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**Ntuli, Nonhlanhla**

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UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

School of Literature, Language and Media

Department of Linguistics

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# An Investigation of How Multilingual Learners Process Questions During Evaluations

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Student No. 475570

A thesis submitted to the Faculty of Humanities at the University of the Witwatersrand,

In fulfilment of the requirements for the degree of Doctor of Philosophy in Linguistics

Supervisor:

Dr Ramona Kunene Nicolas

November 2020

## Declaration

I, Nonhlanhla Ntuli, hereby declare that this thesis is my own unaided work. All citations, references and existing research have been duly acknowledged. It is being submitted for the degree of Doctor of Philosophy in the Faculty of Humanities at the University of the Witwatersrand, Johannesburg. I further confirm that this thesis has not previously been submitted for any degree or examination in any other University.



_____

**Nonhlanhla Ntuli**

27th day of November 2020 in Johannesburg

## Dedication

This thesis is dedicated to my grandparents, Jacob Zwangele and Christina Nomathemba Ntuli who saw me as a Doctor of Philosophy before I even knew what PhD was. Thank you for believing in me more than I believed in myself.

## Acknowledgements

I would like to express my deepest gratitude to my supervisor, Dr Kunene Nicolas. I am thankful for all the guidance, support and mentoring I received from her. Through this long journey of ups and downs, from the drafting of the proposal, the writer's block moments, the constructive criticism, to the last-minute comments and changes, Dr Kunene Nicolas has provided me with much academic and emotional assistance, as well as with finding financial aid support throughout. Her feedback has pushed me to write more intelligibly and to shape my ideas more clearly. I can honestly say this thesis would not be what it is without her invaluable support.

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A huge thank you to the Gauteng Department of Education for granting me permission to conduct my research in schools. The warm and friendly welcome from learners at Bula-Dikgoro Primary School, Jan Kotlolo Primary School, Stanza Bopape High School, as well as from their

educators and principals was nothing short of Ubuntu. Their assistance and cooperation greatly assisted my data collection process. Thank you to all the educators who futher assisted with the coding and validation of my data.

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Finally, I would like to thank my family, whose support has never wavered. My mother, Noxolo Ntuli for teaching me to be an independent thinker at an early age, and for always trusting and supporting my decisions, which gave me the strength and the will to be where I am today. I also want to thank my cousin, Nonkululeko Ntuli for her constant support and inspiration through all my frustrations and anxieties. She has been the absolute best. Many thanks to my lovely siblings, Siyanda and Siphesihle Ntuli, for the joy and laughter they bring to my life.

## Abstract

In a country like South Africa where multilingualism is the norm, multilingual language development is still not well understood. This then raises the question of how educational practices can best scaffold learning for multilingual children. As it stands a great number of school-going children in South Africa continue to be taught through multilingual language practices in class and then during formal assessments and examinations, they are evaluated in the second or third languages. Implying that learners have to master complex concepts in a language that is still being acquired. This can result in difficulties in learners' abilities to use language for learning, including their comprehension and answering of questions. Consequently, this study focuses on how a sample population of multilingual 10–11-year-olds (primary school, grade 5) and 14–15-year-old (high school, Grade 9) learners from Mamelodi and Nellmapius townships in Tshwane, Gauteng, process questions during evaluations.

A mixed methods design was used to investigate their processing of questions (which includes both the answering and comprehension of questions). The study applied the question comprehension theory informed by several question processing models (such as Robertson's (1994) theory of simultaneous understanding, answering and memory interaction model, and Pollitt and Ahmed's (1999) Question-Answering process model), and the bottom-up framework (Kempen, 1999) in the analysis of learners' question processing. As a framework for language processing, the bottom-up approach presented a staged process of how an individual can construct meaning and arrive at the answer.

The results of the study highlight the ways that learners of different ages manoeuvre in the process of answering questions that demand different cognitive skills in their second and third languages. Results of the study showed that while all learners were able to provide a response to the questions. However, not all responses were accurate. This indicates that there is a breakdown in the processing and comprehension of the question. Moreover, there was no difference between the 10–11-year-olds and 14–15-year-old learners in processing / answering of knowledge and comprehension questions.

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## List of Abbreviations

| | |
|---|---|
| **Adv** | Adverb |
| **ANA** | Annual National Assessments |
| **APPL** | Applicative verbal extension |
| **BCL** | Bloom’s cognitive level |
| **CAPS** | Curriculum and Assessment Policy Statement |
| **Conj** | Conjunction |
| **Cont** | Continuous Tense |
| **COP** | Copulative |
| **CR** | Correct |
| **DBE** | Department of Basic Education |
| **ECD** | Early childhood development |
| **EXCL** | Exclusive Morpheme |
| **FUT** | Future Tense |
| **FV** | Final Vowel |

| | |
|---|---|
| **HL** | Home language |
| **INC** | Incorrect |
| **L1** | Mother tongue |
| **L2** | Second language |
| **L3** | Additional language |
| **LiEP** | Language in education policy |
| **LoLT** | Language of learning and teaching |
| **M** | Mean number |
| **NBUV** | Non-standard black urban variety |
| **NC** | Noun Class |
| **NCS** | National Curriculum Statement |
| **NEG** | Negative Marker |
| **NEUT** | Neuter verbal extension |
| **no.** | Number |
| **OC** | Object concord |
| **PAST** | Past Tense |
| **PC** | Partially correct |
| **PCom** | Processing competency |
| **PIRLS** | Progress in International Reading Literacy Study |
| **Poss** | Possessive |
| **PRES** | Present Tense |
| **Pron** | Pronoun |
| **RA** | Response accuracy |

**SACMEQ** Southern Africa Consortium for Monitoring Educational Quality

**SC** subject concord

**SD** Standard deviation

**SVO** Subject-verb-object

**TIMMS** Trends in International Mathematics and Science Study

# Chapter One: Introduction

## 1. Introduction

This study seeks to understand the level of question comprehension skills for language subjects by school-going multilingual South African children. The study is focused on primary and high school learners aged between 10 and 15 (Grade 5 and 9), and how they process questions. For the majority of South African learners in multilingual areas, the languages of learning in the school environment are normally their second and third language. Therefore, the study further seeks to investigate how the language(s) spoken at home influence learners' performance at school. This is achieved by comparing learner responses to comprehension and knowledge questions in two language subjects (English and a Bantu language) offered at school.

In this introductory chapter, the background of the study is given, and the rationale is explained, followed by the research questions and hypotheses of the study and finally, an outline of the thesis is provided.

### 1.1. Background of the Study

A number of reports have indicated that in accordance to local and international measures, tests and standards, South Africa has a poor learner performance, which is evident in the low levels of literacy and numeracy skills (Roodt, 2018; Spaull, 2013; Van der Berg et al., 2011). Many scholars (Jordaan, 2011; Modisaotsile, 2012; Pretorius, 2002; Pretorius & Spaull, 2016) have been able to paint a picture of the literacy problem in the country; these studies have highlighted that a large proportion of learners cannot read for meaning. This has undeniably led to poor academic performance, high rates of failures and learners dropping out from school (Department of Basic Education, 2014).

These studies have given insight on the potential reasons for learners' comprehension difficulties, with focus mostly aimed at learners' performance in reading comprehension, or on

how teachers teach reading comprehension (Jooste, 2003; Mudzielwana et al.,2012; Pretorius & Klapwijk, 2016; Zimmerman & Smit, 2014) and on the development of comprehension in children (Kunene Nicolas & Ahmed, 2016). However, with the deepening educational crisis in South Africa, it is very important that research also focuses on the tools of assessing comprehension, since these play a vital role in our understanding of language, learner achievement and the development of diagnostic tools. This study seeks to cover this gap in the literature.

The overall evaluation system used to determine a learner's achievement in school uses different assessment tasks to test their knowledge and assess their academic performance (Department of Basic Education, 2011). These assessments are mostly made up of questions, which are considered the most informative instrument in assessing reading comprehension; consequently, the knowledge and skills acquired by the learner (Sebate, 2017). The answering of questions depends upon various cognitive levels, for example, exctracting information, then interpreting and analysing that information then providing an explanation of that information (Department of Basic Education, 2017); these competencies influence learners' comprehension and academic success.

Moreover, schools in townships with black multilingual learners are worse off when it comes to the production of successful learners by the South African education system. As reported by Van der Berg et al. (2011), learners in such schools exhibit particularly low proficiency in literacy and in numeracy. It is for this reason, coupled with the importance and role of questions in educational success in South African schools that this study focuses on a multilingual population. Specifically, the study looks at multilingual learners and how they process and answer questions during their scholarly evaluations.

Research has pointed out that multilingual classrooms are characterised by learners who use their home language with peers in several class activities including group discussions and in speaking with the teachers. This usually involves the learners code-switching from their L2 or L3 such as English to their L1 (Probyn, 2005). It can also involve code-switching between several indigenous South African languages and English. Scholars have also reported that the input

received from teachers involves a mixture of different languages in teaching and in learning (Jordaan, 2011; Van der Berg et al., 2011). However, when learners are evaluated via written questions, the multilingualism employed in the classroom is no longer available to the learner and they now have to use one standard language. The dynamic multilingual language situation in schools and the linguistic background of multilingual learners is not always sufficiently taken into consideration by South Africa's Curriculum and Assessment Policy Statement (CAPS).

Probyn (2005) suggests that to bridge the linguistic gap, acquire proficiency in English and gain cognitive academic language proficiency that is needed for academic learning and meaningful engagement with the curriculum, can be quite challenging for many learners in these multilingual classrooms. Similarly, some scholars state that both the L1 and L2 skills of the learners will not fully develop if the learners are only exposed to the L2 at school as a medium of instruction that is not spoken at home (Rakgokong, 1994; Sibanda 2019). This negatively affects the learner's performance in their school subjects (Rakgokong, 1994; Secada, 1992; Setati, 1998; Setati, 2001; Setati & Barwell, 2006). Additionally, these learners will lack the contextual knowledge of language essential for better comprehension (Sepeng, 2010). This implies that the learners will have limited and inadequate writing skills and spoken fluency to comprehend the contect of the subject in English (Rakgokong, 1994).

### *Education vs Reality*

There are 11 official languages in South Africa: Afrikaans, English, IsiNdebele, IsiXhosa, IsiZulu, Northern Sotho, Sesotho, Setswana, SiSwati, Tshivenda and Xitsonga. The South African government policy regarding the language of education stipulates that primary school learners have the right to be educated in their home language once admitted to a school. The National Curriculum Statement (NCS) refers to 'home language' as 'the language that a learner acquires first' (Department of Basic Education, 2011); it is also known as the 'native language', 'mother tongue' or 'L1'. However, owing to the diversity and multilingualism in a lot of communities around the country, many South African schools offer home language (HL) subjects that are not necessarily the L1 of the learner. Therefore, the term 'home language' does not refer to the language itself (i.e. the language spoken at home), but rather refers to the level of proficiency

the curriculum requires for that language at a particular stage (Department of Basic Education, 2011). This means that there is an assumption that home language level learners have some knowledge of the language when they arrive at school (Jordaan, 2011). However, when it comes to the additional language (such as English as a second or third language) levels, it is assumed that learners come to school with essentially no knowledge of the language (Department of Basic Education, 2011). As a result, in the first few years of the learners' schooling, there is more focus on the development of their ability to understand and produce the additional language rather than on the learner's actual home language (Department of Basic Education, 2011).

For many multilingual learners, this means that they are not just facing the task of acquiring two languages simultaneously. Rather, they are also acquiring these languages at two different levels (e.g. a child speaking Sepitori at home, but they learn IsiZulu as a home language and English as the first additional language at school), while also expected to meet the requirements of the academic curriculum. Moreover, by the time learners are in the intermediate and senior phase of schooling, most of them have not mastered proficiency in either of the two languages. Yet it is at this stage that they start learning through the medium of their additional language, English; they are thus expected to have become 'reasonably proficient' in the language.

### 1.2. Problem Statement

This study acknowledges that language is not the only factor affecting learners' performance; there is also the strong and complex relationship between the socio-economic status and access to resources, and the interplay that these have with language, school functionality and academic learning (Jordaan, 2011; Van der Berg, et al., 2011). Most of these factors have been exhaustively reported on in the field of education, while the various facets of learners' cognitive processing skills have barely been covered.

Another important factor in the current South African NCS is the assumption that if a learner speaks an indigenous or non-standard language at home, it is presumed they should do well in the second language subject at school. For instance, if a child from Tshwane speaks Sepitori at

home but their school only provides Setswana or IsiZulu as a language subject, the assumption is that their Sepitori competence and proficiency should assist the child to learn Setswana or IsiZulu. However, this assumption is most definitely not informed by the language developmental stages central to L1 and L2 development of basic language skills (for equivalent age) for comprehension.

This study seeks to investigate how children process information in comprehension tasks and subsequent questions. The study looks at what information children retain and what knowledge is produced when answering knowledge- and comprehension-related questions. This research employs a psycholinguistic approach in understanding the cognitive skills required to process and comprehend a question successfully.

### 1.3. Rationale

The role of language in education is undeniable; the proficiencies and competencies of a language are important aspects for educational success (Jordaan, 2011; Van Rooyen & Jordaan, 2009). As stated previously, a greater number of school-going children in South Africa continue to be taught through multilingual language practices in class and then during formal assessments and examinations they are evaluated in the second or third language. This implies that learners have to master complex concepts in a language that is still being acquired (Van Rooyen & Jordaan, 2009). Therefore, these learners who receive education in a second or third language may have difficulties in their abilities to use language for learning. Because, not only does this require the understanding of, but also the use of, classroom discourse such as the oral lessons and written text delivered by their teachers (Van Rooyen & Jordaan, 2009). More importantly, use of language for learning also requires the learners' understanding of questions in the learning materials used (Igbaria, 2013). Question answering requires several cognitive levels, such as extracting information, interpreting and analysing it and then providing an explanation (Department of Basic Education, 2017); hence, understanding how these questions are processed and eventually answered by multilingual learners during written assessments is essential.

The study acknowledges that there is a large body of international literature on question answering both inside and outside the classroom (Mehan, 1979; Pollitt & Ahmed, 2000; Raphael, 1984; Szymanski, 2002); this is also the case for computers in natural language processing (Hirschman & Gaizauskas, 2001; Judge et al., 2005; Kumar et al., 2016). However, literature on the processing of questions using a cognitive-linguistic theory of language processing by humans is still limited. It is for this reason that this study investigates the lesser-studied aspect of question processing, namely the mental processing involved in answering and comprehending questions.

Numerous studies have also looked at the language issues in South African classrooms (Rakgokong, 1994; Secada, 1992; Setati, 1998; Setati, 2001; Setati & Barwell, 2006), at the cognitive demands of questions in the curriculum (Moodley, 2013; Sebate, 2017) and at language processing (Jordaan, 2011; Van Rooyen & Jordaan, 2009). However, the available literature on South African learners has mostly focused on the extent to which bilingual or multilingual education is practised in school; as well as comparative studies on classroom practices of African languages and English first additional language learners. Multilingualism in mathematics education, second language learning, as well as the function of language in the very early phases of education, the attainment of proficiency in an additional language, have also been key focus areas. In these contexts, while they have covered the complexities of implementing the language in education policy (LiEP), the role of educators and their teaching methods, the language and reading literacy challenges in South African schools, they have not specifically researched the psycholinguistic processes that underlie language and literacy development in multilingual learners. Furthermore, most of these studies have focused extensively on one of the South African educational phases of schooling, i.e. foundation phase learners or the early stages of education, and less on the intermediate and senior phases. Additionally, most of the literature that has focused on the complexities of teaching and learning in multilingual contexts, have highlighted the debates around which language is best as the language of learning and teaching (LoLT) for multilingual learners in the classroom (Makalela, 2015b; Setati et al., 2002).Therefore, an investigation of learners' academic learning in the intermediate and senior phases may provide information about the specific processes or

cognitive structures common to both language proficiency and question processing and comprehension. Thus, the manner in which learners understand a comprehension assessment task will significantly depend on what happens in their processing of questions in the given task. Evident when a learner answers a question. Accordingly, the motivation for this research study is the quest for a better understanding of question comprehension by multilingual learners.

### 1.4. Present Study

The study investigates how a sample population of multilingual learners aged between 10 and 15 (Grade 5 and 9) from Mamelodi and Nellmapius townships in Tshwane, Gauteng, process questions. This is undertaken to understand the level and aptitude of their question comprehension skills in language subjects. It further seeks to investigate how the language(s) spoken at home can assist the learners at school by comparing a Bantu language (L2) subject and the English (L3) subject offered at school.

The study uses a mixed method design in that it uses both quantitative and qualitative methods to investigate how children comprehend and process information in comprehension tasks. Two frameworks are used: First, Bloom's taxonomy of cognitive domain (Bloom, Englehart et al., 1956) is used to categorise the questions used by the study to measure learners' cognitive skills in both their L2 and L3. Second, the study applies question comprehension theory informed by several question processing models (such as Robertson's (1994) theory of simultaneous understanding, answering and memory interaction model, and Pollitt and Ahmed's (1999) Question-Answering process model), and the bottom-up framework (Kempen, 1999) in the analysis of learners' question processing (which includes both the answering and comprehension of questions). The bottom-up analysis is achieved by outlining the different processes involved in each linguistic level when processing a question. As a framework for language processing, the bottom-up approach presents a staged process of how an individual can construct meaning and arrive at the answer.

The main aim of the study is to investigate the processing of questions by children between the ages of 10 and 15. The secondary aims of the study are:

- To determine the cognitive-linguistic processes of multilingual learners in each stage of question processing
- To compare the cognitive-linguistic processes of multilingual learners in their L2 and L3 language subjects when processing a question.

### 1.5. Research Questions

The study focuses on question processing and answering of a multilingual learner in their L2 and L3. It therefore aims to answer the following questions:

1. What is the effect of the type of language in the learner's ability to process a question?
2. What are the similarities and differences of question processing in L2 versus L3?
    a. Is there a difference between L2 and L3 learners in the accuracy of processing comprehension questions?
    b. Is there a difference between L2 and L3 learners in the accuracy of processing knowledge questions?
3. How does a multilingual learner process and answer a question?
    a. Do they process or fail to process the question?
    b. How do they arrive at the correct / incorrect response?

In order to answer the research questions several hypotheses were formulated:

#### *Hypotheses*

To answer the first research question, the following hypothesis was formulated:

**$H_0$:** There is no effect of the type of language between a multilingual learner's language and processing skill of a question

**$H_a$:** There is an effect of the type of language between a multilingual learner's language and processing skill of a question

To answer the second research question, the following hypothesis was formulated:

**$H_0$:** There is no similarity between a multilingual learner's language and question processing skill

**$H_a$:** There is a similarity between a multilingual learner's language and question processing skill

The third research question, "How does a multilingual learner process and answer a question?" does not have any hypotheses as this is linguistic behaviour that can be better measured qualitatively.

### 1.6. Summary of Chapter 1

Chapter 1 of this thesis served as an introduction to this study. It has given the background of the study, looking at the educational trends related to the literacy and numeracy crisis faced by learners in most South African schools. The chapter outlined the incompatibility within the South African language in education policy for multilingual children on the one hand, and the reality that these children face on the other. The chapter further highlighted that, although many factors contribute to learners' comprehension skills, research that focuses on the tools of assessing comprehension skills is also significant. The role of questions as a tool to measure learners' comprehension skills was then described. The chapter has also provided the context of the study by outlining the problem statement, the rationale of the study, its aims, and research questions as well as the hypotheses that will be tested further in the study.

### 1.7. Chapter Outline

The remaining chapters of this thesis are organised as follows:

Chapter 2 contextualises the study and outlines the South African education crisis in relation to the comprehension of school content by learners. In addition, the challenges of multilingualism and multilingual learners in the current education system of South Africa are discussed. It explores literature about the central concepts under investigation, such as question processing, question comprehension and question answering.

Chapter 3 provides the methods employed by the study, and describes research design, sampling and population, the instruments used and the procedures followed for data collection

and data analysis. This chapter also discusses the reliability and validity considered, and the ethical considerations of this study.

Chapter 4 presents the study's quantitative results, and describes and discusses the effect of language and age on multilingual learners processing competency and response accuracy in comprehension and knowledge questions. The similarities and differences of the learners' question processing capabilities are also discussed. Finally, the inaccuracies in their processing capabilities are also presented.

Chapter 5 presents the qualitative findings. The learners' linguistic behaviour in the processing of questions is described, and the processing and response inaccuracies are identified and discussed.

Chapter 6 concludes the study by providing a summary and evaluation of the findings. It discusses the theoretical and practical implications of question processing in relation to curriculum development and the teaching of question comprehension in the South African education system, as well as suggesting directions for future research.

# Chapter Two: Literature Review

## 2. Introduction

This chapter provides a review of the literature related to question processing of multilingual speakers in L2 and L3 language subjects. The chapter first gives an overview of the South African education crisis, focusing on issues of comprehension for multilingual learners in education. It then highlights the development of comprehension in children and describes what constitutes comprehension of written text as experienced by learners. It also provides an overview of comprehension issues in the literacy and numeracy skills of South African learners. The next part of the chapter discusses the processing of language, and the manner in which extraction of information is translated into question responses. The processes that are involved in the comprehension of questions are also elucidated. The chapter then discusses the theoretical framework drawn upon in this study.

## 2.1. Overview of the Education Crisis in South Africa

It is well known and documented that South Africa's education system is in a dire situation. This has not only resulted in poor learner performances but has also led to particularly low academic achievement by learners (Department of Basic Education, 2014; Pretorius & Klapwijk, 2016). There is a significant problem with the literacy and numeracy skills in South African schools (Modzuka et al., 2019; Pretorius & Klapwijk, 2016; Van Staden, 2011), as evident in the yearly matric (school leavers' certificate) results and the learners' poor proficiencies in literacy and numeracy assessment tasks. According to several reports (Roodt, 2018; Spaull, 2013; Van der Berg, et al., 2011), the South African education system is ranked among the world's worst.

There are a variety of national and international systematic (benchmarking) tests such as the Annual National Assessments (ANAs), the Southern Africa Consortium for Monitoring Educational Quality (SACMEQ), Progress in International Reading Literacy Study (PIRLS), and

Trends in International Mathematics and Science Study (TIMMS). These are designed to test the numeracy and literacy skills of learners at the foundation, intermediate and senior phase, and they have provided ways to identify and monitor progress and decline in learner achievement in the South African education system. Outcomes from these initiatives (e.g. 2007 SACMEQ, 2011 and 2016 PIRLS and the 2011 TIMMS) confirm the disconcertingly low quality of education in the country. Consequently, as identified by these initiatives and several other existing studies, a closer analysis of the education system in South Africa points to systemic low quality in education (Van der Berg et al., 2011).

According to Taylor (2008), in order to diagnose the low quality in education, research has predominantly focused on identifying the key problems that occur at each structural level, e.g. the classroom, the school and the administrative level. Based on the outcomes of research at these levels, the Department of Basic Education (DBE) has put several measures in place both at national and provincial levels in an effort to address this literacy and numeracy problem (Pretorius & Klapwijk, 2016).

Most of these interventions and projects implemented by the DBE are aimed at assessing learners' reading skills, identifying their reading problems in the early stages of school, and improving the literacy and numeracy levels in the country as a whole. However, they do not reveal the cognitive-linguistic problems underlying poor literacy and numeracy levels reflected in the results. In 1990, De Villar described key influences that characterise the education crisis in South Africa, and almost three decades later this status remains the same (Jooste, 2003). The current establishment of schooling is still not of an acceptable standard for the majority of South Africa's public schools. It is characterised by a tradition of academic failure and under-achievement. There is, furthermore, no special instruction and support for second language learners; therefore, their lack of first- and second language proficiency is being perpetuated (Jooste, 2003).

There has since been ongoing research on how to deal with this education crisis, with many recommendations and interventions outlined (Modzuka et al., 2019; Pretorius & Klapwijk, 2016; Pretorius & Spaull, 2016; Van der Berg et al., 2011). In their report for the National Planning

Commission, Van der Berg et al. (2011) provided several recommendations for education reform. These focused on different areas that they identified as problematic; among these were the need for improved understanding of language issues and the quality of early childhood development (ECD) facilities. Moreover, for each problematic area identified, the authors put forward important suggestions on how to address the challenges at each level (Van der Berg et al., 2011). Nonetheless, what seems to come across very clearly from most of the suggestions in some areas is that more research was required, especially research on the crucial role of language in education.

This study seeks to close this critical gap in the understanding of the processing and comprehending behaviour of learners in their literacy subjects. According to Jordaan (2011), lack of awareness of the psycholinguistic processes that underlie language and literacy development is a contributor to the country's existing education crisis. It is for this reason that this study examines psycholinguistic processes that underlie language and literacy development.

### *Comprehension Crisis in South Africa*

Studies of L1 learners have shown that the skills fundamental to the development of comprehension start emerging early in the child's life before they are at school or receiving formal reading instruction (Melby-Lervag & Hulme, 2013). This means that children begin school already knowing the basic system (sound structure, syntax and meaning) of their L1 (Duke & Carlisle, 2011). The important skills of comprehension are then further developed during their primary schooling, and literacy is built upon this foundation. The literacy levels and learners' ability to comprehend is used as one of the primary measures of school efficacy (Spaull, 2015).

Unfortunately, by the end of Grade 4, the majority of South African children still have poor comprehension skills in both English (their language of learning) and their home language (Howie et al., 2008; Pretorius & Klapwijk, 2016). Furthermore, almost a third of the learners remain functionally illiterate in English by the end of Grade 6 (Spaull, 2013). Research based on national and international tests has provided overwhelming evidence proving that South

African learners struggle with comprehension (Modzuka et al., 2019; Pretorius & Klapwijk, 2016; Sibanda & Graven, 2018); hence the literacy problem in the country.

### *2.1.1. The Language of Learning and Teaching Versus Mother Tongue*

The literature paints a picture of the literacy problems in South Africa. However, owing to absence of standardised measures of reading proficiency for any of the indigenous languages in South Africa, it has been difficult officially to determine the extent of the reading problems experienced by South African learners (Land, 2015; Pretorius, 2002). This becomes a challenge in pinpointing the exact cause of poor academic performance. While it is acknowledged that there is a direct relationship between reading and academic performance (Jordaan, 2011; Land, 2015), the complexity of the language problems in South Africa often masks the reading problems (Pretorius, 2002). This particularly applies because many learners are taught through their second or third language, which leads to the general assumption that academic performance stems from learners' poor proficiency in their second language (Pretorius, 2002; Pretorius & Klapwijk, 2016). In her thesis, Jordaan (2011) argues that although the predominant use of English as the medium of instruction may be problematic, many learners in primary school fail because of the complex effects of language in education practices, rather than South African children learning in a second language per se.

The education policy of South Africa mandates that learners from Grades 1 to 3 be taught in their mother tongue (L1) (Department of Basic Education, 2011; Jordaan; 2011; Motshega, 2010). Thereafter, the language of learning and teaching (LoLT) changes to a second language (L2). This transition occurs at a stage that is considered to be developmental for the learners. Thus, they are expected to advance from learning to read, to being able to use that reading for learning (Van Staden & Howie, 2012). However, research has shown that this policy expectation has been problematic in several ways, including where learners do not necessarily receive education in their L1 for the first three years. Similar to the experience in other multilingual societies, schools often teach learners for the first three years in a language different to that spoken at home (Van Staden et al., 2016). This means that what is expected by the education policy is not necessarily practised in schools, especially in multilingual areas. Such challenges

and inconsistencies in the implementation of the education policy in South African classrooms and classroom practices have led to concerns about poor learner performance in schools around the country, resulting in numerous educational debates and research initiatives that have attempted to better understand and solve this educational crisis.

Nonetheless, understanding the root of the literacy problem that would enable the design of a smooth pedagogical transition from L1 to L2 is yet to happen. Moreover, since there is no clear identification of the real underlying psycholinguistic factors causing poor learner performance, research in this field will continue to reveal results that merely address the surface issues of this educational crisis. Many factors determine the academic success of learners, such as their socio-economic status, the teaching methods and school resources (Pretorius & Klapwijk, 2016). However, knowing how to read, comprehending what you read, and developing academic writing skills are essential (Jordaan & Moonsamy, 2015), and attaining these skills is a step towards academic language proficiency.

Furthermore, as postulated by Pretorius and Klapwijk (2016), the majority of South African learners are taught through a language that is not their home language. Thus, language becomes a factor associated with poor comprehension in learners' home language (L1) and second language (L2). Many other studies have since associated poor learner achievement with poor performance in second language reading comprehension (Alexander, 2010; Brock-Utne & Skattum, 2009; Heugh, 2009; Van Staden et al., 2016), and although there is little doubt that there is a relationship, this is more complex than it appears. The questions of 'why', and 'by how much' language affects achievement – especially learning in a second language – remains unclear.

This study acknowledges the important fact that for many multilingual learners, their L1 as prescribed by the South African education curriculum, is not necessarily the learners' L1. This is because, in addition to learning English as an additional language (L3), multilingual learners speak a different language at home to the one they learn as a home language when they begin school. Owing to this misalignment, these multilingual learners' L1 cognitive development is not

necessarily continued into formal schooling. It is for this reason that the study favours the term L2 for the home language subject and L3 for the English language subject.

### *2.1.2. A multilingual context*

There has been substantial debate around the terminology of speaking more than one language, where the terms 'bilingualism' and 'multilingualism' are sometimes used synonymously. Butler and Hakuta (2004) describe a bilingual speaker as an individual who achieves various degrees of proficiency in the oral and written forms of their communicative skills, thus allowing them to be able to interact with other speakers of one or more languages. On the other hand, Marini and Fabbro (2007) define multilingual competence as the command and use of two or more languages, whatever the level of proficiency and age of acquisition of those languages. A broader definition of multilingualism selected for this study was proposed by Cenoz et al. (2003). They defined multilingualism as encompassing bilingualism and additional languages (three, four and more). According to these authors,

> 'The ability to communicate covers a broad spectrum of proficiencies from having a native-like command of more than one language to the general ability to function and communicate in more than one language at almost any proficiency level. A balanced level of proficiency in bilingualism is infrequent, and a balanced level of proficiency in several languages is not to be expected if we take into account the different dimensions of communicative competence including linguistic, pragmatic, sociolinguistic, discourse and strategic competence' (Cenoz et al., 2003: p.2).

Therefore, a multilingual learner in this study is considered an individual who is capable of communicating in more than two languages. This is considered the most appropriate description for phenomena that involves more than two languages.

At the heart of research into multilingualism is the structure and workings of the lexicon, but research in multilingualism is more complex than research in bilingualism. As stated by Cenoz et al. (2003), a multilingual speaker has a specific type of competence differing from monolingual competence in each of the languages of the speaker. Studies of the bilingual lexicon, such as

the understanding of how words are accessed from the different languages in our lexicon have informed our understanding of a multilingual lexicon. Moreover, the core question most research has been focused with is language-specific versus non-specific access; for instance, during a lexical task, when we are confronted with a word, do we first access the lexicon from one language followed by the next? or there exists a parallel search through all the languages (De Bot, 2004).

Finding out whether there are interconnections between the various lexicons in the multilingual mind is undoubtedly a burning question for researchers focusing on multilingualism (Cenoz et al., 2003). According to de Bot (2004), in a multilingual lexicon, access to words is non-selective; this means that words from more than one language compete. However, the author also states that non-selective access does not mean that words from any of the languages have the same opportunity of being selected, because languages as sets can be activated and inhibited. There is a high default level of activation for languages that are frequently used; they are consequently harder to suppress. However, once deactivated, they are also more difficult to activate (De Bot, 2004). However, closely related languages (such as Bantu languages) share considerable semantic overlap, but unrelated languages do not have much in common (Halsband, 2006).

Regardless of its importance as a global phenomenon, multilingualism has received little attention from the psycholinguistic researcher community (Byers-Heinlein & Lew-Williams, 2013; Cenoz, et al., 2003; Desmet & Duyck, 2007; Rossi & Diaz, 2016). For many years, linguists have tried to describe and explain the way human languages work by focusing on monolingual speakers, then shifting the focus onto bilinguals (Bialystok et al., 2009; Kroll & Bialystok, 2013). Thus, our present understanding of the development and processing of speech is largely based on the results of studies that have examined monolinguals (Escudero et al., 2016; Werker et al., 2006). Only in the last few decades have there been a few researchers in psycholinguistics that have made the move from bilingualism to multilingualism, but many language processing models have limited themselves to the processing of two languages (De Bot, 1992; De Bot,

2007; De Bot & Schreuder, 1993; Dijkstra & Van Hueven, 2002; Gollan & Kroll, 2001; Langeloo et al., 2020; Petitto & Kovelman, 2003).

This study investigates multilingual learners from a psycholinguistic perspective, exploring their metalinguistic skills in the processing and comprehension of questions.

### *2.1.3. Multilingualism in Education*

The multilingual context of schooling, which includes learners' reading and comprehension, requires attention and understanding. Therefore, understanding the dynamic language situation of the country is vital, especially for language policy, as well as for curriculum and language planning. Many children in South Africa grow up exposed to more than one language. In urbanised areas including Gauteng province, the diversity of language is particularly varied; thus, many children grow up exposed to three, four or more languages (Sibanda, 2019).

For many children in South African townships, multilingualism is not an option; it is a way of life. Learners in these linguistically mixed areas do not have an obvious primary language and, in cases like Mamelodi township; the children adopt a non-standard black urban variety (NBUV) such as Sepitori as their dominant language (Ditsele, 2014; Ditsele & Mann, 2014; Wagner et al., 2020). These NBUVs are mostly characterised by their development out of mutually intelligible languages and, owing to their unifying function, they have become the vernacular norm in these areas (Ditsele, 2014; Hurst, 2015; Ntuli, 2016; Webb et al., 2004). In the schooling environment, the use of NBUVs is also caused by the condition that urban township schools are mostly linguistically mixed. This leads to teachers using a language variety that accommodates all learners, often forcing teachers to deviate from the use of standard languages and English for the duration of the lesson. Consequently, the only time a standard language will be used is when it is being studied as a subject (Calteaux, 1996; Webb et al., 2004).

Therefore, from the moment multilingual learners (whose L1 is a non-standard language variety) begin school, they already face the task of acquiring two languages simultaneously (the L2 and L3), while also being expected to meet the requirements of the academic curriculum. Research has shown that a child's home language is the best language for literacy and learning

throughout primary school (Heugh, 2005; Sibanda, 2019); therefore, optimal development of a learner's L1 is critical for transitioning into a second language (Hooijer & Fourie, 2009; Sibanda & Graven, 2018), but this is not always the case for multilingual learners' L1.

While the skills underlying the learning of language are formed at an early age, children are not necessarily fluent speakers of their first language by the time they begin primary schooling (Melby-Lervag & Hulme, 2013). As a result, second language learners are already considered to be at a disadvantage when beginning to learn their language comprehension skills, since they are forced to develop these skills at a faster pace to achieve the same level as first language learners. Therefore, environments that promote the acquisition of language comprehension skills which are essential for the development of the child are crucial, both in terms of the learner's reasoning and communication skills. This means that multilingual education is most likely to succeed in settings where children have the chance to develop a first language fully. Furthermore, it is likely to occur when attention is paid to teaching children the similarities and / or differences of reading in one language compared to in a second or third language (Piper et al., 2016).

The phenomenon of multilingual development is neither well described nor understood. This lack of information is a gap in scientific knowledge which has created a practical problem for teachers, who must assess and educate children from multilingual environments (McCardle & Hoff, 2006). This situation not only raises the question of the types of educational practices that can best serve multilingual children but also how such learners are currently handling their academic content in school.

### *Second Language Learning*

Second language learning is broadly described as the learning of a language to any level after the learner has already acquired a first language (Mitchell et al., 2013). The learning of a second language is a complex phenomenon and over the years there have been an increasing number of empirical and theoretical studies that investigate how this phenomenon occurs. It is also important to clarify that the term 'second language' does not imply that learners know only one other language (Hall & Cook, 2012) because the 'second language' could be the learner's third,

fourth, or fifth language encountered within different language environments (such as in education, the media, at home or in the community), all contributing to the learning of that second language (Jia & Aaronson, 2003; Mitchell et al., 2013).

Children who come from an environment where a particular language (or languages) is not their home language and begin school where that particular language is used, need to adjust to the new linguistic situation; this initiates the development of their skills in a second language (Tabors, 1997). Although the literature has shown that there are differences in how children learn a second language, according to Raikes et al. (2019), children learning a second language while still developing their first language have a different language-learning trajectory and developmental needs from those learning just one language (monolinguals). There is also a consistency in the developmental sequence for such children. Some authors have highlighted that similar underlying cognitive and linguistic component skills that are crucial for learning to read and write in L1 also influence the development of literacy skills in L2 learners (Geva, 2006).

However, while there is a general pattern to the development of the learning of a second language by young children, this does not mean that learning occurs one stage at a time, or that it moves discretely from one period to the next (Ellis, 1989; Tabors, 1997). This is because when children are learning a second language, there is the ongoing addition of new skills to their repertoire (Ellis, 1989; Tabors, 1997). Based on this understanding, the development of L2 is seen as a gradual increase in skills related to the child's comprehension and expressive abilities in their L2. Besides everyday situations, this applies to spoken, written and academic contexts (Geva, 2006).

There has been much debate about the success of second language comprehension, with one group of researchers / scholars concluding that to understand written text in a second language, a level of second language linguistic ability must be first achieved (Perkins et al., 1991; Tang, 1997). This means that success in L2 comprehension depends on second language proficiency. Other researchers believe that comprehension in a second language most likely depends on various skills and strategies in the learner's first language (Constantinescu, 2007). Therefore, successful acquiring of the learner's second language is aided by the development of

their first language (Cummins, 1991). The latter group of researchers argue that once literacy skills have been acquired, they will be available and applicable in a second language context (Tang, 1997).

Nevertheless, from a theoretical perspective, learning to read and comprehend in your L1 is easier than learning to read and comprehend in your L2, especially if the L2 is unfamiliar (Goodman, 1979). This is because when learning to read, an L1 learner will apply their L1 knowledge, thus making it possible for the learner to be able to predict the meaning of the written expression. According to Baker (1996), learning to read in your L1 prepares the groundwork for learning to read in L2, which then facilitates L2 reading comprehension. However, success in L2 comprehension also depends on proficiency and competence in that second language (Yorio, 1971). Inadequate competence in the L2 can hinder the learner's ability that is necessary to predict correct cues; this may then lead to difficulty in creating associations (Perkins et al., 1991) and as such, second language learners may experience a substantial gap in reading comprehension. Thus, there has been broad agreement among policymakers in South Africa that children should be taught in their first language for at least the first three years of schooling (Foley, 2010; Jooste, 2003).

### *Second Language Learners in the South African Context*

As in most multilingual societies, where learners speak more than two South African indigenous languages, the LoLT in the foundation phase can be any one of these languages including IsiZulu and Sepedi. In multilingual schools, English is introduced as a second language in Grade 1 and the transition to English as LoLT occurs in Grade 4 (Jooste, 2003; Owen-Smith, 2010; Van Staden at al., 2016). This means that English is taught as a subject from Grades 1 to 3 with the LoLT as the home language; from Grade 4, the LoLT then changes to English. According to Fawole and Pillay (2019), this affects the period required to introduce and engage with the language as a LoLT for the learners. This applies especially to multilingual learners who are not taught in their L1 from Grade 1 to Grade 3. Therefore, in most cases, teachers switch languages (code-switching and translanguaging) in the classrooms to achieve some cognitive and affective teaching and learning goals for these second language learners. However, this is considered a

double-edged sword, as it could also result in learners not acquiring threshold language proficiency during Grades 1 to 3. This also impairs language proficiency necessary from Grade 4 onwards, that would enable learners to engage actively with the curriculum. There are consequently implications for learners' cognitive development (Van Staden et al., 2016).

