underextension are important to the current study since these may account for why some children of the same age and culture may recognise some objects and actions better than others. Some children may be restricting their ability to name an object because it conflicts with their pre-confirmed concept of what that word reflects in the real world.

The mentioned tested six children between the ages of 1.9 and 2.4 years old. The children each took part in a production and comprehension task independently. The production task was personalised for each specific child as the researcher had to make use of some of the words that the child was using in order to know if any of the child's responses were in fact overextensions.

The words that were used across all of the tests were objects. It is unfortunate to see how predicate structures - such as the verb and adjectives - continue to be excluded from acquisition studies (Kuczaj, 1982).

In all the sessions the production tasks were administered long before the comprehension tasks. One of the reasons for this was for the researcher to find out whether the child was more inclined to overextend after multiple language production tasks. The children were presented with many cards: target cards, exemplars, and overextended exemplars. Eventually the most overextended words from the production tasks resulted in five words that would later on, on a different day and during a different experimental session, be used for the comprehension task. In this task, the child was again presented with multiple words some of these which were the examples mentioned from the production tasks. Thereafter the child was asked to give the researcher the corresponding picture card with what the researcher had asked for. This was how they tested how far the overextension could be stretched.

The results show that the children more commonly chose the cards relating to the target card in the comprehension task even though, beforehand in the production task, it was more common for the child to use the overextended words. Therefore, the conclusion was that children overextend more when they are producing language opposed to when they are comprehending language. This is a very interesting observation in light of the current study as, during the PiNG tasks that took place, semantic relations played an important role for the children in their predicate production. This study supports the idea that children may have many concepts in their minds about what things in their surroundings are. They have not yet mastered the art of lexically labelling and producing them.

Another study which explores the notion of overextension was conducted by Gruendel (1977). The researcher sought to investigate language development and referential identification. Two participants participated in the study. The first was aged 12 and a half months and the other child was 13 and a half months. The data was collected through the use of a video recorder, and the recording was done, intermittently, over a period of 28 hours in total. The recordings were done once a month and depict the children verbally interacting with their mothers.

The results of the study showed that there were certain words within each of the children's vocabularies that would be considered overextension. For example, one child used the word "choo-choo" to refer to trains. These were toy trains as well as pictures of trains. This meaning was sometimes overextended to refer to other forms of transportation. The child would say

“choo-choo” when asked to identify a car or boat were (Gruendel, 1977). Therefore, from this the researcher deduced that the child had conceptualised and comprehended the idea of transportation and how the various transportation objects all offered a similar purpose and presented similar functions. This overextension occurred in October and it was only in March when the child began to distinguish between the different modes of transport and exclusively referred to a car as a “car” and a train as a “choo-choo”. This particular study also identifies the important role that object sounds have in early language acquisition and it is sometimes, through the sounds that an object makes, that a child can identify or create a verbal referent for that object.

As it has been established, a person’s entire vocabulary of lexical items is stored in a type of a mental dictionary. This dictionary is formally referred to as the lexicon. The relationship between the lexicon and semantics occurs through lexeme constructs or, as alternatively referred to as, semantic words (Saeed, 2009). Words can be defined according to various factors and this is naturally a language-specific feature. People can acknowledge words according to their orthographic representation, phonological make-up or their grammatical construction.

When one refers to “lexemes” or “semantic words” the basic meaning and concept of a lexical item is denoted. An example to explain this can be the English verb “to sleep”. The meaning behind this word can be adapted and manipulated according to the grammatical format the word is changed into depending on the context. The following two sentences each offer different meanings from each other, however these make use of the same lexeme and concept. The sentence “He sleeps well” conveys that he sleeps well on a general note. This could therefore refer to most of his sleeps. In the sentence “He slept well”, one sees that the lexeme has been grammatically changed into the past tense. The sentence suggests that he used to sleep well or only very recently he slept well. These two sentences show how the same lexeme has been adapted on a grammatical level to offer a perceiver different meanings and understandings (Saeed, 2009).

This is interesting to the current study as on a semantic level, there are certain abstract concepts referring to something. However, on a lexical level, one may have different lexical words that may also still relate to that initial abstract concept. This relationship does not necessarily need to be on a grammatical level but, as mentioned, can also simply be represented by different lexical words that - at some stage - share similar features with other words. This idea is in alignment with the Prototype Theory.

2.5 A Cross-linguistic Comparison of Predicate Acquisition

This section of the chapter presents a cross-linguistic comparison of contemporary predicate acquisition studies that used the same tool. It has been included as it offers an in-depth perspective of the different PiNG studies that have been conducted. It allows one to see what sort of information was examined and how this data was published. The study will once again note that gesture has only been included as it was one of the modalities that was looked at across some of the PiNG studies that were conducted. The overarching aim of the current study is to evaluate early language acquisition of the predicate structure and this section will therefore contribute towards that aim from a cross-linguistic perspective of studies conducted with the same lexical assessment tool.

All of the PiNG studies presented interesting results that contribute to the understanding of universal theory surrounding language acquisition, cross-linguistic information as well as the various approaches that children employ when comprehending or producing predicate structures. Owing to the fact that the predicate is the grammatical construction upon which this study is focused, where possible the results surrounding the predicate and its various structures are emphasised.

2.6 Italian Language

As has been mentioned the lexical assessment tool PiNG was originally created in Italian to assess the lexical development of Italian-speaking children. Bello, Giannantoni, Pettenati, Stefanini and Caselli (2012) created the tool with the aim of offering researchers a standardised instrument that simultaneously tested a child's comprehension and production of nominals and predicate structures. The creators of PiNG introduced their tool to the linguistic world through a large pilot study. The method that is discussed in Chapter 3 of this dissertation was applied to this particular study.

The age range of the Italian toddler participants who took part in the very first pilot PiNG study is 19 to 37 months old. All of these children are first-language (L1) speakers of Italian. The reported data was based on generalisations made about the verbal speech that the children produced throughout the study. Therefore, the results represent all of the age groups collectively. The results of their study are in alignment with what is universally known in terms

of the stages of language acquisition. The researchers confirmed that all of the comprehension subtests of the tool were performed better across all of the ages than the production subtests. This correlates with what Carroll (2008) claims that comprehension is an earlier-appearing cognitive function in young children opposed to language production. This study also reported the fact that the younger age groups who took part in the study (19 to 33 months) showed a rapidly increasing and fast-growing understanding of the predicate (Bello et al., 2012). This finding correlates with the stages of language acquisition proposed by Harley (2013) which explain how, at around 18 months old, children experience a language explosion. According to the article, the Predicate Production subtests appeared to be the most difficult for the children across all of the ages. This result offers information in support of the Noun Bias Theory (Dhillon, 2010) which states that verbs and other predicate structures appear later than nominal structures. The fact that the Italian children found the predicate structures harder to produce than the nominal structures confirms this concept.

Seeing that this particular study was a validation study, the focus was laid on presenting the PiNG tool and its successful pilot test. Unfortunately, as a result of this no examples of the semantic relations the children may have used when confronted with predicate structures were reported from this particular Italian dataset. Table 4 summarises which domains within predicate development and language acquisition assumptions were confirmed or rejected by the Italian data:

Table 4. *Conclusions of the Italian Data*

Universally Accepted Assumptions	Confirmed (✓) or Rejected (✗)
Comprehension precedes Production	✓
Vocabulary improves with age	✓
Nominals are earlier acquired than Predicates	✓

2.7 Japanese Language

The PiNG tool was adapted to the Japanese language with the aim of the data contributing towards a cross-linguistic comparison. This information was researched by Pettenati et al. (2012). As stated previously, the participants who took part in this particular study fell within the age range of 25 - 37 months and they are all L1 speakers of Japanese.

The Japanese study collected and analysed two different modalities of predicate comprehension and production, namely speech and co-speech gestures. The PiNG tool has been designed in such a way to allow for such variables to be looked at collectively or independently, depending on what the relative study requires. With regard to speech production, the Japanese children achieved a higher number of correct responses as they developed towards the higher age cohorts. This observation is in alignment with what is known regarding language acquisition.

Clark (2009) states that as a child grows older so their linguistic competency improves. This phenomenon is therefore not only true in an English context, which is what theory has typically been based upon, but it is also true in a Japanese context. Therefore, this observation contributes towards the global understanding of the cross-linguistic development of predicate constructions. When taking a closer look at the results presented by Pettenati et al. (2012), it can be seen that the authors also analysed the predicate subtests according to the co-speech gestures that were produced.

It can be seen that when the Japanese participants were confronted with the predicate cards, the children produced, in accordance with speech, representational gestures. However, these representational gestures differed from one another from a strategic point of view. The reported results state that the children produced either "action gestures" or "size and shape gestures". These were different approaches used by the children to communicate their conceptual and perceptual understandings of what they understood the images on the cards to represent. For example, the Japanese children produced a very high number of complete reproduction gestures where, if the image showed someone washing hands, the child would completely re-enact the action verb being portrayed (Pettenati et al., 2012).

Another observation that was reported from the Japanese data was that when children identified objects in the images on the cards, regardless of whether the cards were intended for nominal and predicate elicitation the children strategised to use their action gestures to show how they would manipulate the object on the card. This is very interesting as it shows that the children can relate on a semantic and conceptual level to what they have perceived in the image on the card. Reproducing a gesture based on the identification of an object shows us that the child has a cognitive understanding of the function of that object and understands the verb action that is in typical agreement with that object. All of the gestures that were produced as a result of this study were co-speech gestures, which means these were said in accordance with speech.

The study reported that throughout all of the co-speech gestures that were produced, 77% of them were in synchrony meaning that the speech correlated with what was being gestured. An interesting result was that the Japanese children produced more co-speech gestures relating to the predicate cards than they did for the nominal cards thus not conforming with what is universally understood as the Noun Bias Theory (Dhillon, 2010). The children were obviously more comfortable with producing co-speech gestures for actions, adjectives and adverbs than they were for nominals. This point offers information surrounding the approach the children used in producing predicate structures through co-speech gestures. Table 5 presents which universal assumptions regarding early language development were either confirmed or rejected by the Japanese study:

Table 5. *Conclusions of the Japanese Data*

Universally Accepted Assumptions	Confirmed (✓) or Rejected (×)
Comprehension precedes Production	✓
Semantic relations	✓
Nominals are earlier acquired than Predicates	×
Vocabulary improves with age	✓
Linguistic information is encoded within Gesture	✓

2.8 Canadian English Language

Canadian English was another one of the languages that PiNG was adapted to and tested on. The researchers for this particular study were Marentette, Pettenati, Bello and Volterra (2016) who chose to assess predicate development through the modality of co-speech gesture. As will be mentioned in Chapter 3, the tool had to be slightly adapted in order to be culturally applicable to the Canadian English-speaking children. The children who were included in the study were between the ages of 24 and 36 months and they were all L1 speakers of English in Canada.

With respect to the information on the early development of co-speech gestures that is currently available, the researchers on this Canadian English study wanted to focus their analysis on a very particular element of the gestures that were produced in accordance with the PiNG cards. Chapter 2 mentions the different types of gestures that can be produced and analysed, and one

of them was a representational gesture which is a movement that represents objects or actions (Colletta & Guidetti, 2012).

The Canadian English study reported a predicate analysis based on the different techniques that were used by the children when they produced their gestures. This is offers the current field of literature insight into the cognitive approaches that the children used to communicate their conceptual understanding of the predicate item that was requested of them.

Kendon (2004) states that one cannot view speech in isolation from gesture as these both play very important roles in early language acquisition. The results reported in the study state that the children performed better on the comprehension subtests than the production subtests (Carroll, 2008). This confirms what the theory and available literature about language acquisition has continually stated. The nominal subtests were performed better than the predicate subtests, even though difference between the two subtests was small. This result again supports literature which favours nominal acquisition preceding predicate acquisition (Bornstein et al., 1992).

The interesting part of this particular study is the fact that the children chose to use different techniques when gesturing in response to a predicate card. The categories set out by the study to describe the children's gestures were hand-as-hand, hand-as-object, own-body and size-and-shape. When the children encountered action verb predicate cards, they used their own body to imitate what the actor on the card was doing. For example, if the card showed an image of someone swimming, the child would imitate a swimming motion. When the cards displayed an image of an object, the children would display how that object would function by pretending their hand was the object. This means that these are hand-as-object gestures. When the children encountered an adjective-based card, they used the size-and-shape technique to assist them in describing it. Finally, when the children encountered cards where an actor was interacting with an object, their co-speech gestures would mimic the actor and their gesture required their hand to act as the hand in the image. Therefore it can be seen as a hand-as-hand gesture.

It would have been very interesting to see what the speech was that accompanied the co-speech gestures and to find out whether the gesture was used by the child to offer information they could not lexically produce or whether the speech and gestures represented the same content of information. However, the results that were reported on align with what is already known, in other words that speech and gesture are embedded within each other throughout these early years of linguistic development (Capirci & Volterra, 2008). Table 6 presents which universal

assumptions regarding early language development were either confirmed or rejected by the Canadian English study:

Table 6. *Conclusions of the Canadian English Data*

Universally Accepted Assumptions	Confirmed (✓) or Rejected (×)
Comprehension precedes Production	✓
Nominals are earlier acquired than Predicates	✓
Linguistic information is encoded within Gesture	✓

2.9 LIS

LIS is another language that required the PiNG tool to be adapted however this was not for cultural reasons like the other languages required. As mentioned in Chapter 3, the LIS researchers did not have to change the PiNG cards to make these more culturally relevant. Instead they had to translate the medium of administration and the coding procedure from spoken Italian to signed LIS.

LIS has been included in the current study since, even though it has a different format of communication to spoken languages, it is still considered to be a formal and well-practised language. It also offers a very different typological language structure from the other spoken languages included in this study. Thus, this will add to the understanding of the cross-linguistic development of the predicate from a more universal perspective. The researchers who conducted this LIS study are Rinaldi, Caselli, Di Renzo, Gulli and Volterra (2014).