Second language learners face a double challenge in acquiring a good education. Not only do they need to meet the requirements of the academic curriculum, but they must simultaneously acquire the language of the academic curriculum. They further need to learn to read in a language that they have not even mastered orally (Droop & Verhoeven, 2003; Jooste 2003). If these learners do not comprehend sufficiently, they might be unable to communicate and grasp the content in both the LoLT and the second language. Research has shown that children who are unable to communicate often cannot read and write efficiently because the ability to speak must develop before reading (Koda, 2007; Lenyai, 2011). They might also not be able to decode textbook language in either their home or second language and thus, they experience learning challenges from Grade 4 onwards, resulting in their failing to perform to their full potential (Lenyai, 2011; Owen-Smith, 2010).

The South African CAPS for the first additional language for Grades R to 3 is founded on the above perspective (that is, the three-year home language policy and a Grade 4 switch to English only). The curriculum also recommends the additive bilingual approach to the teaching of an additional language (Department of Basic Education, 2010). However, this approach is based on the assumption that children begin school competent in their home language, and that they can use their home language to learn the second language (Lenyai, 2011). As a result, in the first few years of schooling, there is more focus on the development of the learners' ability to understand and produce the second language (English in most cases for learners from an indigenous South African language background) (Department of Basic Education, 2011). However, in reality, many children enter school without knowing the LoLT (Van Staden et al., 2016), because for most of these learners the LoLT is neither their home nor second language (Kotzé et al., 2017).

Furthermore, research evidence has suggested that the task of bridging the linguistic gap, achieving proficiency in a second or additional language and then gain the skills necessary to comprehend and engage with the curriculum, is rather challenging for many learners in multilingual classrooms (Probyn, 2005). Moreover, there is an argument presented by some scholars that if learners do not speak English at home, but receive teaching through the medium of English at school, the skills of the learners' main language and the additional language remain under developed (Rakgokong, 1994; Sibanda 2019). This negatively affects the learner's performance in their subjects (Rakgokong, 1994; Secada, 1992; Setati, 1998; Setati, 2001; Setati & Barwell, 2006). Additionally, these learners will lack the contextual knowledge of language which requires better understanding (Sepeng, 2010). This implies that the learners will have limited and inadequate writing skills and spoken fluency to grasp the content of the subject in English (Rakgokong, 1994).

One of the earliest and most notable studies in the area of second language learning was undertaken by McDonald in 1990. The study examined Grade 5 learners' language and learning difficulties when they changed from Sepedi, which is their L1, to English as the language of instruction and learning. As in subsequent studies (Khosa, 2012; Montjane, 2013), the McDonald study revealed a substantial problem in the learners' ability to read with meaning in their second language English (Hoadley, 2012). Similarly, in her study, Jooste (2003) compared the performance of first-language isiXhosa Grade 5 learners in the second language English reading comprehension task, to those of first-language English Grade 5 learners. The findings revealed that first-language English learners consistently scored higher than the group of second language-English learners. Furthermore, Van Staden et al. (2016) compared the differences in home language and language of learning reading literacy achievements of Grade 4 learners. Their findings provide evidence that when a strong home language base has not been developed and learners receive learning through a second language, then the learners can be disadvantaged in their literacy performance.

To elaborate the effect of second language proficiency on reading comprehension, Perkins et al. (1991) conducted a study designed to determine whether second language proficiency

significantly affects second language reading comprehension when participants were requested to answer different types of questions. The different question types were employed to determine the performance of second language students on types of questions involving different cognitive processes. Their study's findings revealed that second language reading comprehension for factual and inference questions were more related to second language proficiency than to first- language reading comprehension.

According to Melby-Lervag and Hulme (2013), extensive international studies have also shown the poor learning outcomes demonstrated by second language learners compared to first-language learners. In their study, Droop and Verhoeven (2003) showed that second language learners start with substantially poorer language comprehension skills than first-language learners; from Grade 3 this is a gap that kept increasing between the two groups. Similarly, Jean and Geva (2009) found that when beginning Grade 5, second language learners had less knowledge of word meanings compared to first-language learners. A study by Thomas and Collier (2002) revealed that the longer immigrant children in the United States of America were taught in their mother tongue, the better their academic achievement. According to Piper et al. (2016), the life project in Nigeria was also able to demonstrate that academic performance improved when Nigerian languages of instruction were used. Assessments from other African countries such as Ethiopia, Zambia and Mali have also argued for the use of mother tongue as the medium of instruction, owing to its inevitable learning benefits (Piper et al., 2016).

Goorhuis-Brouwer and de Bot (2010) highlight that studies of large-scale projects in bilingual regions (like Catalunya and Basque) show that third language acquisition varies in different countries. Research on second language learning and teaching has not paid enough attention to learners who speak a different language at home to the one they use at school; these learners are learning English as a third language, in addition to their home language and their school language (Goorhuis-Brouwer & de Bot, 2010).

Research findings about children's comprehension in their first language only are quite different from research findings in multilingual situations. In a country like Kenya, where over 60 languages are spoken, many children speak three or more languages. For many Kenyan

children, Kiswahili is a lingua franca and is frequently a second language, while English (where spoken) is usually a third or fourth language (Piper et al., 2016). Similarly, in South Africa – a multilingual country with 11 official languages – many learners are being educated in a second (third or fourth) language. In these multilingual contexts, learners' reading fluency is more likely assessed in a language in which they have inadequate oral skills and vocabulary. Therefore, the relationship between fluency and comprehension that has been documented with English speaking monolinguals may differ where multilingual speakers are involved (Piper et al., 2016).

In the education context, language diversity exerts a powerful influence on the content taught, the instructional methods and the outcomes of schooling (Jooste, 2003). Therefore, reading becomes important because it is a powerful learning tool that can be used to construct meaning and acquire new knowledge (Pretorius, 2002). Comprehension, whether from a first- or second language perspective, is only established when the learner has extracted and created meaning from the text (Stols, 2012). Thus, the literature on comprehension highlights that learning to read for meaning must be achieved by the end of Grade 3; this can ensure future academic success (Spaull, 2015). Rapid reading is an essential skill, but this is often neglected in the classroom despite the slow reading speed of many second language learners (Spaull, 2015).

### 2.2. Comprehension of Written Text

Several factors influence how learners comprehend written text. The interactive process of reading allows the reader to use their knowledge to construct meaning (Goodman, 1970). This means moving beyond the understanding of words in isolation and past a literal understanding of a text, thus allowing the reader to use their knowledge while reading (Day & Jeong-suk, 2005). According to Melby-Lervang and Hulme (2013), in many of the subjects done at school, reading comprehension becomes a 'salient predictive factor' for educational outcomes. Therefore, learners' poor reading comprehension skills could be the source of poor academic success.

The two main components of reading are *decoding* and *comprehension*. According to Pretorius (2002), decoding involves perceptual and parsing aspects of reading activity whereby written signs and symbols are translated into language. In contrast, comprehension is the entire

process of assigning meaning and understanding to the whole text (Pretorius, 2002); it occurs as the reader builds a mental representation of a text message (Perfetti et al., 2005). Comprehension arises from several cognitive processes that contribute to the reader's ability to make connections between the meanings of sentences and in their construction of a coherent mental representation of the overall meaning of a text (Magliano et al., 2011). In addition to this analysis, the reader not only draws on information from the text, but they must also bring pre-existing knowledge to enable them to interpret and evaluate the text (Angosto et al., 2013; Spiro et al., 2017). Oakhill and Cain (2007) state that skills in the comprehension of spoken language serve as the basis for developing reading (written) comprehension; for one to read a language with adequate comprehension, understanding of that language in its spoken form is required.

Therefore, the comprehension of written language is a multidimensional skill that is complex and involves a wide variety of cognitive skills and processes (Oakhill & Cain, 2007; Rupp et al., 2006), with interactive and dynamic comprehension outcomes (Lipson & Cooper, 2002). The decontextualised (not about the 'here and now') nature of written language and the use of explicit vocabulary and syntactic constructions makes it more abstract than oral interactive language (Oakhill & Cain, 2007; Jooste, 2003). As stated by Garton and Pratt (1998), written language also demands that information be integrated across extended parts of discourse into content schemas. Comprehension of written language requires metalinguistic abilities; that is, the conscious awareness of language with multiple skills that are associated with the formal aspects of language, e.g. phonology, morphology, syntax and lexical awareness (Altman et al., 2018; Duke & Carlisle, 2011; Jooste, 2003). As such, written language is considered to make demands on the reader that are not apparent in spoken language comprehension.

Comprehension is a skill encompassing complex activity that mobilises different representational levels and procedures simultaneously (Fayol, 2004). It is this skill of understanding what is read that is crucial to academic success (Oakhill & Cain, 2007). The questions used to assess learners in this study fall within different levels of comprehension; therefore, we focus on three different levels of comprehension, namely literal, inferential and

evaluative. Each level imposes different degrees of cognitive loads because they require from the reader different stages of interacting with the text (Basaraba et al., 2013). The first level is literal comprehension, which requires a reader to locate information that has explicitly been given in a text (Basaraba et al., 2013). This level of understanding relies primarily on the reader's word-level processing skills; therefore, understanding is considered to be less cognitively demanding compared to inferential and evaluative levels (Alptekin & Ercetin, 2010).

The second level is inferential comprehension; the reader has to make inferences about meanings that are not explicitly stated in the text (Applegate et al., 2002). At this level, the reader goes beyond just recognising facts from the text; they have to connect what they read to what they already know. To quote Basaraba et al., comprehension at this level involves using

> … information in the text to search for relationships among the main idea and details and use that information to interpret and draw conclusions about the author's intended meaning … fill in omitted details, and / or elaborate upon what they have read … (2013: 354),

As a result, this level is cognitively demanding, as readers have to integrate their knowledge with the textual content.

The third and final level of comprehension is evaluative; according to Basaraba et al. (2013), this is the most complex level, as it combines knowledge, skills and strategies required in both literal and inferential comprehension, to understand the text and then make interpretations about the intended meaning. The reader also has to evaluate the text using prior knowledge or experiences (Rayner et al, 2001). At this level, the reader engages with the text from a personal position, by forming their views or judgements based on what they have read (Parker & Hurry, 2007).

### *2.2.1. The Development of Comprehension*

In the first years of a child's life, language interactions and experiences in different settings such as the home or preschool environments contribute and influence the child's language development, including the development of comprehension skills (Duke & Carlisle, 2011; Raikes

et al., 2019). This is considered a fundamental phase in the building of children's language, cognitive abilities and literacy skills, in order to ensure their success at school (Lestari et al., 2020). From birth to five years, there are specific language processes developing and interacting in many ways that affect the overall language development of the child (Duke & Carlisle, 2011; Harley, 2013; Menn & Dronkers, 2017).

Research on language acquisition shows that infants develop the ability to communicate their intentions and feelings long before they comprehend words, but then the development of language quickly follows before they start school (Duke & Carlisle, 2011; Harley, 2013; Menn & Dronkers, 2017). Therefore, for the first few years of life, children are said to master the rudimentary aspects of their native languages (Brown 1973; Carroll, 2007; Harley, 2013; Van Staden & Howie, 2012). By the age of three, they are supposed to have reached a substantial and varied lexicon and by the age of five, their command of a language is rather complex. This complexity is expected to increase and advance as the child starts school and learns to read. At this stage, they are also expected to use these newly developed language skills to assist them in learning (Duff & Tomblin, 2018). This phase (birth to kindergarten) is characterised by an explosion in the child's oral language and cognitive development (Duke & Carlisle, 2011).

Once at school, and throughout the primary schooling years, the child's comprehension development also becomes influenced by the schooling environment. Explicit language instruction presents the opportunity for the learner to gain metacognitive insights that help them acquire metalinguistic capabilities, critical for the development of literacy (Altman et al., 2018; Duke & Carlisle, 2011; Paris & Flukes, 2006). According to Duke and Carlisle (2011), during this schooling phase, learners become exposed to a greater variety of genres and types of text. This exposure makes it possible for them to gain knowledge about the text characteristics and structure (Paris & Fluke, 2006). At the same time, they begin developing their ability to make inferences and to monitor comprehension (Duke & Carlisle, 2011).

In the later elementary school years, the child's comprehension development is characterised by a continuation of language and literacy development, building on the development occurring in the early elementary school years (Oakhill & Cain, 2007; Duke & Carlisle, 2011; Eisenchlas et

al., 2013). As learners' cognitive development advances, so does the content and depth of their metacognitive insights, developing rapidly from five to ten years of age (Paris & Flukes, 2006). Moreover, several studies highlighted in Duke and Carlisle (2011) found that by analysing word structure, learners can infer the meanings of morphologically complex words; by Grade 5, they are learning to infer word meanings from context. During this phase, learners therefore become skillful in the formation and explanation of generalisation. Learners' use of metacognitive strategies can also help to improve their comprehension skills, which are continuing to develop (Duke & Carlisle, 2011; Gomaa, 2015; Paris & Fluke, 2006).

Beyond the elementary school years, the comprehension of written texts is among the most significant and critical factors in academic skills, required by learners to improve as they progress through school (Stanat & Edele, 2015).

### 2.3. Language Processing

One of the most important cognitive functions that humans can convey is language, and right in the center of the psycholinguistics field, is work focused on the knowledge of a language required for language use and for the psychological processes that underlie word processing and cognition (Carroll, 2007; Scliar-Cabral, 2010). This has resulted in much research on language processing in learners (both children and adults) (Phillips & Ehrenhofer, 2015). The study of language processing is a significant part of human information processing (Lindsay & Norman, 2013); this is an approach that makes it possible to explain language comprehension and describe language processing adequately (Massaro, 2014).

Language processing approaches allow researchers to be specific about what the psychological stages and processes are and how they occur. They provide a theoretical framework for describing linguistic processing and provide a precise methodology for the performance and interpretation of psychological research (Massaro, 2014). Reading comprehension and question comprehension share some common mechanisms that underlie comprehension in general. Therefore, in order for a reader to establish comprehension, a firm grasp of higher-level language processes, such as understanding the semantic, syntactic and referential relationships among words in the context in which they appear, is crucial (Basaraba et al., 2013).

Processing is a real-time process (Pollitt & Ahmed, 1999), and begins with attending to the incoming stimuli, where meaning is then constructed either from an acoustic signal or from the printed text (Massaro, 2014). It is a joint product of linguistic principles and psychological mechanisms (Carroll, 2007). Massaro (2014) states that there is a series of transformations of the visual (or acoustic) stimuli that arrive at the eyes (or ears), which is required for meaning to be derived from the written (or spoken) message. Therefore, language processing is seen as 'a sequence of processing stages or operations that occur between stimulus and meaning' (Massaro, 2014:p.5). Consequently, it is understood only to the extent that each of these processing stages is understood.

The processing of linguistic information occurs in many; therefore, according to Carroll (2007), language processing is depends on the linguistic structure and the processing considerations that are independent of language. For example, the parsing of a sentence involves 'assigning a word class (part of speech) to individual words, combining them into groups or phrases, and establishing syntactic relationships between word groups' (Kempen, 1999:p.211). Therefore, human language processing is regarded as occurring on a set of levels (Carroll, 2007; Harley, 2013):

- At the lowest (phonological) level, there is the identification of phonemes and syllables; this level interprets sounds within and across words.
- At a higher (lexical) level, the phonemes and syllables are used to retrieve the lexical entries of the words from your semantic memory. Therefore, meaning is assigned to individual words.
- At the next (syntactic) level, the words are organised into constituents, forming a phrase structure for the sentence. At this level, the sentence is checked for grammatical correctness.
- Finally, at the highest (discourse or pragmatic) level, the meaning of words in a given sentence is linked with preceding ones. The use of contextual and situational meanings is utilised.

Similarly, as stated by Kempen (1999), the parsing and comprehension of a sentence or text is also usually dissected into subtasks that correspond to the linguistic levels:

- *'*auditory and visual word recognition (phonological/orthographic level...)
- lexical and morphological processes (morphological level...)
- parsing (syntactic level...)
- conceptual interpretation (semantic level...)
- referential processes (discourse or pragmatic level...)*'* (Kempen, 1999:p.212)

Furthermore, there are different systems of processing, namely, bottom-up and top-down processing.

> "Bottom-up" processing [...] refers to processes that take a "lower-level" representation as input and create or modify a "higher-level" representation as output. "Top-down" processing [...] refers to processes that operate in the opposite direction, taking a "higher-level" representation as input and producing or modifying a "lower-level" representation as output (Palmer, 1999: p.84–85).

The distinction between the two types of language processing comes from how the systems parse information, according to Rauss and Pourtois (2013). Based on most of the definitions of top-down and bottom-up processing, their common denominator can be summarised into three assumptions:

> *'1. Information processing is organised hierarchically.*
>
> *2. Lower levels of the hierarchy represent detailed stimulus information, while higher levels represent more integrated information.*
>
> *3. Information exchange between levels is bidirectional.'* (Rauss & Pourtois, 2013: p.2)

Processing of questions shares the same mechanisms as the processing of language; therefore, the different levels of processing linguistic information will be used to help us describe question

processing. Moreover, the study uses the assumptions of bottom-up processing as a framework for explaining how multilingual learners process questions (discussed in detail in Section 2.5).

### *2.3.1. Question Processing*

Questions can be asked in order to determine whether a text is understood (Beck & McKeown, 1981); as a result, questions can be used as a measure of comprehension. Generally, a question is defined as a request for information (Cohen, 1929), or to get us thinking about something. According to Faucher (2009), a question can be viewed as an incomplete process of knowledge, and its solution as the finitude of knowledge. Given this definition, it could be stated that to ask a question of someone implies more than just a need for information; it also entails a structure of knowledge where the question is formulated and the response is interpreted (Miyake & Norman, 1979).

Thus, the psychological construct used in dealing with a 'question' involves a process incorporating the integration of mental activities that are required to perform at a certain level of proficiency on the assessment in question (Pollitt & Ahmed, 1999). Moreover, in challenging learners to reason and give explanations, questions can be seen as a useful input which fosters learners' vocabulary and verbal reasoning skills (Rowe et al., 2017). Questions are without a doubt an important tool for directing our reasoning, and for the general process of investigation (Van Benthem & Minica, 2012). Accordingly, asking questions is crucial to meaningful learning (Bay & Hartman, 2015; Chin & Osborne, 2008).

Broadly speaking, questions can be factual, interpretive and evaluative. Research has shown that factual questions require less cognitive processing than questions that require more direct memory (Perkins et al., 1991). Furthermore, questions that require recall of information are easier to answer (Chin & Osborne, 2008). Therefore, variability in types of questions is highly encouraged, as it may prompt the complexity of children's responses. The different complexity levels of questions improve learners' critical thinking (Bay & Hartman, 2015). Bloom's taxonomy of cognitive domain is the most widely applied scheme for understanding and analysing the cognitive complexity of questions (see Section 2.6.1), and is a contributing framework to the description of the questions used in this study.

### *Question Comprehension*

Comprehension can be assessed using questions. Generally, comprehension is the process of finding and constructing meaning from visual (written) or oral stimuli (Aryadoust, 2019). According to Duke and Carlisle (2011), this means that meaning is not necessarily located in written or oral stimuli but rather that it is the person engaging with that particular written or oral stimulus who creates the meaning from the stimulus. Consequently, this involves using multiple interacting factors to create and adjust a mental representation of the meaning of a particular stimulus as it occurs.

Questioning is effective at directing thinking (Morgan et al., 2009). When a learner is asked a question, thinking begins to form (Bay & Hartman, 2015); they retrieve the relevant information from their memory and then they provide a response (Norman, 1972). However, there is more to question processing than merely retrieving information from memory. Question processing involves a variety of cognitive capabilities; hence, the study of the way that people answer questions leads to a study of memory, thought and comprehension (Norman, 1972).

According to Robertson (1994), question comprehension iincludes two components; the first is the location of memory elements that are specified by the given information in the question. The extraction of this information is considered to be the first step in question processing; the learner will then proceed to match this information against items in their memory, to find a reference concept (Jurafsky & Martin, 2014; Robertson, 1994). Once the learner has found the reference concept, it will serve as a source node for the more directed retrieval that comes in response to the question type (Jurafsky & Martin, 2014; Robertson, 1994).

The second component is determined by the question word and differs depending on what is being asked (Robertson, 1994). There are different types of questions, each eliciting different thinking processes and responses (Chin & Osborne, 2008). Therefore, comprehension of the question word leads to the application of rules specific to the question type (see examples in Table 1). Accordingly, the appropriate rules are applied for searching memory for such information. After this step, the question words will trigger different retrieval processes as the search for reasons begins. Furthermore, retrieval rules must utilise information gained from

both the question word and the characteristics of the given information in the question (Robertson, 1994). Therefore, the processing and answering phases play a significant role in the comprehension of a question (Jurafsky & Martin, 2014).

### *Question Answering*

Questions come with possible answers, but answers are not replies, because any expression can serve as a reply to a question but may not necessarily be a satisfactory answer (Wisniewski, 2013). Therefore, according to Robinson and Rackstraw (1975), where replies do not meet the specifications of a satisfactory answer they are classified into several other categories that highlight this distinction (such as statements of ignorance, refusals or failures to observe that a question had been asked). When a reply is categorised as an answer, then the several specifications such as appropriateness, completeness and presupposition (in terms of context, mode and form) are described to determine the accuracy of that answer (Hirschman & Gaizauskas, 2001; Groenendijk & Stokhof, 1985; Moyer & Syrett, 2019; Robinson & Rackstraw, 1975; Ron et al., 2010).

According to Robinson and Rackstraw (1975) the appropriateness of an answer measures its correctness in terms of how the response corresponds with the contextual and / or grammatical and semantic information that is given. Also, how acceptable and suitable that information is. The completeness of an answer is concerned with how much information is given or omitted in that response. This may be in terms of contextual, grammatical or semantic precision. Lastly, the presupposition is concerned with what information is given or not given in the answer with regard to what has already been given in the question (Robinson & Rackstraw, 1975). Presuppositions are generally considered to be the information that is presupposed or taken for granted (Duží & Číhalová, 2015; Wiemer-Hastings et al., 2000), this information can be the shared assumptions that form the background of the asserted meaning (El-Gamal, 2001). When answering questions, many important features of questions are based on their presuppositions (Duží & Číhalová, 2015); therefore, an incorrect presupposition can make answering questions correctly a difficult task (Wiemer-Hastings, et al., 2000). This means that for the answering of questions, it is particularly important to achieve high accuracy in parsing

the questions (Hermjakob, 2001). According to Day (1986), parsing is a process involving the segmentation of sentences into units of meaning. Therefore, the comprehension of questions is essential in the question answering process.

In question processing, when it comes to situations where information is not explicitly present in memory, or when the learner has to make many connecting inferences, then knowledge-based inferences and strategic problem solving may be required (Robertson, 1994). Accordingly, being able to answer questions relates to both the semantic and pragmatic features of the question (Parnell et al., 1984). Furthermore, if the meaning of question words (that is, why, when, who, how, where and why) is not understood, the learner will have 'difficulties in following instructions, responding to questions, using comprehension strategies that encourage the use of self-questioning and in asking questions for clarification of text content or tasks' (Morgan et al., 2009: p.179). Consequently, the learner might provide an incorrect answer. Therefore, the comprehension of questions such as *wh*-questions requires syntactic knowledge of the question and understanding the connections between semantic and pragmatic information in the question (Daar et al., 2015; Parnell et al., 1984; Seidl et al., 2003)

Work on question answering has moved from some scholars viewing the process as an entirely separate information retrieval process (Hirschman & Gaizauskas, 2001), to others viewing it as a process where the understanding and answering of a question relies on the context of the story and the pragmatic notions of the appropriateness of the answer (Hirschman & Gaizauskas, 2001). According to Salomo et al., (2013), there is not a lot of research on children's question answering skills, and most available studies focused on children's informativeness in question answering, where interest is on how children express the referent in their answer under different questioning conditions. This study is more interested in the processing of questions by examining the entirety of learner responses / answers, with the purpose of understanding their question answering skills.

The importance of question answering in literacy and academic achievement cannot be emphasised enough. For the learning experience of children, questioning is not just considered to be an important teaching strategy, but it can also improve their language skills (Bay &

Hartman, 2015). Questions can be very influential and can facilitate children's learning and higher-order thinking; (Bay & Hartman, 2015; Chin & Osborne, 2008). Thus, learners' ability to answer questions has a substantial influence on their language, literacy and academic achievement throughout their schooling (Sanders & Erickson, 2018).

### *2.3.2. Wh- Questions*

Questions are an excellent tool to test students' knowledge and to enable them to develop and extend their thinking (Cakir & Cengiz, 2016). Accordingly, questions can be divided into various categories based on many criteria, such as, the *wh*-questions, yes-no questions, exclusive-or questions (Duží & Číhalová, 2015), alternative questions, tag questions, rising declarative questions, and echo questions (Moyer & Syrett, 2019). Each type of question highlights differences in the types of answers called for by the relevant question. For the purposes of this study, only *wh*-questions are investigated as part of this study.

Children use different types of questions in everyday situations when interacting and communicating with others. *Wh*-questions (as shown in Table 1) require a more complex response than a yes or no question; therefore, they are often considered more challenging for children (Rowe et al., 2017). However, from a very early age children are able to interpret *wh*-questions (Daar et al., 2015) and by the age of four, they are able to comprehend simple *wh*-questions (such as 'what', 'where' and 'who') (Bloom et al., 1982; De Villiers & de Villiers, 2000), followed by the comprehension of more complex *wh*-question forms such as 'why' and 'how', which challenges the child to reason (Rowe et al., 2017) However, the cognitive and linguistic skills needed to respond to the different *wh*-question forms are only developed over time (Einbond, 1997; Jordaan, 2011; Tshule, 2014).

**Table 1** ***Question Word and Related Question Type***

| **Question word** | | | **Describes a** | |
|---|---|---|---|---|
| **English** | ***IsiZulu*** | ***Sepedi*** | | |
| **What** | **(y)ini** | **Eng** | Thing | Wh + thing |
| **Who** | **Bani** | **Mang** | Person. | Wh + person |

| | | | | |
|---|---|---|---|---|
| **Where** | **-phi** | **-kae** | place or direction | Wh + place |
| **When** | **Nini** | **Neng** | Time | Wh + time |
| **Why** | **Ngani** | **Goreng** | Causal reason | Wh + reason |
| **How** | **(ka)njani** | **Byang** | For the means or the manner in which something is done | Wh + manner |

Yet, from their social routines and everyday communicative situations, developing children can typically learn and interpret *wh*-questions; these are skills that allow children to understand the connections between subjects and objects at a much earlier age (Daar et al., 2015). This makes it possible for children to analyse *wh*-questions into components and to be able to abstract contextual cues from such questions. While strategies for question formation may differ cross-linguistically, these strategies may also share certain features. In English and in African language, constituent (*'wh'*-) questions depend on the use of the *wh*- question words to indicate the type of question asked (Tshule, 2014).

### *2.3.3. Question Constructions in English, IsiZulu and Sesotho Languages*

In Sepedi, *wh*-questions are marked by the following words: *mang* (who, whom, whose), *eng* (what, with what), *-kae* (where), *neng* (when), *goreng* (why), and b*yang* (how). In IsiZulu they are marked by the following words: *bani* (who, whom, whose), y*ini* (what, with what), *-phi* (where), *nini* (when), *ngani* (why), and *njani* (how). Syntactically, questions are seen as individual units that have varied distinctive features and word order, with each question having both subject and object form (Sankar et al., 2017).

Moreover, research indicates that there are structural differences across languages for *wh*-questions. Syntactically, a *wh*-question in the English language is an interrogative sentence, beginning with a *wh*-word, which represents missing information (Goodwin et al., 2012). Therefore, the question words 'what', 'where' and 'who' are asking for the major sentence constituents that they replace (Bloom et al., 1982). In contrast, in the question words 'why', 'how' and 'when', the major sentence constituents are not replaced; instead, these question

words ask for information that relates to the semantic relationships between all the constituents in that sentence. Accordingly, as stated by the authors, answers to these *wh*-question words state a reason (why), the time (when) or the manner (how). Semantically, questions are used to indicate literal meaning and to know about conceptual knowledge. Moreover, *wh*-questions tap into both the grammatical and pragmatic aspects of language (Sankar et al., 2017).

### *2.3.4. Models of Question Processing*

#### *TSUNAMI Model.*

The theory of simultaneous understanding, answering and memory interaction (also known as the TSUNAMI framework) is a question comprehension framework that informs the basis of this study.

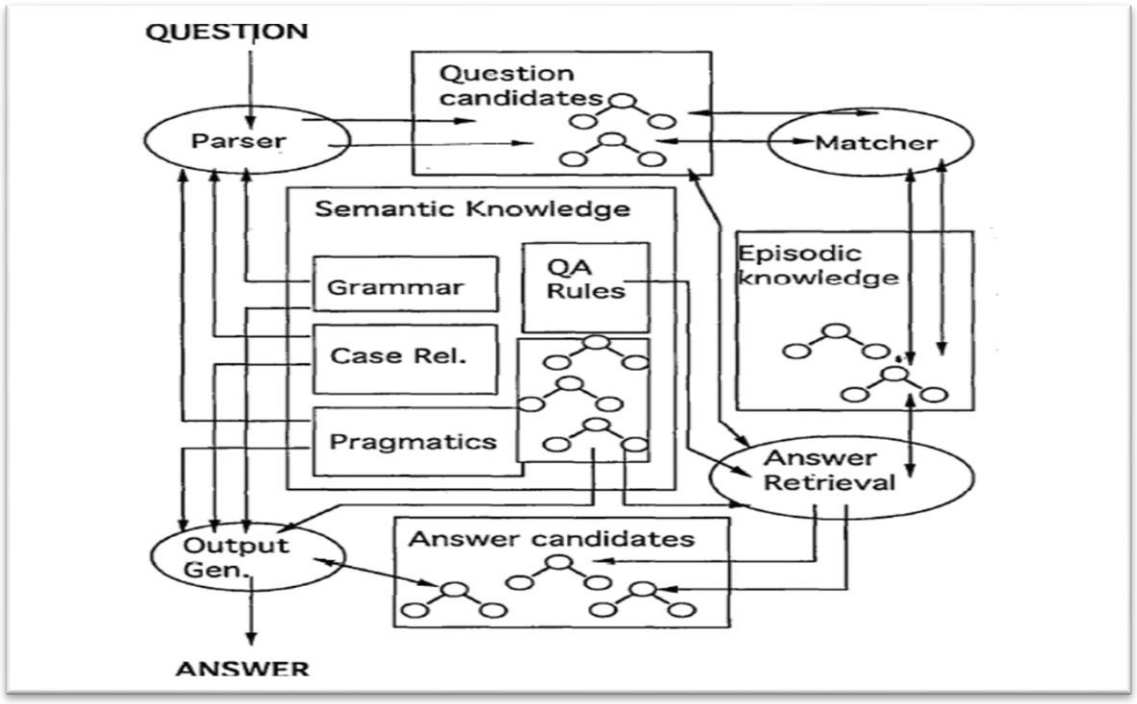



**Figure 1** ***TSUNAMI Model of Question Answering (Robertson, 1994*****)**

***Processes and memories.***

The oval shapes in the model indicate the processes, while the squares indicate memories. The arrows pointing from a process to a memory indicate that the process generates data of that particular type; furthermore, the data of that type can subsequently be modified. The arrows pointing from a memory to a process indicate that the process uses this specific type of information (Robertson, 1994: p.56). Processes and memories may interact in different ways for different problems. Moreover, items stored in a particular memory may be inspected and altered by several processes operating on it simultaneously; therefore, there is no formal flow / control to the model (Robertson, 1994: p.57). Instead, the processing behaviour is a function of the input, the states of the memories and the speed of the processors. In the model, two places of special-purpose working memory are also included, with one place storing 'question candidates', also known as 'possible interpretations of the question'. The second stores 'answer candidates', known as 'potential answers to the questions'. These two memory centres are the only knowledge structures that take the output from processes in the model (Robertson, 1994: p.58).

***Parser and matcher.***

Input for the parser is taken from the question and then the parser utilises grammatical, case and pragmatic information in semantic memory to start with the production of various propositional representations which are then stored in the question candidate buffer (Robertson, 1994: p.58). The multiple arrows from the parser to the question candidate buffer suggest that the parser can produce many candidates in response to the input at any given time (Robertson, 1994: p.58). Once there is any information in the question candidate buffer, the matcher will begin a comparison of the question candidate structures with the activated information in episodic memory. Consequently, when the matcher finds a proposition in episodic memory that corresponds to the question candidate, this then forms the source node for the answer-retrieval process (Robertson, 1994: p.58).

### *Answer-retrieval process and output generation process.*

The answer-retrieval process begins once there is information in the question candidate buffer that might suggest a question or question type (Robertson, 1994: p.59). The answer-retrieval process will make use of the question answering rules stored in semantic memory, and other related general knowledge. More importantly, although the process operates simultaneously with the parser and matcher mechanisms, it is only dependent on the contents of the question candidate memory and the activation states of the nodes in episodic memory (Robertson, 1994: p.59). The candidate answers to questions which the system finds consistent with the input and the memory will be the output of the answer-retrieval process. The answer candidates are examined by an output generation process, which can influence the answer candidate set, but only commit to a final interpretation when all of the input has been processed by the output generation process (Robertson, 1994: p.60).

### *Question-Answering Process Model*

The Question-Answering process model by Pollitt and Ahmed (1999) is made up of six phases (see Table 2).

**Table 2** ***Question-Answering Process Model (Pollitt & Ahmed, 1999)***

| | |
|---|---|
| **0 -** | Learning the subject |
| **1 -** | Reading the question |
| **2 -** | Searching the memory |
| **3 -** | Matching question to memory |
| **4 -** | Generating an answer |
| **5 -** | Writing the answer |

According to this model, there are six phases to question answering; in Phase 0 (zero), the learning of the subject before the exam begins. In Phase 1, the questions are read by the learners, forming a mental representation of what the question requires them to do. In Phases 2–4, learners search their mental representation, continuing to form a personal idiosyncratic

representation provoked by the text and mostly built from pre-existing knowledge (Ahmed & Pollitt, 2001). They then use these to generate an answer. In Phase 5, as they form this representation, certain concepts are activated in their minds, and they are required to select which to use in their answering of the question. Therefore, the learners' mental representation of the answer is turned into a string of words (Pollitt & Ahmed, 1999; 2000; Zuma, 2006).

These models allow for the assessment of the various components of question processing and, as such, also inform the use of the bottom-up approach that is used in the analysis of question processing in the present study. By understanding the different levels that occur in question processing of multilingual learners, the study can determine how these learners navigate between their cognitive and linguistic processes to understand and answer a question. Models such as the TSUNAMI model of question answering by Robertson (1994,) and the Question-Answering process model by Pollitt and Ahmed (1999), are used as the basis for explaining the processing of a question. Additionally, Bloom's taxonomy (Bloom et al., 1956) is implemented as a framework in the categorisation of questions used in this study. Therefore, this study implicitly draws from the above-mentioned question processing models, which foreground my position on question processing and answering.

## 2.4. The Linguistic Structure of Languages of This Study: Bantu Languages and English

### *2.4.1. IsiZulu and Sepedi Languages*

The present research is based on two South African indigenous languages, namely IsiZulu and Sepedi. Both are classified as belonging to Zone S of the Southern Bantu languages (Guthrie, 1967), a fairly homogeneous family of languages (Mheta & Bock, 2014; Nurse & Philippson, 2003; Van der Merwe & Roux, 2014; Zeller, 2004) (see Figure 2).

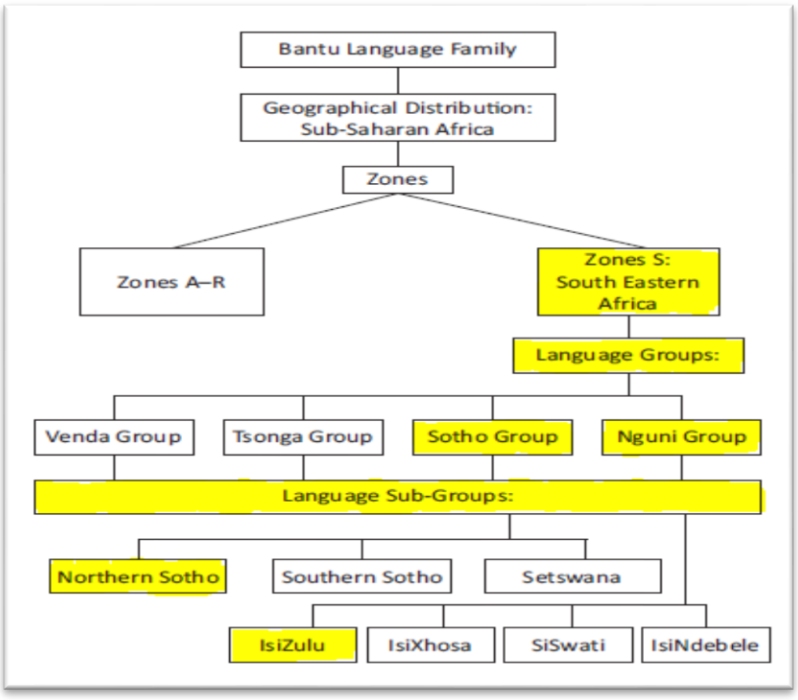



**Figure 2** ***South-Eastern Bantu Language Family Tree (adapted from Van der Merwe & Roux, 2014)***

IsiZulu is a Bantu language belonging to the Nguni language group; it is mutually intelligible to the other Nguni languages (IsiXhosa, IsiNdebele and SiSwati) (Keet & Khumalo, 2017). Northern Sotho (also known as Sepedi) is also a Bantu language and forms part of the Sotho language group. The latter also includes Southern Sotho and Setswana. Southern Sotho, Setswana and Sepedi are all mutually intelligible. Bantu languages are characterised by an agglutinating morphology; this means that they construct whole words by joining discrete roots and morphemes with specific meanings and may modify words by similar processes (Demuth, 1992; 2003);thus, making the structure of such languages rich and complex (Keet & Khumalo, 2017).

IsiZulu and Sepedi are characterised by a basic subject-verb-object (SVO) word order. However, owing to the verb being marked with the subject and sometimes the object, this order may be changed to emphasise certain parts of the predicate. Therefore, the grammatical morphology is prefixed to both the nouns and verbs of the languages (Doke, 1968; Demuth & Suzman, 1997; Poulos & Msimang, 1998). Like other Bantu languages, both IsiZulu and Sepedi have a very productive noun class and agreement system (see Tables 3 and 4). The different prefix

morphemes of IsiZulu and Sepedi nouns indicate several classes of nouns, meaning that each noun belongs to a particular noun class for these languages (Tables 3 and 4)

**Table 3** ***Isizulu Singular and Plural Noun Prefixes***

| Class | Singular | Class | Plural |
|---|---|---|---|
| **1** | u- | **2** | aba- |
| **1a** | u- | **2a** | o- |
| **3** | u- | **4** | i- |
| **5** | li- | **6** | a- |
| **7** | isi- | **8** | izi- |
| **9** | i(n,m)- | **10** | izi(n,m)- |
| **11** | u(lu)- | **10** | lzi (n,m)- |
| **14** | ubu- | | |
| **15** | uku- | | |
| **17** | ku- | | |

**Table 4** ***Sepedi Singular and Plural Noun Prefixes***

| Class | Singular | Class | Plural |
|---|---|---|---|
| **1** | mo- | **2** | ba- |
| **1a** | Ø- | **2a** | bo- |
| **3** | mo- | **4** | me- |
| **5** | le- | **6** | ma |
| **7** | se- | **8** | di- |
| **9** | Ø-,m-,n- | **10** | di- |
| **14** | bo- | | |
| **15** | go- | | |

Demuth states that

> ... the noun class system is part of a larger inflectional agreement system that permeates most Bantu languages. In this system, subject-verb agreement, adjectival agreement, possessives, demonstratives, independent pronouns, relatives and object clitics all "agree" in noun class with their head noun. (1992: p.5)

Therefore, the noun prefixes play a significant role, not only in connecting the noun to other parts of speech but also in determining agreement through a system of concordial agreement (derived from the noun prefixes) (Keet & Khumalo, 2017).