When reporting on the predicate results that were found, the researchers chose to focus on the signed modality produced by the deaf participants which is equivalent to the speech modality produced for some of the other spoken languages. The study included children between the ages of 28 and 37 months and they had all been exposed to LIS from birth. The results confirmed the phenomenon which states that comprehension precedes production as, overall, the children performed better on the comprehension subtests than they did in the production ones. However, it is important to point out that the researchers observed this finding in relation to other reported PiNG comprehension results that were available at the time and it seemed that deaf signing children produced a much lower level of comprehension than other spoken languages. Harris, Clibbens, Chasin and Tibbitts (1989) suggest research has shown that –

owing to the fact that in order for a deaf child to comprehend an utterance - their full attention needs to be focused on the producer of that utterance as their input relies on visual contact. Maintaining constant visual contact and concentration may be a difficult task for such young children. Therefore, one can speculate that the comprehension results from this particular PiNG study contributes towards the general understanding in that even though comprehension does precede production in this language typology it is not as easily acquired as it is for spoken language typologies.

With regard to the participant's scores on the production subtests, they performed better in the predicate subtest than they did in the nominal subtest. This is very interesting as it does not concur with what literature states. Bornstein et al. (1992) emphasise that nominal structures dominate over predicate structures. This result contradicts the statement in a production context in the representation of LIS. Anderson and Reilly (2002) support this claim stating that - as signed languages are based on action as a foundation of its structure, action verbs and other predicates - therefore play an important part in early acquisition.

Another fascinating result that the LIS researchers noted in their report is that the approach used by the children when they were unsure of the correct answer for the predicate production items. The researchers noted that when the children did not know how to sign the correct lexical item for one of the predicate cards, they would take a semantic detour and offer information relating to characteristics they recognised on the card instead of the target action, adjective or adverb. Therefore, these results confirm what the literature states about the early onset of prototype development (Saeed, 2009) as the children did indeed perceive and conceptualise the detailed characteristics present on the cards. An example of how these children offered semantic variations as answers would be where the target lexical item was "roof" and the children signed "house". The same strategy was used in the predicate subtest. Table 7 presents which universal assumptions regarding early language development were either confirmed or rejected by the LIS study:

Table 7. *Conclusions of the LIS Data*

Universally Accepted Assumptions	Confirmed (✓) or Rejected (✗)
Comprehension precedes Production	✓
Nominals are earlier acquired than Predicates	✗
Semantic Relations	✓

2.10 isiZulu Language

isiZulu is the final language to be discussed that adapted and used PiNG to conduct a lexical development assessment under the “FP7-Marie Curie "Gesture and Language Development across Romance and Bantu languages" Research Programme (PIRSES-GA-2013-612563 GEST LAN D), a project that sought to investigate lexical development in French, Italian, isiZulu and Sesotho. The data was coded using the instructions for Administration and Annotation of PiNG denomination task under the GEST_LAN_D Project (Brookes, et al., 2016). The children who were selected to take part in this study fell within the age range of 25 to 36 months old and they were all L1 speakers of isiZulu. The data was collected across three different age groups (Kunene Nicolas & Ahmed, 2016).

The authors of this study reported the isiZulu predicate development through the modality of speech. They also offered age-specific results. Harley (2013) states that children go through certain milestones throughout their early language development and, at each milestone, a new stage of language is acquired. The predicate results of the study confirmed this language acquisition theory in which a clear developmental trend was present. The 36-month-old children produced a much higher number of correct responses than the 25-month-old children. Therefore, language development does increase with age. Across all of the ages, the comprehension subtests were produced much better than the production subtests, which again falls in line with the assumptions made by Carroll (2008) that comprehension precedes production.

In this particular study, the authors presented all of the lexical target items for the predicate that were involved in the study. In accordance with this they presented the percentages of the correct responses that were produced by all of the children (Kunene Nicolas & Ahmed, 2016). This offers practical information about what the children actually do or do not know from a lexical inventory perspective. Clark (2009) states that a child’s early vocabulary is comprised of words that represent their immediate environments. Therefore, the types of action verbs, adjectives and adverb structures that are acquired earlier will be a representation of what that child has been exposed to in their immediate surroundings up to that particular stage. The predicate results from the isiZulu data confirm this as one can see that across both the comprehension and production subtests of the predicate, action verbs such as “To Drink”, “To Pull”, “To Comb” and “To Bite” were all understood well and these words represent actions

that young toddlers between the ages of 25 and 36 months would have most likely come into contact with (Kunene Nicolas & Ahmed, 2016).

On the contrary, the predicate items that were not understood well were “Short”, “Outside” and “Full”. These predicate structures are words that the children may have come into contact with, however “Short” and “Full” are adjective structures and “Outside” is an adverb structure. One can see, even in the predicate production subtests, the words that were produced the worst were “Long”, “Inside” and “Far” (Kunene Nicolas & Ahmed, 2016 p. 7). These structures are again adjectives and adverbs. These results are very interesting as these are adding crucial information about the development of the predicate in isiZulu to the current body of literature available. According to these results, one can begin to extrapolate that in isiZulu predicate development, adjectives and adverbs are acquired later than action verbs. Gentner (1978) supports this finding as the researcher stated that adverb structures are typically the last to be acquired as these require verb acquisition to take place well beforehand.

Therefore, this isiZulu data has contributed more cross-linguistic information surrounding predicate development. The study identifies an approach that the children used when confronted with a picture they could not identify. For some of the predicate cards, the children did not know the correct lexical item that corresponded with the image that they saw on the card so instead they simply named other characteristics about the card that they identified. This shows what the children were conceptually and perceptually were able to identify. Table 8 presents which universal assumptions regarding early language development were either confirmed or rejected by the isiZulu study:

Table 8. *Conclusions of the isiZulu Data*

Universally Accepted Assumptions	Confirmed (✓) or Rejected (✗)
Comprehension precedes Production	✓
Late Appearance of Adverbs	✓
Vocabulary improves with age	✓
Nominals are earlier acquired than Predicates	✓
Semantic Relations	✓

2.11 Overview of cross-linguistic comparison

The overarching aim of the current study is to assess the development of the predicate construction across several languages. The predicate structure is a collective term used to refer to action verbs, adjectives and adverb structures. There is a lot of information available surrounding the various theories of language acquisition. What is currently know now will be discussed in relation to the results that were attained after critically evaluating all of the above cross-linguistic studies.

The languages that were examined were Italian (Bello et al., 2012), Japanese (Pettenati et al., 2012), Canadian English (Marentette et al., 2016), LIS (Rinaldi et al., 2014) and isiZulu (Kunene Nicolas & Ahmed, 2016). Table 9 offers a collective summary displaying which assumptions and theories regarding language development were consulted and either confirmed or rejected by the results formed from the cross-linguistic studies. The presence of a "tick" indicates that that universal assumption was confirmed by the results of the relative study. The presence of a "cross" indicates that the results from that particular language rejected the universal assumption and that, according to that particular language, the assumption did not apply. The presence of "was not mentioned" indicates that that particular universal assumption was not a focal point of the relevant study:

Table 9. *Collective summary of cross-linguistic PiNG results.*

Universally Accepted Assumptions	Italian	Japanese	Canadian English	LIS	isiZulu
Comprehension precedes Production	✓	✓	✓	✓	✓
Late Appearance of Adverbs	Was not mentioned	Was not mentioned	Was not mentioned	Was not mentioned	✓
Linguistic information is encoded within gesture	Was not mentioned	✓	✓	Was not mentioned	Was not mentioned
Vocabulary improves with age	✓	✓	Was not mentioned	Was not mentioned	✓
Nominals are earlier acquired than Predicates	✓	×	✓	×	✓
Semantic Relations	Was not mentioned	✓	Was not mentioned	✓	✓

Language acquisition occurs across many different stages. At each stage, a child is able to advance further towards mastering a particular language. According to Carroll (2008), a child's ability to comprehend language is acquired before their ability to produce language. This universal phenomenon was true for all of the languages that were involved in this cross-linguistic evaluation with regard to predicate comprehension and production. The only language typology that showed a slight variance in this regard was the LIS as their comprehension scores were observed to be much lower than all of the other studies conducted. This was reinforced by Rinaldi et al. (2014) who acknowledged that in order for a signing child to comprehend input, they need to be focusing their full attention on the person signing the input.

There are various stages of acquisition that a child has to develop through. At around the age of 18 months, a child undergoes a vocabulary explosion. The Italian data shows that the 19-month-old children who took part in their study showed a quick rate of acquisition. The youngest children who represented the other languages were all able to complete the given task so thus it is confirmed that their vocabulary explosion had already happened. Therefore, until now, the languages that have been examined in this section of the study are all cooperating on a structural and functional basis with what is universally known.

Dhillon (2010) states that a Universal Noun Bias exists amongst children acquiring language. All of the studies seemed to align with this theory as the children performed better in the nominal subtests than the predicate subtests except for two. The results from the LIS and Japanese studies did not support this theory which could be a sign of typological differences across all of the languages.

Some of the studies chose to assess the development of the predicate through the analysis of co-speech gesture productions. Kendon (2004) and McNeill (1992) state that there is a lot of linguistic information encoded through gesture production and that this is common cross-linguistically. The languages that incorporated gesture in their reported analysis were Canadian English and Japanese. The different types of representational gesture productions assisted the children in communicating their perception of the predicate image on the card. Therefore communicating linguistic information agrees with what universal theories have stated.

Literature states that adverbs are often one of the last predicate structures to develop and be fully acquired (Gentner, 1988). This was confirmed in the results produced from the isiZulu study. Some of the studies, namely the Japanese, LIS and isiZulu studies, looked at what

strategies children used when they were confronted with a predicate item for which they were unsure of the lexical item. It can be assumed that - in alignment with some elements of Prototype Theory as well as general semantic relations - the children chose to produce lexical items they recognised on the PiNG card. These were often the objects they identified on the cards. This result reiterates, what Saeed (2009) states, that conceptualisation and perception are cognitive abilities that start developing at an early age.

Overall, the information that is known surrounding these various elements of language and predicate development were applied and supported by the information that was reported in all of these important studies that were conducted. The next chapter, Chapter 3, presents the methodology that was used throughout all of these PiNG studies as well as the methodological approach that was chosen for the current study.

3 Chapter Three: Methodology

This chapter discusses the processes and methods that were used in the collection and analysis of the data that has been chosen for this study. As it has been mentioned, the data used for the current study is archival data and was therefore initially collected for a different study (Kunene Nicolas & Ahmed, 2016). The data was collected under the ethics protocol number H13/08/43. This chapter presents the method that was used in the collection of the archival data as well as the research approach and method that was used for the current study.

3.1 Theoretical Research Design

This study was inspired by an epistemological approach in order to try and address the research questions that were proposed in Chapter 1. The various epistemological perspectives allow a researcher to explore certain phenomena and design their respective research design based on subjective theoretical frameworks (Hadzilias, 2011). The current study in particular makes use of the interpretivist epistemological perspective, which aims at describing and investigating phenomena in a qualitative manner (Hadzilias, 2011). This philosophical approach allows for methods to be adjusted accordingly throughout a study (Koro-Ljungberg & Douglas, 2008).

The current study is therefore qualitative by nature, meaning that it does not require a hypothesis to be proven or rejected but it aims at addressing a series of broad questions and general ideas (Cresswell, 2014). A qualitative research approach allows for flexibility and adaptation throughout the process (Creswell, 2014). There are many different types of qualitative studies and techniques that may be used. The current study was initially based on "grounded theory" which is an inductive approach to research design (Hadzilias, 2011). A common outcome of this particular approach and analysis is that missing elements and gaps are identified. These missing elements thereafter reveal gaps for further investigation. As a result of this, with respect to the current study, a qualitative "case study" approach was integrated in order to further investigate some of the shortfalls that surfaced as a result of the "grounded theory" approach. This chapter first describes the method that was initially used in the collection and coding of the archival data that is used to assist in answering Research Question 1a and Question 2: Research Question 1 uses grounded theory design and Research Question 2 applies a case study design.

3.2 Background to Archival Data

This method originates from a global project which sought to assess language development through the use of the PiNG tool. The study from which this data is derived assessed the lexical development of noun and predicate comprehension and production in isiZulu. The aims of the study are to test the effectiveness of the adaptation of the tool and to see whether universal theories surrounding comprehension and production applied to lesser-studied languages like isiZulu (Kunene Nicolas & Ahmed, 2016).

3.2.1 Lexical Assessment Tool – PiNG

PiNG is a standardised assessment tool which was designed in Italy (Bello et al., 2012). It is a diagnostic instrument created to assess the lexicon of a toddler thoroughly by means of production and comprehension simultaneously. The tool involves 132 colour photographs that are in the form of laminated cards. This number includes pre-test cards (Bello et al., 2012).

The cards are divided into two subtests: 24 cards represent nominals and 22 cards represent predicates. The photographs on the cards represent either objects, adverbs, action verbs or adjectives. The pictures that are found on the cards were formulated according to a large amount of information collected by the researchers from the "Primo Vocabolario del Bambino". Thus the researchers could identify what common nominals and predicates were known by the toddlers in the index to create a typical generalisation. The "Primo Vocabolario del Bambino" is the Italian version of the McArthur Bates CDI, which offers a universal inventory of lexical items that parents believe their children know at various stages of language acquisition (Kim et al., 2014).

This tool was created to account for some of the shortcomings that other tools have displayed. The PiNG tool has been seen as a direct form of assessment as the data and information is offered by the child participants themselves. The PiNG tool is also multi modal seeing as the rules and guidelines instructing researchers, on how to attain and analyse data with this tool, include both verbal and non-verbal behaviour such as gesture. Another advantage that PiNG offers is the fact that it tests both comprehension and production at the same time. Carroll (2008) claims that language production is the reverse process of language comprehension. Therefore, the role that comprehension plays in language development cannot be ignored and may offer important insight as to whether a child is developing typically or not. Another benefit of the PiNG tool is that it has been categorically designed to account for both the nominal and

the predicate structures found within languages. The current study assesses the development of the predicate structures.

There are many other lexical assessment tools available apart from PiNG, however these have all been critiqued for presenting certain flaws. One traditionally used lexical assessment tool is "***The MacArthur Bates Communicative Development Inventories" (MB-CDI)*** (Dale & Fenson, 1996). It is a global index that offers normative information about infants and toddlers' lexical abilities. This test is in the form of parent questionnaires, one for infant related information and the other for toddlers. The age is 16 – 18 months for the infants and 18 to 30 months for the toddlers (Dale & Fenson, 1996). Another assessment tool that has been used to assess the early lexical development of children is the ***Boston Naming Test***. The Boston Naming Test (BNT) was initially designed to function as a neuropsychological assessment tool to detect language deficits that may be results of degenerative diseases such as Alzheimer's, Dementia, and trauma cases such as Aphasia (Harry & Crowe, 2014). However, these tools have been criticised for relying on biased parental information regarding a child's lexical development, or not accounting for predicate structures. Therefore, PiNG is a satisfactory tool to use as it accounts for both nominal and predicate structures, and it directly assesses the lexicon of the child.

The PiNG tool has had to be adapted to different languages in order for it to be used to assess children who do not speak Italian that is the language in which it was designed (Kunene Nicolas & Ahmed, 2016). This phenomenon contributes to the current study as, in order to perform an evaluation across several languages, the languages need to have something in common with each other. This commonality was the fact that the PiNG tool was adapted to each of the languages involved in the case studies: LIS, Japanese, isiZulu and Canadian English. The tool was not adapted to Italian seeing as that is the language it was designed in. This offers an opportunity for a cross-linguistic comparison to be done.

3.2.2 Adaptation of the Lexical Assessment Tool

The original version of the PiNG tool has been adapted to different languages in order for it to be used to assess the lexical acquisition of those particular languages. However, the process of adapting the tool was a complex one that had to consider many variables such as dialect, phonological similarity, semantic similarity and possibly, the most important factor, the social and cultural differences that exist between the different groups. In some cases, the PiNG tool had to be adapted to a completely different language typology and cultural context.

In order to adapt the tool effectively, various stages took place across all language adaptations of the tool. Firstly, everything about the actual tool as it was needed to be translated from Italian into the respective language to which it was being adapted.

One of the adaptations that the PiNG tool underwent was where the Italian version was adapted to Japanese. The reason that this study was conducted in a Japanese context was to see whether the Japanese children, coming from a totally different linguistic background and culture, would perform similarly to the Italian children with regard to lexical acquisition and representational gesture production (Pettenati et al., 2012). This Japanese study needed to adapt the tool because some of the images that were present on the cards were either not relative or relatable to the Japanese children. The researchers themselves changed certain images and targeted lexical items from the original tool. As an example of what was changed a "radiator" was changed to a "stove" (Pettenati et al., 2012).

Another very interesting fact about the Japanese adaptation was that the researchers opted to change the race of some of the actors that were present on the cards representing predicate actions. This emphasises how children construct their semantic concepts based on prototypical characteristics they observe and are familiar with. Therefore, by changing the race of the people on the card from White to Asian, the children were able to relate more to what was occurring on the card. The Canadian English study also conducted an adaptation process on the PiNG tool. They noted that one of the images of a merry go round was changed to one that was more commonly found in Canada (Marentette et al., 2016).

The adaptations across all of the various languages includes the target words referring to the images on the cards as well as the way in which the task was administered (Kunene Nicolas & Ahmed, 2016). These target words and methods of administration had to be translated into the target language. The translation stages of the adaptations had to have been either done or checked by a native speaker of the respective language to ensure accuracy and applicability to the larger population speaking that language. Once this translation stage was competed, the tool was often tested against adult speakers of the relevant language.

Many of the PiNG studies reported that some of the European-based images that were on the PiNG cards were not always appropriate or relevant to all of the cultures that were involved in this global collaboration. When examining the isiZulu adaptation process, certain nominal examples were unknown to the adults who were involved in the pilot stage of the adaptation (Brookes et al., 2016; Kunene Nicolas & Ahmed, 2016). These words were "seal" and

"penguin". After this, the researchers decided to change these images to a "snail" and a "crocodile" as they were more culturally and geographically applicable. All of the researchers involved in the study collectively decided that if the adults were unsure of the lexical items, the children were likely also to be unsure, which would not yield effective results. Figure 1 shows two of the culturally relevant cards that were used in the isiZulu PiNG task. The first image represents the PiNG card that was initially a seal but had to be changed to a snail. The second image a heater, which was initially meant to be a radiator, but again this was not as culturally relevant as a heater:





Kunene Nicolas & Judin (2016)

Figure 1. Adapted cards used for isiZulu PiNG study, Seal to Snail and Radiator to Heater

The fact that both the Japanese and isiZulu studies had to adapt the card that represented a radiator is noteworthy. It is also interesting to see how these two different cultures chose to adapt the image to two different pictures and lexical concepts. One can see that a semantic relation of heat production is present across all three of the images that were included on this card at some point. The LIS researchers had to translate the tool from spoken Italian and adapt everything about the tool into LIS (Rinaldi, et al., 2014).

3.2.3 Population

It has been established in Chapter 2 that there are several published studies available in which PiNG has been used as the chosen lexical assessment tool (Bello et al., 2012; Kunene Nicolas & Ahmed, 2016; Marentette et al., 2016; Pettenati et al., 2012; Rinaldi et al., 2014). These different studies were all conducted on typologically and geographically different languages. Research has shown that language is not acquired all at once but is rather gradually attained through the transition of different cognitive and biological stages (Harley, 2013). The following table presents the number and ages of participants who took part in the original isiZulu PiNG study (Kunene Nicolas & Ahmed, 2016):

Table 10. *Ages of Participants for the isiZulu PiNG Study*

Age (months)	Number of Participants
25	12
30	12
36	12

(Kunene Nicolas & Ahmed, 2016)

3.2.4 Procedure and Administration of the Tool

The sequence of events used to elicit the speech data from children using the above-mentioned assessment tool for the original archival data is as follows. The child who was taking part in the research task would be seated at a small table with a researcher after a period of familiarisation had been conducted. Familiarisation is important as it improves the quality of data collected by researchers. After familiarisation, participants, whether young or old, feel more comfortable and at ease with the researcher. This, in turn, helps them to produce a more authentic performance in a given task (Barley, 2011).

The researcher then presented the cards to the child in a pre-arranged order to maintain consistency across all of the individual data-collection sessions. Once both the researcher and the child were ready, the researcher administered the two training cards to see whether or not the child was able to complete the entire task at hand. If the child was able to finish the assignment, the test administration continued. When the comprehension subtest cards were administered, the researcher placed the target card, a semantically similar distractor card and another distractor card – which was not semantically similar - in front of the child in no particular spatial organisation (Bello et al., 2012). Next the child was asked to identify the target card according to what they understand. An example of how a child would be asked to complete such a task for the comprehension subtests would be “Where is the cat” for the nominal subtests and “Who is drinking” for the predicate subtests. Typically, this should entice the child either to identify the card verbally or through gesture (pointing, touching, lifting) that they understand to represent the animal “cat” or the action of “drinking”.

Thereafter the researcher moved on to the production subtests. For the production subtests, the researcher showed the child one card - or at times two cards - representing a new lexical target item. For the nominal production subtests, the researcher asked the child “What is this” and for the predicate production sub-tests the researcher asked “What is he/she doing” or “How is this”. The child then had to give the response they deemed fit, which reflected their comprehension

and production abilities. The entire task elicitation took each child approximately 45 minutes to complete all four of the above-mentioned four subtests. PiNG can be administered over two different sessions if need be. Factors that could contribute towards the task being split up over a longer period of time may be logistical or practical or, alternatively, the concentration levels of the child taking part in the task. The tool has been designed in a way that appears to be fun for the child to play.

All of the experimental sessions were both recorded using a video and auditory recorder. The reason for this is that in order to analyse the speech effectively that the children may have produced, physical footage needed to be obtained that could be saved and worked on from an analytical point of view after the assessment task took place. The videos were recorded according to a backdrop of set guidelines to maintain consistency. The videos of the assessment task were subsequently coded often on computational software to allow the researchers to analyse whichever elements of language and/or gesture their study placed a focus on.

The guidelines according to which a researcher collects and codes data can be found in the form of a manual that was created by some of the experts on the assessment tool and for the isiZulu data. The coding manual constructed for the project was entitled "Instructions for Administration and Annotation of PiNG denomination task under the GEST_LAN_D Project" (Brookes, Capirci, Colletta, Hadian-Cefidekhanie, Kunene Nicolas & Sparaci, 2016).

3.2.5 Coding and Transcription

After all of the data was collected according to the above-mentioned standardised procedure, it needed to be analysed. The term "coding" is often referred to because all the speech is typically coded computationally. The software often used to perform the coding is called *Elan.* It is an annotation tool that was developed for applied linguistic analysis at the Max Planck Institute (*ELAN*, n.d; Wittenburg, Brugman, Russel, Klassmann & Sloetjies, 2006). Each of the four mentioned subtests were coded independently and all of the children's responses were considered to be either correct or incorrect.

The main goal of the analysis was to see what a child essentially knew on a lexical level and what they did not. A response was considered to be correct when it corresponded with the pre-decided lexical target word pertaining to the image on the card. For the comprehension subtests (Nominal Comprehension and Predicate Comprehension) the children pointed, touched or gave the card that corresponded with their semantic understanding of the word that they were

required to identify to the administrator. However, for the production subtests (Nominal Production and Predicate Production) the child was shown one card, or sometimes two, by the researcher and they were required to produce verbally the target lexical item corresponding to that card. The current study will only make use of the predicate subtests in line with the aim of this report. The way in which the responses for the production subtests were coded can be found in Table 11:

Table 11. *Response Types*

Response type	Explanation	Examples
C	Correct	Target: To Kiss, Response: They are kissing
NT	Incorrect/No Target	Target: Clean, Response: red
NT-S	No Target Semantic	Target: To Swim, Response: Playing with water
NR	No Response	Target: To Swim, Response: No Response

Adapted from (Brookes et al., 2016). p. 16

Table 11 offers particular coding conventions and the terms to which they correspond. These conventions were used whilst conducting an annotation in *Elan*. The examples given have been taken from the isiZulu dataset. The way in which *Elan* is designed allows a coder to create certain tiers in order to analyse a variety of different variables. The speech that the child produced was transcribed and translated to and from the respective languages. Thereafter, it was classified according to the above-mentioned categories. Please see Appendix A for more examples regarding the alternative coding conventions.

Some of the studies that made use of the PiNG tool examined predicate development through different modalities. One of these was gesture production. Kendon (2004) states that gesture and speech both offer one information about what someone is trying to communicate. Therefore, gesture is an important element to consider when dealing with early language acquisition. With regard to the PiNG tool and the way in which the raw data is coded, provisions have been designed to allow a researcher to examine intricate and subtle elements of the gestures that the children produced. This is one of the reasons that the PiNG experiments are always video recorded so that raw gesture data is always attained in case one was the choice is made to investigate further the gesture modality of lexical development. It is important to note that gesture is not the focus of the current study as the case study will present sufficient speech data to explore the development of the predicate construction in the target language used. Both the speech and gesture information are coded according to a set of guidelines. These

are once again referred in the “Instructions for Administration and Annotation of PiNG denomination task under the GEST_LAN_D Project” (Brookes, Capirci, Colletta, Hadian-Cefidekhanie, Kunene Nicolas & Sparaci, 2016).

3.3 Research Methodology for Current Study

After evaluating all the published PiNG studies using the Grounded Theory Design, it became clear that a gap existed with regard to the types and amount of data presented throughout the studies. This is because not all researchers systematically presented the development of the predicate construction in the respective languages with the exception of LIS, Italian and IsiZulu.

Data for Research Question 1: For this research question, the study critically evaluated several articles that all sought to explore early language acquisition across typologically different languages. This was done with Grounded Theory in mind with the aim of seeing how the predicate was acquired across these different languages. The articles all made use of the same methodological approach. The current study critically evaluates and compares all of the results that were published across these articles. The pieces were written on studies done in Italian, Japanese, Canadian English, LIS and isiZulu (Bello et al., 2012; Kunene Nicolas & Ahmed, 2016; Marentette et al., 2016; Pettenati et al., 2012; Rinaldi et al., 2014).

The Italian study made use of 388 typically developing children between the ages of 19 and 37 months of age, it focused on verbal speech. The Japanese study made use of 22 children between the ages of 25 and 37 months, it focused on gesture production. The Canadian English study looked at 42 children between the ages of 24 and 36 months, it focused on gesture production. For the Italian Sign Language study eight deaf children took part and they were between the ages of 28 and 38 months, it focused on the sign language. Finally, the isiZulu study assessed 36 children across the ages of 25 and 36 months, it focussed on verbal speech.

Data for Research Question 2

For the isiZulu data, the archived data was collected by the Wits member of the Greatland Project under grant FP7-Marie Curie "Gesture and Language Development across Romance and Bantu languages" for the research programme (PIRSES-GA-2013-612563 GEST_LAN_D). The researchers collected the data within the aims and objectives of the larger

research project which were the development of the lexical construction of Zulu children between the ages of 25 and 36 months. A quantitative method was used to collect the data using PiNG tool from children in Soweto. Data was collected on both noun and predicate construction (Kunene Nicolas & Ahmed, 2016).

The researchers found that throughout the predicate subtests, there was a certain pattern that emerged in the sense that the isiZulu-speaking children performed their worst with the adverb constructs. The children performed their best for the action verb constructs. The study suggests that a developmental trend exists between the three age cohorts involved in the study. It has been established that the raw isiZulu data was initially coded by the researchers who collected it (Kunene Nicolas & Ahmed, 2016). However, in light of this, there were certain elements and processes within the coded data that have not yet been analysed and qualitatively explored. The current study has therefore chosen to present some of these variables. The already coded data was exported out of the computational annotation programme, *Elan*, and it was qualitatively analysed in Microsoft Excel.

From the archived data, the author of the current research report selected data of the predicate construction of children aged between 24 and 36 months in order to answer Research 2. In the isiZulu project, the actual data counts for the various subtests were not specifically reported on in terms of the different age groups and no alternative cognitive data was presented either, i.e. semantics. In this study, the author selected the comprehension and production of the predicate to explore further the isiZulu PiNG data with the aim of answering the Research Question 2. This has been done by applying the case study design which allows a researcher to focus on a bounded set of data to extrapolate on various phenomena (Creswell, 2014).

The research questions of this study are therefore:

1. How does the predicate structure develop in the early language acquisition period of children between the ages of 25 months and 36 months who speak different languages?

    a. What is the order of the predicate construction in early language development?

2. What role does semantic relation of predicate items play in early development?

The focus of the current study is predicate acquisition and development. Therefore, the analysis has only included the data relevant to the predicate comprehension and production subtests.