### *2.4.2. English*

As with IsiZulu and Sepedi, English is one of the 11 official languages in South Africa. However, unlike the other languages, it is also the LoLT in most South African schools. The English language is part of the Germanic branch of the Proto-Indo-European language family (Mheta & Bock, 2014). The West Germanic group comprises three divisions, Anglo-Frisian, Low German, and High German. The Anglo-Frisian group, in turn, includes English and Frisian. The latter two languages are closely related and share many features that set them apart from the other West Germanic languages (Fulk, 2008) (see Figure 3).

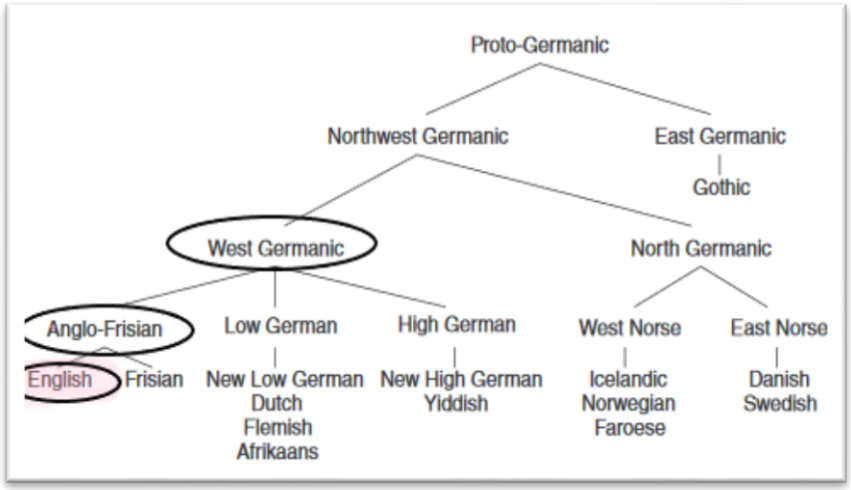



**Figure 3** ***Derivation of Germanic Languages from Proto-Germanic***

The English language is also characterised by an SVO word order and a morphology that is isolating in nature (thus it is considered to be an isolating language). Moreover, English is only

considered to have two tenses, namely the present and past. According to Willis (1990), together with the other components, these generate all the verb forms in English, from the simplest to the most complex. Therefore, according to Lester et al., (2009), six basic verb forms are used to create the entire tense system of English. An illustration of these forms, using the regular verb *jump* and the irregular verb *bite*, are shown in the example below (Table 5).

**Table 5** ***English Basic Verb Forms***

| Six basic verb forms | Regular verb | Irregular verb |
|---|---|---|
| **Verb Base Form** | jump | bite |
| **Present Tense** | jump or jumps | bite or bites |
| **Past Tense** | jumped | bit |
| **Infinitive** | to jump | to bite |
| **Present Participle** | jumping | biting |
| **Past Participle** | jumped | bitten |

Furthermore, owing to the many varieties of English spoken around the world, there are substantial differences in spelling and pronunciation (or accent) in different regions. However, the grammar of standard English is much more stable and uniform than its pronunciation (Huddleston & Pullum, 2005).

To assess how processing of questions occurs, this study seeks to examine all linguistic levels that children use. The next section focuses on the theoretical framework explicitly used in this study.

## 2.5. Theoretical Framework

To describe and understand question processing, the present study is guided by theory. As defined by Mitchell et al. (2013: p.2) ‘a theory is a more or less abstract set of claims about the entities which are significant within the phenomenon under study, the relationships which exist between them, and the processes which bring about change’. Question processing involves

cognitive mechanisms that are not open to direct inspection; therefore, we are required to examine the learners' responses so that we can infer how processing of questions occurs.

First, this study uses Bloom's taxonomy of cognitive domains as a framework in the categorisation of questions used to assess how learners process and comprehend different types of questions. Second, the bottom-up approach of processing language serves as the study's overarching framework, used in conjunction with the theory of the comprehension and question processing models (discussed already in the previous sections).

This section begins with a brief discussion of Bloom's taxonomy, followed by a description and differentiation of the top-down and bottom-up approaches. It then describes how the bottom-up approach is applied in the processing of a question, by outlining the different processes involved in each linguistic level when processing a question.

### *2.5.1. Bloom's Taxonomy*

As previously mentioned, the questions used in this study are categorised according to Bloom's taxonomy and they only cover the two lower levels (the knowledge and comprehension levels, respectively). In 1956, Bloom and his colleagues developed a taxonomy of cognitive domains (Bloom et al., 1956), which was subsequently revised by Anderson and Krathwohl (2001). The taxonomy was developed for educational objectives, to promote higher forms of thinking (Bloom et al., 1971). Therefore, it is used for classifying statements of what is expected or intended for students to learn as a result of instruction (Krathwohl, 2002).

Bloom's taxonomy provides six major categories in the cognitive domain; these categories are arranged from simple to complex, and from concrete to abstract (Krathwohl, 2002). The lower categories in the taxonomy are less cognitively demanding and require fewer thinking skills, while the reverse is true of the higher categories (Duron et al., 2006). Anderson & Krathwohl's (2001) terminological and structural revisions to the original taxonomy are shown in Figure 4.

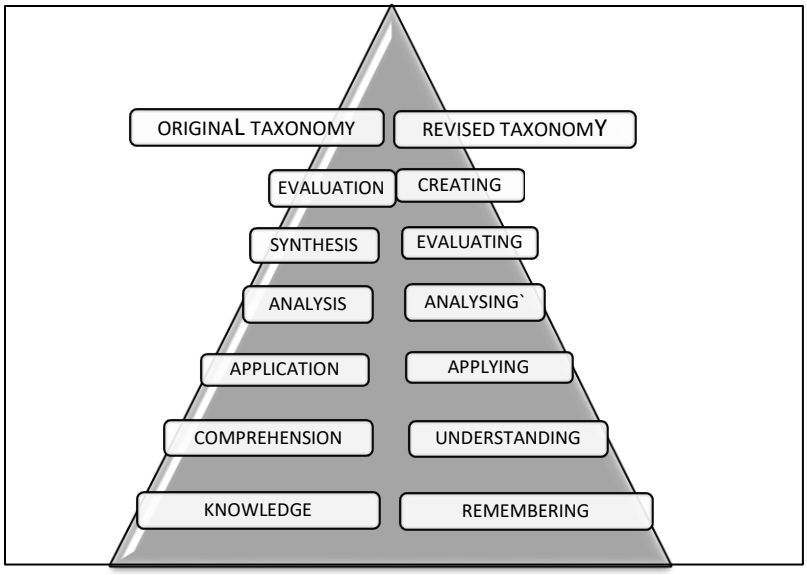



**Figure 4** ***Bloom's Taxonomy of Cognitive Domains (adapted from Anderson & Krathwohl, 2001)***

Anderson and Krathwohl (2001: 67-68) define the levels of the taxonomy as follows:

1. '**Knowledge/Remembering**: Retrieving, recognising and recalling relevant knowledge from long-term memory.

2. **Comprehension/Understanding**: Constructing meaning from oral, written and graphic message through interpreting.

3. **Application/Applying**: Carrying out or using a procedure through executing or implementing.

4. **Analysis/Analysing**: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organising and attributing.

5. **Evaluation/Evaluating**: Making judgements based on criteria and standards through checking and critiquing.

6. **Synthesis/Creating**: Putting elements together to form a coherent or functional whole; reorganising elements into new patterns or structure through generating, planning or producing.'

### *2.5.2. Top-Down and Bottom-Up Approaches*

Top-down and bottom-up processing are two of the main approaches through which information is processed and comprehended by individuals (Lovrich, 2004). These theories describe how individuals understand what they read, and as such, have been used to account for reading comprehension. Lovrich (2004) states that thinking constantly occurs from bottom to top and vice versa. In contrast to top-down processing, the bottom-up levels of processing make relatively few demands on the brain, because they only involve shallow analysis of perceptual data (Owens, 2012).

Top-down processing is conceptually driven; this means that the reader's knowledge, previous experiences and reader expectations are essential to the comprehension process (Angosto et al., 2013; Owens, 2012; Shea, 2014). Accordingly, emphasis is placed on the reader bringing meaning to the text and interpreting it based on their experience and drawing on existing knowledge. Comprehension begins at the top, with more global aspects and then continues to smaller linguistic aspects (Angosto et al., 2013). Therefore, instead of understanding the meaning of each word in a sentence, the top-down approach focuses predominantly on understanding the main ideas of a text as a whole.

Being data-driven, bottom-up processing is the opposite of top-down in that it depends directly on external stimuli (Owens, 2012; Shea, 2014). Hence, analysis begins at the sound and syllable (bottom) levels and proceeds upward to comprehension (Owens, 2012). For example, when bottom-up processing is used to process text, the orthography and phonology of words are first identified (Lovrich, 2007). This then provides access to more extensive units such as sentences or paragraphs, and eventually leads to the interpretation of the whole text (Angosto et al., 2013). Comprehension is essentially a result of interpreting each word, which determines the interpretation of the next sentence and this, in turn, determines the interpretation of each paragraph, and so on (Angosto et al., 2013).

While it is clear that the two processing mechanisms differ regarding the level of informational input (Owens, 2012), it can also be stated that both bottom-up and top-down processes work together at each level of analysis to govern how we comprehend text (Kintsch, 2005). In the last

decade, the view that text comprehension is an interactive process including the joint influence of bottom-up and top-down processing has been preferred (Angosto et al., 2013). However, when processing text, a reader may rely more on one of the two processing strategies or use both simultaneously (Owens, 2012). Therefore, reading comprehension can be considered a result of bottom-up and top-down processes (Aryadoust, 2019).

### *Bottom-Up Processing of Questions*

According to Shapiro (1992), bottom-up processing involves organising the search from where it is initially located, and searching continues until the searcher finds themselves where they want to be. The bottom-up approach to question processing is based on the characterisation of bottom-up processing, and involves using the learners' responses to identify lower-order components that facilitate their subsequent synthesis into higher-order forms (Kinchla &Wolfe, 1979). The low- and high-order components are based on the five linguistic levels, starting with the phonological, followed by the morphological, syntactic, semantic, and pragmatic levels respectively (Kempen, 1999; Santrock, 2007).

- *Phonological level*
    - This involves the rules of how a language sounds, and how and when certain sounds can be combined.
    - Where learners' responses are written, as is the case in the present study, it is assumed that at this level there is a link between the print and the speech. Therefore, in this study the orthographic form of words and affixes are used to represent this level, instead of the phonological representation.
- *Morphological level*
    - This is the 'words and endings' level, where there is an analysis of minimal forms in language. These forms comprise sounds that are used to construct words with either grammatical or lexical functions.

- The learner's response is broken down into the respective morphemes of the language to perform an analysis of word structure.

- *Syntactic level*

  - This level analyses the rules concerning word order. It is at the sentence level, and focuses on the structure of the language of the responses. It also centres on the differences in meaning caused by changes in word order, and the addition or subtraction of words from sentences or changes in the form of sentences.

- *Semantic level*

  - This level involves the meaning of words and sentences, and the combination of separate word meanings into a sensible, meaningful whole. This level also draws on the other levels since meaning exists in lexical, grammatical and sentence forms.

- *Pragmatic level*

  - This level deals with the use of language in specific situations, and the use of appropriate knowledge related to the effective use of language in context. Thus, the meaning of sentences need not be the same in abstract and practical use forms.

Following the above assumptions for each linguistic level, the present study uses these levels as the foundation for analysing the bottom-up processing and comprehension of questions by multilingual Grade 5 and 9 learners.

## 2.6. Summary of Chapter

Chapter 2 presents literature that contextualises the study and outlines the South African education crisis with regard to learners' comprehension of school content. It discussed the challenges faced with regard to the teaching and learning of multilingual learners in the South African education system. The chapter further discusses that language processing has focused

on bilingualism and very little research has examined more than two languages. This gap in knowledge has created a practical problem for teachers, who must assess and educate children from a range of different multilingual environments. Therefore an emphasis is placed on how multilingual language development is not well researched, even less so multilingual question processing. Thus, elucidates on concepts such as question processing, question comprehension and question answering.

The chapter zoomed in on *Wh*-questions as the main tools used to examine question processing in this study. Then, discussed the theoretical frameworks that inform the study's description, analysis and interpretation of question processing. Highlighting that question processing involves cognitive mechanisms that are not open to direct inspection; but are rather examined through the responses of the learners so that we can infer how processing of the questions occurs. While the bottom-up approach of processing language served as the study's overarching framework, used in conjunction with the theory of the comprehension and question processing models discussed in this chapter, Bloom's taxonomy of cognitive domains to categorize the questions used to assess how learners process and comprehend different types of questions in this study was also discussed.

# Chapter Three: Methodology

## 3. Introduction

The purpose of this chapter is to introduce the research methodology for this mixed methods study regarding the processing and answering of questions by multilingual learners. Application of the explanatory sequential mixed methods approach allowed for the development of a wide-ranging view on question comprehension, and the uncovering of existing relationships between the multifaceted research questions of this study.

The chapter first outlines the research questions of the current study. It then provides the research method and design chosen, defines the study population and describes the sampling carried out. The test materials and instruments that were developed and used are also detailed. Thereafter, procedures for data collection and analysis are described. Issues of validity and reliability are also explained. Lastly, the chapter describes the ethical considerations followed in the study.

### *Research Questions*

1. What is the effect of the type of language in the learner's ability to process a question?
2. What are the similarities and differences of question processing in L2 versus L3?
    a. Is there a difference between L2 and L3 learners in the accuracy of processing comprehension questions?
    b. Is there a difference between L2 and L3 learners in the accuracy of processing knowledge questions?
3. How does a multilingual learner process and answer a question?
    a. Did they process or fail to process the question?
    b. How did they arrive at the correct / incorrect response?

### 3.1. Research Approaches

This study adopts a mixed method approach. According to Creswell and Poth (2016), such an approach to research integrates qualitative and quantitative aspects. Its purpose is not just to expand the study's conclusions but to strengthen them as well (Schoonenboom & Johnson, 2017). According to Doyle et al., (2009), there are many reasons to justify the use of mixed methods research design, and these include: triangulation, complementarity, development, initiation and expansion. According to Doyle et al. (2009:179), these reasons 'identify the usefulness that a mixed methods research approach can have in answering a particular research question(s)'. Moreover, many authors have provided a detailed description of these reasons, explaining the benefits of using mixed methods (Bryman, 2006; Creswell & Plano Clark, 2007; Doyle et al., 2009).

- Triangulation: This allows for greater validity in a study by seeking corroboration between quantitative and qualitative data.
- Completeness: With combined research approaches, this provides a more complete and comprehensive picture of the study.
- Answering different research questions: This helps to answer the research questions that are not answered solely by quantitative or qualitative methods, therefore providing a greater repertoire of tools to meet the aims and objectives of a study.
- Explanation of findings: This allows for the use of one research approach (i.e. quantitative or qualitative) to explain data generated from a study using the other research approach. This is mainly valuable when unexpected findings emerge from the study.
- Illustration of data: The use of a qualitative research approach to illustrate quantitative findings can help to paint a better picture of the phenomenon investigated.
- Instrument development and testing: In a qualitative study, items may be generated for inclusion in a questionnaire and then used in the quantitative phase of that study.

### *3.1.1. Types of Mixed Methods Designs*

To address the above research questions, a mixed method approach was used. This included the collection of data using a comprehension test with questions, followed by the grading of the comprehension test using rubrics. Creswell (2014) provides three basic mixed methods designs as follows in Figures 5 – 7.

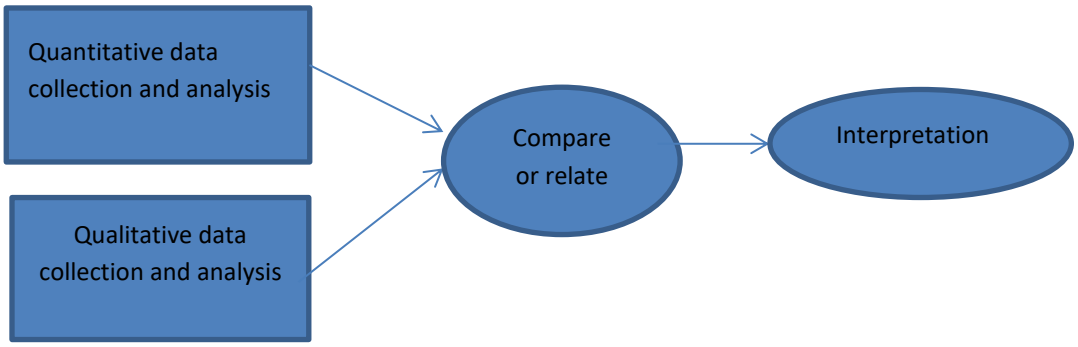



**Figure 5** ***Convergent Parallel Mixed Method Design***

In this approach (Figure 5), the researcher collects both quantitative and qualitative data, analyses them separately, and then compares the results to see if the findings confirm or refute each other. The key assumption of this approach is that both qualitative and quantitative data provide different types of information, which together yield results that should be the same.

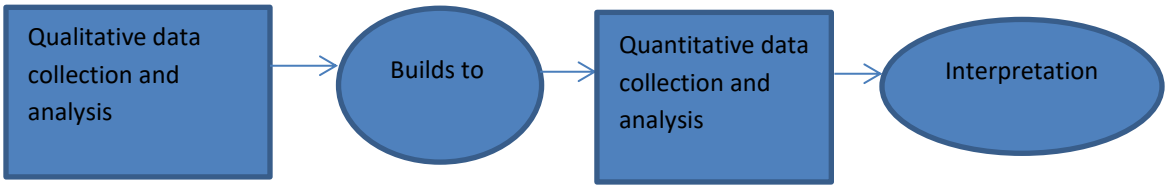



**Figure 6** ***Exploratory Sequential Mixed Method Design***

The researcher first begins the exploratory sequential mixed methods design (Figure 6) by exploring with qualitative data and analysis, and then uses the findings in a second quantitative phase. Thus, the findings from the initial exploratory database (qualitative results) are used to build into quantitative measures.

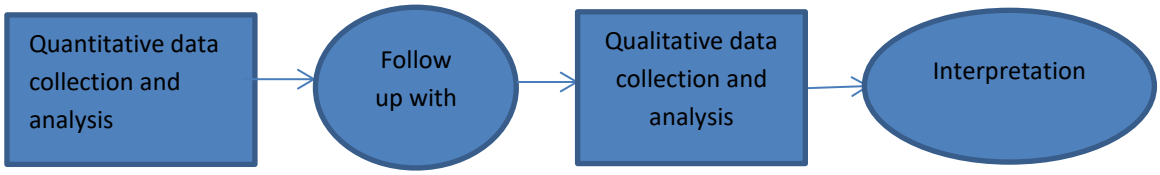



**Figure 7** ***Explanatory Sequential Mixed Method Design***

The approach shown in Figure 7 involves a two-phase project in which the researcher collects quantitative data in the first phase, analyses the results and then uses the results to plan (or build onto) the second qualitative phase. The quantitative results typically inform the types of participants to be purposefully selected for the qualitative phase and the types of questions that will be asked of the participants. According to Creswell (2014), the overall intent of this design is to have the qualitative data help to explain in more detail the initial quantitative results. For data analysis in this approach, the quantitative results are used to plan the qualitative follow-up. This is the design that the study adopts.

As this study follows the 'explanatory' sequential mixed methods, the two different approaches (qualitative and quantitative) that make up the design are explained.

### *Quantitative Approach*

Quantitative research is based on the measurement of quantity or some type of numerical data to answer a study's research questions (Christensen et al., 2015; Kothari, 2004). Quantitative research emphasises facts and the causes of behaviour (Golafshani, 2003). Its major focus is on populations; thus, it seeks to discover general patterns for a population, rather than for particular individuals (Seers & Critelton, 2001). It allows for observable, measurable and quantifiable facts to be observed objectively and tested scientifically. Accordingly, a quantitative approach to research is concerned with generating data in quantitative form, to allow for formal and rigid analysis (Kothari, 2004). This approach is a suitable method of inquiry for the study because of its ability to test objective theories by examining the relationships among variables (Creswell & Poth, 2016). By using structured closed-ended rubrics, this study was able to highlight the learners' responses in an observable, measurable and quantifiable form.

Furthermore, a quantitative research approach can either be experimental or non-experimental. In quantitative experimental research, the researcher is able to manipulate some variables (independent variables) to demonstrate a cause-and-effect relationship on other variables (Christensen et al., 2015; Kothari, 2004); thus, experimental research has much greater control over the research environment. On the other hand, in non-experimental quantitative research, the researcher is not able to manipulate the independent variable (Christensen et al., 2015). This type of research is descriptive, with the goal to provide accurate descriptions of a particular situation or phenomenon or to describe the size and direction of relationships between variables (Christensen et al., 2015). As a result, this study uses a non-experimental quantitative approach, as opposed to the experimental quantitative approach, because it is considered the most appropriate method of obtaining information about the phenomenon of processing questions. This is complex and real-time process influenced by a number of variables (Pollitt & Ahmed, 1999; 2000).

### *Qualitative Approach*

Qualitative research has been defined by Bogdan and Taylor (1975:2) as '… procedures which produce descriptive data: people's own written or spoken word and observable behaviour. [It] directs itself at settings and the individuals within those settings holistically…'. It is thus considered, interpretative, naturalistic and subjective (Hatch, 2002; Locke et al., 2009). Therefore, a qualitative approach to research is concerned with the subjective assessment of attitudes, opinions and behaviour and mostly uses the techniques of focus group, interviews, projective techniques and in-depth interviews (Kothari, 2004).

According to Creswell and Poth (2018), a researcher can select from five qualitative approaches in deciding which approach is best to use for their study. The different types of qualitative research designs are identified as: narrative research, phenomenology, ethnography, case study and grounded theory (Astalin, 2013; Creswell, 2009; Creswell & Poth, 2018).

In narrative research, the researcher studies the experiences of individuals, focusing on the stories they tell about their lives. Therefore, narrative research is defined as a type of qualitative design where spoken or written information is retold or re-stated by the researcher

into a narrative chronology or a series of events / actions (Creswell, 2009; Creswell & Poth, 2018).

Unlike narrative studies, which focus on single individual experiences, phenomenological studies focus on the lived experiences of several individuals (Creswell, 2009; Creswell & Poth, 2018), describing the common factors that all participants share in their experience of a particular phenomenon (which may be an event, concepts or situations). Grounded theory research moves beyond just describing a phenomenon, to the researcher deriving or discovering a general theory of a process (action or interaction) that is grounded in the views or experienced process of the participants in that study (Creswell, 2009; Creswell & Poth, 2018). This means that grounded theory studies allow for the emergence of theory from the collected data (Astalin, 2013; Creswell, 2009; Creswell & Poth, 2018).

Ethnographic research focuses on an entire and intact cultural group in a natural setting, primarily through observations of the culture-sharing group (Creswell, 2009; Creswell & Poth, 2018). These groups' shared and learned patterns of their values, behaviours, beliefs and language is then described and interpreted by the researcher (Creswell, 2009; Creswell & Poth, 2018). Lastly, case study research involves the studying of an issue that is explored through one or more cases within a setting or context (within a bounded system) over time. The researcher conducts an in-depth investigation involving a variety of sources of information and then reports a case description (Creswell, 2009; Creswell & Poth, 2018).

Overall, regardless of which qualitative approach to inquiry a researcher uses, qualitative research is especially important when the researcher wants to discover underlying motives of human behaviour; for example how interactions take place, the manner in which they occur and why in that specific manner or situation (Henning, 2004; Kothari, 2004). This is precisely the case in this study, as we are interested in understanding the process of question comprehension using theory (the bottom-up framework). According to Collins and Stockton (2018), theory and theoretical frameworks are some of the terms that have blurred lines within the literature of qualitative methods. In research studies, the theoretical framework makes use of theory or theories, thus conveying the researcher's values and providing 'a clearly articulated

signpost or lens for how the study will process new knowledge' (Collins & Stockton, 2018: 2). Therefore, as described by the authors, a theoretical framework is characterised by three elements that make it a valuable tool to determine the coherency and depth of a study. First, the existing knowledge and previously formed ideas about complex phenomena are established. Second, 'the researcher's epistemological dispositions, and third[ly], a lens and a methodically analytic approach' (Collins & Stockton, 2018:2).

Qualitatively, using a bottom-up framework, this study describes how question processing and answering by multilingual learners occurs. The bottom-up approach to question processing is based on the characterisation of bottom-up processing in language and involves using the learners' responses to identifying lower-order components that facilitate their subsequent synthesis into higher-order forms (Kinchla & Wolfe, 1979) The examples below show how the processing of questions in each linguistic level was determined using the collected data, i.e. learners' responses (the different bottom-up levels are explained in detail in Chapter 2 Section 2.5.2).

To maintain anonymity, the learners' names were given a code using the following criteria; Participant Number + Language + Question type + Gender + Age Group, i.e. **P42L2CF10Y** (where **P42** is the forty-second participant, **L2** is the learner's second language, **C** is a comprehension question type, **F** for female and **10Y** is the learner's age group)

***Bottom-up Analysis Example***

P1L2CF10Y: Wayephatheke kahle ngoba bekuyiphupho lakhe

*He was feeling/felt good because it was his dream*

**Phonological level**: Not applicable since data was written and not spoken.

**Morphological level**: The learner's response is broken down into the respective different morphemes of the language to perform an analysis of word structure, e.g.

Wa-ye-phath-ek-e ka-hle ngoba be-ku-yi-phuph-o la-khe

*He was feeling/felt good because it was his dream*

**Syntactic level**: This level analyses the rules concerning word order of the given sentence above, focusing on the structure of the language that the responses are in and the differences in meaning caused by changes in word order, e.g.

| | | |
|---|---|---|
| *Wa-ye-phath-ek-e* | *ka-hle* | *ngoba* |
| 1SC he- PASTCont was- carry-NEUT-PAST | Adv well/good | Conj because |
| *beku-yi-phupho* | *lakhe* | |
| PASTCont it was-SC-NC5dream | POSSPron his | |

**Semantic level**: This is the level that examines the literal meaning of the learner's response in relation to the information requested by the question. The response must indicate that the learner knows something about the content of the question. Therefore, the reference concept drawn from the given text must contain accurate and correct semantic content. In this case, an accurate description of the feelings experienced by the subject when he played his first match for his country, would be correct. For example, *Wayephatheke kahle ngoba bekuyiphupho lakhe* literally means that the assumed subject felt good because it was their dream. This literal meaning is not explicitly given in the text.

**Pragmatic level**: This level analyses the learner's responses based on the context of the text (story given) and the question under discussion. Therefore, the learner's response is a pragmatic interpretation, and must provide information that is neither less nor more than what is requested by the question. For example; the learner's response can be pragmatically interpreted to mean that the subject of the question (Pele) felt good (because it was their dream to play for his country). This interpretation describes an aspect of what could have been meant by 'being in a dream' from the question. Therefore, the feelings associated with a dreamlike state are inferred as responses.

### *3.1.2. Research Design for the Study*

This study, therefore, falls within a mixed methods research design; an explanatory sequential method that is quantitatively non-experimental and correlational and uses a theoretical framework qualitatively. Correlational research involves the collection and use of data to determine whether a relationship exists between two or more quantifiable variables and, if so, to determine the extent of this relationship (Johnson, 2001; Christensen et al., 2015). This study is correlational because there was no experimental manipulation of variables; rather, the relationships among variables were measured (Kathori, 2004; Christensen et al., 2015). Correlational research allows for the description of relationships among variables, which makes it possible for this study to observe group differences, similarities and comparisons between the two languages (L2 and L3) and age groups (10–11- and 14–15-year-olds). Within group comparisons, it also allows for the correlation between the independent variables (language and age) and dependent variables (processing skill, response and processing breakdown).

## 3.2. Sampling and Population

### *3.2.1. Selection Criteria and Technique*

The learners needed to be multilingual speakers, speaking more than two indigenous South African languages; therefore, a language and background questionnaire (see Appendix A) given out to the learners was used to confirm this. Then, only those who met this criterion were selected. Participants were learners who are speakers of Sepitori, and learning either IsiZulu or Sepedi as a subject. The selected learners were all from Mamelodi and Nellmapius areas as these are the languages spoken by the majority of the population in these regions (Census, 2011). They were also required to be learning English (as a first additional language in school). The learners needed to be either in the 10–11-year-old age group (Grade 5) or the 14–15-year-old age group (Grade 9). As additional criteria, the learners needed to have attended their present school for at least two consecutive years and must have been in their first year of study for that specific grade, i.e. no learners who had repeated the grade.

### *3.2.2. Sampling Procedure*

After the participants were chosen, a stratified sampling method was used. This means that the participants were divided further into characteristics of importance for the research. In this case, their level of educational achievement, as recorded by the school in the languages mentioned above, was the selected characteristic. This allowed for a baseline to test different learners' processing of questions, thus ensuring that each achievement group is represented.

**Table *6 L2 and L3 Learner Achievement Level***

| **Level of achievement** | | | **No. of Grade 5 Learners** | | **No. of Grade 9 Learners** | |
|---|---|---|---|---|---|---|
| | | | **L2** | **L3** | **L2** | **L3** |
| **3** | 40-49% | Below average | 3 | 3 | 6 | 5 |
| **2** | 50-69% | Average | 12 | 13 | 7 | 10 |
| **1** | 70-100% | Above average | 9 | 8 | 5 | 3 |
| **Total** | | | **24** | | **18** | |

For this study, learners from three achievement level groups were selected. This classification was based on their recorded school marks (Term 1 and 2) for each language subject. Table 6 shows the sample of different achievement groups of learners used in the study. Therefore, three different levels of academic achievement (based on their Term 1 and 2 final marks provided by the teachers) were categorised and recorded. Gender was also balanced, i.e. equal numbers of boys and girls, to ensure that every group of the participants is represented in the sample (see Table 7).

Several primary and high schools in Mamelodi (indicated as A in Figure 8) and Nellmapius (indicated as B in Figure 8), Pretoria area of the Gauteng Province, were identified and selected from the Gauteng Department of Education website (https://www.education.gov.za/Programmes/EMIS/EMISDownloads.aspx)

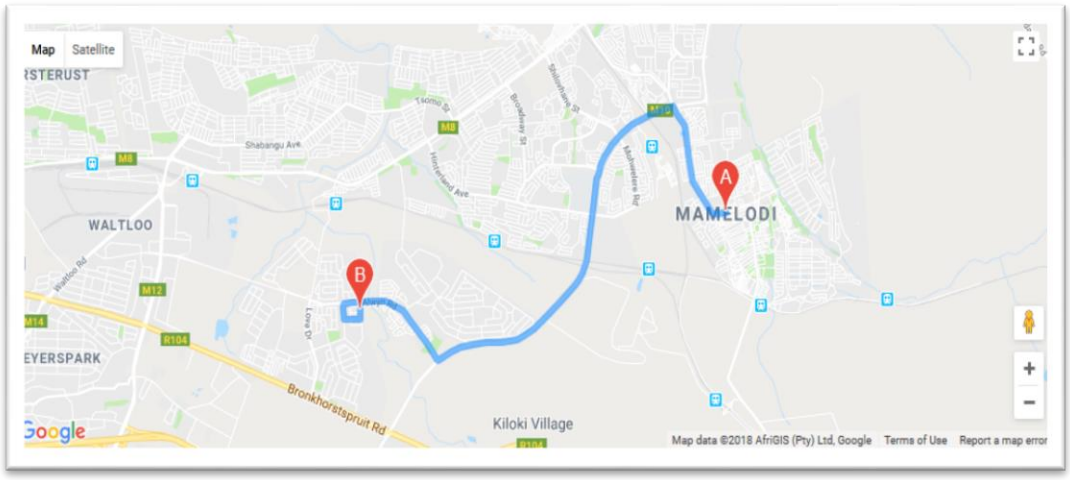



**Figure 8** ***Map of Mamelodi and Nellmapius Townships (Google Maps, 2018)***

These areas were chosen, first because of their proximity to each other, and second, owing to their dynamic and multilingual language situation. Mamelodi and Nellmapius, as two of the many townships in Gauteng, display a diversity of languages that children grow up exposed to, thus resulting in many linguistically mixed schools and classrooms.

Initially, six schools (three primary schools and three high schools), which were conveniently close to the researcher's home, were identified and approached. The researcher met with the school principals of each school to request permission to conduct research with the learners at the school. Only four school principals (two primary schools and two high schools) granted permission to conduct research (see Appendix B). With the assistance of the L2 and L3 language teachers, all Grade 5 and Grade 9 learners of IsiZulu and Sepedi were given parent information sheets (see Appendix C) and consent forms (see Appendix D). Only children whose parents gave consent for their participation were included in the study.

### *Description of participants.*

A total of 42 participants were selected to participate in the comprehension tasks. Table 7 provides a detailed rundown of the total number of learners, age and gender.

**Table 7** ***Learners' Age Groups***

| Grade | Average Age in Months/Years | Age range | | Mean | SD | Number of learners | | Total |
|---|---|---|---|---|---|---|---|---|
| | | Min | Max | | | Male | Female | |
| **5** | 132/11 | 121 | 134 | 129,86 | 4,34 | 12 | 12 | **24** |
| **9** | 180/15 | 169 | 183 | 179.80 | 4.10 | 9 | 9 | **18** |
| **Total** | | | | | | 21 | 21 | **42** |

The participants in the study consist of a total of 42 learners (see Table 7), of whom 24 learners were between the ages of 10 and 11 and the 18 learners were between the ages of 14 and 15. These two school grades were chosen because of their different representations and the expectations of the curriculum and assessment levels. For each group, there was an equal gender split.

## 3.3. Test Materials and Instruments

The following data collection instruments were used in an attempt to address the primary research question:

### *3.3.1. Language Background Questionnaire*

The 10–11-year-old (Grade 5), and the 14–15-year-old (Grade 9) learners completed a brief language background questionnaire (see Appendix A) with the help of the researcher to establish the following:

- The home language(s) of the learners (to ensure that they met the selection criteria)
- Other languages spoken by the learner, to record how many indigenous South African languages they could speak
- Background information about the languages used in different contexts by the learner.

### *3.3.2. L2 and L3 Comprehension Texts*

The comprehension excerpts and questions for IsiZulu and Sepedi languages were taken from the 2015 DBE workbooks (see Appendix E). The English language comprehension text and questions were taken from the Gauteng Department of Education Ekurhuleni North November 2015 English exam paper (see Appendix F). Both age groups (10–11 and 14–15 years old) were tested for comprehension using the same Grade 5 short story excerpt.

The workbooks and question paper chosen for this research study employed the standard of the CAPS for intermediate phase (Grade 4–6). Therefore, the questions of the comprehension tasks in each covered a range of cognitive levels. However, in the categorisation of questions for the L2 and L3 language subjects, the cognitive order and representation did not follow an equitable assessment order from basic remembering to the highest level category of creating, with some of the cognitive levels not even represented. Therefore, using the existing questions from the chosen workbooks and question paper, the researcher amended some questions in the L2 workbooks and L3 question paper, to align appropriately with the cognitive level that the study intended to assess. The CAPS documents use a combination of various taxonomies to categorise cognitive levels; including Bloom's taxonomy. Therefore, before the comprehension was written by the learners, the researcher used Bloom's taxonomy levels of cognitive processing (Bloom et al., 1956) to categorise all the questions. Once this was achieved, the questions were reduced in number and a few were chosen to represent each cognitive level.

#### *L2 (IsiZulu and Sepedi) Amendment of Questions*

> **Q1**: Ubani okhulumayo esigabeni sokuqala?/Ke mang yo a bolelago ka go temana ya Pele? *'Who is speaking in the first paragraph?'* –Bloom's cognitive level (BCL) 1: Knowledge/Remembering

Question (1) above was used as is.

> **Q2**: Waphatheka kanjani uPele ngenkathi edlalela izwe lakhe umdlalo wakhe wokuqala?/Na Pele o ile a ikwa bjang ge a be a raloka papadi ya gagwe ya mathomo ya naga ya gabo? *'How did Pele feel when he played his first match for his country?'* –BCL 2: Comprehension/Understanding

Question (2) above was used as is.

**Q3**: Upele wayekholelwa ekuzigcineni ephilile.Ukwazi kanjani lokhu?/Pele o dumela tabeng tša gore motho a dule a phetše gabotse. Na o tseba bjang? *'Pele believed in keeping healthy. How do you know this?'* –BCL 2: Comprehension/Understanding

3(a): Yini ubaba kaPele amfundisa yona ukuthi ahlale aphilile?/ Ke eng seo Papago Pele a mo rutileng ka go phela bophelo bja maleba? *'What did Pele's father teach him about living a healthy lifestyle?'* BCL 1: Knowledge/Remembering

Question (3) above was amended to question 3(a) with the BCL changing from comprehension to knowledge

**Q4**: Yini eyenza uPele ukuthi abe umdlali oqeqeshile kakhulu?/Ke eng seo se dirilego Pele gore a tswelele go ba sebapadi sa kgwele ya maoto se hlwahla? *'What makes Pele a successful soccer player?'* –BCL 2: Comprehension/Understanding

Question (4) above was then added by the researcher and language subject teachers who assisted in the coding and categorising of the questions and used as is.

**Q5**: uPele wabuyela esikoleni eseshadile. Ucabanga ukuthi lokhu kwaba lula noma kwaba nzima kuye? Ukusho ngani lokho? Pele o ile a boela sekolong ge a šetše a nyetše. Na o nagana gore se se be se le bonolo goba se le boima? Efa lebaka. *'Pele went back to school when he was married. Do you think this was easy or hard for him? Say why.'* –BCL 4: Analysis/Analysing

Question (5) above, was used as is.

**Q6**: Yikuphi okunye afakangakho isandla esadlala ibhola uPele?/Ke eng tse dingwe tseo Pele a ditlaleleditsego mo kgweleng ya maoto? '*What other contributions did Pele make in football?*' –BCL 4: Analysis/Analysing

Question (6) above, was also added by the researcher, with the assistance of the language subject teachers and used as is.

***L3 (English) Amendment of Questions.***

**Q1**: Write down the name of the speaker in the first paragraph– BCL 1: Knowledge/Remembering

1(a): What is the name of the person telling the story?–BCL 1: Knowledge/Remembering

Question (1) above, was amended to question 1(a) with the BCL remaining as is.

**Q2**: Explain what happens to the family pet when Peter's sister sings in the shower–BCL 1: Knowledge/Remembering

2(a): What happens to the cat when Peter's sister Kate sings in the shower–BCL 1: Knowledge/Remembering

Question (2) above, was amended to question 2(a) and the BCL changed from comprehension to knowledge.

**Q3**: Why does the speaker compare himself to a cheese sandwich?–BCL 2: Comprehension/understanding

Question (3) above, was used as is.

**Q4**: Explain why Peter knows how to open the front door when it gets stuck?–BCL 2: Comprehension/understanding

Question (4) above, was added by the researcher with the assistance of the language subject teachers and was used as is.

**Q5**: What does Peter's baby sister have that irritates him? –BCL 2: Comprehension/understanding

5(a): Why do you think Peter is irritated by his baby sister?–BCL 4: Analysis/Analysing

Question (5) above, was amended to question 5(a) and the BCL changed from comprehension to analysis.

**Q6**: What can you point out about the chores that need to be done by everyone compared to the activities that Peter's father does when he is not at work??–BCL 4: Analysis/Analysing

Question (6) above, was added by the researcher with the assistance of the language subject teachers and was used as is.

Subsequently, with the assistance of two language teachers, the length of the comprehension texts was also amended and reduced accordingly to align with the information required by the chosen and added questions (See Appendices G and H). These amended questions and story excerpts were then used for the collection of the pilot data.

## 3.4. Data Collection

### *3.4.1. Pilot Study*

The study initially focused on the pilot data, with the sample consisting of 24 learners between the ages of 10 and 11 (in Grade 5). The comprehension task for both L2 and L3 language subjects (see Appendices G and H) consisted of six questions from three different cognitive levels (Knowledge, Comprehension and Analysis) categorised using Bloom's taxonomy. The section below thus describes the procedures undertaken in the collection of the pilot data (which informed the data collection process of the main study, discussed later in the chapter).