3.3.1 Predicate Production and Comprehension Lexical Items

This section of the chapter presents the lexical target items that were included in the Predicate Comprehension and Predicate Production subtests of the PiNG tool. This offers an idea of the level of difficulty of the words that were a part of these subtests. To reiterate, these target words were all represented on colour picture cards and presented to the child participant. For the comprehension subtest the child was asked to identify a particular card in front of them that had the image translation of what was being asked of them. For the production subtest the child had to name the verb, adjective or adverb that they were able to identify in response to what the researcher asked. The predicate comprehension lexical target items can be found in Table 12:

Table 12. *Lexical Items for Predicate Comprehension Subtest*

Lexical Items		
Verb	Adjective	Adverb
ukucula /To Sing	okufushane /Short	ngaphandle /Outside
ukulala /To Sleep	ezinkulu /Big	ngemuva /Behind
ukujikela /To Swing	egcwele /Full	vala /Close
ukukhuphuka /To Scramble Up	phezulu /High	
ukubingelela /To Greet	ezingcolile /Dirty	
ukuphuza /To Drink		
ukubambana /To Embrace		
ukuluma /To Bite		
ukuhamba /To Walk		
ukwakha /To Build		
ukushanyela /To Sweep		
ukukama /To Comb		
ukudonsa /To Pull		
ukugijima /To Run		

Table 12 shows the target words that were used to elicit correct responses from the child participants. In order to represent the predicate structure correctly, action verbs, adjectives and adverbs were included in the subtest. The images that were shown to the children were designed in relation to the words found in Table 12. Children were shown three images (see Method section, page 61) and children would point to the correct response. Images were randomly

positioned between the correct, incorrect and distractor card**.** Table 13 presents the target words included in the Predicate Production subtest:

Table 13. *Lexical Items for Predicate Production Subtest*

Lexical Items		
Verb	Adjective	Adverb
ukubhala/To Write	ayinalutho /Empty	kude /Far
ukuquabula /To Kiss	akungcolanga /Clean	okungaphakathi /Inside
ukudla /To Eat	encane /Small	phambili /Front
ukushayela /To Drive	esindayo /Heavy	
ukuphusha /To Push	okude /Long	
ukushayela /To Phone		
ukuwa /To Fall		
ukugeza /To Wash		
ukuhleka /To Laugh		
ukudlala /To Play		
ukuvula /To Open		
ukubukhuda /To Swim		
ukugida /To Dance		
ukujikela /To Turn		

In isiZulu, the verb is constructed in an inflectional manner (Poulos & Msimang, 1998). The verb consists of a stem, which is affixed to various prefixes and suffixes in order to join the various subjects and concords of the requirement statement. The predicate items in Table 13 show the types of action verbs, adjectives and adverbs that were used to test the children's productive vocabulary. They either produced these words correctly or incorrectly. One can observe that the words found across the two subtests are all different from one another.

Validity

When dealing with secondary data in a qualitative manner there are some validation problems that may arise. The most common validation critique of secondary data analysis is the concern that the secondary researcher may be too distant from the primary collection of the data (Irwin & Winterton, 2011a). This implies that there is context-based knowledge that the secondary researcher does not have and this may therefore hold an influence over their ability to analyse the same data correctly. However, in light of this, Cresswell (2014) offers validation strategies to ensure that such problems as the one listed above do not occur and affect the research.

The strategy that was used for the current study was “Peer Debriefing” (Cresswell, 2014). The case study data analysis, that makes up a part of this research study, was thoroughly checked and reviewed independently by two of the primary researchers who collected the initial data. This was to ensure that the quality and approach of the data analysis were appropriate.

4 Chapter Four: Analysis

This study seeks to examine predicate development across a variety of different languages. This chapter presents the findings of this study with the focus on answering the research questions that were posed in Chapter 1.

Research Question 1: How does the predicate structure develop in the early language acquisition period of children between the ages of 25 months and 36 months who speak different languages?

Research Question 1a: What is the order of the predicate construction in early language development?

In order to answer these research questions, the aim was to collate and analyse the findings of the predicate construction in typologically different languages. However, a very important finding of the presentation of the data from the different studies posed an interesting if somewhat limiting finding. Not all the studies presented similar data despite all using the same tool and the same age range.

Italian Language

For the Italian language, the Italian researchers found that the predicate production subtests were performed the worst out of all of the subtests, however the types of predicates that were performed better than others were not reported on. The results for the predicate comprehension subtest showed a rapid increase in words for the younger ages. A plateau occurred at the older ages. There was an average score of 14.6 with a variance of 8.6 for the correctly responses. The predicate production subtest produced an average score of 10 with very high variance, reaching 21.6. The researchers also found that lexical development does increase with age, however the data counts for the participants' performances at the different ages was not presented.

Japanese Language

For Japanese, the Japanese researchers found that the amount of correct responses increased with age, however no information was reported on which predicate lexical items were performed better than others. The study also focused primarily on the role that gesture plays in language acquisition through the use of the PiNG tool. A Spearman correlation test was

conducted to see whether there was a relationship between age and correct responses, the result was (Spearman $p = .65<.01$). Unfortunately, very little detailed information was reported on speech comprehension and production. The study mentions that children identified some semantic related items in the predicate cards but none of this information was reported on.

Canadian English

For Canadian English, the Canadian researchers presented their predicate data through the modality of gesture and not much information surrounding the speech data was published. The study reported that the noun category was performed much better than the predicate category. In total across all of the subtests, the children verbally scored an average of 12.1 correct respoonses, with a SD of 5.0. There too was no mention of the semantic alternatives the children offered, which the PiNG tool allows for throughout the coding process. The data also did not represent each age group involved independently.

LIS

The LIS researchers presented the actual data counts in their article; however. this was done collectively for all of the age groups that were involved. The study reported that for the predicate comprehension subtest the children comprehended 71.09% of the words correctly. For the predicate production subtest Therefore, one is unable to see which words were comprehended or signed better than others according to the different age groups. No semantic information was further investigated.

IsiZulu Language

The isiZulu study also presented the actual data counts and target lexical items. It too presented the data counts in a collective manner, and the information represented all of the isiZulu participants as a whole. Through the conduction of an ANOVA test, the study found a result of ($F[2.33] = 0.94$, $p<0.40$) for th predicate comprehension subtest. For the predicate production subtest the study found a result of ($F[2.33] = 0.96$, $p<0.393$). The study did not show if the individual correctly and incorrectly performed lexical items according to each age group involved. The article also did not discuss any of the semantic alternatives that the children offered when they did not know the correct answer.

In summary, with the exception of isiZulu and LIS, the data in the reviewed articles does not provide a conclusive result on a cross-linguistic development of the predicate in early

development. The isiZulu project offered some information with regard to the order of predicate development; however, this was limited and did not represent each age group individually.

Research Question 2: What role does the semantic relationship of predicate items play in early development?

This research question is better answered using the isiZulu data as data is available to allow one to examine the semantic relationship of the predicate construction as well as its development.

This section of the chapter presents an analysis of some of the results from the isiZulu predicate comprehension and production subtests. This part of the analysis makes use of archival data, for further information about this dataset (Kunene, Nicolas and Ahmed, 2016). It has become clear that many of the well-known theories and assumptions relating to the early language acquisition of predicate construction are supported by the cross-linguistic results that were attained by the various PiNG studies that were critically evaluated in the literature review chapter. After evaluating the other PiNG studies, it became clear which elements of the isiZulu data needed to be targeted and further explored. This chapter therefore presents an analysis of the correctly and incorrectly comprehended and produced predicate items. This has been done according to age group that took part in the initial study. This chapter also briefly looks at why some of the children did not comprehend or produce correct items. Lastly this chapter explores the role that semantic relations played in the children's early development of predicate structures.

Kunene, Nicolas and Ahmed (2016) mention that the children who took part in the assessment from which the data for the current research report is derived are all L1 isiZulu speakers. All of the child participants fell within the age cohorts of 25, 30 or 36 months. The results that are presented are a representation of the performance of 12 children per age division.

4.1 Data Coding

In qualitative methodology, the coding forms part of the analysis (Jacob, 1987; Cresswell, 2014). The next section includes both the coding and the analysis of the predicate construction of isiZulu. The coding of the relevant data followed the "Instructions for Administration and

Annotation of PiNG denomination task under the GEST_LAN_D Project" (Brookes, et al., 2016). The information that is analysed offers an overview of the correct and incorrect lexical items that were produced across all of the age groups as well as some of the semantic approaches that children use when they do not know the correct answer to something. The types of the data that have been considered are the specific lexical items that some of the children produced correctly or incorrectly (See Coding Manual, page 16, Appendix A). These specific lexical items were identified as being correct or incorrect according to the response types in Table 11.

4.2 Correct and Incorrect Items for Comprehension and Production Subtests

After coding and analysing all of the responses that the children produced, the researchers were able to identify how many predicate items were either correctly or incorrectly produced. The children were presented with a series of cards that showed images portraying an action, adjective or adverb. Thereafter, they were asked to identify a particular image according to what they comprehended or for the production subtest. In addition, the participants were asked to name the action, adjective or adverb that was portrayed on the target card they were shown. They either completed this successfully with a correct response, or unsuccessfully with an incorrect response. The task was administered in isiZulu and the children's responses were all in isiZulu (Kunene, Nicolas & Ahmed, 2016; Kunene, Nicolas & Judin, 2016).

For the comprehension subtest, a response was considered correct if the child was asked for example "Which one is singing" and they identified/chose a particular card that represented the relevant information. When the children produced correct responses for the production subtest, for example, they were presented with an image of an individual speaking on the phone and they stated as such. It proved that they could firstly understand the action being portrayed in the image on the card and, secondly, knew how to produce their semantic knowledge in their L1 language linguistically which, in the case of this data, was isiZulu. If, however, a child did not offer a correct response for a target card within the subtest, it was coded as incorrect. These varied incorrect responses are of much interest to the current study. The following tables all present the correctly and incorrectly produced responses that were performed across both the comprehension and production subtests across the three different age cohorts:

Table 14. *Predicate Comprehension words correctly produced by 25-month old children*

Target Word	Frequency of Correct Responses	Target Word	Frequency of Correct Responses
ukulala /To Sleep	12	ukwakha /To Build	8
ukudonsa /To Pull	12	phezulu /High	7
ukukama /To Comb	11	ezingcolile /Dirty	7
ukuluma /To Bite	11	vala /Close	6
ukucula /To Sing	10	egcwele /Full	5
ezinkulu /Big	10	ngemuva /Behind	5
ukushanyela/To Sweep	10	ukuhamba /To Walk	5
ukujikela /To Swing	9	okufushane /Short	4
ukukhuphuka/To Scramble Up	9	ukubingelela /To Greet	4
ukuphuza /To Drink	9	ngaphandle /Outside	2
ukugijima /To Run	8	ukubambana /To Embrace	2

Table 14 presents the performance of the 25-month-old children for the predicate comprehension subtest. When observing the above results one can see that the action verb cards were comprehended very well. There were 12 25-month-old children who took part in the study and one can therefore see that all of the children comprehended the words "ukulala/To Sleep" and "ukudonsa/To Pull". They identified the correct corresponding card.

Table 14 shows that one adjective was comprehended better than the others. This was the word "ezinkulu/Big". The lexical items that elicited only two correct responses across the twelve children were "ngaphandle/Outside" and "ukubambana/To Embrace". These words are adverbs and action verbs respectively. The following table presents the comprehension subtest results for the 30-month-old children:

Table 15. *Predicate Comprehension words correctly produced by 30-month old children*

Target Word	Frequency of Correct Responses	Target Word	Frequency of Correct Responses
ukucula /To Sing	12	ukwakha /To Build	8
ukudonsa /To Pull	12	ezinkulu /Big	7
ukushanyela /To Sweep	12	phezulu /High	7
ezingcolile /Dirty	12	ukubingelela /To Greet	7
ukulala /To Sleep	11	ukuhamba /To Walk	7
ukuphuza /To Drink	11	ngaphandle /Outside	6
ukuluma /To Bite	11	vala /Close	4
ukukama /To Comb	10	ngemuva /Behind	4
ukukhuphuka /To Scramble Up	9	egcwele /Full	3
ukugijima /To Run	9	ukubambana /To Embrace	3
ukujikela /To Swing	8	okufushane /Short	2

The data presented in Table 15 reflects the correctly and incorrectly produced items that were performed for the comprehension subtest for the 30-month-old children. For this age group there were four lexical items that were comprehended correctly by all twelve children for this age cohort. These words are “ukucula/To Sing”, “ukudonsa /To Pull”, “ukushanyela /To Sweep” and “ezingcolile /Dirty”. Of these collectively correctly produced lexical items, it is interesting to find an adjective. As was seen for the younger age group, most of the correctly produced items were action verbs however, again, there was one adjective that was comprehended better than the others. It must be noted that the adjectives which were performed well for the first two age cohorts were different lexical items. For the 30-month-old children the action verb “ukubambana/To Embrace” was performed as poorly as it was by the 25-month-old children. From this it can be seen that this word was difficult for the children to comprehend and identify at the two youngest age groups. The next table will present the predicate comprehension subtest responses for the 36 month-old children:

Table 16. *Predicate Comprehension words correctly produced by 36-month old children*

Target Word	Frequency of Correct Responses	Target Word	Frequency of Correct Responses
ukujikela /To Swing	12	ukuluma /To Bite	9
ukugijima /To Run	12	ukwakha /To Build	9
ukuphuza /To Drink	12	ezinkulu /Big	8
ukukama /To Comb	12	phezulu /High	7
ezingcolile /Dirty	11	ukubambana /To Embrace	6
ukushanyela /To Sweep	11	ngemuva /Behind	6
ukulala /To Sleep	10	ukuhamba /To Walk	6
ukudonsa /To Pull	10	vala /Close	4
ukucula /To Sing	9	okufushane /Short	3
ukukhuphuka /To Scramble Up	9	egcwele /Full	3
ukubingelela /To Greet	9	ngaphandle /Outside	3

Table 16 shows the correctly and incorrectly produced lexical items that were performed by the 36-month-old children. Once again, as with the other two age groups that were involved in the study, the action verbs were collectively performed better than other constructs such as the adjective and adverb. As was seen with the earlier age groups there was one adjective that was comprehended and identified better than the others. This was the same word that was comprehended well for the 30-month-old children: “ezingcolile/Dirty”. When looking at the data the action verb “ukubambana/To Embrace” was comprehended better across the 36-month-old age group than it was in both of the younger ages. This shows a very small - although not significant - advancement in lexical comprehension between the youngest and oldest age groups involved in the study.

Across all of the age groups involved, a clear pattern can be seen in that the action verbs were comprehended better than adjectives and adverbs. Only around half of the children from each age group correctly comprehended and identified some of the adverb constructs. This shows one that the adverb construct is more difficult to acquire or takes a little bit more overall time to be acquired opposed to action verbs and some adjectives. When looking at the particular lexical items that each age group comprehended correctly in its entirety as all of the children in that age group received a correct response type for that lexical item one can observe different items across the age groups. It is interesting to see that at certain ages different action words are more prominent than others, however, one cannot see any real distinguishing feature between all of the perfectly comprehended lexical items.

The following set of tables presents the performance across the different age groups with regard to the predicate production subtests. As discussed, the children were shown a card and they had to state verbally what was happening in the card according to what they perceived. There were 12 children per age group who took part in this study. Table 17 shows the correctly produced lexical items for the 25-month-old isiZulu-speaking children:

Table 17. *Predicate Production words correctly produced by 25-month old children*

Target Word	**Frequency of Correct Responses**	**Target Word**	**Frequency of Correct Responses**
ukubhala/To Write	11	ukubukhuda /To Swim	5
ukuquabula /To Kiss	10	ukugida /To Dance	4
ukudla /To Eat	10	ukujikela /To Turn	2
ukushayela /To Drive	10	ayinalutho /Empty	2
ukuphusha /To Push	10	akungcolanga /Clean	2
ukushayela /To Phone	9	encane /Small	1
ukuwa /To Fall	8	esindayo /Heavy	1
ukugeza /To Wash	8	kude /Far	1
ukuhleka /To Laugh	8	okungaphakathi /Inside	0
ukudlala /To Play	8	phambili /Front	0
ukuvula /To Open	8	okude /Long	0

In Table 17 a clear pattern can be seen with regard to the types of words that were produced better than others. The 25-month-old children identified and produced the action verbs much better than they did the adjectives and adverbs. For this age group, there were no lexical target items that were produced completely correctly by all of the children. The best-produced word was “ukubhala/To Write” where 11 of the 12 children produced it correctly. In contrast to this one can see that the adverb constructs received no or one correct responses for this age group which suggests that this linguistic construct is a difficult one to acquire at 25 months of age. When looking at the adjectives in Table 17 one can see that these were all performed similarly, without any exceptions, and only one or two children produced correct responses for the adjective pictures. The next table presents the correctly produced responses for the 30-month-old children:

Table 18. *Predicate Production words correctly produced by 30-month old children*

Target Word	Frequency of Correct Responses	Target Word	Frequency of Correct Responses
ukushayela /To Drive	12	ukudlala /To Play	7
ukuphusha /To Push	12	ukujikela /To Turn	4
ukubhala/To Write	11	akungcolanga /Clean	4
ukudla /To Eat	10	ukuhleka /To Laugh	3
ukugeza /To Wash	9	ukugida /To Dance	1
ukushayela /To Phone	9	ayinalutho /Empty	1
ukuquabula /To Kiss	8	phambili /Front	1
ukuvula /To Open	8	esindayo /Heavy	0
encane /Small	7	kude /Far	0
ukubukhuda /To Swim	7	okungaphakathi /Inside	0
ukuwa /To Fall	7	okude /Long	0

According to the data presented in Table 18 one can see the pattern that was present for the 25-month-old children has now changed and shifted for the 30-month-old children. The adjective “encane/Small” was produced fairly well with seven children correctly producing it. The other adjective items were not performed very well and, once again, it can be seen that the adverb construct was not performed well either. The action verbs were performed well and a difference between the results for the two younger age groups can be seen. All of the 30-month-old children who took part in the study correctly produced the words “ukushayela/To Drive” and “ukuphusha/To Push”. This is an improvement from the 25-month-old children seeing as they did not all correctly produce any lexical target items. It is interesting to observe that for the adjective “esindayo/Heavy” no one out of the 30-month-old children correctly produced it however one of the 25-month-old children did correctly produce it. The next table presents the correctly produced lexical items for the 36-month-old children:

Table 19. *Predicate Production words correctly produced by 36-month old children*

Target Word	Frequency of Correct Responses	Target Word	Frequency of Correct Responses
ukubhala/To Write	12	ukuquabula /To Kiss	6
ukudla /To Eat	12	ukuvula /To Open	6
ukushayela /To Phone	12	akungcolanga /Clean	4
ukuphusha /To Push	12	ukugida /To Dance	2
ukuhleka /To Laugh	11	phambili /Front	1
ukudlala /To Play	11	ukujikela /To Turn	0
ukushayela /To Drive	10	ayinalutho /Empty	0
encane /Small	10	esindayo /Heavy	0
ukugeza /To Wash	9	kude /Far	0
ukuwa /To Fall	9	okungaphakathi /Inside	0
ukubukhuda /To Swim	7	okude /Long	0

In Table 19 one can observe, as expected, that the action verbs were produced better than the adjective and adverb constructs. As was seen with the 30-month-old children, the adjective "encane /Small" was the best produced adjective, however - compared to the younger age group - it was performed correctly by more children in this age group. When examining this data set one notices that there is quite a distinct difference in the frequency of the correct responses column as the number of correct responses for the set of data on the left presents very high frequencies opposed to the younger age groups. The oldest age group had the highest number out of all the age groups for completely incorrectly produced lexical target items. This is very interesting and as - for the younger age groups - the worst performed linguistic constructs were the adverb and some adjective items. In saying this, the 36-month-old children did produce the highest number of completely correctly produced lexical target items which were "ukubhala/To Write", "ukudla /To Eat", "ukushayela /To Phone" and "ukuphusha /To Push".

4.3 Summary of Correct and Incorrect Items for Comprehension and Production Subtests

When looking at all of the data that has just been presented one can see that there is a distinct difference in performance between the comprehension and production subtests. The participants fell within three different age groups: 25, 30 and 36 months of age and there were 12 children per age group. Overall for all of the comprehension datasets the frequency of correct responses ranked fairly highly with a lot of children comprehending the lexical items they were told and correctly identifying the right picture card in front of them. The production subtests did not produce a high frequency of correct responses. This finding is in alignment with literature in the sense that comprehension is a cognitive ability that develops before production. Throughout both the comprehension and production subtests across all of the age groups the action verbs were performed better than the adjectives and adverbs. Once again, this suggests that action verbs are acquired earlier than more complicated linguistic structures such as adverbs. When looking at the overall amount of correct responses for the comprehension and production subtests, one can see a developmental trend is present. Table 20 presents the total number of correct responses that were comprehended and produced for each age group respectively:

Table 20. *Correct Responses for Comprehension and Production Subtests.*

Age Groups	Correct Responses for Comprehension Subtest	Correct Responses for Production Subtest
25 months	166	118
30 months	175	121
36 months	181	134

The above table shows the total number of correct responses that were elicited from each of the age groups. This has been done for both the comprehension subtest as well as the production subtest. It is clear to see that overall the comprehension subtest was performed better than the production subtest across all of the age groups. This is because comprehension is typically acquired earlier than production. One can also see the developmental trend across the different age groups in Table 20 as the number of correct responses for both of the subtests increases along with the ages of the children. The next section of this chapter looks specifically at the incorrectly produced lexical target items.

4.4 Incorrect Lexical Items for predicate production subtests

The previous section of this chapter presents the actual data counts for predicate comprehension and production subtests. The tables showed which words were correctly and incorrectly produced by the different age groups that took part in the study as well as the overall developmental trend that was present. As it has been mentioned, this data was coded according to certain categories which can be found in the coding manual in the Methodology chapter and Appendix A. When an item was coded as "NT – No Target" it meant that the child did not correctly produce the target lexical item. This section of the chapter will briefly present why some of the children's responses were coded as incorrect and what types of linguistic constructs were offered by the children instead of the correct response.

The predicate production subtest requires children to produce an action verb, adjective or adverb correctly. When they were not able to do this appropriately, their response or lack of response was recorded as being incorrect. When the children were asked to produce an action verb, they would sometimes instead offer a noun.

Example 1: Target word – "long"

Child's response – "it's a pencil"

This is interesting seeing as Dhillon (2010) suggests that children acquire nouns before predicate structures and, in this example, the child did not produce the required adjective but instead identified the noun in the picture card and produced the noun word. Sometimes the children offered incorrect adjectives in place of target adjectives.

Example 2: Target word – "heavy"

Child's response – "nice"

In example 2 the child still managed to offer an adjective, which means they did understand the question. However, they did not correctly identify the target and goal of the picture. This particular image was of a person carrying something very heavy accompanied with facial expressions and body language to display this. The child's response did not reflect any information around the action or facial expression the picture was portraying. The children would also offer incorrect action verbs or correct action verbs in their incorrect responses.

Example 3: Target word – "to fall"

Child's response – "running"

In example 3 one can see that the child understood that an action and movement was occurring in the image however their response did not match the target lexical item nor was their response semantically related to exactly what was occurring in the image. Therefore the response was considered to be incorrect. Some children's incorrect responses were owing to them describing non-target elements found in the images on the picture cards.

Example 4: Target word – "far"

Child's response – "wearing a T-shirt"

In example 4 the child did not produce the correct response. Instead the child described the noun image on the picture card. Once again this example shows how the children often focused on the noun in the image and in this case the child described the noun by stating the person in the image was wearing a T-shirt. The next section of this chapter explores the cases where a child offered an incorrect response, however the response that was given was semantically and closely related to the correct target lexical item.

When looking at the incorrect responses from the children, one can see that some of them were incorrect yet semantically similar to the target word and that others were simply incorrect for reasons that were just discussed. For the isiZulu data, the incorrect responses were either NT, NT-S or NR (which means no response was given by the child at all). The following table presents the percentage make-up of the incorrect responses per age group:

Table 21. *Percentages of types of incorrect response types for predicate production*

Age Groups	No Target	No Target-Semantics	No Response
25 months	70.6%	11.6%	17.8%
30 months	65.7%	11.9%	22.4%
36 months	69.2%	22.3%	8.5%

Table 21 shows the ratio of response types that made up the incorrect responses for the predicate production subtests across three different age groups. It is clear to see that for all the age groups the most popular incorrect response type was NT. One can also see that the 36-month-old children produced the most types of NT-S responses and the least amount of "no responses".

4.5 Semantic Relations of Predicate Production

When the coding took place, certain words and short phrases did not meet the lexical target word requirements. Instead these offered an alternative semantic relationship to the predicate card that was presented to the child during the experiment. The examples that are about to be presented represent the subjective approaches some of the children, across the three age groups, chose to use when they did not have a lexical item to correspond correctly with the image they were presented with.

Before continuing, it is important to note that even though the subtest that has been analysed for the current study all portray a predicate structure, some of the images on the cards contained objects and other visuals portraying nominal lexical items. In some cases, an object was incorporated into an image to elicit how the character in the card was interacting with or manipulating that object.

This interaction and manipulation would essentially be done in the form of an action. Again, these actions that the characters on the cards may have been performing acts as stimuli for lexical production. The responses that were offered in place of the correct lexical items are now analysed with regard to their various conceptual similarities. The responses were therefore analysed and interpreted according to typical academic and logical reasoning. The responses have been presented in an ascending order for the age groups that took part in the study.

4.5.1 25-Month-Age Group

The youngest age group that took part in the study was the 25-month-old children. Table 22 presents the semantic alternatives that these children offered the researcher in place of the correct target lexical items:

Table 22**.** *Semantically related words produced by 25 month old children*

Target Word	**Semantically Related Words**			
ukubukhuda /*to swim*	ungena emanzini/*they are going into the water*	udlala emanzini/*he is playing in the water*	udlala emanzini /*he is playing in the water*	ungene manzini/*he got into the water*
ukujikela /*to turn*	etulweni bayahlala/*they are sitting on chairs*	bahleli/*they are sitting*	baya chichiliza/*they are sliding*	bahleli/*they are sitting*
okude /*long*	inkulu/*it's big*	inkulu/*it's big*	iballpeni/*a pen*	
akungcolanga /*clean*	sirighiti/*it's alright*	ayingkolanga/*it is not dirty*		
okungaphakathi /*inside*	nayi ballpeni/*here is the pen*			
ukuwa /*to fall*	uyahlala abhasikilini/*they are on the bicycle*			
ukugeza /*to wash*	udlala ngamanzi/*playing with water*			
ukuvula /*to open*	udlala ngomnyango/*he is playing with the door*			

When observing Table 22, one can see that the column to the very left presents the target words in both isiZulu and English that were required as responses for the relevant PiNG cards. The remaining columns that follow the first column all portray the alternative lexical items that the child participants offered instead of the target items. These have also been presented in both the original isiZulu form in which they were produced as well as the English translation. Some of the rows have information stretching over three or more columns and this is owing to the fact that those particular target words elicited a few different semantically related responses. All of the semantically related responses that were offered by the children have been included in Table 22 so that all of the variations can be viewed as well as how many semantically related responses were offered in total per age group for each target lexical item. The target words have been arranged in a particular hierarchy where the words with the most semantically related alternatives can be found at the top and thereafter the rows and lexical items continue

downwards in a descending order. This table is discussed in accordance with the grammatical categories with which the above words correspond.

4.5.1.1 Action verbs

Action verbs are lexical items that represent the concept of "doing" (Straus et al., 2014). When examining Table 22, it can be seen that there were many action verb items that elicited a semantically similar response. These responses are now analysed and discussed.

ukubukhuda/*To Swim*

According to Table 22, for the lexical item "ukubukhuda/To swim", the semantically related responses all followed a similar pattern. A communal thought process can be identified when considering what each child was possibly thinking when they offered their response. Firstly, the focus was clearly directed towards the water in the image. Water is something that all of the children would have been familiar with. Water is also a nominal structure so it was therefore not the target word. Rather the target word was the action "ukubukhuda/to swim".