The data collection procedure of the pilot phase consisted of three stages: stage one, which involved the collection of learners' language background information. Stage two involved a

group of learners writing the comprehension test without any timer, and the final stage concerned a new group of learners who wrote the comprehension test with a timer.

**a)** ***Stage 1: Language background questionnaire***

The first step required the learners to complete a language background questionnaire. The administration of this questionnaire took place at a time which was convenient for the teachers and the learners to avoid using teaching time. The Grade 5 learners who met the criteria identified in the section above were selected from one of the primary schools. These learners were placed in a quiet, empty school classroom and were asked to complete the questionnaire, with the researcher present to assist with clarifications. They took approximately 10–20 minutes to complete, with a total of 24 learners in Grade 5 completing the questionnaire.

**b)** ***Stage 2: Written comprehension task***

Of the 24 learners who completed the questionnaire, nine were selected for the first phase of the pilot. The selected learners were from three different achievement level groups, namely three above-average achievers, three average achievers, and three below-average learners. All nine learners were put in an empty, quiet classroom and informed that they would be writing a comprehension task.

They were then informed that they would receive the story excerpt first, which they needed to read for understanding. Once they were satisfied that they were done reading, they were asked to indicate this to the research team by raising their hands. They were further informed that by raising their hands, it also meant that they were ready to be given the questions and that they could start answering.

Once all the rules and instructions were explained, the learners were then given the story excerpt and instructed to start reading. The starting time for reading was recorded as the same for all learners. Once learners started indicating to the research team that they had completed reading, the end time for reading by the learner would be recorded. The learner was then given the questions and an answer sheet to use for answering the questions.

Although all learners were given the story to read at the same time, the end time differed (different learners finished reading at different times). This means they also had different start times for answering the questions (the start time for answering questions was dependent on the time individual learners took to finish reading their comprehension). Once the learners were done with answering and ready to submit, they were instructed to raise their hands and the researcher recorded the end time of answering the questions and collected the answer sheet.

This procedure was conducted for both the L2 (IsiZulu and Sepedi) and L3 (English) comprehension tasks, on two different days. The group of nine learners wrote the L3 (English) comprehension on the first day, and then wrote the L2 (IsiZulu or Sepedi) the following day. The comprehension stories used were the same for the different L2s (see Appendix G), but different from the L3 comprehension story (see Appendix H); the same applied to the questions.

**c)** ***Stage 3: Written comprehension task with a time limit***

Following the transcription and analysis of the start and end time (see Section 3.5) gathered from the data of the nine learners in the first stage of the pilot study, an average reading time for both the L2 and L3 groups was determined. Therefore, the next step required the learners to write the comprehension test with a time limit given for completing the reading of the text.

The remaining 15 learners were selected for the second phase of the pilot, although only 11 of them arrived to participate. Four of these were from the above-average group, three from the average group and four from the below-average achieving group.

The written 'timed-comprehension' task was completed for both the L2 (IsiZulu and Sepedi) and L3 languages, on two different days, just as in the first phase of the pilot. All 11 learners were seated in a quiet, empty quiet classroom after school and informed that they would be writing a comprehension task. They were informed that they would be given the comprehension text to read first for understanding. After the specified reading minutes had elapsed, the comprehension text was taken away, so that they could immediately be given question papers and answer sheets to start answering. Time allocated to the reading task in this phase was

taken from the average reading time that was recorded from the first phase of the pilot. The comprehension text was then handed out to the learners and placed face-down on their tables. Once all the learners had the comprehension in front of them, they were instructed to turn the page over and to start reading.

For the L2 (IsiZulu and Sepedi) comprehensions, the learners were stopped after 8 minutes of reading and the comprehension text was taken away from them. The learners were then immediately and simultaneously given the question papers and answer sheets; the precise time that this was done was recorded and considered the beginning of the response time.

For the L3 (English) comprehension, the learners were stopped after 10 minutes of reading, and then the comprehension text was taken away by the research team. Just as in the L2 procedure, this was followed by immediate and simultaneous distribution of the question papers and answer sheets. The time was also recorded and considered the beginning of the response time.

Most learners finished reading the comprehension before the given reading time limit; therefore, they had different starting times for their responses to the questions, because once a learner was done reading (end time for reading varied for each learner), a question and answer sheet was given to them immediately. The learners were not given a time limit for answering the questions, so when a learner felt that they were done or ready to submit then they would indicate to the researcher by raising their hand. The researcher would then record the time the learner finished the task (response time) and then proceeded to collect the answer sheet.

### *Results of Pilot*

Results from the L2 and L3 comprehension tasks showed that all six questions were answered by all 20 learners (nine learners from the second stage of the pilot and 11 learners from the third stage). All learners also accurately processed the knowledge and comprehension-focused questions in both L2 and L3, while the results varied (from accurate, partial, to inaccurate processing) for the processing of the analysis-focused questions in both language subjects. This indicated that about 50% of the learners had challenges identifying the information given and requested by the questions in the L2 and L3 analysis-focused questions.

When it came to learner responses, the knowledge and comprehension-focused questions were better performed, with high frequencies of *correct response* in both L2 and L3. In contrast, learner performance for analysis-focused questions was poor, with a high frequency of *incorrect responses* in both language subjects. This also indicated that learners who accurately processed the analysis-focused question, still had difficulty in providing a correct response. Moreover, a trend showed that the added and amended comprehension-and analysis-focused questions were the ones that provided most difficulty for the learners.

In the light of these results and the consideration that the Grade 5 DBE workbooks and question paper used for this study did not have many higher-order cognitively demanding *wh*-questions, therefore, for the main study, the amended comprehension-focused questions and the all analysis –focused questions were removed. Moreover, for the sake of a systematic balance of the low-order questions, only one knowledge and one comprehension-focused question was used for the main study.

### *3.4.2. Main Study*

Following the results of the pilot study, the comprehension task used for the main study contained a shorter story excerpt, with just two questions (one knowledge-based and one comprehension – focused, as shown in Table 8 (see Appendices I and J). Moreover, after the transcription and analysis of the first and second phase of the piloted data (see Section 3.5), the researcher used the average reading time (8 min) and average response time (15 min) obtained from the English L2 IsiZulu and Sepedi comprehension task to conduct the next first phase of the main study. The same was done for the L3 English comprehension task: the learners were given 10 minutes of reading time and 8 minutes of response time.

**Table 8** ***Levels of Thinking Skills and Related L2 and L3 Wh-Question Words***

| Levels of thinking skill | Question word |
|---|---|
| **Level 1 – Knowledge / Remembering** | L2 and L3: Yini '*What*' (happens in the story) |
| **Level 2 – Comprehension / Understanding exploration of understanding including cause and effect, feelings, attitudes and behaviours** | L2: (Ka)njani '*How*' (ways that things happen / people feel)<br>L3: Why (reason for things happening) |

In the different schools, the 10–11-year-olds (Grade 5) and the 14–15-year-old (Grade 9) learners were put in a quiet, empty classroom and then informed that they would be writing a comprehension task. This was done for both the L2 and L3 comprehension tasks, on two different days. The following procedure took place:

- They were first given the comprehension text to read for 8 min for L2, and 10 min for L3.
- Once the time was up, the comprehension text was removed / taken away from them. However, in cases where the learner finished reading before the time was up; the researcher recorded the learner's reading time.
- The learners would then immediately receive the question paper (which had space for them to write their answer). As soon as they received the question paper, learners could begin answering.
- The learners were given a 15-minute time limit to respond to the L2 questions, and 8 minutes to respond to the L3 questions.
- However, once a learner completed answering before the given time limit was up, and was ready to submit, they raised their hand to indicate this. The researcher would, in that case, immediately record the time (that the learner completed the task of answering questions) and proceed to collect the answer sheet from the learner.

### 3.5. Transcription and Coding

At the end of each period of data collection, the times that were recorded during learners' reading and response to questions were transcribed onto a Microsoft Excel spreadsheet, containing the pseudo name, date of birth, age, gender, school attended and grade, of the learner (see Appendix K). The learners' responses were transcribed onto Excel and graded according to Rubric 1 (see Table 9) for the accuracy of responses and Rubric 2 (see Table 10) for the accuracy of processing (see page 74-75). Each learner's score from both rubrics was then entered into the Microsoft Excel sheet, corresponding with their given pseudonym. Finally, the learners' responses were copied to Microsoft Word and each response to the questions was analysed, for the identification of linguistic errors / breakdowns (identified from four linguistic levels: morphological, syntactical, semantic and pragmatic). Each identified level of the

linguistic breakdown was then coded following the coding grid (see Table 11) as a guideline and then entered into Microsoft Excel (next to the corresponding learner's response).

### *3.5.1. Grading Rubrics*

Rubrics are seen as assessment tools, used to score or assess the outcome of a task (Stevens & Levi, 2013; Jonsson, & Svingby, 2007). Rezaei and Lovorn (2010:19) define a rubric as 'a set of criteria for grading assignments'. They distinguish between two categories of rubrics: a holistic rubric and an analytic rubric. The holistic rubric assesses the overall quality of the response provided by the learners and is more focused on the performance / product in its entirety (Rezaei & Lovorn, 2010; Jonsson & Svingby, 2007, while the analytic rubric is more focused on the separate steps one takes to arrive at the final product, thus assigning a score to each dimension that is assessed (Rezaei & Lovorn, 2010; Jonsson & Svingby, 2007; Bargainnier, 2003). Rubrics divide a task into its components and provide detailed descriptions of what is considered satisfactory or unsatisfactory levels of performance for each of those parts, thus making them a crucial tool in the classification and organisation of learners' performance in the processing and answering of questions. In their simplest form, rubrics are made up of four basic parts set out in a grid:

1. 'Task description (the assignment)
2. A scale of some sort (levels of achievement)
3. The dimensions of the assignment ( a breakdown of the skills/knowledge involved in the assignment)
4. Descriptions of what constitutes each level of performance (specific feedback)' (Stevens & Levi, 2013:3)

Two holistic rubrics created by the researcher were used as guidelines for the evaluation of the learners' responses. These scoring rubrics were used to guide the evaluation of the learners' responses to the task and to evaluate their processing accuracy of the questions. Rubric 1 groups the learners' responses into three categories: incorrect, partially correct and correct response (Table 9). These categories were assigned a scale (1 to 3) for each question (considered the dimension) and a description of what each level of the scale represents. This

was the same with Rubric 2 (Table 10), which focused on the processing accuracy of the question by the learners and identified three categories: inaccurate processing; partially accurate processing; accurate processing. The categories were assigned a score (1 to 3) for each question and a description of each level. The description of the task for both Rubric 1 (Table 9) and 2 (Table 10) required the learners to read a short story (passage) and answer two questions that followed. This was the same for both language (L2 and L3) subjects. Therefore, all four components of a rubric were taken into consideration and applied when creating this study's rubrics.

Moreover, in creating the criteria for what constituted an acceptable answer for the comprehension task's questions, several literature guidelines (Groenendijk & Stokhof, 1985; Moyer & Syrett, 2019; Ron et al., 2010; Robinson & Racksaw, 1975) including the following list provided by Hirschman and Gaizauskas (2001:294) were used:

- 'Relevance: the answer should be a response to the question.
- Correctness: the answer should be factually correct.
- Conciseness: the answer should not contain extraneous or irrelevant information.
- Completeness: the answer should be complete, i.e. a partial answer should not get full credit.
- Coherence: an answer should be coherent so that the questioner can read it easily.
- Justification: the answer should be supplied with sufficient context to allow a reader to determine why this was chosen as an answer to the question'.

The answering evaluation criteria above were used to determine whether learner responses were answers to the questions asked, and whether they met the specifications of a correct response. In the event that the response was not correct, they were classified as incorrect. If only some and not all of the conditions of a correct response were met, then the response was categorised as partially correct. Therefore, all response types were described in terms of the presupposition, appropriateness and completeness.

### a) *Rubric 1: Response Accuracy*

**Table 9** ***Response to Question Rubric***

| Response scale | L2Q1 | L3Q1 | L2Q2 | L3Q2 |
|---|---|---|---|---|
| **1 – Incorrect** (incorrect presupposition inaccurate categorisation and incorrect reference concept) | Response is incorrect, irrelevant or inappropriate. | Response is incorrect, irrelevant or inappropriate. | Response is incorrect, irrelevant or inappropriate. | Response is incorrect, irrelevant or inappropriate. |
| **2 – Partially Correct** (correct presupposition, accurate categorisation and incomplete but correct reference concept) | The response has some correct information but also has minor omissions and/or some incorrect or irrelevant information. | The response has some correct information but also has minor omissions and/or some incorrect or irrelevant information. | The response has some correct information but also has minor omissions and/or some incorrect or irrelevant information.<br><br>The response includes one of the two actions bold and underlined below. | The response has some correct information but also has minor omissions and/or some incorrect or irrelevant information.<br><br>The response includes one of the two actions bold and underlined below. |
| **3 – Correct** (correct presupposition, accurate categorisation and correct reference concept) | The response is reasonably complete, clear and satisfactory. Should be one of the following responses:<br>1. He felt like he was in a dream<br>2. He felt like he was dreaming. | The response is reasonably complete, clear and satisfactory. Should be one of the following responses:<br>1. Because he (the speaker) is the middle child in his family. | The response is reasonably complete, clear and satisfactory.<br>The learner should include two of the actions:<br>1. **Smoking** and **drinking** alcohol are not healthy (not good for your health)<br>**OR**<br>2. Not to smoke and not to drink alcohol. | The response is reasonably complete, clear and satisfactory.<br>The learner should include two of the actions performed by the cat in his/her answer:<br>1. The cat **runs** and **hides.** |

Rubric 1 focused on coding the L2 and L3 learner responses to the comprehension and knowledge questions. For the L2 comprehension question the code L2Q1 was used, and for the L2 knowledge question the code L2Q2 was used. The L3 questions were coded as L3Q1 for

comprehension questions and L3Q2 for the knowledge questions. Each question had a response accuracy category assigned (on a scale of 1-3). It categorises the response to that particular question as either incorrect (1), partially correct (2), or correct (3).

### b) *Rubric 2: Processing Competency*

**Table 10** ***Processing Competency to Questions Rubric***

| **Scale** | **Cognitive Level** | **Comprehension / Understanding** | | **Knowledge / Remembering** | |
|---|---|---|---|---|---|
| | Question word | How | why | What | What |
| | Processing level | L2Q1 | L3Q1 | L2Q2 | L3Q2 |
| **1** | Inaccurate processing | • Inaccurate presupposition<br>• No *wh*-questions answered /incorrect *wh*-question word answered<br>• Repetition of the question as a response<br>• Ungrammatical and incomprehensible | | | |
| **2** | Partially accurate processing | • Accurate presupposition<br>• Accurate *wh*-question word answered | | | |
| **3** | Accurate processing | • Accurate presupposition<br>• Correct *wh*-question word answered | | | |

Rubric 2 focused on coding the L2 and L3 learners' processing competency based on their responses. The processing competency described learners' identification of the presupposition extracted from the question (focusing on structure and understanding of the question) and the type of question word answered (determining how the question is answered). Similar to Rubric 1, for the L2 comprehension question the code L2Q1 was used, and for the L2 knowledge question the code L2Q2 was used. The L3 questions were coded as L3Q1 for comprehension questions and L3Q2 for the knowledge questions. Each question had a processing competency category assigned (on a scale of 1-3). It categorised the processing competency of learner responses to the above-mentioned questions as either inaccurate (1), partially accurate (2), or accurate (3).

Table 11 is the coding grid used to identify and code the learners' processing and response inaccuracies/linguistic breakdowns. These breakdowns were identified from four main linguistic levels (see Table 11).

### c) *Linguistic breakdown coding grid*

**Table 11** ***Coding Grid for Processing and Response Errors***

| **Level of Breakdown** | **Cognitive and Linguistic Breakdown in Response** | | | |
|---|---|---|---|---|
| | Morphological | Syntactical | Semantic | Pragmatic |
| **Category 1** | Morphological | - | - | - |
| **Category 2** | - | Syntactical | - | - |
| **Category 3** | - | - | Semantic | - |
| **Category 4** | - | - | - | Pragmatic |

From the learner responses, each category was analysed; therefore, the morphological, syntactical, semantic and pragmatic nature of learner responses to the questions under inquiry were examined. If responses had breakdowns in more than one category, the bottom-up approach was used to determine the major / dominant level; from the lowest level to the highest levels.

## 3.6. Data Analysis

The data obtained from the rubrics were analysed with the IBM SPSS statistical software version 25. Using non-parametric statistical techniques, it allowed for the description, organisation, interpretation of measurements, the drawing of inferences, and conclusions. Specifically, descriptive and inferential statistics were used to explain (organise, summarise and describe) the quantitative data obtained from the rubrics. The quantitative results were then used to plan the qualitative follow-up. This involved the qualitative analysis of learners' responses using the bottom-up approach to question processing and comprehension to identify the linguistic breakdowns.

## 3.7. Reliability and Validity

Psycholinguistic research conducted in the context of assessing language comprehension often depends on measurements of observed behaviour, where the measured observations are then used to provide evidence that supports a researcher's meaningful claims about the participants' knowledge, skills and abilities (Purpura et al., 2015). To measure such variables or constructs, tests and or coded observations with score values are used to extrapolate the relationship(s) between theoretical constructs (e.g. question comprehension, grammatical knowledge, etc.) and other specific language behaviours associated with these constructs such as accuracy, complexity, etc. as elicited by different relevant tasks. In this study, notions of reliability and validity were considered.

### *3.7.1. Validity*

It is important that the theoretical constructs used in one's research reflects a collective understanding of the phenomena measured (Purpura et al., 2015). That is to say, the theoretical constructs used needs to be justified by validity evidence. 'Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are' (Joppe, 2000:p.1).

Therefore, the construct validity of the research (which could be a research question or hypothesis) will determine which data is gathered and how it is gathered (Golafshani, 2003).In this study, the construct validity of the questions used to measure learners' processing and comprehension was established. Bloom's taxonomy was used to categorise and standardise the questions according to their cognitive levels by the researcher and a group of four language subject teachers. Similarly, to ensure the validity of the newly amended questions, i.e. that they addressed the appropriate cognitive-linguistic level of processing, inter-coder-reliability was employed by having the teachers re-categorise each question. The teachers also independently provided feedback on how and why some of the questions needed to be changed or adapted to meet the required cognitive level in each language subject.

Moreover, the questions were piloted on Grade 5 learners for both languages under investigation and the learners were able to provide answers, which were then marked following the rubrics used to determine learners' response accuracy and processing competency of the questions. This also allowed for the identification of any methodological problems that could have arisen before commencing with the full data collection process.

### *3.7.2. Reliability*

Reliability is defined as '… the extent to which results are consistent over time …' (Joppe, 2000: p1). It is concerned with the degree of replication and consistency of findings in a study (Franklin et al., 2010). To ensure reliability of measurements as a representative measure of the learners' performance on the comprehension tasks in their L2 and L3, the researcher and school teachers analysed the marking schemes for the tasks.

#### *a) The inter-rater reliability*

To obtain inter-reliability, all L2 and L3 learner responses were sent to be marked independently by four markers who were language teachers; two are teachers at the intermediate phase (Grade 4–6) and two at the senior phase (Grade 7–9). After careful explanation of the coding procedure, the markers worked on their own to mark the learner responses individually. Markers had the freedom to incorporate new response criteria into the response accuracy rubric, as necessary. After each marker completed scoring the responses, their scores were compared with those of the researcher. Therefore, for learners' response accuracy the inter-reliability was determined by comparing the scores of the researcher with the scores of each of the independent markers. Where there was divergence in the scoring of the responses, the final score was the researcher's score that was applied. There were very few cases of divergence. The percentage of the inter-rater agreement was calculated. Table 12 presents the percentage of inter-reliability. The percentages indicate the degree of agreement between the scores of the markers and that of the researcher.

**Table 12** ***Inter-Rater Reliability % for Response Accuracy***

| Markers | L2 | L3 | Mean |
|---|---|---|---|
| Marker 1 | 94% | 90% | 92% |
| Marker 2 | 98% | 94% | 96% |
| Marker 3 | 88% | 96% | 92% |
| Marker 4 | 100% | 90% | 95% |

The inter-reliability, that is the degree of agreement between the researcher and Marker 1, was 92 %, between the researcher and Marker 2 was 96%, 92% between the researcher and Marker 3, and 95% between the researcher and Marker 4. This result indicates that the coding of the categories of learners response accuracy was reliable.

For learners' processing competency, different coders were used. Two independent coders; one a psycholinguistics PhD candidate, the other a psycholinguistics specialist (lecturer), both multilingual speakers, annotated the responses based on the processing competency rubric. The percentage of the inter-coder agreement was calculated. Table 13 presents the percentage of inter-coder reliability.

**Table 13** ***Inter-Coder Reliability of Processing Competency***

| Coders | L2 | L3 | Mean |
|---|---|---|---|
| Coder 1 | 96% | 98% | 97% |
| Coder 2 | 96% | 90% | 93% |

Inter-reliability was determined by comparing the scores of the researcher with the scores of each of the independent coders. The degree of agreement between the researcher and Coder 1 was 97 %, and 93% between the researcher and Coder 2. The high reliability percentage also contributes to the validity of the rubrics as marking schemes.

### 3.8. Ethical Considerations

Certain ethical considerations had to be taken into account owing to the participants being of school-going age and under the legal age of eighteen. First, ethical clearance was obtained from the Human Research Ethics Committee (Non-Medical) of the University of the Witwatersrand (protocol number: H18/03/23) (see Appendix L). Thereafter, approval was obtained from the Gauteng Department of Education (GDE) to conduct research in an educational setting (see Appendix M). In addition, approval was also obtained from the principals of the selected schools (Appendix B). Furthermore, before data collection commenced, informed consent was first obtained from the learners' parents/legal guardians (Appendix D).

The participant information sheet (Appendix C) and consent forms, given to learners' parents included details regarding the general purpose of the study and emphasis on the voluntary nature of participation and that they may withdraw from the study at any time. Moreover, confidentiality and the anonymity of participants were assured. Assent was also required and obtained from the learners acknowledging that they were prepared and willing to participate in the study (Appendix N). Once all relevant parties had signed all the consent forms acknowledging their child's participation and granting their consent, data collection began.

The learners were not advantaged or disadvantaged in any way by choosing to complete the language background questionnaires and writing the comprehension test. There were no direct risks or benefits attached to participating in this study.

### 3.9. Summary of Chapter 3

This chapter discussed the research methodology of this study as the mixed methods design, which draws on the strengths of both qualitative and quantitative approaches to examine the processing and comprehension of questions by multilingual learners. The study uses the explanatory sequential mixed methods. Quantitatively, the study used the scores obtained from the rubrics and coding grid to measure the response accuracy, processing competency and response breakdowns in learners' responses. Qualitatively, it examined question processing based on the characterization of bottom-up processing in language which involves using the

learner's responses to identify lower-order components that facilitate their subsequent synthesis into higher-order forms. The chapter further discusses how the Bottom-up analysis was used to examine the morphological, syntactic, semantic, and pragmatic linguistic levels.

The chapter then outlined the sampling criteria and technique used in the selection of participants suitable for this study. The final sample comprised of a total of 42 participants; categorised into two groups of learners (with equal numbers of males and females in each group) in grades 5 (n=24) and 9 (n=18). Data collection took place in different schools around two townships located in Tshwane, Gauteng. The chapter details the development of the comprehension materials for IsiZulu and Sepedi languages from those currently used by the Department of Education for these grades. The questions from L2 and L3 comprehension tasks in the DBE workbooks were adapted to align appropriately with the cognitive levels that the study intended to assess. The amended questions and story excerpts were then piloted, to test the stimuli with 24 learners between the ages of 10-11 (in Grade 5) with comprehension tasks for both L2 and L3. Necessary adjustments were made to the materials following the pilot.

This chapter also discussed the different steps used in the transcription and coding of the collected data, by describing the different marking rubrics and the coding grid that were created for scoring the learners' responses, to tap the requisite information (processing competency and response accuracy) needed to answer the research questions. The coding grid provided a coding scheme (based on the bottom-up framework) of identifying the different errors in learners' responses. The data was then analysed using various statistical measures. Construct validity of the materials and inter-reliability of the scores and the use of standardised theory were also described. Lastly, the ethical measures considered for the study were discussed. The next chapter focuses on the quantitative findings of the study.

# Chapter Four: Quantitative Analysis

## 4. Introduction

The purpose of this study was to investigate how multilingual learners between the ages of 10 and 15 comprehend and process information in L2 and L3 comprehension tasks and subsequent questions. Therefore, in order to investigate the hypotheses and consequently answer the research questions, both descriptive and inferential statistics were run. Non-parametric tests were used because the data was not normally distributed. The hypotheses were tested using the independent samples Kruskal-Wallis test, the related samples Wilcoxon test and the Spearman rho correlation test with the significance level at $p < .05$.

### 4.1. Research Questions

1. What is the effect of the type of language in the learner's ability to process a question?
2. What are the similarities and differences of question processing in L2 versus L3?
3. How does a multilingual learner process and answer a question?

This chapter presents the quantitative findings related to each research question.

The study had 42 multilingual learners who participated. All the learners completed the written comprehension tasks in both their L2 and L3, answering two types of questions: (1) comprehension-focused and (2) knowledge-focused questions. All the learners took more time when answering the L2 questions compared to when they were answering the L3 questions. Moreover, the younger group of learners (10–11-year-olds) took more time answering both the L2 and L3 questions compared to the older group of learners (14–15-year-olds).

## 4.2. Participants

Table 14 shows the total number of participants in the study.

**Table 14** ***Age And Gender of Participants***

| Grade | Age range in years | Mean in months (SD) | Number of participants | Gender (M/F) |
|---|---|---|---|---|
| 5th Grade | 10–11 | 129,86 (4.34) | 24 | 12 Males<br>12 Females |
| 9th Grade | 14–15 | 179.80 (4.10) | 18 | 9 Males<br>9 Females |
| | **Total** | | | **42** |

Learners who participated in this study were either 10–11-years of age and in Grade 5, or were 14–15-years of age and in Grade 9. The terms for age / grade are thus used synonymously for this study within Grades 5 and 9, respectively.

## 4.3. Variables

### *4.3.1. Independent Variables*

The independent variables used for the study were language (Bantu L2 and English L3 participants) and age (10–11-year-olds in Grade 5, and 14–15-year-olds in Grade 9).

### *4.3.2. Dependent Variables*

The dependent variable for the study was the processing capability of learners to process and answer questions. Items analysed for this variable are listed in Table 15.

**Table 15** ***List of Dependent Variables***

| Variable | Item analysed | Language | |
|---|---|---|---|
| | | **L2 (Bantu language)** | **L3 (English)** |
| Processing Capability | Processing competency | Comprehension questions (L2Q1_PCom) | Comprehension questions (L3Q1_PCom) |

| | | | |
|---|---|---|---|
| | (PCom) | Knowledge questions (L2Q2_PCom) | Knowledge questions (L3Q2_PCom) |
| | Response accuracy (RA) | Comprehension questions (L2Q1_RA) | Comprehension questions (L3Q1_RA) |
| | | Knowledge questions (L2Q2_RA) | Knowledge questions (L3Q2_RA) |

**RQ1: What is the effect of type of language in the learner's ability to process a question?**

In order to answer the first research question, the following hypothesis was formulated:

> **$H_0$:** There is no effect of the type of language between a multilingual learner's language and processing skill of a question
>
> **$H_a$:** There is an effect of the type of language between a multilingual learner's language and processing skill of a question

### 4.4. The Effect of the Type of Language on the Processing Capabilities

The 42 learners who participated in this study are Sepitori speakers, who learn IsiZulu or Sepedi and English at school. The descriptive statistics from the language background questionnaires confirmed that the learners spoke more than two indigenous South African languages (see Table 16).

**Table 16** ***Number of Languages Spoken by Participants***

| **Number of languages** | **Number of learners** | **Percentage (%)** |
|---|---|---|
| Three | 19 | 45.2 |
| Four | 14 | 33.3 |
| Five | 7 | 16.7 |
| Six | 2 | 4.8 |
| **Total** | **42** | **100.0** |

The languages spoken by the learners ranged across the Sotho language group (Sepedi, Setswana, and Southern Sotho), the Nguni language group (IsiNdebele, IsiXhosa, and SiSwati)

and Xitsonga, and the English language. The Bantu languages were therefore grouped into three groups, namely Sotho, Nguni, and Xitsonga. Table 17 shows the different language groups of the languages spoken by the learners.

**Table 17** ***Number of Bantu Languages Spoken by Learners & Groups in Which These Languages Fall***

| **# of participants** | **# of languages** | **Language groups** |
|---|---|---|
| 16 | 3 | Nguni, Sotho |
| 3 | 3 | Nguni, Sotho, Xitsonga |
| 14 | 4 | Nguni, Sotho |
| 5 | 5 | Nguni, Sotho |
| 2 | 5 | Nguni, Sotho, Xitsonga |
| 1 | 6 | Nguni, Sotho |
| 1 | 6 | Nguni, Sotho, Xitsonga |
| **Total** **42** | | |

Two Bantu languages, namely IsiZulu and Sepedi, were L2 languages selected for this study. However, considering the number of different languages spoken by the learners, the influence of type of language on their processing of questions between the two L2 languages (IsiZulu and Sepedi) and L3 (English) was first examined.

**Table 18** ***Mean no. of PCom in L2 and L3 Question for Study Participants***

| | Language | L2Q1_PCom | L2Q2_PCom | L3Q1_PCom | L3Q2_PC om |
|---|---|---|---|---|---|
| Mean (SD) | IsiZulu | 2.77 (0.61) | 2.82 (0.59) | 2.73 (0.55) | 2.86 (0.47) |
| | Sepedi | 3.00 (0.00) | 3.00 (0.00) | 2.95 (0.22) | 2.95 (0.22) |

It can be seen from Table 18 above that for all four questions (L2Q1, L2Q2, L3Q1 and L3Q2), the Sepedi and IsiZulu learners had similar averages with little variance between the processing competency of questions in L2 versus L3.

An independent samples test (Kruskal-Wallis) performed revealed that there was no statistically significant difference in the learners' processing of each of the four questions. This means there was no statistical difference in the learners' processing of the L2 comprehension-focused question between learners of IsiZulu and Sepedi (L2Q1 had a *p*-value of.091). There was also no statistical difference in their processing of the L3 comprehension-focused question (L3Q1 had a *p*=.101). This also applied to the processing of knowledge-focused questions for learners of IsiZulu and Sepedi for both the L2 (for L2Q2: *p*=.172), and L3 (for L3Q2: *p*=.592) questions.

Thus, the fact that learners were multilingual and learning different L2 languages at school did not have a significant influence on their performance in the processing of L2 and L3 questions. Based on the fact that there were no significant differences in their processing competency, the response accuracy for the individual L2 languages (IsiZulu and Sepedi) was not analysed further. Therefore the null hypothesis that *there is no effect of the type of language between a multilingual learner's language and processing skill of a question* is accepted.

Irrespective of the number of different languages spoken by a learner, they performed similarly in the two L2 (IsiZulu and Sepedi) and L3 (English) school language subjects. Therefore, for further statistical analysis, the two Bantu languages were grouped as one L2 language subject, while L3 continued to be analysed separately.

**RQ2: What are the similarities and differences of question processing in L2 versus L3?**

To answer the second research question, the following hypothesis was formulated:

> **$H_0$:** There is no similarity between a multilingual learner's language and question processing skill
>
> **$H_a$:** There is a similarity between a multilingual learner's language and question processing skill

## 4.5. The Similarities and Differences in Learners' Question Processing Capabilities in L2 and L3

The similarities and differences in question processing capabilities were tested and observed in learners' (a) processing competency and (b) the response to questions in their L2 (Bantu language), L3 (English) and across age.

### *4.5.1. Processing Competency*

The processing competency of learners in L2 and L3 was compared, first based on comprehension-focused questions, and second, on knowledge-focused questions (see Table 19).

**Table 19** ***Mean no. of PCom for Comprehension & Knowledge Questions in L2 and L3***

| **Competency in processing of questions** | | |
|---|---|---|
| Type of question | **Language** | **Mean (SD)** |
| Comprehension | L2Q1 | 2.88 (0.45) |
| | L3Q1 | 2.83 (0.44) |
| Knowledge | L2Q2 | 2.90 (0.43) |
| | L3Q2 | 2.90 (0.37) |

#### *a) L2 and L3 Processing Competency of Comprehension-focused questions*

The results show that learners' processing of comprehension-focused questions was similar with little variance between the L2 (M = 2.88, SD 0.45) and L3 (M = 2.83, SD 0.44). A related samples Wilcoxon test showed no significant difference between the processing competency of comprehension-focused questions for L2 and L3 ($p$ = 1.000).

#### *b) L2 and L3 Processing Competency of Knowledge-focused questions*

Results show that learners' processing of knowledge-focused questions was identical with little variance between the languages L2 (M = 2.9, SD 0.43) and L3 (M = 2.90, SD 0.37). A related

samples Wilcoxon test showed no significant difference between the processing competency of knowledge-focused questions in both L2 and L3 ($p$ =.480).

Furthermore, the processing competency of learners in both languages across the different age groups was compared, first on comprehension-focused questions and second, on knowledge questions (see Table 20).

**Table 20** ***Mean no. of PCom Per Age Group for Comprehension & Knowledge Questions in L2 & L3***

| **Age Group** | **Mean in comprehension questions (SD)** | | **Mean in knowledge questions (SD)** | |
|---|---|---|---|---|
| | L2 | L3 | L2 | L3 |
| **10–11 years** | 2.79 (0.59) | 2.71 (0.55) | 2.83 (0.57) | 2.83 (0.48) |
| **14–15 years** | 3.00 (0.00) | 3.00 (0.00) | 3.00 (0.00) | 3.00 (0.00) |

### *c) Processing Competency of Comprehension-focused questions across Age groups*

The results show that the 10–11-year-olds and the 14–15-year-old learners had similar processing competency for L2 and L3 comprehension-focused questions. An independent samples Kruskal-Wallis test revealed no statistical difference in the processing competency of comprehension-focused questions between the two age groups for L2 ($p$ =.124). However, there was a significant difference in the processing competency of comprehension-focused questions in their L3 ($p$ =.024). Here the 14–15-year-old learners' processing competency was more accurate than the 10–11-year-olds.

Subsequent to the significant difference between the two age groups in their processing competency of L3 comprehension-focused questions, i.e. the 14–15-year-old learners processing more accurately compared to the 10–11-year-olds, further statistical analysis was conducted to test whether age had an effect in the learners' processing competency. A Spearman's correlation test showed a significant correlation between age and the processing competency of L3 comprehension-focused questions ($p$ =.022). This means age had an effect in learners' processing competency of L3 comprehension-focused questions; the older the learners, the more accurate their processing competency.

### *d) Processing Competency of Knowledge-focused questions across Age groups*

The results showed a similar processing competency across the two age groups (10–11-year-old and 14–15-year-old learners) in their L2 and L3, respectively. An independent samples Kruskal-Wallis test revealed no statistical difference in the processing competency of knowledge-focused questions between the two age groups in their L2 ($p$ =.215) and L3 ($p$ =.124). This means that the two age groups processed the knowledge questions similarly in both languages.

### *e) Trends in the Processing Competency of Comprehension and Knowledge questions in Language (L2 and L3) and across Age groups*

While there was no significant difference found in the processing competency between learners' L2 and L3 for either comprehension- or knowledge-focused questions, there was an observable trend in similarities and differences of their processing competency in both languages. These results are shown in Table 21.

**Table 21** ***Frequencies of PCom for Comprehension & Knowledge Questions in L2 and L3***

| **Processing competency** | **Comprehension** | | | | | **Knowledge** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **L2** | | **L3** | | Total (%) | **L2** | | **L3** | | Total (%) |
| | # | % | # | % | | # | % | # | % | |
| Accurate | 39 | 92.9 | 36 | 85.7 | 89.3 | 40 | 95.2 | 39 | 92.2 | 94.0 |
| Partial | 1 | 2.4 | 5 | 11.9 | 7.1 | 0 | 0.0 | 2 | 4.8 | 2.4 |
| Incorrect | 2 | 4.8 | 1 | 2.4 | 3.6 | 2 | 4.8 | 1 | 2.4 | 3.6 |
| **TOTAL** | **42** | **100.0** | **42** | **100.0** | **100.0** | **42** | **100.0** | **42** | **100.0** | **100.0** |

The highest frequency of processing competency for comprehension-focused questions was *accurate processing* in both language (L2 and L3) subjects, with L2 having an average of 92.9% and L3 with an average of 85.7% (see Table 21). This was followed by low frequency averages of partial and incorrect processing in L2 and L3. Similarly, across age groups, the highest frequency in the processing competency of L2 and L3 comprehension-focused questions was *accurate*

*processing*; the 10–11-year-olds with 87.5% in L2 and 75% in L3, and the 14–15-year -old learners with 100% in both L2 and L3 (see Table 22).

**Table 22** ***Frequencies of PCom Across Age Groups in Comprehension Questions for L2 and L3***

| **Processing competency** | **L2 Comprehension** | | | | | **L3 Comprehension** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **10–11 years** | | **14–15 years** | | **Total %** | **10–11 years** | | **14–15 years** | | **Total %** |
| | **#** | **%** | **#** | **%** | | **#** | **%** | **#** | **%** | |
| Correct | 21 | 87.5 | 18 | 100 | 93.8 | 18 | 75.0 | 18 | 100 | 87.5 |
| Partial | 1 | 4.2 | 0 | 0 | 2.0 | 5 | 20.8 | 0 | 0 | 10.4 |
| Incorrect | 2 | 8.3 | 0 | 0 | 4.2 | 1 | 4.2 | 0 | 0 | 2.1 |
| **TOTAL** | **24** | **100.0** | **18** | **100** | **100** | **24** | **100.0** | **18** | **100** | **100** |

Overall, the 14–15-year-old learners' processing competency of comprehension-focused questions indicated a trend of correct processing competency than the 10–11-year-olds in both their L2 and L3, with no partial and no incorrect processing in either language.

In knowledge-focused questions, the highest frequency of processing competency in learners' L2 was *accurate processing* with an average of 95.2% and 92.2% for L3. *Partial* and *incorrect* processing were the least frequent processing competency capabilities for knowledge-focused questions in learners' L2 and L3 (see Table 21). For knowledge-focused questions across age groups, the highest frequency in the processing competency was also *accurate processing*; the 10–11-year-olds attained 91.7% in L2 and 87.5% in L3 while the 14–15-year-old learners obtained 100% in both L2 and L3 (see Table 23).

**Table 23** ***Frequencies of PCom for Knowledge Questions Across Age Groups in L2 and L3***

| **Processing competency** | **L2 Knowledge** | | | | | **L3 Knowledge** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **10–11 years** | | **14–15 years** | | **Total %** | **10–11 years** | | **14–15 years** | | **Total %** |
| | **#** | **%** | **#** | **%** | | **#** | **%** | **#** | **%** | |
| Correct | 22 | 91.7 | 18 | 100 | 95.8 | 21 | 87.5 | 18 | 100 | 93.8 |
| Partial | 0 | 0.0 | 0 | 0.0 | 0.0 | 2 | 8.3 | 0 | 0.0 | 4.2 |
| Incorrect | 2 | 8.3 | 0 | 0.0 | 4.2 | 1 | 4.2 | 0 | 0.0 | 2.0 |
| **Total** | **24** | **100.0** | **18** | **100.0** | **100.0** | **24** | **100.0** | **18** | **100.0** | **100.0** |

Similar to the trend in processing competency of comprehension-focused questions, the 14–15-year-old learners had a higher processing competency average than the 10–11-year-old learners in both L2 and L3; the former group showed no partial or incorrect processing.

Overall, the learners' processing competency trends shown in this section highlight the extent of the similarities and differences in comprehension- and knowledge-focused questions across language and age.