The tense in which the child responded did not matter as long as the root word was correct. In accordance with water, the children also offered alternative predicate structures such as "udlala /playing" or "ungena/going in". Therefore, it can be understood that the children knew that the person in the image on the card was doing something in or with the water. The important observation for this lexical item in relation to the 25-month-old age cohort is that some of these children did not know the action verb "ukubukhuda/to swim". They did semantically and conceptually understand what was happening in the image on the card but they had not yet developed that vocabulary items to express their mental concept correctly.

ukujikela /To Turn

The second lexical target item that elicited a high frequency of semantically similar responses was "ukujikela/To turn". Table 22 presents four semantically similar responses that were produced by the children in place of the verb "ukujikela/To turn". As seen in the previous example, the semantics used by the children were fairly similar as the most popular semantic alternative was "bahleli/they are sitting". This action verb was not the correct lexical item however, in relation to the image on the card, the people were in fact sitting on a form of a merry-go-round. Another semantically similar response was "chichiliza/sliding". This response was also an action verb. From these results it can be seen that on a conceptual level the children at 25-months-old had an understanding of what the people in the image on the card were doing,

however they were not able to link the merry-go-round with the action of turning semantically. Therefore their responses stated the verb that they conceptually identified.

ukuwa /To Fall

For this particular lexical verb item, the child was expected to produce the verb item "ukuwa /To fall". The image that was on the subtest card portrayed a person falling off a bicycle. Table 22 shows the semantically similar response that was offered by the child stated that "uyahlala abhasikilini /they are on the bicycle". This is semantically similar to the target item because the children were able to conceptualise and understand that the person in the image was on a bicycle. Other mentioned examples also pointed out that the children often identified and focused on the object in the image on the card opposed to the action the object was being used to portray.

ukugeza /To Wash

When looking at Table 22, the action verb "ukugeza /to wash" received one semantically similar response across the 25-month-old age group. The response was "udlala ngamanzi /playing with water" which is a very similar response to what the children offered for the verb "ukubukhuda /To swim". Once again, like the other children have done previously, this child took note of the object that was in the picture and stated what they identified the object to be, according to their conceptualisation. The default verb that was used in this example was the verb "udladla/playing".

ukuvula /To Open

The semantically related response that was offered by one child for the target item "ukuvula /To open" said, "udlala ngomnyango/he is playing with the door". Therefore, this relates back to what was mentioned earlier about how a child may identify certain objects in the image and that would distract them from focusing on the required action verb being requested from them. The image on this particular card showed a person opening a door, and the target lexical item was "ukuvula/To open". However, instead, the child stated the person was playing with the door. It can be assumed that that particular child at 25-months-old does not yet know the lexical item "open" and they possibly also do not know the conceptual act of opening something either.

4.5.1.2 Adjective

Adjectives are grammatical constructs that offer information about a nominal structure (Straus et al., 2014). Table 22 presents different adjectival examples where semantically related alternatives were offered by the children.

okude/Long

For this lexical target item, the child was shown two cards: one that had a short pencil on it and another that had a long pencil on it. The researcher would then point at the long pencil and ask "How is this one?". It was at this point where the child could observe the two pencils on the cards placed in front of him/her and it was up to them firstly to identify what is different between the two images on a perceptual basis and thereafter be able to produce the vocabulary item "okude/*long*". However obviously not all of the children got this item correct but sometimes offered a semantically similar option.

Two of the three responses relating to this item that were recorded stated that it was big, "inkulu/it's big", instead of saying it was long: "okude/long". The third response said it is a pen, "iballpeni/a pen", however even though they were incorrect in the fact that they only stated the object and did not offer a describing adjective, the response that they did offer was still indeed semantically similar to what was shown in the image. The fact that the children said that the longer pencil was big is a very good result seeing as even though the target word was "okude/long", the word "inkulu/big" offers a very similar concept and still portrays the message that one pencil was differently sized to the other pencil.

akungcolanga/Clean

For this lexical item, the children were again shown two different cards. Both of the cards had a T-Shirt on them. The one T-Shirt was clean and the other one was dirty. The children were expected to state that the one shirt was clean when asked how it compared to the dirty one. Two semantically similar responses were recorded. The one response was: "sirighiti/it's alright" and the other response was: "ayingkolanga/it's not dirty". Therefore, the children had the semantic idea of what the image was showing them. The first mentioned response is the type of answer an adult would possibly give. It may not be the target word but it is expressing a very stereotypical way of describing the clean state of something.

The second response that was offered by the child participant was "ayingkolanga/it's not dirty". This is showing that the child semantically understands the difference between the adjectives

clean and dirty, however he or she may not have had the lexical tool at that given time to produce the word clean. This means that they instead chose to go a different syntactic route to describe what was shown on the picture card. This last result offers insight into a child's understanding of negation. He or she was able to communicate that the shirt was not dirty, therefore showing an understanding of the meaning of the word "not" in the correct context.

4.5.1.3 Adverbs

Adverbs are grammatical constructs that describe something about a verb construct. These parts of speech can function in different forms and they can reflect information regarding manner, place and time (Straus et al., 2014). According to Table 22, there was only one adverb construct that elicited a semantically similar response.

okungaphakathi /Inside

Table 22 shows one semantically alternative response that was produced for the adverb lexical item "okungaphakathi/inside". The response was "nayi ballpeni/here is the pen". This is interesting because it shows how the child did not know the adverb structure. The finding aligns with the research which found that the adverb is one of the last predicate grammatical constructions to be acquired. The children did not know the adverb lexical item so they therefore did not produce it. Instead, the child focused on the object that was included in the image, which was in fact crayons and the child referred to those as a pen. This is another semantic relation that the child was able to create.

4.5.2 30-Month-Age Group

The second-youngest age group that took part in the study was the 30-month-old children. Table 23 presents the semantic alternatives these children offered the researcher in place of the correct lexical items:

Table 23. *Semantically related words produced by 30 month old children*

Target Word	Semantically Related Words		
ukujikela /*to turn*	baphusha into lena/*they are pushing this thing*	bahleli/*they are sitting*	bahleli eyitulweni/*they are sitting on chairs*
okude /*long*	inkulu/*it's big*	inkulu/*it's big*	inkulu/*it's big*
akungcolanga /*clean*	liright/*it is alright*	siright/*it is ok*	
phambili /*front*	usesofeni lo/*he is by the sofa this one*	ula/*he is here*	
ukushayela /*to phone*	udlala ngefoni/*he is playing with the phone*	uyakhuluma/*he is talking*	
kude /*far*	bamile/*they are standing*	basondele la/*they are close to here*	
okungaphakathi /*inside*	asendlini/*they are in the house*		
ukuwa /*to fall*	ugibele ibhisikili/*he is on the bicycle*		

4.5.2.1 Action verbs

This section of the chapter continues to analyse the action verbs that elicited semantically similar responses across the 30-month-old children who took part in the isiZulu study.

ukujikela /To turn

One can immediately see, in Table 23, that the lexical target item "ukujikela/To turn" is present. This item was also found in the previous table for the 25-month-old age cohort. The alternative semantically related responses that were offered in support of this item for this age group were very similar to the responses produced by the younger 25-month-old age group. Out of the three semantically similar responses, two of these are about the children sitting: "bahleli/they are sitting" and "bahleli eyitulweni/they are sitting on chairs" whilst the third response was about the children pushing: "baphusha into lena/they are pushing this thing". It is clear to see that in light of these responses all of these children understood the nature of the question as they all offered an action verb response by either saying pushing or sitting. In the one response,

the child specified that the children were sitting on “chairs”. This indicates that the object upon which the children were indeed sitting was prominent for that specific child.

ukushayela /To phone

When examining Table 23, it is evident that there were two semantically related responses recorded for the action verb “ukushayela/To phone*”*. The first one was “udlala ngefoni/he is playing with the phone” and the second one was “uyakhuluma/he is talking”. When comparing these two results, it is clear to see that one is more correct than the other in terms of the predicate structure which is the focus of the current study. The term “udlala/playing” has come up again as it has many times throughout the various semantically related responses.

This is another example of how the object that was involved in the image on the card played a prominent role in the child’s lexical-retrieval process since the phone was specifically mentioned. The second response that was mentioned for this item was “uyakhuluma/he is *talking*” and this is semantically, conceptually and linguistically correct. That specific child was able to know the function of the object that was present on the card, however he or she did not know how to transfer the nominal structure into its actionable state. In other words, phone – phoning. This was the challenge of this particular card which this specific child had not yet developed the ability to complete. However, again instead of offering a “No Target” or “No Response” to this item, the children discovered an alternative lexical item that would account for the same concept he or she had already developed with reference to the image on the card.

ukuwa /To fall

The action verb “ukuwa /To fall” can be found in Table 23 and it elicited one semantically similar response: “ugibele ibhisikili/he is on the bicycle*”.* The image that was on the card portrayed someone falling off their bicycle. In this example again, the child identified the nominal object which was the bicycle. From the image, the child either possibly could not perceive the details of the image that indicated the person was falling off the bike, or the child had yet to develop the lexical item to express the concept of falling. The question used for such an action verb card would have possibly asked “What is he doing?” and, in that case, the child’s response is technically correct as in order for the child to be perceived as falling off the bicycle he or she needed to be perceived as being on the bicycle in the first place.

4.5.2.2 Adjective

This section examines the semantic alternatives that the 30-month-old children offered in place of the correct adjective structures as seen in Table 23.

okude/long

The lexical item "okude/long" was asked in a particular way. The aim was to stimulate the children to distinguish the difference in length between two pencils. It is evident to see, in Table 23, that all of the semantically similar responses for the 30-month-age cohort state that the pencil was big - "inkulu/it's big" – as opposed to stating the target word: "okude/long". This particular approach and alternative response was also commonly used in the younger age cohort involved in the study. From this result, it is apparent that on a conceptual level the children were able to differentiate between the two differently sized pencil images that were placed in front of them.

akungcolanga /clean

The lexical target item "akungcolanga/clean" also elicited some interesting responses amongst the 30-month age cohort. One can observe that, for this lexical item as well as some of the other items that have been discussed, similar semantically alternative strategies across the age cohorts discussed there have been yielded. In Table 23, it can be seen that the words "liright/it is alright" and "siright/it is ok" have been used in place of "akungcolanga/clean". Therefore, once again a similar trend can be seen developing in terms of the semantic development used. The responses for this lexical target item, like for the 25-month age cohort, were casual ways of communicating their perception of the state of the T-Shirt image with which they were presented.

4.5.2.3 Adverbs

The adverb structures that elicited semantically alternative responses to the target items by the 30-month-old children are now discussed in accordance with the words found in Table 23.

phambili /front

Table 23 states that there were two semantically similar response produced by the 30 month old children for the lexical item "phambili */front".* The two responses were "usesofeni lo/he is by the sofa this one" and "ula/he is here*".* The image on the card required the child to differentiate between adverbs of place, namely in front and behind. The image on the card showed a person's placement in relation to a sofa. From the first semantically similar response,

the child understood that he or she needed to offer the researcher information regarding the location of the person in the image. On a semantic and perceptual level, the child achieved the goal by locating the person in the image, however they did not do this with the target lexical item.

It can therefore be assumed that this child did not know that adverb yet. This response is another example of how the nominal object in the image was significant and easily identifiable for the child. The second semantically related response was "ula/he is here". From this particular response, it is evident that the child took the question the researcher asked him or her literally and possibly pointed directly to the person in the image. Semantically, this response is not wrong as the child did correctly identify the location of the person on the card. However, again, this was not done with the expected lexical tools.

kude /far

The next adverbial lexical item to be discussed is "kude/far" according to Table 23. For the 30-month age cohort the semantically similar responses that were offered in place of this lexical target item were "bamile/they are standing" and "basondele la/they are close to here". With regard to the first response, the child was supposed to say "kude/far" however, instead of this, the child offered a different predicate structure which consists of an action verb which was, in fact, correct. Even though the actors on the card were meant to be perceived as being far away, they were also standing. This was perceived and lexicalised by the child.

The second semantically similar response for this category was very interesting. The child stated that "basondele la/they are close to here". Therefore instead of producing the lexical item "kude/far", they strategised to take a different lexical route to reach the same concept. The child did not know the target lexical item but instead offered the antonym of "kude/far". This shows that on a perceptual level, this child probably understood what was being portrayed in the image, however they had not yet developed the target lexical item. This means that instead the child probably made use of other lexical items that they did know. Across both of the age groups discussed, it is clear that the adverb grammatical category was difficult for the children.

okungaphakathi /inside

When looking at Table 23, one can see the lexical item "okungaphakathi /inside". This word is considered to be an adverb relating to location. Research has shown that adverbs are syntactic structures that children present difficulty in acquiring (Gentner, 1988) and the results from the

current dataset prove this to be true. It is noted here that across the two age groups that have been discussed so far, not one child offered a correct response for this particular lexical target item. Instead, one semantically similar alternative was produced per age group but neither of those responses were closely related to one another. Therefore, no trend can be viewed amongst the two discussed age groups yet.

In Table 23, it is evident that the alternative response that was offered was "asendlini/*they are in the house*". Therefore, again the concept of something being "in" something else is present, however the child had not yet developed the required vocabulary to communicate this according to what was initially required. This is another example of how adverbs require the child first to know the verb that is being described by the adverb before being able to apply that adverb correctly.

4.5.3 36-Month Age Group

The oldest age group that took part in the study was the 36-month-old children. Table 24 presents the semantic alternatives these children offered the researcher in place of the correct lexical items:

Table 24. *Semantically related words produced by 36 month old children*

Target Word	**Semantically Related Words**			
okude /*long*	inkulu/*it's big*	yinkulu/*it is big*	kukhulu/*it is big*	ikhulu/*it is big*
ukuvula /*to open*	uvala isivalo/*he is closing the doo*r	ubambe umnyango/*he is holding the door*	uyabheka/*he is looking*	ubambe umnyango/*he is holding the door*
ukujikela /*to turn*	bahleli/*they are sitting*	bayadlala/*they are playing*	bahleli/*they are sitting*	
akungcolanga /*clean*	isikibha lesi sinice/*this t-shirt is nice*	ikahle/*it is alright*	raithi/*alright*	
okungaphakathi /*inside*	aseboxini/*they are in the box*	ebhokisini/*in the box*	aseboxini/*they are in the box*	
ukuwa /*to fall*	uyalimala*/he got hurt*	ugibule ibicycle/*riding a bicycle*		
phambili /*front*	ula/*he is here*	uhleli phansi/*he is sitting down*		
encane /*small*	yakhahlela/*it is kicking*			
ukubukhuda /*to swim*	udlala emanzini/*he is playing with the water*			
ayinalutho /*empty*	yincane/*it is small*			
ukugeza /*to wash*	udlala ngamanzi/*playing with water*			
kude /*far*	bagcwele laba/*they are all over*			
ukushayela /*to drive*	emotweni/*in the car*			
ukudlala /*to play*	uthatha amatoys/*he is taking toys*			

4.5.3.1 Action verbs

This section examines the semantic alternatives that the 36-month-old children offered in place of the correct action verb structures, as seen in Table 24.

ukujikela /To turn

Table 24 shows that one of the action verbs that was produced was "ukujikela /to turn". This lexical item was also replaced by semantically similar alternatives across both of the younger age groups and, similar to what occurred with the adjective "okude/long", the majority of the results across the age groups were the same. This means that children across the ages of 25, 30 and 36 months all offered the same semantically similar responses for this item. The actual responses that were offered by the 36-month-old children were: "bahleli/they are sitting", "bayadlala/they are playing" and, again, "bahleli/they are sitting". As in the same examples that were shown in the earlier age cohorts, these children also identified that the children in the image were sitting. This is true with respect to the actual picture.

One of the semantically similar responses for the lexical target item "ukujikela/to turn", that seems to be different to a lot of the others, is "bayadlala/they are playing". It has been observed that, in a few of the responses, the child possibly understood that they needed to produce an action verb but may not have acquired that particular action verb as yet. One approach that keeps arising is that children tend to default to the action verb "ukudlala/to play". Playing is something that most children spend a lot of their time doing so it is no surprise if this word was well known across the ages involved in this qualitative analysis.

ukuvula /To open

The action verb "ukuvula /To open" received four semantically similar responses across the 36-month-old age group, according to Table 24. The responses were "uvala isivalo/he is closing the door", "ubambe umnyango/he is holding the door", "uyabheka/he is looking" and "ubambe umnyango/he is holding the door". Of these four responses, it is clear that two of the responses are exactly the same.

Again, these responses were each produced by different children so it is interesting to see that on occasion these different children strategised in the same way and come up with the same semantically similar alternatives. The first response listed in this paragraph states "uvala isivalo/he is closing the door". This example shows that the child conceptually understood that something was happening to the door. It is possible that the child knew that the door could

either open or close. However, the semantic element comes in here where the child may not have had the lexical item to explain the concept of opening but rather had the lexical item to explain the concept of closing. Therefore, by default, that was the route the child decided to take with their response. Across most of the semantically similar responses, the children made reference to the object and nominal construct: the door that was present in the image. Two of the other semantic responses were: "ubambe umnyango/he is holding the door".

This response suggests that the particular child could identify that the person in the image was interacting with the object. In the case of this card that was the door. It is possible that the child did not know exactly what the person in the picture was doing or they knew and did not have the lexical terms to describe it accurately. The last response that was offered by a 36-month-old child for this lexical target item was "uyabheka/he is looking". This is interesting as the child noticed very subtle details like the direction of the actor's gaze that was found on the card. The child still understood that a predicate construction was being asked of him/her and therefore the child's response is still an action verb. Therefore, this particular response, like many others, was not correct but not entirely incorrect either.

ukuwa /To fall

When looking at Table 24, it is clear that one of the action verb constructions is "ukuwa/To fall". When looking at the semantically similar responses, it is evident that two versions were produced by the 36-month-old children. The first response that is discussed is "uyalimala/he got hurt". This response is the only one of its kind and it is different from all of the other responses as it displays a sign of empathy.

Children are very emotional beings who are, especially at this age, learning how to figure out the world. The image on this particular card is of a person falling off his bicycle and the lexical target item is, therefore, "ukuwa /to fall". This child did not produce the correct lexical item in response to the image but instead expressed how he/ or he thought the person falling off their bicycle may have felt. This semantically similar example can be looked at from two different perspectives. Firstly, the child may have experienced falling off a bicycle as bicycles and children's bikes are sometimes introduced around the age of 36 months. If that were the case, this would align with the idea that children express vocabulary that represents their immediate environment. An experience like that would qualify as having an effect on that child and the card may have brought back some memories.

The other way that one can look at this example is by considering that the child may have simply not produced the action that was occurring in the image which was the target item but rather linguistically produced what the end result would have been after the person in the picture had already fallen off the bicycle. The other semantically similar response that was produced for this lexical item was "ugibule ibicycle/riding a bicycle". As has been seen before, technically this is a correct answer however it does not contain the lexical item that was required and so it was coded as being semantically similar. The term "ibicycle/a bicycle" was stated and this represents that the nominal object in the image was important to that specific child.

ukubukhuda /To swim

For the lexical item "ukubukhuda/To swim", one of the 36-month-old children offered a response that was in alignment with the responses the younger age groups offered for the same lexical item. The semantically similar response, according to Table 24, was "udlala emanzini/he is playing with the water". Once again it appears that the children direct their focus towards the object in the image which, in this case, was the water. Again, when the child was possibly not sure of the action verb that complemented the action in the image, the children tended to default to a more familiar action verb. As in many cases that familiar verb was "udlala/playing". This example also emphasises how a child's early lexicon is full of lexical items that reflect the immediate environment of that child. Water is definitely a concept with a lexical item that would be present in these children's lives.

ukugeza /To wash

According to Table 24, the lexical target item "ukugeza /To wash" received one semantically related response out of all of the 36-month-old children which was almost exactly the same as the "ukubukhuda/to swim". In other words "udlala ngamanzi/playing with water". For some of the 36-month -old children, two different images that both had the image of water incorporated into them elicited the exact same response. This simply emphasises that the approaches children use and the processes they go through all have some form of universal and typical pattern.

ukushayela /To drive

Table 24 shows the action verb "ukushayela /To drive" and this particular lexical target item elicited one semantically similar response. The response was "emotweni/in the car" and the

target action verb was clearly not produced. However the child did offer correct information regarding what the person in the image on the card was doing. The child was able to identify the nominal object in the image which was indeed the car.

ukudlala /To play

The final action verb that received a semantically alternative response across the 36-month-old children who took part in the study was "ukudlala/to play", according to Table 24. It is surprising that this particular action verb received a semantically alternative response since across a lot of the other examples from the other age cohorts, "udlala/playing" seemed to have been a rather well-known and well-produced action verb. In many cases, this particular action verb was in fact the semantic replacement for a lot of the other lexical target items. The alternative response for this item was "uthatha amatoys/he is taking toys". This is the perfect example to display the dominating effect the nominal objects in the pictures have over the children's perception. The image of the toys on this picture card was able to draw the child's attention away from the action verb that was being requested of him or her. Toys are also things that would be very comfortable for, and familiar to, a lot of children since it would be normal for them at the age of 36 months to spend a lot of time playing with such toys.

4.5.3.2 Adjective

This section of the current chapter looks at some of the semantic alternatives that the 36-month-old children offered in place of the correct adjective structures, as seen in Table 24.

okude /long

According to Table 24, there are four semantically similar responses produced for the lexical target item "okude /long". Interestingly enough, all of the four responses offered the exact same semantically alternative meaning. The responses were all variations of "ikhulu/it is big". This again shows one that cognitively these children used the same manner of processing as well as the same approach when it came to identifying what they had perceived. This image was two differently lengthened pencils. On a semantic level, if something is considered to be longer than something else, it is automatically considered to be bigger.

The lexical items "big" and "small" are easy and simple for children to understand, acquire and apply. These types of adjectives are words the children would most likely have come into contact with by the age of 36 months, however the terms "long" and "short" are a little bit more advanced and would therefore be types of adjectives that develop at a later stage. One more

interesting observation about the lexical item “okude /long” is that across all of the age groups it was one of the words that enticed semantically similar responses. In fact, the majority of the semantically similar responses reflected the concept of “ikhulu/it is big”. Therefore, this lexical item is definitely acquired early and is probably commonly used.

akungcolanga /clean

With regard to this lexical item found in Table 24, it is apparent that three semantically similar responses were recorded across the 36-month-old age group. The responses were “isikipha lesi siNice/this t-shirt is nice”, “ikahle/it is alright” and “raithi/alright”. The first alternative response is interesting since the child chose to describe the state of the T-Shirt that was present on the picture with a different adjective to the target adjective.

The target item was “akungcolanga /clean” and the child used the word “siNice/is nice”. “Nice” is an adjective often used to describe something that is pleasant or good. From this, it can be suggested that the child’s concept of the appearance of the shirt in the image was both pleasant and good so they chose the lexical item “siNice/it’s nice” opposed to “akungcolanga /clean”. It is also possible that the child was referring to the style of the shirt and not the cleanliness of it but even if this was so, the pleasant idea was still present and communicated through different lexical items rather than the target one. The other two responses for this lexical item, “ikahle/it is alright” and “raithi/alright” are similar to the responses the younger age group offered where a satisfied meaning was conveyed through words other than the target items.

encane /small

The lexical target item “encane /small” in the 36 month old age cohort brought about an interesting semantically similar response. Across all of the examples that have been seen, a common trend that the children have displayed is they produced the object and nominal structure that was evidently significant to them in the picture.

In this specific case, the child was shown two images. One of the images was a large soccer ball and the other image was a smaller soccer ball. The child was asked to distinguish between the two and produce the lexical item “encane/small” in reference to the smaller one. However, in this example, it can be assumed that the child did not understand that an adjective type word was being requested. Instead their response was an action verb: “yakhahlela/it is kicking”. This is interesting as the child most probably identified the object in the image on the card and

conceptually identified what one normally does with a soccer ball. The child then produced the action verb that is very commonly associated with the soccer ball.

ayinalutho /empty

The last adjective that elicited a semantically similar response amongst the 36-month-old participants was "ayinalutho/empty", as seen in Table 24. The response that was offered in place of the lexical target item was "yincane/it is small". This response offers information about the child's ability to perceive size and quantity. The term "small" can be associated with concepts such as "a little" and "minimal" and those words can be associated with the term "ayinalutho/empty". The child was able to distinguish a smaller amount opposed to a larger amount in terms of quantity.

4.5.3.3 Adverbs

This section examines the semantic alternatives that the 36-month-old children offered in place of the correct adverb lexical items, as seen in Table 24.

okungaphakathi /inside

This is the first lexical adverb structure to be analysed from the 36-month-old responses found in Table 24. The semantically similar results that were attained as alternative options from the target word "okungaphakathi /inside" were all surprisingly similar. The image on the card that the children were presented with was of an open box of crayons. Evidently, the target word was an adverb and the children were asked where the crayons were. The semantically similar responses across the 36-month-old children were "aseboxini/they are in the box", "ebhokisini/in the box" and "aseboxini/they are in the box". It is immediately clear that two out of the three responses were the same. This is interesting as two different children produced these responses. This shows the researcher that there may be a cognitively logical thought processes that take place in the child's mind as they develop which cause different children to come to very similar conclusions. With regard to these responses, one may argue that the lexical term "in" functions in an almost identical way to the term "okungaphakathi/inside". However, for the purpose of this PiNG task, the researchers wanted to see whether any of the children would use that particular target item. Evidently these children did not name the required lexical item however, instead, they still conveyed the correct information. This is why these responses were coded under this particular coding category.

phambili /front

The lexical item “phambili/front” elicited two semantically similar responses amongst the 36-month-old children who took part in the study. The first response, according to Table 24, was “ula/he is here”. This same response has been seen before in the earlier age groups and, again, this response was produced in accordance with the child pointing to something on the picture card. As discussed previously, this reflects that the child is literally answering the question however, instead of needing to use lexical items that he or she may not have developed yet, the child employed a different approach and produced a deictic gesture instead. The child therefore communicated the correct response in an unconventional and incorrect way according to what was required for the task.

The second semantically similar response that was produced by one of the 36-month-old children was “uhleli phansi/he is sitting down”. This response is technically correct, and even more so because they responded with an action verb which still falls under the construction of the predicate. The response however was not considered correct by the researchers as that was not the target item. The child was meant to identify that he or she was in front of the sofa that was in the image as opposed to just sitting near it.

kude /far

With regards to this particular lexical item, one of the 36-month-old children offered a semantically similar response which can be seen in Table 24. Instead of the target word they said “bagcwele laba/they are all over”. This response shows the researchers that the child comprehended from the question that they were expected to indicate the placement of something on the picture card. From their response, it can be assumed that the child did not have the lexical item “kude/far” to specify exactly where that something on the card was. The response the child offered was confirmation to the researcher that although the child was able to perceive the spatial awareness on the card, he/she was just not able to specify the exact adverb structure that was required to describe exactly what they saw. Gentner (1978; 1988) states that adverb structures require a higher level of cognitive processing than, for example, tangible nominal structures do. This is one of the reasons that these are often acquired quite late.

4.6 Summary

This section of the chapter discusses some of the results that were analysed. The overarching aim of the current study is to investigate and evaluate early predicate development. The

predicate is a term that collectively accounts for certain parts of speech, namely the action verb, adjective and adverb. Literature states that children acquire these lexical categories at different stages (Clark, 2009; Harley, 2013; Gentner, 1988; MacWhinney, 1987). The aim of this case study was to investigate further certain elements of PiNG data that had not been previously published across any of the PiNG studies that have been discussed throughout this research report. This qualitative analysis was conducted on a small section of archival isiZulu data, which is the same data that was used to guide the earlier mentioned isiZulu PiNG study. The aim of this activity was to answer the remaining research questions guiding this study (Kunene Nicolas & Ahmed, 2016). The children fell into three different age cohorts; 25, 30 and 36 months.

After reviewing the outcomes of the case study, it became clear that children between the above-mentioned ages managed to find ways of communicating their mental concepts even if they did not have the exact lexical items in their vocabulary to express that concept correctly. This was done through a number of different ways.

Saeed (2009) states that concepts are formed in accordance with what children are exposed to and are able to perceive about the environment in which they live. Therefore, a child's very first concepts are built on things that they see and do every day. As a child continues to develop, they slowly become exposed to more perspectives of the world. These experiences lead to new concepts constantly being formed. When one perceives and understands more about the world, conceptual and lexical inventories grow according to what lexical references are offered in support of those concepts.

The lexical assessment task that was administered to the isiZulu-speaking children required them to look at picture cards which would, in turn, stimulate the child's comprehension and production of lexical items within the predicate category. When the child had a matching lexical item for the concept they had perceived to be presented in the picture card, they would produce it and, if that lexical item matched the pre-determined target items, that child produced a correct response. However, when the child's response did not match the lexical target item, that response was considered to be incorrect. Overall, a developmental trend could be seen in the correct and incorrect lexical items. It was also clear that a sequential order existed with regard to predicate development with action verbs appearing earlier than adverbs. This pattern was observed across all three age groups.