Furthermore, processing competency also includes response accuracy to questions. The next section looks at the response accuracy to comprehension- and knowledge-focused questions in learners' L2 and L3.

### *4.5.2. Response Accuracy to a Question*

Learners' responses to comprehension- and knowledge-focused questions in their L2 and L3 were compared in Table 24.

**Table 24** ***Mean no. of RA to Comprehension & Knowledge Questions in L2 and L3***

| **Accuracy of response to questions** | | |
|---|---|---|
| Type of question | **Language** | **Mean (SD)** |
| Comprehension | L2Q1 | 2.02 (0.98) |
| | L3Q1 | 2.19 (0.89) |
| Knowledge | L2Q2 | 2.45 (0.98) |
| | L3Q2 | 2.43 (0.70) |

#### a) *L2 and L3 Response Accuracy to Comprehension-focused questions*

As we can see from Table 24, the response means of comprehension-focused questions in learners' L2 (M = 2.02, SD 0.98) and L3 (M = 2.19, SD 0.89) was similar, that is with little variance. A related samples Wilcoxon test revealed that there was no significant difference

*(p =.911)* in the learners' responses to comprehension-focused questions in their L2 and L3, respectively.

### b) *L2 and L3 Response Accuracy to Knowledge-focused questions*

Similar to the results of learners' response accuracy to comprehension-focused questions, learners' mean of ability to respond correctly to knowledge-focused questions in their L2 (M = 2.45, SD 0.98) and L3 (M = 2.43, SD 0.70) was fairly similar (see Table 24). A related samples Wilcoxon test revealed no significant difference *(p =.232)* in the learners' responses to knowledge-focused questions in their L2 and L3.

Furthermore, the response accuracy of learners in both languages across the different age groups was compared, first using comprehension questions and then based on knowledge questions (see Table 25).

**Table 25** ***Mean no. of RA Per Age Group for Comprehension & Knowledge Questions in L2 and L3***

| **Age group** | **Mean result for comprehension questions (SD)** | | **Mean result for knowledge questions (SD)** | |
|---|---|---|---|---|
| | L2 | L3 | L2 | L3 |
| 10–11 years | 1.92 (0.97) | 2.00 (0.93) | 2.46 (0.88) | 2.29 (0.75) |
| 14–15 years | 2.17 (0.99) | 2.44 (0.78) | 2.44 (0.86) | 2.61 (0.61) |

### c) *Response Accuracy to Comprehension-focused questions across Age groups*

As shown in Table 25, the mean L2 response accuracy by the 10–11-year-olds (M = 1.92, SD 0.97) was similar, with little variance from the 14–15year-olds' L2 response accuracy mean (M = 2.17, SD 0.99). This was the same for comprehension-focused questions in L3 in that 10–11-year-olds (M = 2.00, SD 0.93) and 14–15-year-olds (M = 2.44, SD 0.78) had similar means.

An independent samples (Kruskal-Wallis) test revealed no statistical difference in the response accuracy to comprehension-focused questions between the two age groups in either their L2 (*p* =.410) or L3 (*p* =.120). This means that there is no effect of age in the accuracy of response to

comprehension-focused questions in either L2 or L3; hence, response accuracy was the same across age groups.

**d)** ***Response Accuracy to Knowledge-focused questions across Age groups***

The mean response accuracy of the learners' responses across age groups to knowledge-focused questions as shown in Table 25 was similar, with little variance between the 10–11-year-olds (M = 2.46, SD 0.88) and the 14–15-year-olds (M = 2.44, SD 0.86) in their L2. This was the same for response accuracy of the knowledge-focused question in their L3, in that 10–11-year-olds (M = 2.29, SD 0.75) and 14–15-year-olds (M = 2.61, SD 0.61) had similar means with little variance.

An independent samples (Kruskal-Wallis) test revealed no significant difference in the response accuracy of knowledge-focused questions between the two age groups in either their L2 ($p$ =.875) and or their L3 ($p$ =.151). This means that there is no effect of age in L2 or L3 accuracy of response to knowledge-focused questions; thus response accuracy was the same across age groups.

**e)** ***Trends in the Response Accuracy to Comprehension and Knowledge questions in Language (L2 and L3) and across Age***

Although there was no statistical significance in learners' response accuracy to either comprehension- or knowledge-focused questions in learners L2 or L3, performance trends in accuracy of response to questions in both languages is shown in Table 26.

**Table 26** ***Frequencies of Response Accuracy for Comprehension & Knowledge Questions in L2 and L3***

| **Response accuracy** | **Comprehension** | | | | | **Knowledge** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **L2** | | **L3** | | Total (%) | **L2** | | **L3** | | Total (%) |
| | # | % | # | % | | # | % | # | % | |
| Correct | 20 | 47.6 | 21 | 50.0 | 48.8 | 29 | 69.0 | 23 | 54.8 | 61.9 |
| Partially correct | 3 | 7.1 | 8 | 19.0 | 13.1 | 3 | 7.1 | 14 | 33.3 | 20.2 |
| Incorrect | 19 | 45.2 | 13 | 31.0 | 38.1 | 10 | 23.8 | 5 | 11.9 | 17.9 |
| **TOTAL** | **42** | **100.0** | **42** | **100.0** | **100.0** | **42** | **100.0** | **42** | **100.0** | **100.0** |

Table 26 shows the similarity and differences in learners' accuracy of response to comprehension- and knowledge-focused questions in their L2 and L3. The highest frequency of accuracy in learners' L2 responses for the comprehension-focused question was a *correct* response, with an average of 47.6%. Similarly, in L3, the highest frequency average (50%) was for *correct* responses. This indicates that only 1 in 2 learners that participated answered comprehension questions correctly. This was followed by *incorrect* responses in both languages (L2 and L3), while the least frequent result was for *partially correct* responses in both L2 and L3. Although the overall trend was similar for L2 and L3, there were differences in the response accuracy of each response type for the comprehension-focused question of Bantu (L2) versus English (L3) language (see Figure 9).

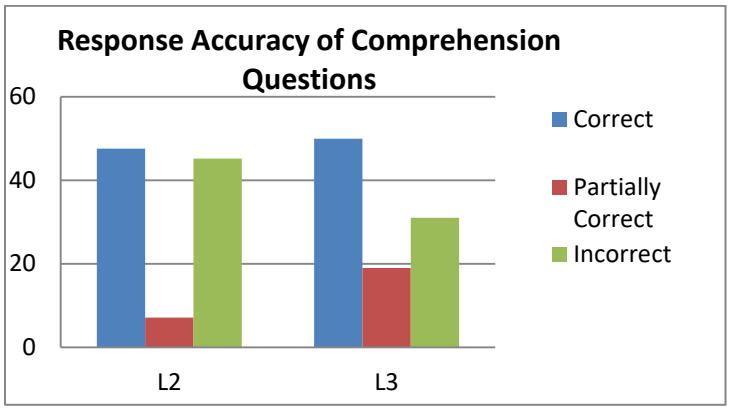



**Figure 9** ***Response Accuracy of Comprehension Questions***

Figure 9 shows the trend in the response accuracy of comprehension-focused questions for each language (L2 and L3). The *correct* and *incorrect* response frequency averages for the comprehension-focused question in L2 are similar, with a low frequency average for *partially correct* responses, whereas, in learners' L3, the frequency average for *correct* responses was higher than that of *incorrect* and *partially correct* responses. Across age groups, the highest frequency of response accuracy varied, with *incorrect* response having the highest frequency for the 10–11-year-olds in L2. In contrast, in 14–15-year-olds, the highest frequency in L2 was *correct* responses (see Table 27).

**Table 27** ***Frequencies of RA in Comprehension Questions Across Age Groups in L2 and L3***

| **Response accuracy** | **L2 Comprehension** | | | | | **L3 Comprehension** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **1011 years** | | **1415 years** | | **Total %** | **1011 years** | | **1415 years** | | **Total %** |
| | **#** | **%** | **#** | **%** | | **#** | **%** | **#** | **%** | |
| Correct | 10 | 41.7 | 10 | 55.5 | 48.6 | 10 | 41.7 | 11 | 61.1 | 51.4 |
| Partially correct | 2 | 8.3 | 1 | 5.5 | 7.0 | 4 | 16.7 | 4 | 22.2 | 19.4 |
| Incorrect | 12 | 50.0 | 7 | 39.0 | 44.4 | 10 | 41.7 | 3 | 16.7 | 29.2 |
| **Total** | **24** | **100.0** | **18** | **100.0** | **100.0** | **24** | **100.0** | **18** | **100.0** | **100.0** |

On the other hand, in their L3 the 10–11-year-olds had an equally high frequency of *correct* and *incorrect* responses, while the most frequent response from the 14–15-year-old learners was the *correct* responses. Overall, the 14–15-year-olds produced more correct responses in both their L2 and L3 compared to the 10–11-year-olds, who had a high frequency of incorrect responses in both languages.

In the knowledge-focused question, the highest frequencies of response accuracy in learners' L2 were *correct* responses (average of 69%). This was followed by *incorrect* responses and a low frequency of *partially correct* responses in L2. The highest frequency of response accuracy in learners' knowledge-focused question in L3 was *correct* response (average of 54.8%), but unlike in L2, this was followed by *partially correct* responses and a low frequency of *incorrect* response accuracy. Therefore, the response accuracy in L2 and L3 showed a different response accuracy trend as depicted in Figure 10.

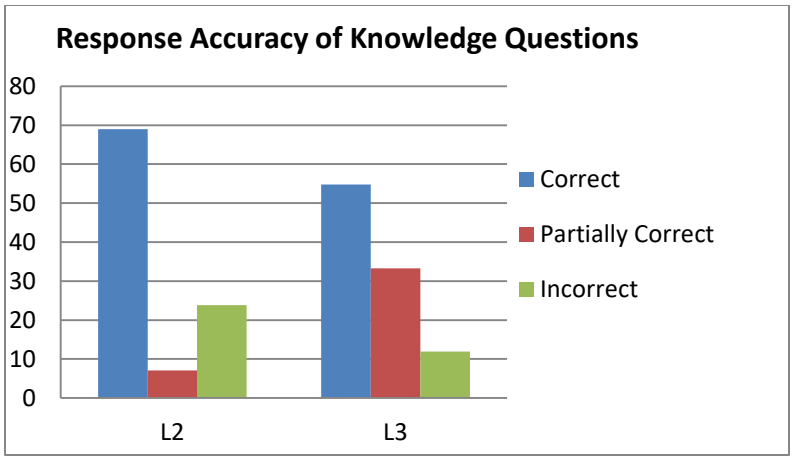



**Figure 10** ***Response Accuracy of Knowledge Questions***

Figure 10 shows the trend in the response accuracy of knowledge-focused questions in each language. Although both languages have the *correct* response as the highest response accuracy, learners had more correct responses in L2 than in L3. Across age, in knowledge-focused questions, the highest frequency in the response accuracy was also *accurate processing*; the 10—11-year-olds with 70.8% in L2 and 45.8% in L3 and the 14–15-year-old learners with 66.7% in both L2 and L3 (see Table 28).

**Table 28** ***Frequencies of RA in Knowledge Questions Across Age Groups in L2 and L3***

| **Response accuracy** | **L2 Knowledge** | | | | | **L3 Knowledge** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **10–11 years** | | **14–15 years** | | | **10–11 years** | | **14–15 years** | | |
| | **#** | **%** | **#** | **%** | **Total %** | **#** | **%** | **#** | **%** | **Total %** |
| Correct | 17 | 70.8 | 12 | 66.7 | 68.8 | 11 | 45.8 | 12 | 66.7 | 56.3 |
| Partially correct | 1 | 4.2 | 2 | 11.1 | 7.6 | 9 | 37.5 | 5 | 27.8 | 32.6 |
| Incorrect | 6 | 25.0 | 4 | 22.2 | 23.6 | 4 | 16.7 | 1 | 5.6 | 11.1 |
| **Total** | **24** | **100.0** | **18** | **100.0** | **100.0** | **24** | **100.0** | **18** | **100.0** | **100.0** |

The 10–11-year-old learners produced more *correct* responses in their L2 but less in their L3 compared to the 14–15-year-old learners, who produced a similar amount of *correct* responses in their L2 and L3.

Overall, the trend shows that learners' response accuracy for comprehension- and knowledge-focused questions was more accurate in L2 than L3, and overall performance was more

accurate for knowledge-focused questions compared to comprehension-focused questions. Moreover, the 14–15-year-old learners had higher response accuracy for comprehension-focused questions in their L2 and L3 compared to the 10–11-year-old learners. However, the 10–11-year-old learners had higher correct response accuracy for the knowledge-focused question in their L2; in contrast the 14–15-year-old learners had higher response accuracy for the knowledge-focused question in their L3.

The figures below show the overall trend of the similarities and differences in the learners' processing competency and response accuracy to comprehension- and knowledge-focused questions in both languages (see Figure 11) and across age groups (see Figures 12 and 13).

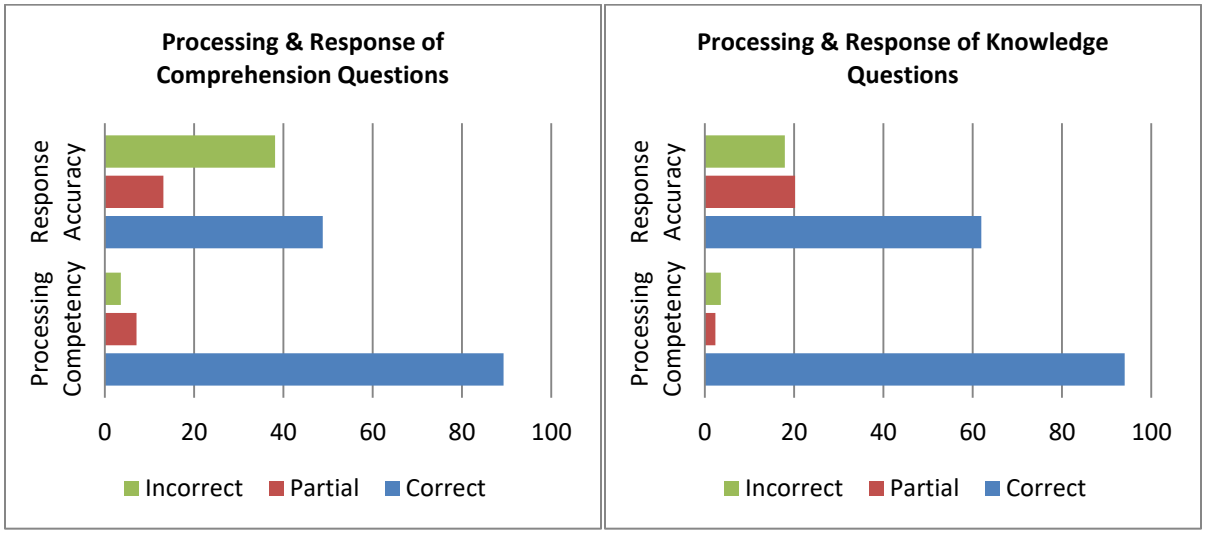



**Figure 11** ***PCom and RA of Comprehension- and Knowledge-Focused Questions***

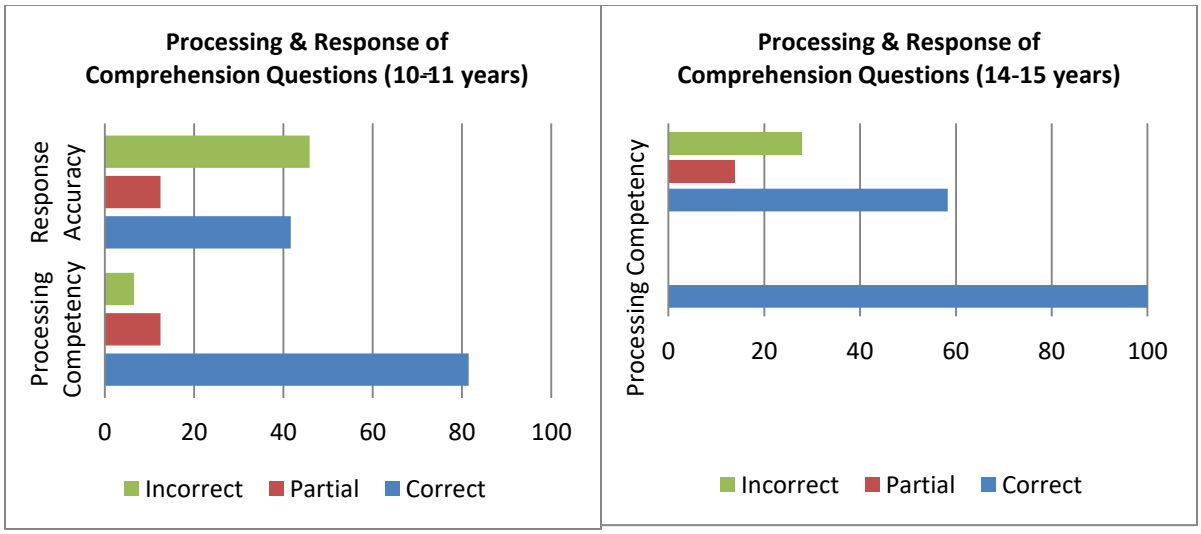



**Figure 12** ***PC and RA of Comprehension-Focused Questions Across Age Groups***

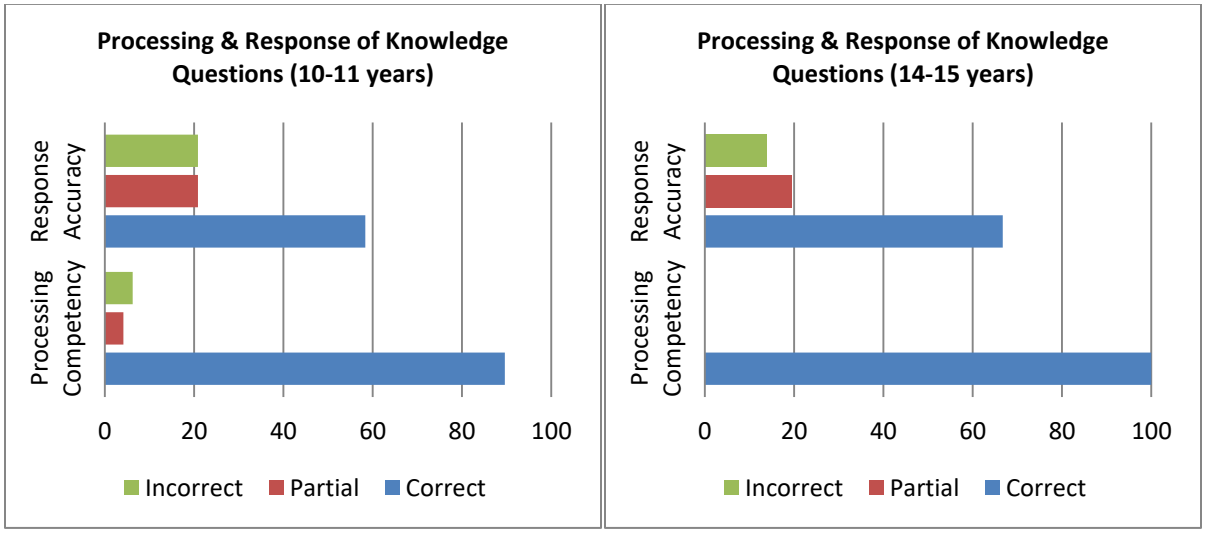



**Figure 13** ***PCom and RA of Knowledge-Focused Questions Across Age Groups***

The next section provides further quantitative analysis on the relationship between processing competency and response accuracy, with focus on the response processing inaccuracies produced by learners.

### *4.5.3. Errors in Processing and Responses to Questions*

A processing and response coding grid (see Table 11 in Chapter 3) was used to identify, categorise and code the processing errors in learners' responses to comprehension- and

knowledge-focused questions. For the purpose of this quantitative analysis, the learners' responses were grouped into two categories: category 1 was *Error Present* (if there was an error), and category 2 was *No Error* (when there was no error).

The processing and response errors of learners in their L2 and L3 were first compared for comprehension-focused questions, followed by knowledge-focused questions (see Table 29)

**Table 29** ***PCom and RA Inaccuracies of Comprehension- and Knowledge-Focused Questions in L2 and L3***

| **Processing and response Inaccuracies** | | |
|---|---|---|
| Type of question | **Language** | **Mean (SD)** |
| Comprehension | L2Q1 | 1.38 (0.49) |
| | L3Q1 | 1.10 (0.30) |
| Knowledge | L2Q2 | 1.40 (0.50) |
| | L3Q2 | 1.07 (0.26) |

### a) *L2 and L3 Processing and Response Errors to Comprehension-focused questions*

Table 29 shows that the means for learners' processing and response inaccuracies to comprehension-focused questions were different in L2 (M = 1.38, SD 0.49) and L3 (M = 1.10, SD 0.30); learners produced a slightly higher average in the processing and response of the L2 comprehension-focused question compared to L3, thus producing fewer inaccuracies in L2.

A related samples Wilcoxon test revealed a statistical significance in the number of inaccuracies between L2 and L3 (*p =.001*). This means that learners produced significantly fewer errors in their L2 with the comprehension-focused question than in their L3; Figure 14 shows that learners had significantly more errors when using their L3 compared to L2.

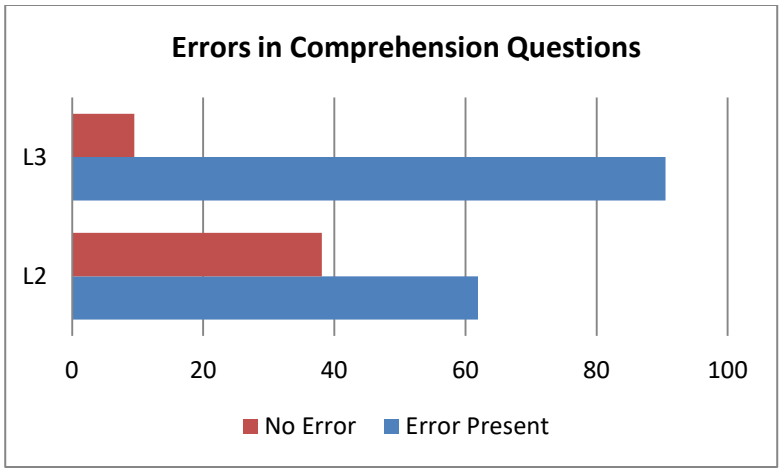



**Figure 14** ***L2 and L3 Errors in the Processing and Response of Comprehension-Focused Questions***

Since there was a statistical difference in the accuracy of the learners' performance between the two languages, i.e. learners producing less errors in their L2 (Bantu language) than in L3 (English), the study further sought to test whether one's level of response processing competency in one language has an influence in their performance of the other language, as these are the same individuals performing in the two languages. A Spearman's correlation test revealed no significant correlation ($p$ =.115) between the response processing errors in learners L2 and L3 for comprehension-focused questions. Therefore, a learner's processing and response competency in the comprehension-focused question in their L2 had no influence on their processing and response competency inthe L3 comprehension-focused question and vice versa.

### b) *L2 and L3 Processing and Response errors to Knowledge-focused questions*

For knowledge-focused questions, results show that learners had a marginally higher average number of response processing inaccuracies in their L2 (M = 1.40, SD 0.50) than in their L3 (M = 1.07, SD 0.26) (see Table 29). Thus learners produced fewer inaccuracies in their L2 compared to their production in L3.

A related samples Wilcoxon test revealed a significant difference ($p$ =.000) in the number of inaccuracies in knowledge-focused questions across L2 and L3. Learners produced significantly fewer errors in their L2 compared to their L3; Figure 15 shows that in L3 learners had significantly more errors compared to L2.

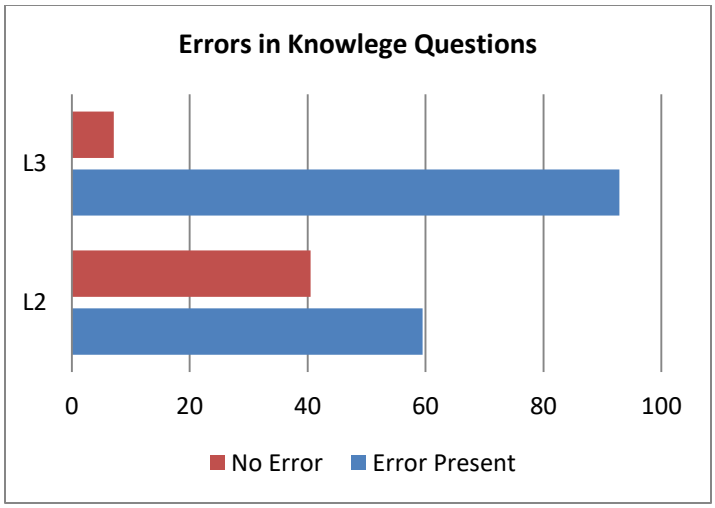



**Figure 15** ***L2 and L3 Errors in the Processing and Response of Knowledge-Focused Questions***

Following the learners' significant difference in the response processing inaccuracies of knowledge-focused questions, i.e. producing less errors in their L2 than their L3, further statistical analysis was undertaken to test whether a learner's response processing competency in one language had an influence on their performance on the other language. A Spearman's correlation test revealed no significant correlation ($p$ =.350) between the response processing errors in learners L2 and in their L3 for knowledge-focused questions. This means that a learner's level of processing and response competency in their L2 has no influence in their processing and response competency of L3 and vice versa.

### c) *Processing and Response Errors to Comprehension-focused questions across Age groups*

Across age groups, the processing and response errors were also compared in comprehension- and knowledge-focused questions (see Table 30).

**Table 30** ***Mean no. of PCom and RA Errors to Comprehension- and Knowledge-Focused Questions Across Age***

| **Age group** | **Mean in comprehension questions (SD)** | | **Mean in knowledge questions (SD)** | |
|---|---|---|---|---|
| | L2 | L3 | L2 | L3 |
| 10–11 years | 1.42 (0.50) | 1.08 (0.28) | 1.33 (0.48) | 1.04 (0.20) |
| 14–15 years | 1.33 (0.49) | 1.11 (0.32) | 1.50 (0.51) | 1.11 (0.32) |

Results in Table 30 show that in the L2 comprehension-focused question, the 10–11-year-old learners (M = 1.42, SD 0.50) had a similar performance to the 14–15-year-old learners (M = 1.33, SD 0.49). Similarly, in L3 the averages of processing and response inaccuracies produced by 10–11-year-old learners (M = 1.08, SD 0.28) and the 14–15-year-old learners (M = 1.11, SD 0.32) for the comprehension-focused question were similar.

An independent samples (Kruskal-Wallis) test revealed no statistical difference in the processing and response inaccuracies of comprehension questions produced between the 10–11-year-old learners and the 14–15-year-old learners in their L2 ($p$ =.587) and L3 ($p$ =.764). This means that in both L2 and L3 the learners' distribution of response processing errors was the same across age groups.

**d)** ***Processing and Response Errors to Knowledge-focused questions across Age groups***

As shown in Table 30, the mean processing and response errors for the L2 knowledge-focused question by the 10–11-year-old learners (M = 1.33, SD 0.48) was similar, with little variance from that of the 14–15-year-old learners in L2 (M = 1.50, SD 0.51). This was the same for the knowledge-focused question in L3; the 10–11-year-olds (M = 1.04, SD 0.20) and the 14–15-year-olds (M = 1.11, SD.32) had similar means. This shows that both age groups had a similar performance in the inaccuracies produced for knowledge-focused questions in both languages.

Statistically, an independent samples (Kruskal-Wallis) test revealed no significant difference in the response processing inaccuracies of knowledge-focused questions between the 10–11-year-old learners and the 14–15-year-old learners in their L2 ($p$ =.282) and in their L3 ($p$ =.393). Thus, the distribution of response processing errors in learners' L2 and L3 is the same across age groups.

### e) *Trends in the Processing and Response Errors to Comprehension and Knowledge questions in language (L2 and L3) and across Age*

Although there was no statistical significance in learners' processing and response inaccuracies to either comprehension- or knowledge-based questions across age groups, trends in their performance are shown in Table 31.

**Table 31** ***Pcom and RA Errors to Comprehension-Focused Questions in L2 and L3 Across Age***

| **Processing and response errors** | **L2 Comprehension** | | | | | **L3 Comprehension** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **10–11 years** | | **14–15 years** | | | **10–11 years** | | **14–15 years** | | |
| | **#** | **%** | **#** | **%** | **Total %** | **#** | **%** | **#** | **%** | **Total %** |
| Error | 14 | 58.0 | 12 | 67.0 | 62.5 | 22 | 92.0 | 16 | 89.0 | 90.0 |
| No error | 10 | 42.0 | 6 | 33.0 | 37.5 | 2 | 8.0 | 2 | 11.0 | 10.0 |
| **Total** | **24** | **100.0** | **18** | **100.0** | **100.0** | **24** | **100.0** | **18** | **100.0** | **100.0** |

Across age in comprehension-focused questions, both age groups had higher frequencies of *errors* compared to *no errors* for both languages. The 10–11-year-old learners had a low frequency (58%) of response processing inaccuracies in L2 compared to the 14–15-year-olds who had the highest frequency of 67%, in contrast to their L3 performance, where the 10–11-year-olds had the highest frequency (92%) of errors compared to the 14–15-year-old learners with 89%. Similarly, in knowledge-focused questions across age, the highest frequencies for both age groups a both languages are for *error* present compared to *no errors* (see Table 32)

**Table 32** ***PCom and RA Errors to Knowledge-Focused Questions in L2 and L3 Across Age***

| **Processing and response errors** | **L2 Knowledge** | | | | | **L3 Knowledge** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **10–11 years** | | **14–15 years** | | | **10–11 years** | | **14–15 years** | | |
| | **#** | **%** | **#** | **%** | **Total %** | **#** | **%** | **#** | **%** | **Total %** |
| Error | 16 | 67.0 | 9 | 50.0 | 58.0 | 23 | 96.0 | 16 | 89.0 | 92.0 |
| No error | 8 | 33.0 | 9 | 50.0 | 42.0 | 1 | 4.0 | 2 | 11.0 | 8.0 |
| **Total** | **24** | **100.0** | **18** | **100.0** | **100.0** | **24** | **100.0** | **18** | **100.0** | **100.0** |

The 10–11-year-old learners had the highest frequency (67%) of response processing inaccuracies in L2 compared to the 14–15-year-olds who had the highest frequency of 50%, similar to their L3 performance, where the 10–11-year-olds had the highest frequency (96%) of errors compared to the 14–15-year-old learners with 89%.

Based on the overall results of processing competency and response accuracy, the null hypothesis, that *there is no similarity between a multilingual learner's language and processing capability* is rejected. The alternative hypothesis that *there is similarity between a multilingual learner's language and processing capability* is accepted. Processing competency of questions was similar for learners in their L2 and L3, the same as with the response accuracy of questions. However, when it came to the processing and response errors, there were differences between the languages for both comprehension- and knowledge-focused questions.

The study then moves on to the analysis of how a learner processes and answers a question. This necessitated a qualitative analysis of the third research question.

### 4.6. Summary of Quantitative Results

The results show that there was no effect of the type of language in the processing competency of multilingual learners. Thus, whether learners spoke three, four, five or six different languages and / or were taught different Bantu languages at school, their performance was similar in both comprehension- and knowledge-focused questions in L2 and L3 language subjects. Also, the learners' processing capabilities, which looked at their processing competency and response accuracy to comprehension- and knowledge-focused questions, were similar in their L2 and L3. However, age had a significant effect (correlational relationship) on the processing competency of comprehension-focused questions in learners' L3. Therefore, age had an effect on the accurateness of the processing competency; the older the learners, the more accurate the processing of the comprehension-focused question in L3. The 14–15-year-old learners processed the L3 comprehension-focused question more accurately. Furthermore, trends between learners' processing competencies and response accuracies in L2 and L3 and across

age led to the analysis of the relationship between the variables. Learners' processing and response inaccuracies were analysed. Results show that learners' processing and response errors to comprehension- and knowledge-focused questions were statistically significant in both languages (L2 and L3); there were fewer errors produced in L2 for both comprehension- and knowledge-focused questions compared to L3.

# Chapter Five: Qualitative Analysis

## 5. Introduction

In order to respond to the third research question, a qualitative method was required, first to understand conceptually the linguistic behaviour from the perspective of the participants. Second, to provide a full analysis of the processing procedures applied by the learners, from a methodological perspective, when responding to the questions. The qualitative analysis provides a description of these underlying procedures of question processing and comprehension. This chapter accordingly presents the qualitative findings on 'how does a multilingual learner process and answer a question?' The findings of this question are given using two approaches: 1) the question comprehension approach (informed by Robertson's 1994 TSUNAMI model, and Pollitt and Ahmed's 1999 question processing model) and 2) the bottom-up framework.

Processing and answering of questions by learners resulted in different outcomes, as illustrated in the quantitative analysis, in Chapter 4. The objective of finding out how learners process and answer questions requires a comprehensive qualitative analysis that examines more than the extraction of the question presupposition and categorisation of the question word. The qualitative analysis includes evaluation of the errors / inaccuracies produced by learners in their response, thereby analysing the accuracy achieved in the answering of questions. Therefore, in this chapter psycholinguistic and linguistic perspectives are used to examine the processing competency and response accuracy of learners' responses, as the ability of a learner to answer questions has a major influence on their language, literacy and academic achievement during the course of their schooling.

Applying a question comprehension approach, these outcomes were coded and categorised. The approach examined processing behaviour as a function of the input, therefore focusing on

the evaluation of how learners (a) extracted the question presupposition, (b) categorised the question word, and (c) consequently, answered the question. In order to achieve this, focus was placed on the learner's response as a whole; thus, even if the response had grammatical errors or omissions but the meaning was intact, the answer was categorised as correct in the marking guideline / rubric.

This qualitative chapter is presented in the following order. First, an overview of the learners' processing and response performance in comprehension and knowledge questions in their L2 and L3 is given. Second, the analysis of the different response outcomes are given, using both a question comprehension approach and a bottom-up framework. The approaches were used to extrapolate from the learners' responses how they processed and answered the comprehension and knowledge questions in their L2 and L3. The correct (CR) response category is the first response examined, and the learners' correct responses are analysed using the question comprehension approach, followed by bottom-up analysis. The category of partially correct (PC) responses is then examined, applying both the question comprehension approach, followed by bottom-up analysis. The last response outcome category examined is the incorrect (INC) response category; the same analyses are carried out for this category.

### 5.1. L2 and L3 Processing and Response Performance

The previous chapter showed that learners' performance in comprehension and knowledge questions was similar for L2 and L3, respectively and with no significant difference between the age groups. Therefore, for the purposes of this qualitative analysis, the two age groups (10–11- and 14–15-year-olds) were combined. Results in that chapter also showed that the majority of the learners provided correct responses to the comprehension and knowledge questions in both their L2 and L3 (Table 33). This means that in their processing, these learners were able successfully to extract an acceptable presupposition from the given question, and then to categorise correctly the question word and consequently, to give a correct response.

**Table 33** ***Frequencies of RA to Comprehension- and Knowledge-Focused Questions in L2 and L3***

| Response accuracy | Comprehension | | | | | Knowledge | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | L2 | | L3 | | Total (%) | L2 | | L3 | | Total (%) |
| | # | % | # | % | | # | % | # | % | |
| Correct | 20 | 47.6 | 21 | 50.0 | 48.8 | 29 | 69.0 | 23 | 54.8 | 61.9 |
| Partially correct | 3 | 7.1 | 8 | 19.0 | 13.1 | 3 | 7.1 | 14 | 33.3 | 20.2 |
| Incorrect | 19 | 45.2 | 13 | 31.0 | 38.1 | 10 | 23.8 | 5 | 11.9 | 17.9 |
| **TOTAL** | **42** | **100.0** | **42** | **100.0** | **100.0** | **42** | **100.0** | **42** | **100.0** | **100.0** |

However, many of these learner responses contained errors (Table 34). The errors in the L2 and L3 learners' responses to both comprehension and knowledge questions were evident for different linguistic levels such as morphology, syntax, semantics and pragmatics. Therefore, a bottom-up framework was used to tease out from the learners' responses the nuances of question processing and comprehension.

**Table 34** ***PCom and RA Errors to Comprehension- and Knowledge-Focused Questions in L2 and L3***

| **Processing and response errors** | **Comprehension** | | | **Knowledge** | | |
|---|---|---|---|---|---|---|
| | **Error** | **No error** | **Total** | **Error** | **No error** | **Total** |
| | **%** | **%** | **%** | **%** | **%** | **%** |
| **L2** | 61.9 | 38.1 | 100.0 | 59.5 | 40.5 | 100.0 |
| **L3** | 90.5 | 9.5 | 100.0 | 92.9 | 7.1 | 100.0 |
| **Total** | **76.2** | **23.8** | **100.0** | **76.2** | **23.8** | **100.0** |

A sample of learner responses from the different response outcomes was analysed using the bottom-up framework. The sample looked at correct, partially correct, and incorrect responses in order to extrapolate and evaluate how learners processed the questions. For each response outcome, the framework provided a comprehensive account of where and how the responses provided by the learners broke down.

However, since the data were in the form of written responses and not oral data, the phonological level was not considered. Therefore, only the morphological, syntactic, semantic and pragmatic levels were considered and are discussed with each response outcome.

## 5.2. Correct Responses

Most learners provided correct responses to the comprehension and knowledge questions in both their L2 and L3 (Table 33). This means that the learners were able to (a) successfully extract an acceptable presupposition from the given question, (b) correctly categorise the question word, and (c) give a correct answer. Examples in this section show how a, b and c were achieved. The bottom-up analysis of learner responses further highlighted the processing competency and response accuracy of the learner responses throughout the different linguistic levels.

### *5.2.1. L2 Correct Responses*

#### *L2 Comprehension Question*

As shown in Table 33, about 20 learners (47.6%) gave a correct response to the L2 comprehension question. Several examples of learners' responses that were categorised as correct (CR) responses are discussed further.

Example A1:

> **P1L2CF14Y:** Wayezizwa sengathi uyaphupha - *he was feeling like he was dreaming*
> **P2L2CM10Y:** uPele wezwa sengathi usephusheni - *Pele felt like he was in a dream*
> **P3L2CM10Y:** weyezizwa ingathi uyaphupha - *he was feeling like he is dreaming*
> **P4L2CF10Y:** O be a ikwa o kare o a lora -*he felt like he was dreaming*
> **P5L2CF10Y:** O be a ikwa o kare o a lora - *he felt like he was dreaming'*
> **P6L2CM14Y:** O ile a ekwa o kare ke toro ge a tlo raloka papadi ya gagwe ya mathomo lefaseng la Sweden. - *He felt like it was a dream when he played his first game in the country of Sweden'*

It can be assumed from the learner responses in example A1 that the learners were able to deduce from question (L2Q1) that *Pele felt a certain way when he played his first match for his country*. This is because the learners' responses contained the description of a feeling experienced by the subject when he played his first match for his country. Therefore, these responses show success in the extraction of an acceptable presupposition to the question asked.

In addition to the successful extraction of the presupposition, the learners' responses also show correct categorisation of the *wh-question* word; the question word 'how' for L2Q1. This means that learners were able to identify the function(s) of the question word 'how' correctly, which asked learners either to describe the manner of doing or the condition / quality of something or someone. This accurate categorisation of the question words subsequently led to the use of a correct reference concept from the passage / story. As a result, the learners answered the question correctly. For example, as per the question (L2Q1), the correct (and acceptable) response was the description of the feelings experienced by Pele when he played soccer for his country, i.e. *Pele felt like he was dreaming/Pele could not believe his eyes, it felt like a dream (unreal)*.

**Bottom-Up Analysis**

The bottom-up analysis of learner responses in Example A1 did not reveal any errors at any of the levels; thus the learners' correct responses were also processed accurately (Tables 35 and 36) with no breakdowns/errors in either the language or comprehension of the question.

**Table 35** ***Bottom-Up Analysis of L2 Response for Learner P1L2CF14Y***

| Level | Response | Status |
|---|---|---|
| Phonological | / Wayezizwa sengathi uyaphupha / | **Not applicable** |
| Morphological | Wa-ye-zi-zw-a se-ngathi u-ya-phuph-a | **No breakdown** |
| Syntactical | Wa-ye -zi -zwa se-ngathi<br>1SC he- PASTCont was-10OC-feel-FV EXCL-adv like<br>u-ya-phuph-a<br>1SC he-PRES is-dream-FV<br><br>*He was feeling like he is dreaming* | **No breakdown**<br>Syntactically accurate processing and extraction of information |
| Semantic | Wayezizwa sengathi uyaphupha,<br>*He was feeling like he was dreaming* | **No breakdown**<br>Acceptable and accurate presupposition and question categorisation |
| Pragmatic | Wayezizwa sengathi uyaphupha<br>*He was feeling like he was dreaming* | **No Breakdown**<br>Accurate interpretation and comprehension of question and correct response |

The morphological and syntactical levels for the learner responses for Table 35 show that the learners used accurate word order, as well as correct subject and object agreement. There were also no grammatical errors that affected the coherency and accuracy of the response. Moreover, the structure of these learner responses matches the syntactic patterns that apply to this specific type of *wh*-question.

**Table 36** ***Bottom-Up Analysis of Response for Learner P4L2CF10Y***

| Level | Response | Status |
|---|---|---|
| Phonological level | / O be a ikwa o kare o a lora / | **Not applicable** |
| Morphological level | O be a ikwa o kare o a lora | **No breakdown** |
| Syntactical level | O- be- a- ikwa okare o a lora<br>1SC he- PAST was- 1SC-feel adv like 1SC he-1SC-dream<br><br>*He was feeling like he is dreaming* | **No breakdown**<br>Syntactically accurate processing and extraction of information |
| Semantic level | O be a ikwa o kare o a lora<br>*He was feeling like he is dreaming* | **No breakdown**<br>Acceptable and accurate presupposition and question categorisation |
| Pragmatic level | O be a ikwa o kare o a lora<br>*He was feeling like he is dreaming* | **No Breakdown**<br>Accurate interpretation and comprehension of question and correct response |

### *L2 Knowledge Questions*

A total of 29 learners (69%) correctly responded to the L2 knowledge question (Table 33). Therefore, several examples of learners' responses that were categorised as *correct responses* to the knowledge question are discussed. These include responses both with and without errors.

The six learners in Example A1 that provided correct responses to the L2 comprehension questions also provided correct responses to L2 knowledge questions; however, unlike in Example A1 where there were no processing breakdowns in their responses, Example A2 below shows that this was not always the case for all learners in their responses to L2 knowledge questions.

Example A2:

**P1L2KF14Y:** ukubhema nokuphuza amanzi amponjwane akamlungele

*To smoke and to drink alcohol he is not good for him*

**P2L2KM10Y:** wamfundisa ukuthi anga bhemi futhi angaphuzi ngoba akulungile

*He taught him that he should not smoke and not drink because it is not good*

**P3L2KM10Y:** ukubhema nokuphuza akumfanela

*To smoke and to drink is not good for him*

**P4L2KF10Y:** o mo rutile gore mokgogo matsoko le go-nwa bjala ga-se gwa mo lokela

*He taught him that the smoking cigarettes and drinking alcohol is not good for him*

**P5L2KF10Y:** go kgoga motsoko le go-nwa bjala di ka se mo lokele mo bophelong

*To smoke cigarettes and to drink alcohol will not be good for him in life*

**P6L2KM14Y:** o mo rutile gore go kgokga motsoko le bjala ga-se tsona. O swanetse gore a phele bophelo bja maleba kago raloka kgwele ya maoto

*He taught him that to smoke cigarettes and alcohol is not okay. He must live a healthy lifestyle by playing football.*

The knowledge question (L2Q2) presupposes that *there is specific information or a lesson relating to living healthy, taught to Pele by his father*. Example A2 above shows learner responses highlighting several lessons learned from the father. Therefore, it can be inferred that learners were able to presuppose relevant information based on the question correctly.

Furthermore, the question word was correctly categorised as 'what' for L2Q2. The 'what' question word asks learners to give information on an action or thing. In this case, the question specifically asked learners for information about the healthy lifestyle lessons taught to Pele by his father. The responses show that learners were able to identify the functions of the question word correctly, and therefore answered with a response that corresponded structurally to the appropriate *wh-question* word form. They then used the correct reference concept from the given text / story. As a result, the learners answered the knowledge questions correctly, by identifying the information the knowledge question requested correctly; the correct and acceptable response was to list or recount the two lessons taught to Pele, i.e. *his father taught him that smoking and drinking is not healthy /he taught him that he must neither smoke nor drink.*

**Bottom-Up Analysis**

The bottom-up analysis of responses from learners *P2L2KM10Y* and *P5L2KF10Y* to the L2 knowledge question revealed that there were no errors for any of the levels. On the other hand, learners *P1L2KF14Y*, *P3L2KM10Y*, *P4L2KF10Y* and *P6L2KM14Y* had errors at various levels (Tables 37–40). This means there was a breakdown in processing and response to the knowledge question.

**Table 37** ***Bottom-Up Analysis of Response for Learner P1L2KF14Y***

| Level | Response | Status |
|---|---|---|
| Phonological | / Ukubhema nokuphuza amanzi amponjwane akamlungele/ | **Not applicable** |
| Morphological level | U-ku-bhem-a- no – ku-phuz-a - amanzi amponjwane<br><br>**a-ka-**m-lung-el-e | **Breakdown Present**<br>Omission of the morpheme[-ku-] |
| Syntactic level | **Uku**bhema- no - **ku**phuza amanzi amponjwane<br>NC15 to smoke –and–NC15 to drink water intoxicating<br>**a-ka**-m-lung-ele<br>NEG is not–1SC he -1OC him-good- APPL for<br><br>*To smoke and to drink alcohol he is not good for him* | **Breakdown Present**<br>Error in sentence agreement |

*P1L2KF14Y's* response started with a breakdown in the morphological level, where the morpheme **-ku-** (a negative subject concord marker) was omitted. As a result, the sentence agreement is affected at the syntactic level, which also causes ambiguity at the semantic level; for example, it is neither clear who the **'he'** is that is not good for him, nor what smoking and drinking alcohol does.

The presence of the morpheme **-ku-** would have resulted in the sentence shown below in Example 1(i), which not only clearly expresses the meaning, but grammatically shows understanding of the language system.

1. (i). Ukubhema nokuphuza amanzi amponjwane a**ku**kamlungeli

*To smoke and to drink alcohol is not good for him*

However, the breakdown at the morphological level had an impact on the accuracy of the response. Thus the response given by *P1L2KF14Y* is, in essence, incorrect.

**Table 38** ***Bottom-Up Analysis of Response for Learner P3L2KM10Y***

| **Level** | **Response** | **Status** |
|---|---|---|
| Phonological | / Ukubhema nokuphuza akumfanela/ | **Not applicable** |
| Morphological level | U-ku-bhem-a no-ku-phuz-a a-ku-m-fan-el-**a** | **Breakdown Present** incorrect final suffix [–a] |
| Syntactical level | Uku-bhema –no-kuphuza<br>NC15 to smoke–and–NC15 to drink<br>a-ku-m-fan-el-**a**<br>NEG is not–15SC it-1OC him – appropriate – APPL for- FV<br><br>*To smoke and to drink it is not appropriate for him* | **Breakdown Present**<br>Error in sentence agreement |

*P3L2KM10Y's* response started with a breakdown at the morphological level, where an incorrect morpheme **[–a]** (final vowel of the verb) was used. This error not only affects the negative actions encoded in the verb, which also determines the tense (see Examples 2 (i), (ii) and (iii)), but also affects the comprehension of the verb as a whole, because at the lexical level, it does not make sense semantically to say ***akumfanela***; therefore the meaning is lost. Moreover, with this breakdown, the response of the learner becomes incorrect.

2. (i) a-ku-m-fan-el-a instead of a-ku-m-fan-el-**e** (negative potential)
   (ii) a-ku-m-fan-el-a instead of a-ku-m-fan-el-**i** (negative present)
   (iii) a-ku-m-fan-el-a instead of a-ku-m-fan-el-**anga** (negative recent past)

**Table 39** ***Bottom-Up Analysis of Response for Learner P4L2KF10Y***

| Level | Response | Status |
|---|---|---|
| Phonological | /o mo rutile gore mokgogo matsoko le go-nwa bjala ga-se gwa mo lokela/ | **Not applicable** |
| Morphological level | o- mo- rut-il-e gore **mo**-kgogo **ma**-tsoko<br>le go-nwa bjala ga-se gwa mo lok-el-a | **Breakdown Present**<br>Incorrect affixes |

| | | |
|---|---|---|
| Syntactical level | o- mo- rut-ile gore **mo**-kgogo **ma**-tsoko<br>1SC he- NC1 him- teach-PAST that mokgogo matsoko<br><br>*He taught him that mokgogo matsoko and drinking alcohol is not good for him* | **Breakdown Present**<br>Error in sentence agreement |
| Sematic level | O mo rutile gore **mokgogo** **matsoko**<br><br>le go-nwa bjala ga-se gwa mo lokela<br><br>*He taught him that mokgogo[1] matsoko[2] and drinking alcohol is not good for him* | **Breakdown Present**<br>Incorrect lexicals and incomprehensible meaning |

*P4L2KF10Y's* response (Table 39) also has a breakdown, first at the morphological level, where the incorrect class 1 noun prefix **[mo-]** and incorrect suffix **[–o]** in the word ***mokgogo*** are used**,** rather than using the correct class 15 noun prefix **[go-]** and final vowel **[-a]** for the infinitive ***go kgoga***. Moreover, there is the use of an incorrect class 6 noun prefix **[ma-]** in the word ***matsoko,*** rather than the correct class 3 noun prefix **[mo-]** for the word ***motsoko*****.** These errors result in the construction of words that do not make sense semantically. Therefore, this response breaks down fundamentally at the semantic level, since the words used do not exist, making the response of the learner both incomplete and incorrect.

**Table 40** ***Bottom-Up Analysis of Response for Learner P6L2KM14Y***

| |
|---|
| Pragmatic Level **Breakdown Present**<br><br>o mo rutile gore go kgoga motsoko le bjala ha se tsona.**O swanetse gore a phele bophelo bja maleba kago raloka kgwele ya maoto**<br><br>*He taught him that smoking cigarettes and alcohol is not okay. He must live a healthy lifestyle by playing football.* |

[1] The word mokgogo does not exist in the L2 language; therefore there is no equivalent translation of the term.
[2] The word matsoko does not exist in the L2 language; therefore there is no equivalent translation of the term.

On the other hand, the response by learner *P6L2KM14Y* (Table 40) had an error at the pragmatic level. The first clause in Example 3(i) answers the question correctly and sufficiently. However, the learner continues to add incorrect information in the second clause (3ii).

3. (i) o mo rutile gore go kgoga motsoko le bjala ha se tsona.
*He taught him that smoking cigarettes and alcohol is not okay.*
(ii) O swanetse gore a phele bophelo bja maleba kago raloka kgwele ya maoto
*He must live a healthy lifestyle by playing football.*

The response given by the learner presents two independent clauses that express different ideas (one correct and the other incorrect) but both respond to the question. Therefore, the learner over-answered the question, which communicates that they felt that the first clause was slightly inadequate as an answer; therefore, the learner referred to information from the text other than that considered as the appropriate answer. This is a breakdown at the pragmatic level, since the learner failed to provide an answer that denotes a single proposition to the question.

### *5.2.2. L3 Correct Responses*

#### *L3 Comprehension Questions*

A total of 21 learners (50%) provided correct responses to the L3 comprehension question. Some of these *correct responses* in L3 are analysed and discussed.

Only three learners from the previous six learner responses used in Examples A1 (L2 Comprehension) and A2 (L2 Knowledge), provided correct responses to the L3 comprehension question. Furthermore, while some learners provided incorrect responses (discussed in Section 5.4), others gave partially correct responses (discussed in Section 5.3). Therefore, new additional examples of correct learner responses were added and are discussed below.

Example A3:

**P1L3CF14Y:** because Peter is the middle child at home

**P4L3CF10Y:** because he is the middle child in the family

**P6L3CM14Y:** the speaker compare himself to a cheese sandwich he is the middle child and he have two sisters whereby her grandmother likes her a lot.

**P7L3CF14Y**: the speaker compare himself to a cheese sandwich because he is a middle child in his family

**P8L3CM14Y**: because he is a middle child in her family. So that's why he feel that way.

**P9L3CM10Y**: because he is the middle child on the family

Similar to previous examples, learners' responses in Example A3 show the learners were able to deduce that the question (L3Q1) presupposing that ***there exists a particular reason that made the speaker compare himself to a cheese sandwich***. This meant that there was some resemblance between the speaker and a cheese sandwich; hence, the comparison. Therefore, the correctly categorised L3 responses contained a reason behind the speaker's comparison to a cheese sandwich, which highlighted the likeness between the speaker and the cheese sandwich.

In addition to the successful extraction of an acceptable presupposition, the learners' responses also show correct categorisation of the *wh*-question word for L3Q1 'why'. The function of the question word 'why', asked learners for a reason or explanation. Thus, the learners' responses corresponded structurally to the relevant *wh*-question word form. The responses also demonstrate the use of a correct and acceptable reference concept from the passage / story, i.e. *because he is the middle child (just like cheese in the middle of a sandwich) / because his grandmother compared him to cheese in a sandwich since he is the middle child of the family*. As a result, the learners' responses were categorised as correct.

**Bottom-Up Analysis**

The bottom-up analysis of responses for learners *P1L3CF14Y* and *P4L3CF10Y* to the L3 comprehension question revealed no errors at any of the levels. In contrast, the responses for learners *P6L3CM14Y*, *P7L3CF14Y*, *P8L3CM14Y* and *P9L3CM10Y* had errors at various levels (Tables 41–43).

**Table 41** ***Bottom-Up Analysis of Response for Learner P6L3CM14Y***

| Syntactical Level | **Breakdown Present** |
|---|---|
| | the speaker **compare** himself to a cheese sandwich he is the middle child and **he have** two sisters **whereby her** grandmother likes **her** a lot. |

The bottom-up analysis for learner *P6L3CM14Y* (Table 41) revealed several errors at the syntactical level. First, the learner used the verb *compare* in the incorrect tense (the first person present tense).There was then an omission of the conjunction *because* or punctuation after the word sandwich. The learner seems to confuse tenses; using *have* instead of *has*. There is also a breakdown in the use of the pronouns (*her* instead of *his*) and the adverb (*whereby*). This response is made up of more than one clause (see Example 4 (i-iv)), and expresses more than one idea. Therefore, the learner over-answered the question, by adding unnecessary and incorrect information after they had already provided the correct response. This also represents a breakdown at the discourse / pragmatic level, since the learner failed to provide an answer that denotes a single proposition to the question.

4. (i) The speaker compare himself to a cheese sandwich
   (ii) he is the middle child
   (iii) and he have two sisters
   (iv) whereby her grandmother likes her a lot

**Table 42** ***Bottom-Up Analysis of Response for Learner P7L3CF14Y***

| Syntactical Level | **Breakdown Present** |
|---|---|
| the speaker **compare** himself to a cheese sandwich because he is **a** middle child in his family. | |

Similar to learner *P6L3CM14Y* (Table 41), learner *P7L3CF14Y* (Table 42) also used the first person present tense verb *compare* incorrectly, instead of the verb in the third person present tense *compares*. The learner also used the indefinite article *a,* instead of the indefinite article*'the*. However, these errors in response from learner *P7L3CF14Y* do not change the semantics or pragmatics of the response.

**Table 43** ***Bottom-Up Analysis of Response for Learner P8L3CM14Y***

| Syntactical Level | **Breakdown Present** |
|---|---|
| because he is **a** middle child in **her** family. So that's why he **feel** that way. | |

In Table 43, the personal pronoun *he* (in the first clause) as the subject of the sentence does not agree with the possessive pronoun *her*. Moreover, in the second clause, there is a problem of tense, in that the verb *feel* does not agree with the pronoun *he;* the learner used the verb *feel* instead of the third person present verb *feels* or alternatively, the learner could have used the past tense of the verb *felt*, but the correct reference concept (that he is the middle child) is maintained; therefore the response is correct.

The response from learner *P9L3CM10Y* also shows a syntactical error (Table 44).

**Table 44** ***Bottom-Up Analysis of Response for Learner P9L3CM10Y***

| Syntactical Level | **Breakdown Present** |
|---|---|
| because he is the middle child **on** family<br>**Incorrect preposition used** | |

The learner used the incorrect preposition *on'*instead of *in*. However, this error did not change the meaning of the sentence; whether the speaker is part of this family or not, he is still a middle child, therefore the response is correct.

### *L3 Knowledge Questions*

A total of 23 learners (55%) answered the L3 knowledge question (L3Q2) correctly.

Example A4:

**P1L3KF14Y:** the cat gets frightened and runs away to hide

**P2L3KM10Y:** the cat runs away to hide when she sing

**P3L3KM10Y:** it runs away and hide

**P4L3KF10Y:** The cat runs and hide

**P5L3KF10y:** they runs and hide

**P6L3K14Y:** the cat run and hides

**P8L3KM14Y:** the cat became scared runs and hide

The learner responses in Example A4 above show that learners were able to presuppose from the question (L3Q2) that *an event occurred that involved the cat while Peter's sister sang in the shower*. Thus, they were able to identify that there was some association between the event(s) that occurred that involved the cat and the sister's actions. As a result, the learners' responses contained several events that involved the cat. Furthermore, the question word 'what' and its functions were correctly categorised and applied (with a response that corresponds structurally to the *wh*-question word form). The responses also contain a correct reference concept from the given text / story, i.e. *the cat runs and hides.*

**Bottom-Up Analysis**

The response from learner *P1L3KF14Y* reveals problematic processing at the syntactical level, (Table 45); similarly, responses for learners *P2L3KM10Y*, *P3L3KM10Y*, *P4L3KF10Y*, *P5L3KF10Y*, *P7L3KF14Y* and *P8L3KM14Y* also had syntactical breakdowns (Tables 46–51).

**Table 45** ***Bottom-Up Analysis of Response for Learner P1L3KF14Y***

| Level | Response | Status |
|---|---|---|
| Syntactical level | The cat gets frightened and **run** away to hide | **Breakdown Present** Incorrect tense |
| Semantic level | The cat gets frightened and run away to hide | **No Breakdown** |
| Pragmatic level | **The cat gets frightened** and run away | **Breakdown Present** Over-answering |

Learner *P1L3KF14Y*'s response (Table 45) has an error at the syntactical level, with the latter indicated by the incorrect use of tense by using the verb *run* instead of the third person present verb *run'.* Moreover, in a pragmatic sense, the learner also over-answered the question. The first clause (Example 5(i)) is an incorrect reference concept but an acceptable pragmatic inference; this is followed by a correct dependent clause (Example 5(ii)), which answers the question adequately.

5. (i) The cat gets frightened
   (ii) and run away to hide

**Table 46** ***Bottom-Up Analysis of Response for Learner P8L3KM14Y***

| Level | Response | Status |
|---|---|---|
| Syntactical level | The cat **became scared**, **runs and hide** | **Breakdown Present** Incorrect tense |
| Semantic level | The cat became scared, runs and hide | **No Breakdown** |
| Pragmatic level | **The cat became scared** | **Breakdown Present** Over-answering |

As with the response from learner *P1L3KF14Y* (Table 45), learner *P8L3KM14Y*'s response (Table 46) had breakdowns at the syntactical level, with over-answering at the pragmatic level. There was incorrect use of tense, with the learner using past and present tense in the same sentence. At the pragmatic level, the learner over-answered by adding a correct and acceptable inference about the cat's actions.

**Table 47** ***Bottom-Up Analysis of Response for Learner P2L3KM10Y***

| | |
|---|---|
| Syntactical Level | **Breakdown Present** |
| the cat runs away to hide when she | **sing** |

Learners *P2L3KM10Y*, *P3L3KM10Y*, *P4L3KF10Y* and *P7L3KF14Y*'s responses also show errors at the syntactical level. Learners used incorrect verb tenses; *sing* instead of *sings* (Table 47), *hide* instead of *hides* (Tables 48 and 49) and *run* instead of *runs* (Table 50). As this breakdown did not change the meaning of the sentence, the responses are still correct.

**Table 48** ***Bottom-Up Analysis of Response for Learner P3L3KM10Y***

| | |
|---|---|
| Syntactical Level | **Breakdown Present** |
| it runs away and | **hide** |

**Table 49** ***Bottom-Up Analysis of Response for Learner P4L3KF10Y***

| Syntactical Level | **Breakdown Present** |
|---|---|
| The cat runs and | **hide** |

**Table 50** ***Bottom-Up Analysis of Response for Learner P7L3KF14Y***

| Syntactical Level | **Breakdown Present** |
|---|---|
| the cat | **run** and hides |

Learner *P5L3KF10Y*'s response also had a breakdown at the syntactical level, which changed the meaning of the response (Table 51).

**Table 51** ***Bottom-Up Analysis of Response for Learner P5L3KF10Y***

| Syntactical Level | **Breakdown Present** |
|---|---|
| **They runs** and hide | |

There is no agreement in this sentence in that thethird person plural pronoun *they* does not agree with the singular third person present tense verb *runs.* Moreover, this error changes the meaning of the sentence and implies that there was more than one cat that ran and hid; this is inaccurate, despite the events being interpreted accurately.

### 5.3. Partially Correct Responses

Few learners provided only partially correct responses to both the comprehension and knowledge questions; these responses were categorised by (a) successful extraction and acceptable presupposition from the given question, (b) correct categorisation of the question

word, and (c) a correct but incomplete answer. Examples in this section show how a, b and c were achieved and further provides a bottom-up analysis of learners' responses to show the processing competency and response accuracy of the learners' responses.

### *5.3.1. L2 Partially Correct Responses*

#### *L2 Comprehension Questions*

As shown in Table 33, only three learners (7.1%) gave a partially correct response to the L2 comprehension question. All three responses are analysed and discussed below.

Example B1:

**P10L2CM14Y:** waphatheka ngathi yiphupho nqamashi wajabula ngakhulu wathi kumele azibonise ukuthi uyini

*He felt like he is a dream exactly he was very happy and said he must prove himself*

**P11L2CM10Y:** wayezizwa njenge phupho *He was feeling like a dream*

**P12L2CM10Y:** wazizwa ungathi bekasemapupeni uma bacula ingoma yebhola

*He felt like he was in a dream when they sang the soccer anthem*

The learner responses all contain information about Pele experiencing a dreamlike state; therefore, it can be deduced that learners correctly presupposed from the question (L2Q1), and correctly categorised the *wh-question* word 'how'. However, as shown in responses from learners *P10L2CM14Y*, *P11L2CM10Y* and *P12L2CM10Y*, the used reference concept only brings us part of the way towards understanding the relevant implication. These partial answers overlap with more than one presupposition.

**Bottom-Up Analysis**

The bottom-up analysis of learner *P10L2CM14Y*'s response shows several errors at the different linguistic levels (Table 52).

**Table 52** ***Bottom-Up Analysis of Response for Learner P10L2CM14Y***

| Level | Response | Status |
|---|---|---|
| Phonological level | /waphatheka ngathi yiphupho nqamashi wajabula ngakhulu wathi kufanele azibonise ukuthi uyini/ | **Not Applicable** |
| Morphological level | Wa –phath-ek-a ngathi yi-phupho nqamashi wa-jabula<br>**nga**-khulu wathi ku-fan-el-e a-zi-bon-ise u-kuthi u-yini | **Breakdown Present**<br>Incorrect morpheme |
| Syntactical level | Wa-phath-ek-a ngathi yi-phupho nqamashi<br>1SC he-carry-NEUT-FV adv like SC-NC5dream adv exactly<br>**wa** –jabul-a **nga-khulu** wa-thi ku-fanele<br>1SC he- happy-FV 1SC I- big 1SC he- say EXPL-must<br>a-zi-bon-is-e ukuthi u-yini<br>1SC-8OC-see-CAUS-PAST that 1SM he –COP what<br><br>*He felt like he is a dream exactly (just like that) he was very happy and he said he must prove himself.* | **Breakdown Present**<br>Concord breakdown |
| Semantic level | **Waphatheka ngathi yiphupho nqamashi wajabula ngakhulu wathi kufanele azibonise ukuthi uyini.**<br><br>*He felt like he is a dream exactly (just like that) he was very happy and he said he must prove himself.* | **Breakdown Present**<br>Ambiguity in meaning |

At the morphological level, an incorrect morpheme **[nga-],** instead of the correct morpheme **[ka-],** is used. Syntactically, this breakdown creates concord issues within the sentence, especially between the verb construction ***wajabula*** and its adverb ***ngakhulu***. Furthermore, an incorrect prefix is employed. It is evident that the learner used the prefix **[nga-]**,which can be used to form adverbs from infinitives, and the adjective or noun stem ***–khulu*** to form the adverb ***ngakhulu***, instead of using the correct adverbial formative **[ka-]** with the noun stem ***–khulu*** to form the correct adverb ***kakhulu***.

The semantic meaning is also problematic; not only does the response indicate only partial understanding of the question, but it is also ambiguous, which leads to a partially accurate

response. The learner's response can be interpreted in the following ways (see Example 6 (i) and (ii) below);

6. ***"Waphatheka ngathi yiphupho…"***

(i) *He felt like he is a dream…*

(ii) *He felt like it is a dream…*

The meanings are different in these cases: Example 6(i) equates Pele to being the dream himself, instead of the correct meaning that Pele felt like he was dreaming / was in a dream; therefore, this interpretation is incorrect, whereas Example 6(ii) equates Pele to feeling like the experience (of playing football for his country for the first time) was a dream. The latter is a correct interpretation, but owing to the use of past tense *felt* and present tense *it is* in the same sentence, a level of semantic ambiguity is created. Consequently, the ambiguity affects the pragmatic validity of the response. Moreover, the rest of the response (iii) not only adds irrelevant information such as Pele being happy and having to prove himself, but this information is also incorrect. Thus, this response fails to interpret the context within the given text correctly.

(iii)**'…nqamashi wejabula ngakhulu wathi kumele azibonise ukuthi uyini'.**

*…exactly/just like that he was very happy and said he must prove himself*

So, this response as a whole not only failed to give a direct answer, but also failed to contextualise and address the question that was asked directly; therefore, this response is incorrect.

The bottom-up analysis of learner *P11L2CM10Y*'s response shows that the response broke down at the semantic level (Table 53).

**Table 53** ***Bottom-Up Analysis of Response for Learner P11L2CM10Y***

| Semantic Level | **Breakdown Present** |
|---|---|
| | **wayezizwa njengephupho** |
| | *He was feeling like a dream* |

Similar to learner *P10L2CM14Y*'s response, the response of learner *P11L2CM10Y* is also incorrect. Although the response recognises the dreamlike state, it incorrectly equated Pele to feeling like he is the dream himself, instead of Pele feeling like he was in a dream (being in / experiencing a dreamlike state); therefore the response is incorrect.

Learner *P12L2CM10Y*'s response had an error at the pragmatic level (Table 54).

**Table 54** ***Bottom-Up Analysis of Response for Learner P12L2CM10Y***

| Pragmatic Level | **Breakdown Present** |
|---|---|
| wazizwa ungathi bekasemaphupheni | **uma bacula ingoma yebhola** |
| *He felt like he was in a dream when they sang the soccer anthem* | |

The first clause of the response shown in Example 7(i) answers the question correctly and sufficiently. However, the learner continues to add more information in the second clause (7ii), which is incorrect.

7. (i) wazizwa ungathi bekasemaphupheni - *He felt like he was in a dream*

(ii) uma bacula ingomo yebhola - *when they sang the soccer anthem*

The clause (7ii) explains that Pele's dreamlike state / feelings only occurred during the time when the soccer anthem was sung. However, this is an incorrect inference from the text and from the question (L2Q1), as the question was specifically about the period linked to Pele's feelings (coinciding with when he played for his country). Therefore, the learner changed the information about the event that was happening when Pele felt the way he did/circumstances surrounding Pele's feelings. This is both a semantic and pragmatic breakdown because the meaning of the question is changed, and the response fails to link the correct information from the text with the question.

### *L2 Knowledge Questions*

Similar to the L2 comprehension results, only three learners (7.1%) gave a partially correct response to the L2 knowledge question (Table 33).Therefore, all three partially correct responses are analysed below. None of the three learners in the L2 comprehension examples (Example B1) gave partially correct responses to the knowledge question. Some of the learner responses for the knowledge questions were correct, while others were incorrect (all incorrect responses are discussed in Section 5.4).

Example B2

**P9L2KM10Y:** wamfundisa ukuthi utshwala nogwayi udlala ibhola likabutshuzwayo akuphilile

*He taught him that alcohol and cigarettes he plays soccer is not healthy*

**P13L2KF14Y:** ukuthi angabhemi izidakamizwa - *that he must not smoke drugs*

**P14L2KF14Y:** ukuthi angabhemi noma angasebenzisi izidakamizwa

*that he must not smoke or that he must not use drugs*

The L2 knowledge question required learners to list or restate the information as presented in the text regarding the lessons about keeping healthy. From the three learner responses, it is deduced that learners correctly presupposed from the question (L2Q2), and categorised the *wh*-question word 'what' correctly. However, the responses for learners *P9L2KM10Y*, *P13L2KF14Y* and *P14L2KF14Y* show the use of the reference concept that only partially brings us towards understanding the relevant implicative. These partial answers are either not fully congruent or incomplete in listing the required events.

**Bottom-Up Analysis**

The bottom-up analysis of learner *P9L2KM10Y*'s response shows an error at the syntactical level (Table 55).

**Table 55** ***Bottom-Up Analysis of Response for Learner P9L2KM10Y***

| Level | Response | Status |
|---|---|---|
| Syntactical level | Wa-m-fund-isa ukuthi utshwala no- gwayi<br>1SC he- 1OC him-teach-CAUS that alcohol and-cigarettes<br>**u**-dlal-a ibhola likabutshuzwayo<br>1SC he- play-FV soccer of the foot<br>a-ku-phil-ile<br>NEG is not-15SC it-healthy-PAST<br><br>*He taught him that alcohol and cigarettes he plays football is not healthy* | **Breakdown Present**<br>Concord breakdown |
| Semantic level | **wamfundisa ukuthi utshwala nogwayi udlala ibhola likabutshuzwayo akuphilile**<br><br>*He taught him that alcohol and cigarettes he plays soccer is not healthy* | **Breakdown Present**<br>Ambiguity in meaning |

Learner *P9L2KM10Y*'s response (Table 55) included a concord error in the sentence, caused by the missing prefix **[na-],** which functions as a conjunction (see Example 8(i)). Moreover, owing to this error, inclusion of the past and present tense in the sentence causes ambiguity; it is unclear whether there are two sentences or one. Moreover, in each case neither sentence is correct.

8. (i) utshwala nogwayi **na** + ukudlala → utshwala nogwayi **no**kudlala

The responses of both learner *P13L2KF14Y* (Table 56) and learner *P14L2KF14Y* (Table 57) are inaccurate from a pragmatic perspective, because the responses only cover one aspect of the correct reference concept.

**Table 56** ***Bottom-Up Analysis of Response for Learner P13L2KF14Y***

| Pragmatic Level **Breakdown Present** |
|---|
| **ukuthi angabhemi izidakamizwa** |
| *that he must not smoke drugs* |

Learner *P13L2KF14Y*'s response (Table 56) only mentions that the father taught him not to smoke drugs, and fails to add the second lesson.

**Table 57** ***Bottom-Up Analysis of Response for Learner P14L2KF14Y***

| Pragmatic Level **Breakdown Present** |
|---|
| ukuthi angabhemi noma angasebenzisi izidakamizwa |
| *that he must not smoke or that he must not use drugs* |

Learner *P14L2KF14Y*'s response (Table 57) also mentions not smoking as one of the lessons taught to Pele, and then provides a similar explanation of the preceding clause as an alternative. Therefore, the learner only addressed one aspect of the correct reference concept and failed to add the second one provided in the text. The responses of both learner *P13L2KF14Y* and learner *P14L2KF14Y* only mentioned some of the lessons and not all. Thus, their responses are still within the bounds of the question under discussion; however, they are only partially accurate.

### *5.3.2. L3 Partially Correct Responses*

#### *L3 Comprehension Questions*

A total of eight learners (19%) of the 42 who participated in the study gave a partially correct response to the L3 comprehension question (Table 33). Some of these partially correct responses are analysed and discussed below.

Example B3:

**P5L3CF10Y:** because he is the middle one in the family

**P15L3CF14Y**: because he is in the middle just like a cheese

**P16L3CF14Y**: because he is in the middle

**P17L3CF10Y**: because she is in the middle

**P18L3CF10Y:** because she is the middle one like a cheese in a sandwich

All of the above L3 learner responses contain information supporting the speaker's comparison to a cheese sandwich; therefore, it is deduced that learners correctly presupposed from the question (L3Q1), and correctly categorised the *wh-question* word 'why'. However, as shown in Example B3 above, the learner responses used a reference concept that only brought us part of the way towards understanding the relevant reasoning. Moreover, these partial answers contained an ambiguous semantic and pragmatic intent.

**Bottom-Up Analysis**

The bottom-up analysis of learner *P5L3CF10Y*'s response (Table 58) shows no breakdown at any of the levels. The semantic and pragmatic aspects of the response are clear and appropriate within the context (the response gives rise to an inference based on the linguistically encoded meaning); e.g. the *one* pronoun refers to the speaker who is the child. Therefore, the response is correct.

**Table 58** ***Bottom-Up Analysis of Response for Learner P5L3CF10Y***

| Level | Response | Status |
|---|---|---|
| Phonological level | / because he is the middle one in the family / | **Not Applicable** |
| Morphological level | because he is the middle one in the family | **No Breakdown** |
| Syntactical level | because he is the middle one in the family | **No Breakdown** |
| Semantic level | because he is the middle one in the family | **No Breakdown** |
| Pragmatic level | because he is the middle one in the family | **No Breakdown** |

In contrast, learner *P16L3CF14Y*'s response was problematic at the pragmatic linguistic level (Table 59).

**Table 59** ***Bottom-Up Analysis of Response for Learner P16L3CF14Y***

| Pragmatic Level | **Breakdown Present** |
|---|---|
| | because he is in the middle |

The response (shown in Table 59) is incomplete, and information appears to be missing. It is not clear 'what he is in the middle of'; this gap opens room for extraction of multiple 'what' interpretations (in an attempt to identify and complete what the speaker is in the middle of). Similarly, learner *P15L3CF14Y*'s response (Table 60) has a pragmatic breakdown. Although the learner's response notes the resemblance between the speaker and a cheese sandwich, this comparison is incomplete and ambiguous. These responses are neither incorrect, nor completely correct since they are partially accurate.

**Table 60** ***Bottom-Up Analysis of Response for Learner P15L3CF14Y***

| Pragmatic Level | **Breakdown Present** |
|---|---|
| | because he is in the middle just like a cheese |

Responses for learner *P17L3CF10Y* (Table 61) and learner *P18L3CF10Y* (Table 62) also both reveal problems at the semantic level.

**Table 61** ***Bottom-Up Analysis for Response of Learner P17L3CF10Y***

| Semantic Level | **Breakdown Present** |
|---|---|
| because **she** is in the middle | |

The question (L3Q1) made clear reference of the speaker as a *he*; however, the responses for learners *P17L3CF10Y* (Table 61) and *P18L3CF10Y* (Table 62) changed the subject pronoun to *she*, thus encoding a different meaning from both the question and reference concept. Such breakdowns also lead to incorrect inferences.

**Table 62** ***Bottom-Up Analysis of Response for Learner P18L3CF10Y***

| Semantic Level | **Breakdown Present** |
|---|---|
| because **she** is the middle one like a cheese in a sandwich | |

### *L3 Knowledge Questions*

Of the 42 learners who participated in the study, only 14 of them (33%) gave a partially correct response to the L3 knowledge question (Table 33). However, none of the learners in the previous partially correct response example for L3 comprehension gave a partially correct response to the knowledge question (L3Q2). Therefore, only learners whose responses were partially correct are analysed here.

Example B4:

> **P6L3KM14Y:** the cat hides when Peter's sister sings in the shower and she is a pop star.
>
> **P11L3KM10Y:** the cat runs
>
> **P12L3KM10Y**: she scared the cat and the cat run away from her

**P19L3KM10Y**: the cat run to *chafe*[3] herself, that the Peters sister sing to much

**P20L3KM10Y**: the cat it is run away

**P21L3KM10Y:** the cat are hiding them self

A knowledge question such as L3Q2, may be answered by recalling facts from the passage and restating them as they are. Therefore, the question word 'what' is more likely to be answered by describing the event(s) surrounding the cat, relative to the sister's singing (e.g. the cat runs and hides when the sister sings in the shower). From the learner responses in Example B4 (above), the learners were able to presuppose from the knowledge question (L3Q2) that *something happens to the cat when Peter's sister sings in the shower*. These responses contain an event that affects the cat, thus demonstrating successful extraction of an acceptable presupposition to the question. These L3 learner responses also show correct categorisation of the *wh*-question word 'what'**.** However, this was followed by the use of a partially correct reference concept from the given text. The given passage lists two events; if the learner's response only identifies one, then the response is not completely accurate, just partially so. As shown in the learner responses in Example B4 above, the reference concept used only describes the cat either as running or hiding (but not both).

### Bottom-Up Analysis

The bottom-up analysis of learner *P6L3KM14Y*'s response shows a breakdown at the pragmatic level (Table 63)

**Table 63** ***Bottom-Up Analysis of Response for Learner P6L3KM14Y***

| Pragmatic Level | **Breakdown Present** |
|---|---|
| | the cat hides when Peter's sister sings in the shower and she is a pop star. |

[3] This is a Sepitori (a non-standard language variety) word.

Pragmatically, the learner's response only mentions part of the context, i.e. that the cat hides; this is an incomplete description of events occurring in this particular context. Moreover, the response also gives additional out of context information not within the bounds of the question under discussion. The additional information reveals a different categorisation of the *wh*-question word.

Similarly, learner *P11L3KM10Y*'s response also has a breakdown at the pragmatic level (Table 64).

**Table 64** ***Bottom-Up Analysis of Response for Learner P11L3KM10Y***

| Pragmatic Level **Breakdown Present** |
| --- |
| the cat runs |

The response for learner *P11L3KM10Y* (Table 64) only covered one aspect of the correct reference concept, which is in an incomplete representation of the given context. Similarly, learner *P12L3KM10Y*'s response is problematic at the pragmatic level (Table 65).

**Table 65** ***Bottom-Up Analysis of Response for Learner P12L3KM10Y***

| Pragmatic Level **Breakdown Present** |
| --- |
| she scared the cat and the cat **run** away from her |

Learner *P12L3KM10Y*'s response (Table 65) denotes more than one proposition to the question. The first clause (9(i)) is inferred from the text, which explains a different question not asked *i.e. what did the sister do to the cat?* The second clause (9(ii)) only describes a partial context of what happened to the cat. Moreover, the second clause also indicates incorrect use of tense; using the verb *run* instead of the third person present verb *runs* or the past tense verb *ran*.

9. (i) she scared the cat

   (ii) and the cat run away from her

Learner *P19L3KM10Y*'s response is problematic in several ways at the syntactic level (Table 66); these errors also affect comprehension of the response on semantic and pragmatic levels.

**Table 66** ***Bottom-Up Analysis of Response for Learner P19L3KM10Y***

| Syntactical Level | **Breakdown Present** |
|---|---|
| | the cat run to *chafe* herself, **that the Peters sister sing to much** |

The syntactic level shows a breakdown in learner's grammar, such as the use of the preposition *to* instead of an adverb *too,* incorrect verb tense; *run* instead of the third person present verb *runs***,** among others. Moreover, the response uses a lexical item that does not exist in the English language; *chafe.* The part of speech for this construction is not clear, which creates a semantic breakdown. Moreover, owing to just one characteristic of the two events being described, the response has failed to contextualise the response fully within the bounds of the text and question under discussion.