Some of the incorrect responses that were offered by the children were in fact very closely related to what was being represented on the picture card. From this it became clear that - when children are faced with a stimulus they need to describe - they make use of what lexical items and concepts they have to complete the task in the most correct way possible.

Across all of the age groups, when children did not know the action verb, adjective or adverb structure they would identify the object that was in the picture even though that is not what they were asked to do. Literature states that universally, across many languages, nominal structures are acquired first so these nominal structures were possibly more familiar to them on a conceptual and lexical level (Dhillon, 2010). This adds to the understanding of the dominating effect nominal categories have on the early stages of lexical development.

The study also observed that across all of the age groups that were included in this study, a lot of the types of semantically similar and alternative responses were the same. Therefore, similar semantic relations were formed based on the same picture card examples. Kuczaj (1982) discusses the Prototype Theory which is built on principles which state that as one acquires lexical and semantic concepts, a scaffolding and expansion effect takes place. Where one begins at a certain point, taking note of obvious features and functions of an object or even an act, one is able to identify those obvious features in different objects and acts. This allows semantic connections to be formed and join the different variables that surround us together with what they may or may not have in common.

The children's responses were similar in a semantic and referential manner. Certain features about the picture cards appeared more salient to the children than others. This suggests that between the ages of 25 and 36 months, children show the same pattern of conceptualisation. As they develop, they acquire more lexical items to convey these newly developed concepts. The fact that many of the responses were the same shows that the children, despite their slight age differences, were able still to perceive what was present on the card. The developmental trend is clear when looking at how quickly those concepts were recognised and produced through lexical items. This observation aligns with what literature states in other words that language development does improve with age (Clark, 2009). It is also important to take note of the fact that a child's early lexicon is based on things they have been exposed to in their immediate environment. Therefore lexical items like "water" and "playing" would naturally be terms a child would be comfortable with producing.

Some of the children's responses were examples of overextension. Overextension refers to when a child applies a lexical item in a broad sense. Therefore, many different concepts are communicated through that one lexical item. The results of this study showed that children overextended the use of the word "udlala/playing". When they possibly knew an action verb was being requested of them, and they did not have the lexical means to produce that action verb, the children would default their response to "playing". This is a normal stage for children to go through and it changes when more concepts are given referential lexical items.

Another phenomenon that was observed was that children made use of multimodal forms of communication. There were some instances, especially for the cards that presented adverbs where the child did not know the corresponding lexical item to the question, so instead they pointed to a feature of the card as their response. Again, as with many of the alternative responses that were offered by the children on a technical level, the concept that was communicated was correct. It would be very interesting to see in future studies if these semantic alternatives are in fact universal or whether these are culturally based as these are built upon what the child perceives and conceptualises in their immediate environment.

One last observation was the fact that when one of the children saw a picture of an individual falling off a bicycle, he or she responded that the person in the picture was hurt. This is a very interesting result seeing that the child was able to predict the outcome of the action that was occurring. This means that the child's answer was not a direct reflection of what was seen on the picture card but it was rather a subjective opinion about what was going to happen as a result of the action in the picture card. This type of semantic approach was only seen once throughout the complete dataset, however, it would be interesting in future studies to see if the questions were asked in a different way, if all the children would be able to predict similar types of outcomes. The next chapter, Chapter 5, offers some concluding remarks regarding everything that has been discussed and explored in this study.

5 Chapter Five: Discussion and Conclusion

This study investigates the way in which the predicate structure develops. The term 'predicate' in the case of this research study is used to refer to action verbs, adjectives and adverbs. The information regarding early language, and particularly predicate, acquisition that is currently available states that predicate development in fact occurs well after nominal development has already taken place (Dhillon, 2010; Gentner, 1988). Research has also said that the cognitive ability to comprehend linguistic information is acquired before the ability to produce linguistic information (Gentner, 1988). Many researchers and studies also suggested that the process through which a child develops and masters their particular language occurs over a series of stages and milestones which are dependent on biological, environmental and cognitive factors.

One problem that arises when referring to this universally accepted and implemented information is the fact that a lot of these governing rules and theories were based and devised on English data which does not offer a true reflection of the different language typologies that exist throughout the world. These different language typologies identify that not all languages are constructed, or function, in the same manner. Clark (2009) suggests that these differences are most likely to reflect in a language's stages of acquisition therefore challenging what is thought is known about universal language acquisition and early lexical development. Therefore, it is very important to conduct cross-linguistic studies continuously to challenge current theories and make absolutely sure that no languages are being excluded from the process.

The overarching aim of this study is to assess the development of the predicate construction from a language typology perspective. Languages that were critically compared were Canadian English, Italian, LIS, Japanese and isiZulu (Bello et al., 2012; Kunene Nicolas & Ahmed, 2016; Marentette et al., 2016; Pettenati et al., 2012; Rinaldi et al., 2014). One of the reasons that all of these other languages were chosen to be cross-linguistically critiqued was because studies have been published on their respective processes of early lexical acquisition. These published studies had many variables in common and the most crucial variable is that all of the languages were tested and assessed through the administration of the PiNG tool. Universal theories state that comprehension is a cognitive function that precedes production. These also postulate that across many languages, predicate development typically occurs after nominal development has

already occurred and been well established. Literature also states that language is acquired through the transition of different stages and, in turn, vocabulary increases with age.

The second objective of this study is to examine how the predicate construction develops. A case study was used for the isiZulu language that applied a semantic theory to further the development of the various aspects of the predicate. The isiZulu data presented the researchers with a unique perspective to study the linguistic milestones of predicate development of this agglutinative Bantu language.

The initial data that was exhibited showcases the early development of the predicate in isiZulu. As it is known, this data was collected through the use of the PiNG lexical assessment tool. The PiNG tool allows one to assess both the child's comprehension and production abilities. For the predicate comprehension subtest, it was interesting to see the types of predicate lexical target items that were produced either correctly or incorrectly. Action verbs were comprehended very well whilst certain adjectives were not. This was found across the three age groups included in the study. It was also interesting to see that for the predicate production subtest, action verbs were also performed well compared to the other predicate categories. However, in saying this, the predicate production subtest was not performed as well as the predicate comprehension subtest. Again this was the case for all of the age groups involved. This finding aligns with what Gentner (1988) and Clark (2009) state about comprehension preceding production in terms of early language acquisition.

One concern that was posed earlier in this research report was that many well-known universal theories have not always been tested on the lesser-studied languages like isiZulu. Therefore the results from this study and the original study this raw data was taken from help in this regard. This study offers some insight on the linguistic nature of isiZulu as it shows how the predicate structure is acquired according to a particular pattern and order.

The study further focuses very briefly on the nature of the incorrect responses and it was found that the children produced incorrect answers because they were either focused on merely describing what they saw on the picture card which was not the typical response for the question that was asked of them nor was it the required response. Another reason why children gave incorrect responses was because they may have simply not yet acquired the particular lexical item that was being asked of them so they would simply offer a blatantly incorrect answer instead of not offering a response at all.

This data represented the semantically related alternative responses that 25- to 36-month-old children chose to produce when they were possibly unsure of the correct way in which to communicate a target lexical item. This was done by isolating the lexical items that were identified as not being correct, however these items were not entirely incorrect either. These particular responses were considered to be semantically related to the correct response.

The study examined these alternative responses in an exploratory and qualitative manner whilst continuously considering theories of semantics and the construction of prototypes. The results of this section of the analysis are very interesting as the children who took part in the study made use of a variety of different approaches and methods when they did not know the name of either the action verb, adjective or adverb that was being presented to them in the form of a picture card. Some of these approaches included nominal identification, overextension of the action verb "udlala/playing" and offering emotional responses to what occurred in the picture opposed to what actually happened in the picture.

The results showed that objects are extremely significant to children and possibly offer them a sense of lexical comfort. The children across all of the ages offered similar responses which indicates that children conceptualise what they see in a similar manner across the three age cohorts included in this study, however the developmental difference between these ages is whether they have been able to assign lexical items to these concepts or not. The oldest age group produced the largest amount of semantically similar responses and this indicates that the older age group possibly had more lexical items to refer to semantically than the younger age groups. The second part of the analysis offered further confirmation on some of the findings from the first part of the analysis. In certain cases, the children offered action-verb responses which were similar but different to the lexical target item.

This indicates that the children understood the nature of the question that was asked and knew they had to offer a response that indicated some form of an action. This correlates with what the research states about comprehension developing effectively at an early age in typical situations. The most dominant approach the children used was nominal identification where they knew they had to offer some form of a response to the question and they identified objects in the images and therefore produced the lexical items they had for those nominal objects. This aligns with what a significant amount of literature has stated, that nominal structures dominate the early lexicon.

When looking at the initial aims and research questions of the current study, it can be seen that the first research question which first guided this research study aimed to investigate how the predicate develops between the ages of 25 to 36 months cross-linguistically. The study showed that language develops gradually through the transition of many biological, conceptual and typological stages. Predicate lexical items are productively acquired when a child becomes able to assign language-specific labels to the concepts and actions that they have formed on a cognitive and perceptual basis. The study showed that comprehension is one of the first observable cues that a child's language is developing. Thereafter, children begin to communicate with intention through their first words. Unfortunately, this research question could not be adequately answered seeing as missing elements and gaps were identified in the literature that was available on multiple languages that used the same assessment tool.

The next research question guiding this study asked if the predicate structure develops according to a particular order. In conclusion, it can be seen that an order may possibly exist with regard to predicate development where action verbs appear most frequently followed by the adjective construction. According to the data that was looked at in this study, the adverb was the last predicate structure to develop and be acquired because it was performed so poorly. More languages would need to be included and compared in order to arrive at a final conclusion.

The last research question that was asked at the beginning of this research study had aimed to investigate the role that semantic relations would have on the early acquisition of predicate structures. Children do present certain prototypical inclinations when searching for predicate items. They were definitely able to identify common characteristics across their mental concepts and, therefore produced words that were semantically similar to the lexical items they were meant to produce instead.

5.1 Limitations

One of the limitations of the current study was the fact that it was not possible to gain access to the raw data that was collected for all of the studies that made use of the PiNG tool to assess early lexical development, apart from the isiZulu data. It would have been very interesting to have had the opportunity to compare the actual lexical items cross-linguistically that were comprehended and produced by all of the children who took part.

Another limitation that was identified throughout this study was that because of the non-

availability of the raw from the other studies that used the PiNG tool, a cross-linguistic comparison of semantic development was not possible.

One final limitation of this study is that the other studies that made use of the PiNG tool were all conducted by different researchers and, as a result, the articles that were published on of the respective collected data did not all publish the actual results pertaining to speech development. This is because some of the studies focused more on the gesture element of lexical development rather than the speech element. It too would have been interesting for the studies to have looked at earlier development stages such as the original Italian study to see universal and language-specific features. A higher number of participants would have also added more information to mitigate individual variation as one knows that not all children learn concepts at the same time.

5.2 Future recommendations

It would be very interesting in possible future studies to administer the lexical assessment tool to children according to a longitudinal method and make observations over a fixed period of time to see how the results from the same children may differ as the time of the study progresses. This would uncover detailed and controlled information about how many new words a child learns over that fixed period as well as whether the above stated order of predicate acquisition reaches a plateau or continues to stagger in their rate of acquisition.

If the PiNG tool were continued to be adapted to typologically different languages, all of the results that were found throughout this research report could be further challenged or confirmed if more typologically different languages were added into the scope of analysis. If future studies were to be conducted using the PiNG assessment tool, it would be very interesting to see if different responses could be attained through different modes of questioning. Future studies could investigate how far can one stretch the semantic relations and connections within a child's limited lexicon to the point where the semantic connection becomes lost.

In conclusion, the present study confirms several features of language development already reported in the robust studies of early research of Snow et al. (1978) that language develops in stages and different categories are acquired progressively. Children will always find a way around expressing meaning even if they do not know the exact label of action.

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Appendix A

Instructions for Administration and Annotation of the PiNG Task in the GEST_LAN_D Project pg.16

(Brookes, Capirci, Colletta, Hadian-Cefidekhanie, Kunene Nicolas & Sparaci, 2016).

response type

(*Parent tier*: child speech turn; *Stereotype*: Symbolic Association; *Linguistic Type*: response type; *Controlled Vocabulary*: response type)

Annotation timing must fall for its entire duration within child speech turn. It is a descriptive tier describing child performance on the task (e.g. correct, incorrect, etc.).

Controlled vocabulary

All the correct answers are coded as with a C (eventually followed by a more detailed description), and all the incorrect as NT (eventually followed by a more detailed description)
Definitions & examples:

- **C** = correct response (e.g. item DOG, correct response could be 'dog' or phonological errors, for example 'dug' instead of DOG, or phonological simplification, for example 'og' for DOG)
- **C-O** = correct response onomatopea (e.g. 'woof woof' for DOG)
- **C-S** = correct response synonym (e.g. 'truck' for LORRY)
- **C2** = second correct response
- **NT** = no target incorrect response (e.g. 'brown' for DOG)
- **NT-S** = no target semantic response (e.g. see list in the PING manual)
- **NT- I** = non intelligible (e.g. child speaks, but answer is intelligible in the video, and coder cannot hear response to determine if on target or not on target)
- **NR** = no response or says 'I don't know'
- **NR-G** = gesture production substituting or accompaying incomplete or incorrect vocal response
- **NS** = item not administered (e.g. error done by the administrator or if child does not complete the task)
- **NA** = none of the above applies.

response mode (only for 'comprehension')

(*Parent tier*: child speech turn; *Stereotype*: Symbolic Association; *Linguistic Type*: response mode; *Controlled Vocabulary*: response mode)

Annotation timing must fall for its entire duration within child speech turn. It is a descriptive tier describing the modality in which the answer was given by the child (e.g. vocal, gestural, etc).

Note: This tier should be coded only for the Comprehension test.

Controlled vocabulary

- **point** = with the index finger being the prominent, although any extensible body part or held object can be used for pointing.
- **touch** = using any part of the body to touch the card and hand
- **point-touch** = with the index finger and any other part of the hand to touch the card
- **give** = with a physical transference of the card
- **show** = without physical transference of the card the card is placed in the visual line of adult.
- **NA** = neither of the above applies.