On the other hand, considering the multilingualism nature of the learners, the lexical *chafe* is a non-standard term from the non-standard language variety known as Sepitori (the learner's L1). In this language variety, the word means *hide*. Therefore, a possible explanation is a case of language transfer. Considering a variety of possible answers with some of the different breakdowns, the response can be viewed as being completely correct (see Example 10(i)).

10. (i) the cat run to *chafe* [hide] herself, that the Peters sister sing to much

Responses of learner *P20L3KM10Y* (Table 67) and learner *P21L3KM10Y* (Table 68) are also problematic at the syntactic and pragmatic levels.

**Table 67** ***Bottom-Up Analysis of Response for Learner P20L3KM10Y***

| Syntactical Level | **Breakdown Present** |
|---|---|
| **the cat it is run away** | |

Syntactically, the responses for learner *P20L3KM10Y* (Table 67) and learner *P21L3KM10Y* (Table 68) make use of incorrect tense and pronouns.

**Table 68** ***Bottom-Up Analysis of Response for Learner P21L3KM10Y***

| Syntactical Level | **Breakdown Present** |
|---|---|
| **the cat are hiding them self** | |

Pragmatically, the incomplete learner responses (P20L3KM10Y and P21L3KM10Y) specified either the running of the cat without mentioning that it also hid (Table 67) or only mentioned that the cat hid without mentioning that the cat also ran (Table 68). Therefore, since the given passage lists two events as correct reference concepts, an identification of just one is not completely accurate.

### 5.4. Incorrect Responses

In the incorrect learner responses, four question processing trends were identified:

a. Successful and acceptable presupposition, accurate categorisation of the question word and incorrect response
b. Correct but unacceptable presupposition, accurate categorisation of the question word and incorrect response
c. Incorrect and unacceptable presupposition, inaccurate categorisation of the question word and incorrect response

d. Incomprehensible presupposition, incomprehensible categorisation of the question word and incorrect response.

However, regardless of the trend, all learners consequently gave an incorrect response. Therefore, in this section, the extraction of the presupposition and categorisation of the question word for L2 and L3 responses categorised as incorrect in both comprehension- and knowledge questions is analysed and discussed using the bottom-up approach.

### *5.4.1. L2 Incorrect Responses*

#### *L2 Comprehension Questions*

Nineteen learners (45%) provided an incorrect response to the L2 comprehension question (Table 33).

Example C1:

**P7L2CF14Y:** uPele wazizwa ejabulile kakhulu futhi emangele

*Pele felt very happy and surprised*

**P8L2CM14Y:** wazizwa ejabulile ngoba bekuyiphupho lakhe ukudlala ibhola lezinyawo

*He felt happy because it was his dream to play football*

**P13L2CF14Y**: waphatheka kahle futhi bekajabulile

*He felt good and was happy*

**P14L2CF14Y**: wazizwa eziqenya futhi ephatheke kahle futhi ejabulile

*He felt proud and felt good and happy*

**P15L2CF14Y**: wayezizwa ejabulile ngoba wayodlala icembu le Brazil

*He felt happy because he was going to play the Brazil team*

**P19L2CM10Y**: waphatheka kabi ngoba wayezwe ingoma yendawo bayiqula wakhumbula yendawo yakhe

*He felt badly because he heard the song of the place being sang and remembered his place*

The above learner responses in Example C1 show that learners successfully extracted the correct and acceptable presuppositions from the respective questions, for example learners' responses described the feeling experienced by Pele. These examples also show that learners

correctly categorised the question word 'how' and thus provided a response that corresponds structurally with the applicable *wh*-question word form. However, the responses were categorised as incorrect owing to the use of a reference concept that did not satisfy the criteria for a correct response according to the marking guidelines and rubric.

**Bottom-Up Analysis**

The bottom-up analysis of responses from learners *P7L2CF14Y*, *P8L2CM14Y*, *P13L2CF14Y* and *P14L2CF14Y* show no breakdown at any of the levels. These responses go beyond the expected (linguistically encoded) literal answer; the responses provide meaning that use inference pragmatically (Table 69).

**Table 69** ***Bottom-Up Analysis of Response for Learner P7L2CF14Y, P8L2CM14Y, P13L2CF14Y and P14L214Y***

| |
|---|
| Pragmatic Level **No breakdown present** |
| **P7L2CF14Y:** uPele wazizwa ejabulile kakhulu futhi emangele |
| *Pele felt very happy and surprised* |
| **P8L2CM14Y:** wazizwa ejabulile ngoba bekuyiphupho lakhe ukudlala ibhola lezinyawo |
| *He felt happy because it was his dream to play football* |
| **P13L2CF14Y**: waphatheka kahle futhi bekajabulile |
| *He felt good and was happy* |
| **P14L2CF14Y**: wazizwa eziqenya futhi ephatheke kahle futhi ejabulile |
| *He felt proud and felt good and happy* |

The learner responses (Table 69) are a pragmatic interpretation of the expected response. Instead of just describing or restating the response as *he felt like he was in a dream/ he felt like he was dreaming*, the responses provided by the learners were less figurative and constituted an aspect of what could have been meant by *being in a dream*. Consequently, feelings associated with a dreamlike state such as happiness or surreal experiences are inferred as responses. Moreover, considering the context of the question in relation to the text, the responses are relevant to the goals of the question.

Unlike the previous learner responses, the response of learner *P15L2CF14Y* (Table 70) is problematic at the semantic level.

**Table 70** ***Bottom-Up Analysis of Response for Learner P15L2CF14Y***

| Semantic Level | **Breakdown Present** |
|---|---|
| | Wa-ye-zizwa e-jabulile **ngoba wayodlala** icembu le Brazil |
| | *He was feeling happy because he was going to play the Brazil team* |

The semantic level indicates incorrect use of the verb conjugation **'wayodlala'** instead of **'wayodlalela'**, which changes the meaning of the response. Therefore, instead of Pele feeling happy because he was going to play for the Brazil team; the learner states that Pele was happy to be playing against the Brazil team. This is an incorrect interpretation, explanation, and inference from the given text, and as a consequence, a pragmatic error as well.

The response of learner *P19L2CM10Y* (Table 71) had an error at the semantic level. The learner used a reference concept with incorrect semantic content, justified by pragmatically incorrect inferences.

**Table 71** ***Bottom-Up Analysis of Response for Learner P19L2CM10Y***

| Semantic Level | **Breakdown Present** |
|---|---|
| | waphatheka kabi ngoba wayezwe ingoma yendawo bayiqula wakhumbula yendawo yakhe |
| | *He felt bad because he had heard the song of the place being sung and remembered the from his place* |

### *L2 Knowledge Questions*

Only ten learners (24%) provided inaccurate responses to the L2 knowledge question (Table 33).

Example C2:

**P7L2KF14Y:** ubaba kaPele amfundisa ukuthi aqgubeke ngezimfundo zakhe futhi ahole izwe lakhe

*Pele's father taught him to continue with his studies and lead his country*

**P12L2KM10Y:** ubaba kaPele bekafundisa uPele ukubhema kahle nokuphuza kahle nokudlala ibhola lezinyawo

*Pele's father was teaching Pele to smoke properly and drink properly and play football*

**P22L2KM14Y**: Papagwe o mo rutile go raloka ka matla le goba o monyane mo Brazil.

*His father taught him to play with might and be small in Brazil*

**P23L2KM14Y**: ubaba wakhe umfundise ukuthi ahlale aphilile edlala kahle ibhola likanobutshuzwayo

*His father taught him to stay healthy playing football well*

**P24L2KF10Y**: o mo rutile go kgoga motsoko

*He taught him to smoke*

**P25L2KM10Y**: umfundise ibola lezinyawo ngoba ubaba wakhe bekadlala umdlalo wezinyawo

*He taught him football because his father was playing football*

The learner responses in Example C2 show correct extraction of the presupposition, for example learners' responses state certain lessons / skills taught to Pele by the father. Therefore, the extraction of the presupposition is accurate; however, since none of these lessons are related to keeping healthy, the extracted presupposition is unacceptable. Even though the responses correspond structurally to the *wh*-question word form, i.e. the correct *wh*-word 'what' is categorised and answered, the reference concept used is incorrect. Thus the responses were categorised as incorrect.

**Bottom-Up Analysis**

The bottom-up analysis of all the learner responses in Example C2 above shows breakdowns at the semantic level. Each learner response uses a reference concept with incorrect semantic content, justified by pragmatically incorrect inferences. For example, the responses of learner *P7L2KF14Y* (Table 72) and learner *P24L2KF10Y* (Table 73) are inaccurate.

**Table 72** ***Bottom-Up Analysis of Response for Learner P7L2KF14Y***

| Semantic Level | **Breakdown Present** |
|---|---|
| | ubaba kaPele amfundisa ukuthi aqgubeke ngezimfundo zakhe futhi ahole izwe lakhe |
| | *Pele's father taught him to continue with his studies and lead his country* |

The encoded information in the learner responses (Table 72 and Table 73) is not accurately linked to the encoded information in the text. Therefore, the response is semantically faulty, as it offers a different and inaccurate description of the lessons taught to Pele about keeping healthy. Furthermore, none of the lessons mentioned by the learners is either related, or relevant to Pele's keeping healthy in the context of the text.

**Table 73** ***Bottom-Up Analysis of Response for Learner P24L2KF10Y***

| Semantic Level | **Breakdown Present** |
|---|---|
| | o mo rutile go kgoga motsoko |
| | *He taught him to smoke* |

Moreover, these learner responses (Table 74) also show little to no understanding of the text and meaning of the question.

**Table 74** ***Bottom-Up Analysis of Responses for Learners P22L2KM14Y and P25L2KM10Y***

| Semantic Level | **Breakdown Present** |
|---|---|
| **P22L2KM14Y** | Papagwe o mo rutile go raloka ka matla le goba o monyane mo Brazil. |
| *His father taught him to play with might and be small in Brazil* | |
| **P25L2KM10Y**: | umfundise ibola lezinyawo ngoba ubaba wakhe bekadlala umdlalo wezinyawo |
| *He taught him football because his father was playing football* | |

### *5.4.2. L3 Incorrect Responses*

#### *L3 Comprehension Questions*

Thirteen learners (31%) provided incorrect responses to the L3 comprehension question.

Example C3:

**P2L3CM10y:** because Peter's grandmother tell him his a cheese sandwich

**P12L3M10y**: she likes cheese in the sandwich and his sister like to sing she think is a popstar

**P13L3CF14Y**: because of his life, it is so smooth.

**P14L3CF14Y**: because of his life, it is so smooth as cheese

**P19L3CM10Y**: because in her home he is a last born that is why he cold himself a cheese sandwich

**P20L3CM10Y**: her learnt on his grandmother to eat cheese and sandwich

**P23L3CM14Y**: because of the speaker himself he was telling a story that's when he was comparing himself with a cheese sandwich

Example C4:

**P3L3CM10Y:** his grandmother

**P11L3CM10Y**: his grandmother

The learner responses in Example C3 show correct extraction of the presupposition, for example learners' responses provide a reason behind the speaker's comparison to a cheese sandwich. Thus, it can be deduced that learners presupposed that the speaker compared himself to a cheese sandwich for a reason. Therefore, the extraction of the presupposition is accurate. The *wh*-question word is correctly categorised; as such, the response structures correspond to the *wh*-question form. However, the reference concept used is incorrect. Therefore, the responses were categorised as incorrect.

In contrast to Example C3, in the example L12 learner responses, the presupposition is incorrect; as the response does not entail that the speaker compared himself to a cheese sandwich for a reason. Consequently, the structure and meaning of the response does not correspond to the correct *wh*-question form. Therefore, responses for learners *P3L3cM10y* and *P11L3CM10Y* are incorrect.

**Bottom-Up Analysis**

The bottom-up analysis of learner *P2L3CM10Y* (Table 75) shows a breakdown at the syntactical and semantic levels.

**Table 75** ***Bottom-Up Analysis of Response for Learner P2L3CM10Y***

| Level | Response | Status |
|---|---|---|
| Syntactical level | because Peter's grandmother **tell** him **his** a cheese sandwich | **Breakdown Present** Incorrect tense |
| Semantic level | because Peter's grandmother tell him his a cheese sandwich | **Breakdown Present** Incorrect reference concept |

The breakdown is evident in the use of tense; using the verb *tell* instead of the third person present tense verb *tells*. The use of the determiner / pronoun *his* instead of *he is* or he's is also incorrect. At the semantic level, the breakdown is evident in the use of a reference concept

containing incorrect semantic content. The learner's response does not address the reason directly linked to the speaker's comparison, namely the similarity between the speaker's position in the family (as a middle child) and the position of the cheese in a sandwich (middle).

Similar to learner *P2L3CM10Y*, the response for learner *P12L3CM10Y* (Table 76) also had errors at both the syntactical and semantic levels.

**Table 76** ***Bottom-Up Analysis of Response for Learner P12L3CM10Y***

| Level | Response | Status |
|---|---|---|
| Syntactical level | **she** likes cheese in the sandwich and **his** sister **like** to sing **she think is a popstar** | **Breakdown Present** Incorrect tense |
| Semantic level | **she likes cheese in the sandwich and his sister like to sing she think is a popstar** | **Breakdown Present** Incorrect reference concept |

Similarly, learner *P14L3CF14Y*'s response also had syntactic and semantic breakdowns (Table 77).

**Table 77** ***Bottom-Up Analysis of Response for Learner P14L3CF14Y***

| Level | Response | Status |
|---|---|---|
| Syntactical level | because of his life, it is **so** smooth as cheese | **Breakdown Present** Incorrect adverb |
| Semantic level | **because of his life, it is so smooth as cheese** | **Breakdown Present** Incorrect reference concept |

This was also the case for learner *P19L3CM10Y*'s response (Table 78), which also shows semantic ambiguity and errors in inference.

**Table 78** ***Bottom-Up Analysis of Response for Learner P19L3CM10Y***

| Level | Response | Status |
|---|---|---|
| Syntactical level | because in **her** home **he** is a last born that is why he **cold** himself a cheese sandwich | **Breakdown Present** Incorrect pronouns |
| Semantic level | **because in her home he is a last born that is why he cold himself a cheese sandwich** | **Breakdown Present** Incorrect reference concept |

The breakdowns in *P19L3CM10Y*'s response (Table 78), lead to alternative interpretations of the response (see Example 11 (i) below). This is not only incorrect but infers subjects that are not the subject of enquiry for the question.

> 11. (i) that in this previously mentioned female person's home the speaker is a last born child…

Learner *P23L3CM14Y*'s response (Table 79) reveals a breakdown at both semantic and pragmatic levels; the incorrect reference concept demonstrates a breakdown in pragmatic inference.

**Table 79** ***Bottom-Up Analysis of Response for Learner P23L3CM14Y***

| Level | Response | Status |
|---|---|---|
| Semantic level | because of the speaker himself he was telling a story that's when he was comparing himself with a cheese sandwich | **Breakdown Present** Incorrect reference concept |
| Pragmatic level | **because of the speaker himself he was telling a story that's when he was comparing himself with a cheese sandwich** | **Breakdown Present** Out of context |

Learner *P23L3CM14Y* (Table 79) failed to contextualise the response in the context of the question under discussion and the given text

### *L3 Knowledge Questions*

Five learners (12%) provided incorrect responses to the L3 knowledge question

Example C5:

**P9L3KM10Y:** her grandmother thing that his a pop star

**P13L3KF14Y:** the cat becomes frightened in a shower

**P14L3KF14Y**: the cat becomes frightened and shocked

**P26L3KF10Y**: the cat shower and that was not good for the cat make noise

**P27L3KF10Y:** why and *bea*[*] do happens to the cat when peters sister the shower and compare himself to a cheese

The L3 learner responses to the knowledge question in Example C5 show different extracted presuppositions; for example, learner *P9L3KM10Y* extracted an incorrect presupposition (e.g. that the grandmother thinks someone is a popstar). Learners *P13L3KF14Y*, *P14L3KF14Y* and *P26L3KF10Y* extracted a correct presupposition, e.g. that something happens to the cat. However, learner *P27L3KF10Y*'s extracted presupposition and *wh*-question word are incomprehensible. Moreover, the reference concepts used in all learner responses mentioned are incorrect. Therefore, the responses were categorised as incorrect.

### Bottom-Up Analysis

The bottom-up analysis of learner *P9L3KM10Y* shows a breakdown at the syntactic level (Table 80). These syntactic errors affect the semantic and pragmatic levels.

**Table 80** ***Bottom-Up Analysis of Response for Learner P9L3KM10Y***

| Syntactical Level | **Breakdown Present** |
|---|---|
| | **her** grandmother **thing** that **his** a pop star |

[*] The word does not exist in the L3 (English Language).

The learner response (in Table 80) incorrectly refers to the speaker as a *her*, and then uses a different pronoun *his,* which creates agreement problem within the sentence. Additionally, the noun *thing* is incorrectly used instead of the verb *thinks*, and the determiner / pronoun *his* instead of *he is* or *he's***.** These syntactic breakdowns alter the meaning of the sentence. The response is not within the bounds of the question under discussion and the given text.

Similarly, responses for learners *P13L3KF14Y* and *P14L3KF14Y* also show breakdowns in the semantic level (Table 81).

**Table 81** ***Bottom-Up Analysis of Responses for Learners P13L3KF14Y and P14L3KF14Y***

| Semantic Level | **Breakdown Present** |
|---|---|
| | ***P13L3KF14Y*****:** the cat becomes frightened in a shower |
| | ***P14L3KF14Y***: the cat becomes frightened and shocked |

The semantic breakdowns in responses for learners *P13L3KF14Y* and *P14L3KF14Y* are evident through the incorrect reference concept, namely that the cat became frightened and shocked. This is inaccurate association with the events that occurred (e.g the cat running and hiding). Similarly, with the response for learner *P26L3KF10Y*, in addition to the syntactic errors, the encoded information is also incorrect with an inaccurate pragmatic interpretation.

Learner *P27L3KF10Y*'s response has errors on both the syntactic and semantic levels (Table 82). The response is ungrammatical, leading to incomprehensible meaning and interpretation.

**Table 82** ***Bottom-Up Analysis of Response for Learner P27L3KF10Y***

| Level | Response | Status |
|---|---|---|
| Syntactic level | why and ***bea*** do happens to the cat when peters sister the shower and compare himself to a cheese | **Breakdown Present** Ungrammatical |
| Semantic level | **why and *bea* do happens to the cat when peters sister the shower and compare himself to a cheese** | **Breakdown Present** incomprehensible |

### 5.5. Summary of Qualitative Findings

When answering a question, a learner must understand the meaning of the question, extract the presupposition embedded in the question, categorise the different question types, and apply the rules specific to that question type. Finally, they must provide an answer. The application of the bottom-up approach revealed additional information which could not be properly examined through quantitative analysis, and deals with the processing competency and response accuracy of the learner responses when answering a question. Therefore, the learner responses in the three categorised response outcomes (correct, partially correct, and incorrect) were analysed using the bottom-up approach. This allowed interpretation of the way that learners processed and comprehended information given in a question and text to get to their response. The results revealed that learners' processing and comprehension of questions elicited different response outcomes, some of which showed variability in learners' processing competency and response accuracy. This distinguished whether or not learner responses were satisfactory.

Under the category of correct (CR) responses, learner responses demonstrated correct extraction of the presupposition, accurate categorisation and application of the question word, and the use of a correct reference concept in both comprehension- and knowledge-focused questions for L2 and L3 learners. The bottom-up analysis of the learner responses in L2 revealed no errors in the processing and comprehension of the L2 comprehension question (L2Q1). This

means that the processing competency and response accuracy of learners whose responses were coded as correct indicated great accuracy of the response; with no errors in the morphology, syntax, semantics, and pragmatics of the response given. In contrast, the bottom-up analysis of the L3 responses to comprehension questions (L3Q1) revealed learner responses both with and without errors. The L3 responses that contained errors indicated issues of tense, omission of conjunctions, use of incorrect adverbs and incorrect pronouns. Some of these responses also involved over-answering and the addition of unnecessary information after they had already given the correct / required information. However, despite the errors, the analysis also revealed that the use of a correct reference concept retained the linguistically encoded (semantic) and pragmatic meanings of the response in relation to the question under discussion; therefore, the responses remained correct after bottom-up analysis.

The bottom-up analysis of the learner responses in the L2 knowledge question (L2Q2), revealed both correct and incorrect responses within the CR response category. This means that not all correct responses in the CR category were correct, while the correct responses had no errors (indicating good response accuracy). However, the incorrect responses had errors at the morphological level, such as omissions of negation morphemes, use of incorrect morphemes with the conjugated verbs, incorrect noun class prefixes used. These breakdowns affected the tense, agreement, and meanings of the sentences. Thus, responses had semantic ambiguities, non-existent words and out of context interpretations. The bottom-up analysis of the L3 knowledge questions (L3Q2) revealed errors at the syntactic level, namely problems with tense and sentence agreement; however, these responses remained correct.

Under the partially correct (PC) category for comprehension- and knowledge questions, the learners' L2 and L3 responses also indicated the extraction of a correct presupposition and correct categorisation of the question word; however, the response given used a reference concept that only brings us part of the way towards understanding the relevant implicative statement. The bottom-up analysis of the learners' L2 comprehension (L2Q1) responses revealed breakdowns in the processing competency and response accuracy, exposing the impreciseness of the responses in learners' application of the information given by the question

and the information gained from the text. Even though different L2Q1 PC responses had different breakdowns at different levels, all had the semantic level breakdown in common. The breakdown at the semantic level resulted in ambiguities,and multiple interpretations, which either changed the meaning or linked the response to information neither asked in the question nor given in the text (in some responses this also led to a breakdown at the pragmatic level). Similarly, the bottom-up analysis of the L3 comprehension (L3Q1) responses showed breakdowns at the semantic and pragmatic levels; this resulted in partial answers that contained ambiguous semantic and pragmatic meanings. Nonetheless, all the L2 and L3 responses remained partially correct.

Also regarding PC responses, the bottom-up analysis of learner responses to the L2 knowledge-focused question (L2Q2) revealed that some responses were actually incorrect, while others remained partially correct. The incorrect response had syntactic and semantic breakdowns, whereas the partially correct responses had pragmatic breakdowns. All L3 responses to the knowledge question (L3Q2) in this category remained partially correct, with breakdowns at the syntactical level, such as use of incorrect prepositions, incorrect verb tenses and incorrect pronouns. Moreover, all the L3 partially correct responses had breakdowns at the pragmatic level.

The category of incorrect (INC) responses revealed several incorrect outcome combinations from the learners' L2 and L3 responses to comprehension and knowledge questions. However, in each combination, the responses were still incorrect. First, for comprehension-focused questions, all L2 and some L3 responses revealed correct extraction of the presupposition, correct categorisation of the question word and the use of an incorrect reference concept from the passage. Second, the remainder of the L3 responses to the comprehension-focused question revealed the extraction of an incorrect presupposition, incorrect categorisation of the *wh*-question word and the use of an incorrect reference concept.

However, using bottom-up analysis, the results of the L2 responses to the comprehension question showed that some of the responses in the INC category were correct. Therefore, two types of response outcomes were identified in the L2 INC response category: correct responses

and incorrect responses. The correct responses were a result of great response accuracy; these learner responses went beyond the literal meaning of the expected response, using a more pragmatic interpretation that accurately and correctly made inferences from the text. On the other hand, with bottom-up analysis, the incorrect responses to the comprehension question in this category all had semantic breakdowns, which led to an incorrect reference concept being justified by incorrect inferences; thus, a pragmatic breakdown occurred as well. Similarly, all the L3 incorrect responses to the comprehension question remained incorrect and contained several breakdowns that affected tense, or sentence agreement, made used of incorrect adverbs, incorrect pronouns, and the addition of incorrect information not under query, thus affecting the syntax, semantics and, in some cases, the pragmatic interpretation of the information.

The INC category for L2 responses to knowledge-focused questions showed a correct but unacceptable extracted presupposition, with a correct categorisation of the *wh*-question word, and incorrect reference concept. The L3 responses, on the other hand, had a variety of combinations; some responses had incorrect presuppositions with correct categorisation of *wh*-question word, while others had correct presuppositions with correct categorisation of *wh*-question. Yet others had incomprehensible presuppositions and categorisation of the *wh*-question word. However, all L2 and L3 responses to the knowledge questions used incorrect reference concepts. Moreover, all the L2 responses had semantic errors, while L3 responses had syntactic and semantic errors.

This analysis showed that the learner responses with no breakdowns in question processing and response accuracy would result in a correct answer; that is, where question comprehension was successful. However, once the response showed one or more breakdowns at any of the levels, the processing and comprehension of the question could lead to responses that were still correct, partially correct or incorrect. In each case, the study was able to extrapolate from the learner response the competencies and accuracy levels of question answering by the learner and, as a result, identify the problem.

Overall, a comparison of the L2 and L3 performance in question processing and comprehension shows that learners' performance in answering questions was similar in their L2 and L3 for the partially understood comprehension questions. However, it was different for comprehension questions that were correctly answered: the responses were more accurate in L2 (with little to no breakdowns in the correct responses) compared to L3 responses (illustrating a higher frequency of errors). Similarly, for the L2 and L3 partially correct responses to knowledge questions, all the partially correct responses had errors, including instances of code-switching in L3 responses. The learners' performances in answering knowledge questions were also similar in their L2 and L3 for the incorrect responses (all responses had errors and remained incorrect after bottom-up analysis). However, although their performance in the correct responses to the knowledge question varied (e.g. some L2 responses became incorrect after bottom-up analysis), the L2 responses that were correct had no breakdowns while all the L3 correct responses had a higher frequency of errors.

# Chapter Six: Discussion and Conclusion

## 6. Introduction

This study investigated how South African school-going multilingual children process questions. Through the use of a comprehension task, the learners' processing of questions was assessed to understand the quality of their comprehension skills. Learners' processing of questions was examined through their responses to comprehension-and knowledge-focused questions for two language subjects (L2 and L3).

This study had three research questions. First, what is the effect of the type of language on the learner's ability to process a question? Second, what are the similarities and differences in question processing in L2 versus L3? Third, how does a multilingual learner process and answer a question?

To answer these research questions, the study adopted a mixed method design consisting of both a non-experimental quantitative method and a qualitative method. The quantitative analysis focused on answering the first and second research questions. Based on the findings of the quantitative analysis, the qualitative method was applied to answering the third research question. All research questions were linked to the aims of the study.

This chapter synthesises and discusses the quantitative and qualitative data generated in this study. First, a summary is presented of the results that emerged from the analysis of learners' processing of questions. This is focused on the responses that learners provided and is linked to what learners comprehended and how they processed information. Second, the data are discussed within the context of the theoretical underpinnings of this study. Third, a conclusion is given, along with limitations of the study; recommendations for future research are also outlined.

## 6.1. Summary of Findings

Two questions, each involving different levels of cognitive demands, namely knowledge and comprehension respectively, were selected using Bloom's taxonomic categories of cognitive domains. The questions were piloted and subsequently surveyed using a sample population of young multilingual learners aged between 10 and 15 years of age. The comprehension level consisted of *wh*-questions: for L2 (IsiZulu and Sepedi) these were 'why' questions, while for L3 (English) comprehension questions, these were 'how' questions. Regarding knowledge level, the selected *wh*-question was 'what' for both L2 and L3 questions.

All questions were coded based on whether the learners had accurately processed (correctly identifying the information given by the question, such as the presupposition and the question word), partially processed (identifying only part of the information given by the question) or incorrectly processed (identifying incorrect information given by the question) by the learners based on their respective responses.

### *6.1.1. What is the Effect of the Type of Language in the Learner's Ability to Process a Question?*

As the children were multilingual speakers, the first point of analysis was to investigate the effect of the languages spoken at home on the language subjects learned at school, i.e. if a child speaks three or four languages at home, how would this influence their performance in their language subject? The latter languages such as IsiZulu or Sepedi are two Bantu languages and are therefore similar or in some cases the same languages that children speak at home. To test this, the first analysis involved examining how these multilingual speakers performed in all three language subjects at school.

Research Question 1 was to determine the effect of the type of language on learners' processing capability. The null hypothesis ($\mathbf{H_{0)}}$ tested was**:** *There is no effect of the type of language between a multilingual learner's language and processing skill of a question* and the alternative hypothesis ($\mathbf{H_{a)}}$ was**:** *There is an effect of the type of language between a multilingual learner's language and processing skill of a question.* The multilingual learners

were first tested in their L2 (IsiZulu and Sepedi, Bantu languages), then in their L3 (English, a Germanic language) subjects.

The results of learners' performance in the processing of comprehension-focused questions showed that there was no statistical difference in the processing of the L2 comprehension-focused question for learners of the two Bantu languages (L2 learners of IsiZulu and the L2 learners of Sepedi). The results also showed no statistical difference in the two L2 Bantu language (IsiZulu and Sepedi) learners' processing of the L3 (English) comprehension-focused question. The results for learners of the two L2 Bantu language groups (IsiZulu and Sepedi) were similar for the knowledge-focused questions in both their L2 and L3 language subjects.

This means that even if learners were multilingual (spoke more than three languages) and learning different L2 languages (either IsiZulu or Sepedi) at school, the learners' performance in the processing of comprehension and knowledge questions in L2 and L3 was not significantly influenced. Therefore, the $\mathbf{H_0}$ that *there is no effect of the type of language between a multilingual learner's language and processing skill of a question* was accepted. Subsequent analyses grouped IsiZulu and Sepedi (the Bantu languages) as one group, L2 and the English language as L3.

### *6.1.2. What Are the Similarities and Differences in Question Processing in L2 Versus L3?*

The second research question had the following hypotheses: $\mathbf{H_0}$ was that *there is no similarity between a multilingual learner's language and question processing skill* and the $\mathbf{H_1}$ was that *there is a similarity between a multilingual learner's language and question processing skill*. Determining the similarities and differences in question processing capabilities in L2 versus L3 involved the analysis of two categories of question processing, namely a) processing competency, and b) the response accuracy in L2 and L3 and across age.

#### *Processing Competency*

The processing competency of learners was first tested for the independent variable, namely language. Results from the processing competency category indicated that learners' processing skill for comprehension-focused questions revealed similar mean scores for learners in their L2

and L3. This means that there was no significant difference in the processing competency of comprehension-focused questions for L2 and L3, respectively. Observable trends in learners' processing competency of comprehension-focused questions in L2 and L3 showed that a high number of learners *accurately processed* the comprehension-focused questions. This was followed by low frequency averages of *partial* and *incorrect processing* in L2 and L3.

Similarly, results for knowledge-focused questions indicated similar mean scores for L2 and L3, as there was no significant difference in the processing competency of knowledge-focused questions for L2 and L3. Observable trends in learners' processing competency performance on knowledge-focused questions show that *accurate processing* had a high frequency in both L2 and L3, while, *partial* and *incorrect processing* had low frequencies.

Learners' processing competency was then tested for the second independent variable, namely age. The results for processing competency of comprehension-focused questions across age categories indicated similar means scores in learners L2 but different in their L3. There was a significant difference in the processing competency of comprehension-focused questions in the learners' L3, i.e. the 14–15-year-old learners showed superior processing compared to the 10–11-year-olds. Trends in processing competency across age groups showed that *accurate processing* had the highest frequency in L2 and L3 comprehension-focused questions for both ages (the 10–11-year-olds and the 14–15-year-olds). However, overall processing competency of comprehension-focused questions was more accurate in 14–15-year-old learners than in 10–11-year-olds in their L2 and L3.

Further statistical analysis showed a correlation between age and processing of comprehension-focused questions in L3. This means there was an effect of age in learners' processing competency of L3 comprehension-focused questions; the older the learners, the more accurate their processing competency was in English.

In contrast, the averages for processing competency of knowledge-focused questions across both age groups (10–11-year-old- and 14–15-year-old learners) and in both languages (L2 and L3) was the same. This means that the two age groups processed the knowledge-focused questions similarly in both languages. There was no statistical difference in the processing

competency of knowledge-focused questions between the two age groups in their L2 and L3. Knowledge-focused questions require less cognitive processing because they focus on remembering/recall of information, rather than understanding the information. Hence, it is the lowest level of learning outcome in Bloom's taxonomy of cognitive domain. Therefore, by the age of 10, children appear to be competent in processing knowledge questions satisfactorily. Trends in the processing competency of knowledge-focused questions across age groups showed that the highest frequency in learners processing competency corresponded with *accurate processing* for both age groups (the 10–11-year-olds and the 14–15-year-olds) in L2 and L3. However, the 14–15-year-old learners had the most accurate processing in both languages L2 and L3), compared to the 10–11-year-old learners.

***Response Accuracy***

For the language variable, the category of response accuracy was analysed. Results indicated that learners' response accuracy to comprehension-focused questions in their L2 and L3 had similar mean scores. There was no significant difference in the learner responses to comprehension-focused questions in their L2 and L3, respectively. Trends in the response accuracy of comprehension-focused questions show that learners had a high frequency of *correct response* in both L2 and L3; one in two learners responded accurately.

This was followed by *incorrect* and *partially correct* responses for both languages.

Results were the same for the mean scores of knowledge-focused questions; with no significant difference in the learner responses to knowledge-focused questions in their L2 and L3. Trends in learners' response accuracy showed that learners had a high frequency of *correct* responses in L2 and L3. However, in their L2 this was followed by *incorrec*t responses, and *partially correct* responses had the lowest frequency. In contrast, their L3 followed with *partially correct* responses, and finally, *incorrect* responses which were the least frequent.

Overall, the trend shows that learners' response accuracy for comprehension- and knowledge-focused questions was more accurate in L2 than L3, and overall performance trend indicated

more correct response accuracy for knowledge-focused questions than for comprehension-focused questions.

The response accuracy of learners in terms of the variable, age, was also analysed. Results for response accuracy across age groups revealed that the 10**–**11-year-olds and the 14–15-year-old learners had similar mean scores in L2 and L3 comprehension-focused questions. There was no statistical difference in learner response accuracy to comprehension-focused questions between the two age groups in either their L2 or L3. Trends in the response accuracy across age showed that the 10–11-year-olds had a high frequency of *incorrect response* in their L2. This contrasted with 14–15-year-old learners who had a high frequency of *correct responses* in their L2. The 10–11-year-olds had an equal number of *correct* and *incorrect* responses in their L3, while the most frequent response from 14–15-year-old learners was the *correct* responses. Overall, the 14–15-year-olds produced more correct responses in comprehension-focused questions for both their L2 and L3 compared to the 10–11-year-olds, who had a high frequency of incorrect responses in both languages.

Results for knowledge-focused questions showed that response accuracy across age had similar mean scores between the 10–11-year-olds and the 14–15-year-olds in both their L2 and L3. There was no statistical difference in the response accuracy of knowledge-focused questions between the two age groups in either their L2 and or their L3. Trends in the response accuracy across age show that both age groups had high frequencies of *correct* responses in both their L2 and L3. However, the 10–11-year-old learners produced more *correct* responses in their L2 than the 14–15-year-old learners. However, in their L3, the 10–11-year-old learners produced fewer *correct* responses compared to the 14–15-year-old learners.

The results did not show statistical significance, however. The trends for learners' processing competencies and response accuracies in their L2 and L3 and across age groups nevertheless, led to the analysis of the relationship between the two variables. Based on the fact that not all accurately processed questions resulted in the correct responses, the focus for analysis shifted to what failed with the relevant learners' processing competency and response accuracy. Therefore, learners' processing and responses inaccuracies were analysed.

### *Processing and Response Inaccuracies*

Although responses were mostly accurate, a granular linguistic analysis showed that the quality of responses varied in terms of relevancy and conciseness, correctness, completeness, coherence and justification.

In terms of the language variable, the results for processing and response inaccuracies of comprehension-focused questions in learners' L2 and L3 revealed different mean scores. Learners produced fewer inaccuracies in their L2 (Bantu language subject) compared to their production in L3 (English language subject). There was a statistical significance in the inaccuracies produced between the two languages (L2 and L3). Learners produced significantly more errors when processing and responding to the comprehension-focused question in their L3 compared to their L2.

The processing and response inaccuracy of knowledge-focused questions in learners L2 and L3 mean scores also differed; learners produced fewer inaccuracies in their L2 (Bantu language subject) compared to their production in L3 (English language subject). The processing and response inaccuracies produced between the two languages (L2 and L3) were statistically significant, with learners producing significantly more errors in their L3 compared to their L2.

For the age variable, the results of the processing and response inaccuracies of comprehension-focused questions across age categories showed that both groups (the 10–11-year-olds versus the 14–15-year-old learners) had similar mean scores in their L2 and L3. There was no statistical difference in the inaccuracies produced for the two age groups in their L2 versus their L3.

Results for processing and response inaccuracy of knowledge-focused questions across age categories showed that both groups (the 10–11-year-olds and the 14–15-year-old learners) had similar mean scores in both languages (L2 and L3). There was no statistical difference between the inaccuracies produced in the two age groups in their L2 and L3.

The exact differences in the processing and response inaccuracies for comprehension- and knowledge-focused questions in learners' L2 and L3 necessitated a qualitative analysis to determine how and where the inaccuracies occurred linguistically. This qualitative analysis

answered the third research question which was 'how does a multilingual learner process a question?'

### *6.1.3. How Does a Multilingual Learner Process a Question?*

The qualitative analysis described the underlying procedures of question processing, thus revealing the processing and response inaccuracies which have been termed 'linguistic breakdowns' in this study.

The qualitative analysis applied two methods to obtaining the study results a) extraction of presupposition, categorisation of question words and answer to the question, and b) use of a bottom-up framework. The method for (a) is most used for applying the curriculum and pedagogy, which means that educators are likely to question whether responses that meet the criteria are correct or not. However, a bottom-up linguistic analysis which applies a question comprehension approach reveals that there can be linguistic breakdowns that would create a discrepancy between language practitioners and linguistic theorists**.** This is because superficially, the learner responses may look correct, but a granular analysis reveals errors. This could imply that some elements would be detected too late and the learner will continue to create these errors which will negatively impact on their literacy as they develop.

The findings showed three types of responses; the first type was *correct responses*, the second was *partially correct responses* and the third was *incorrect responses*.

**Correct responses**: A question comprehension analysis of learners' *correct responses* to comprehension-and knowledge-focused questions in L2 and L3 indicated their ability to extract a correct presupposition from the question, accurately categorise the question word, and use a correct reference concept.

Using the bottom-up framework, the results showed that in the selected L2 *correct responses* to comprehension-focused questions, learners did not produce any processing and response inaccuracies for any of the linguistic levels. In contrast, the bottom-up analysis of the L3 *correct responses* to comprehension-focused questions showed that some of the learners had processing and response inaccuracies at various levels. These errors were mostly at the

syntactic level. However, despite the syntactic inaccuracies in the L3 *correct responses*, the analysis also revealed that the use of a correct reference concept retained the linguistically encoded (semantic) and pragmatic meanings of the response to the question under discussion; therefore the responses remained correct.

The bottom-up analysis showed that in the L2 *correct responses* to knowledge-focused questions, some learners did not produce any processing and response errors for any of the linguistic levels; therefore, their responses remained correct. In contrast, other learners produced processing and response errors that affected the accuracy of their responses, making the responses incorrect. These linguistic breakdowns were mostly at the morphological level. In contrast, the bottom-up analysis of L3 *correct responses* to knowledge-focused questions showed that learners produced processing and response inaccuracies at various linguistic levels, but predominantly at syntactical levels. However, the overall response accuracy was not affected; therefore, the responses remained correct.

**Partially correct**: Learners' *partially correct responses* to comprehension- and knowledge-focused questions in L2 and L3 indicated their ability to extract a correct presupposition from the question, accurately categorise the question word and the use of a reference concept that only covered partial understanding of the relevant reference concept.

In the bottom-up analysis, results showed that learners' L2 *partially correct responses* to comprehension-focused questions had processing and response inaccuracies at several different linguistic levels, namely morphological, semantic and pragmatic levels. This resulted in ambiguities that either affected the meaning or linked the response to irrelevant information. This was similar for L3 *partially correct responses* to comprehension-focused questions. Bottom-up analysis revealed linguistic breakdowns mostly at semantic and pragmatic levels that resulted in partial answers that contained ambiguity.

The bottom-up analysis also showed that in all the L2 *partially correct responses* to knowledge-focused questions, learners produced processing and response inaccuracies. As with comprehension-focused questions, these linguistic breakdowns were mostly at the semantic and pragmatic levels, which affected the accuracy of some of the *partially correct responses*

and made them *incorrect,* while other responses remained *partially correct*. Similarly, in all the L3 *partially correct responses* to knowledge-focused questions, the learners produced processing and response inaccuracies. These linguistic breakdowns were mostly at the syntactical and pragmatic levels, resulting in the *partially correct responses.*

**Incorrect responses**: A question comprehension analysis of learners' *incorrect responses* to comprehension-and knowledge-focused questions in L2 and L3 was based on several question processing combinations.

In all L2 comprehension-focused questions, learners were able to extract a correct presupposition from the question, correctly categorise the question word and use an incorrect reference concept. The bottom-up analysis further showed that in the selected L2 *incorrect responses* to comprehension-focused questions, some of the processing and response errors produced made the responses accurate at the pragmatic level; this changed the accuracy of the responses and made them correct, even though on a question comprehension analysis they were incorrect. In contrast, the other L2 responses with inaccuracies at the semantic and pragmatic levels remained incorrect.

While some learners extracted a correct presupposition in the L3 *incorrect responses* to the comprehension-focused question, correctly categorised the question word and used an incorrect reference concept. Others extracted an incorrect presupposition, incorrectly categorised the question word and then used an incorrect reference concept. Using the Bottom-up framework for analysis, results show that learners' L3 *incorrect responses* to comprehension-focused questions had linguistics breakdowns, mostly at the syntactic and semantic levels. All the L3 *incorrect responses* remained incorrect even after the bottom-up analysis.

In the L2 knowledge-focused question, the question comprehension analysis to learners L2 *incorrect responses* showed that learners extracted an unacceptable presupposition, correctly categorised the question word and gave an incorrect reference concept. However, the bottom-up analysis revealed linguistic breakdowns at the semantic levels; therefore, the responses remained incorrect.

In L3 knowledge-focused questions, there were various combinations; some learners extracted incorrect presuppositions but correctly categorised the question word, while others extracted a correct presupposition and correctly categorised the question. Other learners had incomprehensible presuppositions and categorisation of the question word. The bottom-up analysis revealed linguistic breakdowns at the syntactic and semantic levels; all L3 *incorrect responses* to the knowledge-focused question used incorrect reference concepts. This made all these responses incorrect.

### 6.2. Discussion and Conclusion

This study sought to investigate how multilingual learners process questions during written school evaluations. The learners were sampled from Mamelodi and Nellmapius townships, East of Pretoria. This research aimed at seeing how comprehension skills develop and if being a multilingual speaker has an effect on these skills.

The results of this study have shown that using comprehension tasks to investigate how learners process questions is an efficient method to solicit their answering and comprehension skills. This is in line with previous studies that have used similar (comprehension task) tools to examine and evaluate learners' thinking abilities and comprehension capabilities. These other studies have used their results as evidence of question processing, answering and comprehension skills (Jooste, 2003; Robertson, 1994; Sebate, 2017).

Moreover, the results obtained are in line with what Hirschman and Gaizauskas (2001) highlighted about using comprehension tasks to assess learners, in that comprehension tasks allow for a different approach to evaluating learners' question answering and comprehension skills based on their ability to answer questions about the given text. This is especially important because as literature has shown, a learner's ability to answer questions is a significant part of their learning and cognitive processing of information (Ahmed & Pollitt, 2001; Bay & Hartman, 2015; Bloom et al., 1956; Chin & Osborne, 2008; Ewing & Whittington, 2007; Hirschman & Gaizauskas, 2001; Igbaria, 2013; Rowe et al., 2017). Therefore, their ability to comprehend those questions is an integral part of meaningful learning and development of cognitive skills.

Using two different Bantu languages (IsiZulu and Sepedi) brought a nuanced understanding of similarities in the Bantu languages. Results of the study showed that the performance of processing questions by multilingual learners learning either in IsiZulu or Sepedi at school did not differ significantly. This means that whether a learner processed the question in IsiZulu or Sepedi, their ability to extract the question presupposition, categorise the question word and apply the appropriate rules in answering the *wh*-questions (whether accurately, inaccurately or partially accurate) was the same. This is interesting because, from a sociolinguistic and cultural perspective, the languages are different; however, from a formal linguistic and psycholinguistic perspective they belong to the same bigger linguistic family of Niger-Congo languages, subgroup Bantu languages (Mheta & Bock, 2014; Van der Merwe & Roux, 2014)**.** For that reason, this finding could be linked to the similarities in the linguistic structure of these languages since they both belong to the Southern Bantu language group (Zone S in Guthrie's (1967) classification). Therefore, IsiZulu or Sepedi learners chunk and processed information in a similar way.

The results of this study can be understood against the backdrop of what other linguistic research (Demuth, 2003; Nurse & Philippson, 2003; Zeller, 2004) has argued, namely that Bantu languages have a common linguistic typology. Therefore, not only are the linguistic structures of the languages similar but so is the mental representation of the languages in learners' processing of questions. One can further extrapolate that whatever Bantu language is used, the results will be similar. This could, in turn, inform how learners are taught to process comprehension texts and how to extract relevant information using pedagogical strategy. This means that curriculum designers could place less emphasis on having nine Bantu languages taught nationally at the foundation phase; there should rather be an underlying understanding that whatever Bantu language that is selected should be treated equally as speakers apply similar linguistic principles. This means that there should be less focus on cultural biases that claim the languages should be treated differently. Furthermore, pedagogical strategies that focus on these languages separately should be revised. Therefore, the inclusion of linguistic and psycholinguistic science in curriculum development is vital, especially for learning the linguistic aspects implicit in language subjects. This bridge could be the link that helps learners to

navigate between their home language and their language of learning when they find it difficult to answer a question in school assessments.

This study's results show that all of the 42 learners who participated in this study were able to answer the questions in both their second (L2) and third (L3) languages; they provided answers to both the comprehension-and knowledge-focused questions. However, not all of the learners provided correct answers to these questions. Taking into account that several scholars have argued that if learners can answer questions correctly, then it means that they have understood the text (Hirschman & Gaizauskas, 2001) and the question (Sebate, 2017; Tshule, 2014), but if they do not answer correctly, then they have not understood both the question and the text (Morgan et al., 2009). Based on this study's results, one in two learners successfully demonstrated understanding of the comprehension-focused questions. This means that there is a 50% chance that a learner would successfully be able to comprehend what they are asked. This finding is in line with existing literature arguing that South African school going children struggle with comprehension (Modzuka et al., 2019; Pretorius & Klapwijk, 2016; Sibanda & Graven, 2018), and that by the time they start grade 5 they still show poor comprehension skills in both English (their language of learning) and their home language (Howie et al., 2008; Pretorius & Klapwijk, 2016). Moreover, this finding can also be used as evidence that multilingual learners whose L1 is a non standard language, then having to learn new languages (L2 and L3) while also learning in the new medium of instruction (L3) can gravely impact their ability to accurately respond to comprehension questions.

On the other hand, learners who provided incorrect answers can lead us to assume that learners did not understand the text concerning the question posed. This indicates a breakdown in the learners' processing and response to questions. However, saying that a learner did not understand a question just because they gave an incorrect answer is simply not enough. It is known from the literature that comprehension is multidimensional, complex, and involves numerous and different cognitive skills and processes (Oakhill & Cain, 2007; Rupp et al., 2006), with interactive and dynamic comprehension outcomes (Lipson & Cooper, 2002). Therefore, from a psycholinguistic perspective, the study must provide information on the

'what' (what was understood and what was not); 'where' (at which linguistic level was it understood or not); and 'how' (how was it understood or not understood). This is also because a learner can understand some parts of a question but not the other parts, or understand the question and yet still give an incorrect response. Thus, educators should also pay attention to other linguistic items such as vocabulary (semantics), grammar (syntax) and devious pragmatics (contextual use of language) to ensure that a learner has fully comprehended a text before being asked a question about it.

Furthermore, the results revealed the learner performance on the type of questions (comprehension or knowledge) answered, how they were answered (correct, incorrect or partially correct), and whether the answers contained any processing and response inaccuracies in learners L2 and L3 and by age group (10–11- versus 14–15-year-olds). Our findings revealed several question answering and question comprehension skills were inadequate in learners who gave incorrect answers, regardless of whether they processed the question accurately or not. This means that accurate processing (such as extracting a correct presupposition, applying the appropriate *wh*-rules) on its own in question answering is insufficient for question comprehension. This is an important finding, based on the two significant goals of question comprehension. First, at the question processing phase, this involves extracting several pieces of information from the question, as identified by Jurafsky and Martin (2014). Second, at the final stage of question processing and answering, this involves the extraction of a specific answer. Therefore, at the final stage of question processing and answering, other significant parts of question answering are required, such as the relevance, conciseness and completeness of the reference concept (Groenendijk & Stokhof, 1985; Hirschman & Gaizauskas, 2001; Moyer & Syrett, 2019; Robinson & Rackstraw, 1975).

However, it cannot be said that a question is comprehended if an incorrect presupposition is extracted or an incorrect question word is answered. This is in line with what Morgan et al. (2009) refers to when they highlight the difficulties that a learner faces in answering a question when parts of the questions are not understood. This is also in line with Robertson's (1994) view of question processes as functioning interactively to provide the most accurate answer;

such as parsing the questions, categorising them accordingly, and initiating the correct answer-retrieval searches to answer correctly. Similar to other scholarly views, Hirschman and Gaizauskas (2001) posit that question answering is a process where the understanding and answering of a question relies on the context of the story and the pragmatic notions of the appropriateness of the answer.

Additionally, learners' L2 and L3 correct and partially correct answers demonstrated similar outcomes for the learners' challenges in using information given in the text and in the question, evident in the learners' failure to contextualise the information in terms of what was given or not given by the questions. This resulted in processing and response inaccuracies in learners' L2 and L3, seen in the learner responses that lacked the 'necessary' elements, either of grammatical structure or expounded semantic and pragmatic information required for a correct response. This means that the processing competency and response accuracy of learners whose responses were coded as correct indicated great accuracy of the response; with no errors in the morphology, syntax, semantics, and pragmatics of the response given. It highlights that, as maintained by researchers in the area of NLP, the analysis and interpretation of questions during question answering is important in achieving accuracy (Judge et al., 2005).

This further emphasises that question processing requires interaction with knowledge structures (namely, the context of the story and pragmatic notions of the appropriateness of the answer) that are relevant to the question (Hirschman & Gaizauskas, 2001; Jurasky & Martin, 2014; Pollitt & Ahmed, 1999; Robertson, 1994). The results of the study also show that learners who answered the questions correctly, had processing and response inaccuracies at different various levels, although these did not affect the semantic and pragmatic appropriateness of the answer. This is because learners' correct responses indicated both accurate processing of the question and success in question answering, regardless of morphological, syntactic or pragmatic inaccuracies. However of particular interest in this finding are learner's correct responses to the L2 comprehension question which revealed no errors at any of the linguistic levels while the L3 correct responses to the comprehension question revealed errors at various levels. This outcome can be used to support the South African language concerns introduced at

the beginning of the study about problems of learning a new home language and the language of learning and teaching (Jordaan, 2011; Pretorius, 2002; Pretorius & Klapwijk, 2016). The finding would suggest that of the two languages that were learned at school (L2 and L3) it is in the L3 (which is also the LoLT) that most of the learners who made errors were least proficient in. This poses even more challenges for multilingual learners since this language (L3) is to continue as the LoLT for the rest of their academic lives.

The study showed that learners process and answer comprehension- and knowledge questions similarly, despite these being at different cognitive levels. This means that the cognitive level at which the question was presented did not affect the processing and answering result. Based on Bloom's (1956) taxonomy of cognitive domain, the cognitive levels for comprehension and knowledge are lower-order questions. Findings in the present study add to the body of work pointing to the similarities and differences of thinking influenced by different cognitive levels in answering questions. The findings on comprehension and knowledge are also consistent with those of Jensen et al. (2014), in whose view these two levels of the taxonomy require no more than memorisation of the material and minimal levels of understanding to perform well on those questions.

Moreover, these two questions at different cognitive levels also encompassed various question words: 'why' in the L2 comprehension-focused question; 'how' in the L3 comprehension-focused question; and 'what' in L2 and L3 knowledge questions. This means that, in addition to the levels of understanding that are required to answer lower-order questions, learners are also required to understand the syntactic, semantic and pragmatic functions of these question words. Our results revealed a high frequency of accurate processing competency and response accuracy to both comprehension- and knowledge-focused questions in learners' L2 and L3. This means that many learners successfully processed the *wh*-questions and accurately answered them in all the language subjects.

Further analysis of the learner responses showed that in the correct, partially correct, and even some incorrect answers, the *wh*-question word was accurately categorised. This means that learners were able to provide a response that was syntactically within the accepted rules of the

specific *wh*-word forms. For example, when asked 'why' (the reason for things happening) learners did not answer a 'how' (ways that things happen). This would indicate that learners had an understanding of the functions of different *wh*-word forms/question words.

However, the fact that there were learners who provided incorrect responses even after correctly categorising the function of the *wh*-word forms, is attributed to the claim that learners did not fully grasp the semantic and pragmatic functions of *wh*-questions within the context under inquiry. The study showed that comprehending a question requires not only the syntactic rules that govern the retrieval process of answering such questions. It also requires the learner to know and understand the semantics and pragmatics of the specific question words, e.g. understanding the relationship of the *wh*-question word to its subject, object or verbs. Suggesting that just knowing what the *wh*-question stands for is not sufficient for comprehension of the question.

This is an important finding in itself because previous research suggested that to comprehend a *wh*-question successfully not only requires syntactic knowledge of the question; this also requires the ability to use that knowledge to guide your thinking in understanding the connections between semantic and pragmatic information in the question (Daar et al., 2015; Parnell et al., 1984; Seidl et al., 2003). This further confirms that question answering and comprehension are interactive processes. Additionally, this finding adds to previous literature by showing that the comprehension of *wh*-question words requires skills that enable the learner to analyse *wh*-questions into components and to be able to abstract contextual cues from such questions.

The literature shows that children can interpret *wh*-questions at a very early age (Daar et al., 2015) and that the cognitive and linguistic skills that are needed to respond to specific *wh*-question forms are only developed and improved as children mature over time (Einbond, 1997; Tshule, 2014). In this study it was found that as much as the 10–11- and 14–15-year-old learners were able to interpret the questions, they had not fully mastered the comprehension of *wh*-questions. This could be an effect of multilingualism or of teaching methods. This raises the question of whether learners' performance in question processing and comprehension is

also an indication of these multilingual learners not having a sufficiently strong foundation in their L1. Furthermore, they are taught their L2 and L3 languages at different levels in schools. It could also be speculated that this is the reason that they produced processing and response inaccuracies when answering questions. Raising questions about just how developed are the learners proficiency of phonology, morphology, syntax, semantics, pragmatics, and of the language skills such as listening, speaking, reading and writing, all of which are required in school.

Finally, the study results suggest that understanding the relationship between accurate processing and correct response when processing questions might better serve learners during question answering. In South African schools, learner evaluations are usually conducted in a written format and learners' knowledge of the subject content and skills is measured through the use of questions. It is important to understand that during a comprehension task, once a learner has found a reference concept, they are capable of applying a more interactive thinking process that a) not only leads to the application of the rules specific to the question word but b) also triggers a retrieval process that utilises both the semantic and pragmatic information gained from the question word. More importantly, these findings point to the significance of schools teaching all aspects of *wh*-questions to develop learners' question- answering and comprehension skills.

All learning begins with questions. The importance of questions in the South African curriculum, coupled with poor learner performance in school assessments was the motivation behind this study. Its findings have added to the understanding of the mechanisms involved in question-answering and comprehension in the psycholinguistics field of question processing. They emphasise the need for the teaching of questioning-answering techniques and a pedagogical structure that enhances the thinking of students, to better scaffold learners' ability to comprehend and answer questions.

### 6.3. Limitations

This study investigated the processing and comprehension of written questions only, without focusing on oral questions. Many researchers have argued that oral assessments combined

with additional tools of evaluations are ideal in achieving higher levels of learner understanding (Boedigheimer et al., 2015). Therefore, accurate question comprehension may be influenced by many factors including the type of stimuli used and the way the questions are asked. As pointed out by Cauchi and Musumeci (2016), oral evaluations allow the opportunity to probe understanding through follow-up questions, which encourages deep approaches to learning. Therefore, both the verbal and non-verbal aspects of learning need to be considered to provide an inclusive account of how learners process questions.

Another limitation of this study may have arisen from only examining lower-order cognitively demanding questions and just a few of the *wh*-questions. It would have been interesting also to include questions emphasising levels of cognition representing higher-order thinking skills. As highlighted by several scholars, questions are a means of leading students' thinking, and accordingly, different kinds of questions have different levels of complexity that require numerous cognitive processes (Ahmed & Pollitt, 2001; Bloom et al., 1956; Ewing & Whittington, 2007; Hirschman & Gaizauskas, 2001; Igbaria, 2013; Rowe et al., 2017). Inclusion of higher-order questions in assessments could prompt different comprehension and answering strategies, determining how these learners navigate between their cognitive and linguistic processes to understand and answer a question.

Lastly, more participants are needed (for a representation of the population studied) to allow for generalisation of the findings.

### 6.4. Future Research Directions

Several recommendations for future research should be considered. First, it would be worthwhile to examine question processing at a younger age, from age four years when children are said to have already acquired the *wh*-questions. This could shed light on the question processing and comprehension skills that children at that age have and those that have not yet been acquired. This could highlight processing and response errors and consequently inform how the teaching of questions to children under school-going age is managed.

Another topic for future research concerns the claim that the position in which question words appear in sentences affects how the question is understood and answered. Although the typology of questions was not the focus of this study, it would be interesting to assess learners' processing and answering of questions when question words are positioned at the end of, or elsewhere, in the sentence.

In conclusion, this study has not only shown how multilingual learners process and answer questions in different languages by describing the different processing and answering phases that lead to different response outcomes, but it has also shown that the quality of a response exposes several linguistic and cognitive factors that contribute to how a question is comprehended and eventually answered. There is an apparent lack of linguistic science in the formulation and application of specific curriculum development for South African multilingual learners; this is particularly the case for language subjects. Therefore, the enquiry into, and understanding of, processes involved in multilingual learners' processing and answering of question are important for enhancing the curriculum and assessments for these learners. This will allow these learners to pursue better academic success in school.

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# APPENDICES

## Appendix A: Language Background Questionnaire

SLLM
SCHOOL OF LITERATURE LANGUAGE AND MEDIA

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

### Language Background Questionnaire

**Personal Details of Learner**

Name of prospective learner/participant _____

Date of birth _____

Number of years living in area _____

Number of years in current school _____

Number of years in current grade_____

**Contact with other Languages**

1. How many languages do you speak? Please tick

| | |
|---|---|
| ☐ Sepedi | ☐ English |
| ☐ Sesotho | ☐ isiNdebele |
| ☐ Setswana | ☐ isiXhosa |
| ☐ Siswati | ☐ isiZulu |
| ☐ Tshivenda | ☐ Afrikaans |
| ☐ Xitsonga | ☐ Other |

If other please specify _____

2. What is your home language?

| | |
|---|---|
| ☐ Sepedi | ☐ English |
| ☐ Sesotho | ☐ isiNdebele |
| ☐ Setswana | ☐ isiXhosa |
| ☐ Siswati | ☐ isiZulu |
| ☐ Tshivenda | ☐ Afrikaans |
| ☐ Xitsonga | ☐ Other |

If other please specify _____

3. Which language(s) do you use at home with family?

| | |
|---|---|
| ☐ Sepedi | ☐ English |
| ☐ Sesotho | ☐ isiNdebele |
| ☐ Setswana | ☐ isiXhosa |
| ☐ Siswati | ☐ isiZulu |
| ☐ Tshivenda | ☐ Afrikaans |
| ☐ Xitsonga | ☐ Other |

If other please specify _____

4. Which language(s) do you use at school?

| | |
|---|---|
| ☐ Sepedi | ☐ English |
| ☐ Sesotho | ☐ isiNdebele |
| ☐ Setswana | ☐ isiXhosa |
| ☐ Siswati | ☐ isiZulu |
| ☐ Tshivenda | ☐ Afrikaans |
| ☐ Xitsonga | ☐ Other |

If other please specify _____

5. Which language(s) do you use with friends?

| | |
|---|---|
| ☐ Sepedi | ☐ English |
| ☐ Sesotho | ☐ isiNdebele |
| ☐ Setswana | ☐ isiXhosa |
| ☐ Siswati | ☐ isiZulu |
| ☐ Tshivenda | ☐ Afrikaans |
| ☐ Xitsonga | ☐ Other |

If other please specify _____

**THANK YOU FOR YOUR TIME!**

**The Researcher:**

Nonhlanhla Ntuli

**Research Supervisor:**

Dr Ramona Kunene Nicolas

0788013589 011-717-4183

Nonhlanhla.ntuli254@gmail.com ramona.kunenenicolas@wits.ac.za

**Appendix B: Approval Letters From Schools**

# Bula-Dikgoro Primary School

ENQ: Montana L.M. | P.O. Box 79261 | 27400 Rammupudu Street
TEL: (012) 815 8010 | Mamelodi East | Mamelodi East
0122 | 0122
REF: 700-220574 | e-mail: montanalilly2@gmail.com | CELL: 082 945 1644

13/02/2018

SCHOOL PERMISSION TO CONDUCT RESEARCH

Dear University of the Witwatersrand Ethics Committee

The purpose of this letter is to inform you that I give Nonhlanhla Ntuli, student number 475570 permission to conduct the research titled ***an investigation of how multilingual learners process questions during evaluations*** at Bula-Dikgoro primary school. This also serves as assurance that this school complies with requirements of the Gauteng department of education and will ensure that these requirements are followed in the conduct of this research.

Sincerely,

Montana L.M.
(Principal)

BULA-DIKGORO PRIMARY SCHOOL
27400 RAMMUPUDU STR. EXT 6
MAMELODI EAST 0122
TEL: 012 815 8010
buladikgoro2@gmail.com
GAUTENG DEPT. OF EDUCATION

# Stanza Bopape Secondary School

**ENQUIRIES: MR B MALEPE** **CELL: 0792361755** **EMAIL: malepebethuel@gmail.com**

**13 FEBRUARY 2018**

**TO: MS FAITH TSHABALALA**
**RE: PERMISSION TO CONDUCT RESEARCH AT STANZA BOPAPE SECONDARY SCHOOL**

This communication serves to grant permission to MS NONHLANHLA NTULI to conduct research at STANZA BOPAPE SECONDARY SCHOOL on the following research topic: AN INVESTIGATION OF HOW MULTILINGUAL LEARNERS PROCESS QUESTIONS DURING EVALUATIONS. We further note that the research process will be as outlined per the document titled: GDE RESEARCH APPROVAL LETTER, DATED 16 JANUARY 2017, and the document titled: PARTICIPATION INFORMATION SHEET, DATED FEBRUARY 2018.

Regards

MR B MALEPE
PRINCIPAL
STANZA BOPAPE SECONDARY SCHOOL
0792361755

STANZA BOPAPE SECONDARY SCHOOL
13413 Mathare Street
MAMELODI EAST, Pretoria 0122
BOX 79204 Mamelodi East
2018 -02- 13
Principal
TEL: 012 801 9207/8
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E-mail:
stanzabopapesecondary@webmail.co.za

**Appendix C: Parent/Participant Information Sheet**

SLLM
SCHOOL OF LITERATURE LANGUAGE AND MEDIA

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

**Participant Information Sheet**

June 2018

**Project title:** An Investigation of how multilingual learners process questions during evaluations

**Dear Participant**

My name is Nonhlanhla Ntuli, a PhD candidate under the academic supervision of Dr. Ramona Kunene Nicolas, from the Department of Linguistics at the University of the Witwatersrand. I am conducting research to understand what children understand from questions given to them at school. The aims of this research project are;

a) To find out how a speaker of many languages obtains meaning from questions.
b) To find out the effects of speaking many languages when the medium language used at school is one indigenous language, for example IsiZulu.
c) To see how your child finds meaning from a question in order to give a correct answer.

As part of this project I would like to invite you to take part in this study, you will be requested to do the following;

- You will be requested to write a comprehension test.
- You will then be requested to provide verbal answers to a comprehension test.
- You will be involved in a discussion with the researcher and required to answer questions on what they understood in both tests.
- Lastly, you will be asked to watch a cartoon video extract of about 3 minutes. After watching the full cartoon you will have to retell the story back to the researcher. This will also be followed by questions and a discussion.
- You will also be observed during learning when in class, this observation will be once a week for 30 minutes of the lesson.

With your permission, I would also like to use a digital device to audio and video record some of the tasks that you will be requested to do; the verbal comprehension test, the discussion of both tests and the retelling of the cartoon. The use of a video recording device will allow for capturing of all details including non-verbal responses and information in a live setting, especially for the oral comprehension test and discussions. This will allow for a greater flexibility with data, in a true representation in the analysis and at a much greater depth.

**Who will participate?**

Participants should be between the ages of 16 and 18 and studying English as a first additional language. They should be speakers of more than two South African indigenous languages. They should also come from Gauteng in Mamelodi Township.

Participation in this study is completely voluntary. If you choose to participate in this study, we would first ask you to do the following;

- Sign the consent form whereby you give permission to participate in this study. You can choose not to participate if you don't feel comfortable even if you have given consent.
- Sign consent form whereby you give permission to film you, to allow the researcher to work on the data if you agree.

**What are the possible benefits of taking part in the study?**

While there may be no direct benefits to your participation in the study, the data gathered will contribute to the improvement of curriculum development and design, especially for children that are in public schools in our communities.

**Possible risks and/or discomforts**

Participation in the study does not hold any risk for the participants and will not cause any discomfort. The tasks are in line with what the participant normally does in their school activities.

**Confidentiality**

The transcripts of this data will make use of false names and codes and replace any information that may lead to the identification of participants. Any audio recordings will be beeped at the mention of a name, an address or a telephone number identified. The video will also be

anonymized by blurring the face in the video and if a picture of the video data is to be published in an academic paper, they will blur the face in the picture. At academic research conferences they may show a short clip of video data with the faces blurred, however, no video material will be released into the public domain. The data will be purely for academic purposes and will not in any way be used to the participant's disadvantage. The collected data will be stored and locked in departmental archives and the electronic data will be stored in a folder on the researcher's password-protected computer.

**What will happen to the results of the study?**

The study will form the basis of my PhD dissertation that will be submitted in fulfilment of the PhD degree in Linguistics. Therefore, the results of the study will be published in the form of a dissertation and possibly, at a later stage, also in the form of articles in scientific and academic journals. If the participant requires feedback or are interested in the outcome of the investigation, results will be provided on request.

**Participation and withdrawal**

Participation in this study is completely voluntary. Participants may withdraw from the study at any time or refuse to participate entirely without giving any reason.

If you have any questions afterwards about this research, feel free to contact me on the details listed below. This study will be written up as a research report which will be available online through the University library website. If you wish to receive a summary of this report, I will be happy to send it to you upon request (optional). If you have any queries, concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (non-medical), telephone + 27(0)11 717 1408, email hrec-medical.researchoffice@wits.ac.za/ Shaun.Schoeman@wits.ac.za

Yours sincerely,
Nonhlanhla Ntuli

**The researcher**
Nonhlanhla Ntuli
Nonhlanhla.ntuli254@gmail.com and 475570@students.wits.ac.za
0788013589

**Research Supervisor**
Dr Ramona Kunene Nicolas
ramona.kunenenicolas.wits.ac.za
011-717-4183

**Participant Information Sheet**

June 2018

**Isihloko sephrojekthi**: Ukuphenya ukuthi abafundi abaningi benza kanjani imibuzo ngesikhathi sokuhlolwa

**Sawubona Mfundi**

Igama lami nguNonhlanhla Ntuli, umfundi we-PhD ngaphansi kokuqondiswa kwezemfundo kuka Dr Ramona Kunene Nicolas, ovela eMnyangweni WezoLwimi eNyuvesi yaseWitwatersrand. Ngizokwenza ucwaningo ngendlela abafundi abaningi abaphatha ngayo imibuzo ekuhlolweni esikoleni. Izinhloso eziyinhloko zocwaningo yizo lezi:

a) Ukuthola ukuthi umfundi uqonda kanjani umbuzo
b) Ukuthola ukuthi kwenzakalani uma ukhuluma amalimi amaningi umakufundiswa ngelimi elilodwa eskoleni
c) Ukuthola amasu asetshenziselwa ukukhomba ulwazi olufanele

Njengengxenye yale phrojekthi ngingathanda ukumema ukuthi uhlanganyele kulolu cwaningo, kodwa ukuze uthole ukuthi uhlangabezana nemigomo yokubamba iqhaza uzocelwa ukuthi ugcwalise uhlu lwemibuzo yangemuva lolimi. Leli phepha lemibuzo ehlolwayo yiziphi izilimi abafundi abazi futhi ukuthi ziyisebenzisa kanjani ekuphileni kwabo kwansuku zonke. Ukuqedela leli fomu lemvelaphi yolwimi, akuqinisekisi ukuthi uhlanganyela kulolu cwaningo

Uma ukhethiwe futhi ukhethe ukubamba iqhaza kulolu cwaningo, uzobe uceliwe ukwenza okulandelayo;

- ukuthi ubhale isivivinyo.
- uzocelwa ukuthi inikeze izimpendulo zomlomo kwesinye isivivinyo.
- uzoba nengxoxo nomcwaningi futhi kudingeke ukuthi uphendule imibuzo ngezivinvinyo zombini.
- Okokugcina, uzobuka onopopi abadlala amaninithi amathathu, bese kumele ingitsele ukuthi iboneni. Bese, kuzolandela imibuzo nengxoxo nomcwaningi.
- Ngemvume yakho nomzali wakho imisebenzi izobe iqoshwe ngevidiyo.

Ukuhlanganyela kulolu cwaningo ngokuzithandela ngokuphelele. Uma ukhetha ukubamba iqhaza kulolu cwaningo, uzonikezwa ishidi lwazi oluchaza yonke imininingwane nezinqubo zesifundo socwaningo. Uzonikezwa ifomu lokuvuma kanye nefomu lokuvuma ividiyo lomzali wakho noma umlondolozi ukuba asayine.

**Yiziphi izinzuzo ezikhona zokungenela lesifundo?**

Nakuba kungase kube khona izinzuzo zomuntu siqu ekubambeni kwengane yakho ekutadisheni, idatha ehlangene ingasiza ekuqondeni kangcono ukuthuthukiswa kolimi ezindaweni ezihlukahlukene zokufunda. Ngaphezu kwalokho, izohlinzeka ngolwazi olubalulekile ngolimi nokucubungula imibuzo ngabafundi baseNingizimu Afrika.

**Izingozi ezingenzeka noma ukuphazamiseka**

Ukubamba iqhaza kulolucwaningo angeke kulethe ingozi kungane yakho, futhi ngeke kubange izinkinga. Izivivinyo abozozenza zihambelana nemisebenzi ebayenzayo esikoleni.

**Ukugcineka kwemfihlo**

Konke lokubhaliwe kwedatha kuzothatha kusetshenziswe amagama amanga noma izinombolo, futhi kuzosuswa noma yiluphi ulwazi olungase luholele ekuboneni abahlanganyeli. I-audiotape ezokwethula izothunyelwa ekukhulunyweni kwegama, ikheli noma inombolo yefoni ekhonjisiwe. Ekuboniseni ividiyo sizofihla ubuso, umasisebenzisa isithombe sevidiyo ephepheni lezemfundo sizofihla ubuso bengane esithombeni. Ezingqungqutheleni zocwaningo singabonisa isiqeshana esifushane sedatha yevidiyo, noma kunjalo, akukho okushicilelwe kwevidiyo okuzokhishwa kusizinda somphakathi. Idatha izobe ibe yinjongo kuphela yezifundo futhi ngeke neze isetshenziselwe ukukhubazeka kwakho. Idatha eqoqwe izogcinwa kwikhabhinethi evaliwe ehhovisi lomcwaningi kanye nedatha ye-elektroniki izogcinwa kufolda ekhompyutheni evikelwe iphasiwedi.

**Kuzokwenzekani emiphumeleni yocwaningo?**

Ucwaningo luzokwakha isisekelo senkulumo yami ezokwethula ngokugcwalisa i-PhD degree kumaLimi. Ngakho-ke, imiphumela yocwaningo izoshicilelwa ngesimo se-dissertation futhi mhlawumbe, esikhathini esizayo, futhi ibe yizihloko ezincwadini zezesayensi nezenfundo. Uma abazali / ababheki kanye / noma abahlanganyeli badinga impendulo noma banesithakazelo emiphumeleni yophenyo, imiphumela izonikezwa ngesicelo.

**Ukubamba iqhaza nokuhoxiswa**

Ukuhlanganyela kulolu cwaningo ngokuzithandela ngokuphelele. Abahlanganyeli bangase bahoxise isifundo nganoma yisiphi isikhathi noma benqabe ukubamba iqhaza ngokuphelele ngaphandle kokunikeza isizathu.

**Imininingwane yokuxhumana yabaphenyi**

Uma unemibuzo noma ufisa ukwaziswa okwengeziwe, sicela ukhululeke ukuxhumana -

Uma unemibuzo emva kwalokho mayelana nalolu cwaningo, zizwe ukhululekile ukungithintana nami ngemininingwane ebalwe ngezansi. Lolu cwaningo luzobhalwa njengombiko wocwaningo ozotholakala ku-intanethi ngewebhsayithi yamayunivesithi yunivesithi. Uma ufisa ukuthola isifinyeto salombiko, ngizojabula ukukuthumela kuwe ngenkathi isicelo (ngokuzithandela). Uma unemibuzo, ukukhathazeka noma izikhalazo mayelana nezinqubo zokuziphatha zalolu cwaningo, wamukelekile ukuxhumana neKomiti Yezokuziphatha Ezomuntu YaseNyuvesi (engeyona yezokwelapha), ucingo + 27 (0) 11 717 1408, i-email hrec-medical.researchoffice @ wits.ac.za / Shaun.Schoeman@wits.ac.za

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0788013589

**The supervisor**
Dr Ramona Kunene Nicolas
Ramona.kunenenicolas.wits.ac.za
011 717 4183

**Appendix D: Consent Form**

**Parent/Guardian Consent Form**

**Project title:** An Investigation of how multilingual learners process questions during evaluations

**Name of researcher: Nonhlanhla Ntuli**

I (Your Name) _____ the Parent/Guardian of _____ (Your child's name), agree for my child to participate in this research project. I have read and understood the information provided in the information sheet and I understand what participation for my child will involve.

| | (Please circle) |
|---|---|
| I agree that my child's identity will be remain confidential in reporting of results | YES NO |
| I agree that the interview and discussions may be audio recorded | YES NO |
| I agree that the narrative and oral comprehension task may be video recorded | YES NO |
| I agree that the video will be anonymized by blurring the face | YES NO |

I agree that the information my child provides may be used anonymously by other researchers following this study YES NO

Signature _____

Name of parent/guardian _____

Date_____

SLLM
SCHOOL OF LITERATURE LANGUAGE AND MEDIA

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

**Umzali noma lomele Umzali Consent Form**

**Isihloko sephrojekthi**: Ukuphenya ukuthi abafundi abaningi benza kanjani imibuzo ngesikhathi sokuhlolwa

**Igama :** Nonhlanhla Ntuli

Mina U (Igama lakho) _____ umzali noma lomele Umzali ka _____

(Igama lengane), ngiyavumela ukusetshenziswa kwedatha yomsindo nevidiyo ngenhloso yocwaningo kuphrojekthi yocwaningo, kanye nenhloso yemfundo yeyunivesithi.

(Sicela uzungeze)

Ngiyavuma ukuthi ubunikazi bami buzohlala buyimfihlo ekubikeni kwemiphumela YEBO CHA

Ngiyavuma ukuthi ingxoxo kanye nezingxoxo zingase zibekwe umsindo oqoshiwe YEBO CHA

Ngiyavuma ukuthi umsebenzi wokuqonda nokulandisa ngomlomo ungaba ividiyo iqoshiwe YEBO CHA

Ngiyavuma ukuthi ividiyo izokwaziswa ngokufiphaza ubuso YEBO CHA

Ngiyavuma ukuthi ulwazi olunikezwa ngumntanami lungasetshenziswa ngokungaziwa ngabanye abacwaningi emva kwalolu cwaningo YEBO CHA

Isignesha yabazali / isiqiniseko _____ Usuku _____

Igama lomzali _____

**Appendix E: Isizulu and Sepedi DBE Comprehension Excerpts and Questions**




"Uma ngizwa Iculo Lesizwe LaseBrazil, ngizizwa sengathi ngisephusheni. Ngizama ukucabangisisa ukuthi ngizodlala kanjani kepha ngiqhubeke ngokucabanga: Kwenzeke kanjani ukuthi ngibe lapha, eqenjini laseBrazil, eSweden, sengizodlalela izwe lami? Kufanele ukuba yiphupho!"




Lona nguPele ngenkathi eneminyaka eyi-17, edlala umdlalo wakhe wokuqala wamanqamu webhola likanobhutshuzwayo leNdebe Yomhlaba. Ngubani lo mfana? Ufinyelele kanjani eNdebeni Yomhlaba? Uzizwa enjani ngebhola likanobhutshuzwayo, umdlalo owamenza waduma? UPele wayehlala edolobheni elincane laseBrazil. Umndeni wakhe wawumpofu kakhulu. UPele wayeyilo mfana owayedlala ibhola lezinyawo noma kwakufanele abe sesikoleni. Wayenenhlahla ngoba ubaba wakhe wayengumdlali webhola lezinyawo, wabe esemfundisa ukuthi ukubhema nokuphuza akumlungele.

UPele uthi, "Abantu baseBrazil bayasangana ngebhola lezinyawo. Bafunda ukukhahlela uma nje sebekwazi ukuzimela. Ukuhamba kuza kamuva."

Waqala iqembu lakhe lebhola lokuqala, iThe Shoeless Ones, eneminyaka eyi-10. Wayenekhono. Eneminyaka eyi- 14 wayedlalela iqembu lasekhaya labasubathi.

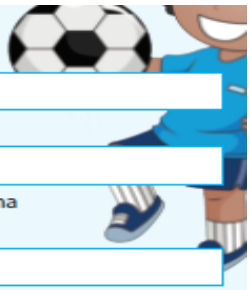
Ngaleso sikhathi wayengasebenzi kahle esikoleni. Wayekhathalele kakhulu ukudlala ibhola lezinyawo. Wawuphinda unyaka owodwa esikoleni. Wasiyeka isikole eneminyaka eyi-14 wase eqala ukusebenza embonini yezicathulo. Uthe esekhulile waphatheka kabi ngokuyekela isikole. Wabe esebuyela esikoleni futhi waya nasenyuvesi emva kokuba eseshadile futhi esenengane.

Eneminyaka enyi-15, waya kodlalela iqembu elidumile elalibizwa ngokuthi iSantos. Emva kweminyaka emibili wadlalela iBrazil eNdebeni Yomhlaba yango-1958 eSweden. Washaya amagoli ayishumi emidlalweni yobushampeni, eyanqotshwa yi-Brazil.

Emva kwalokho wadlala emidlalweni eminingi, washaya amagoli angaphezu kwayi-1 300.

Kungani uPele wayephumelela kangaka? Kunezizathu eziningi. Okokuqala, wayelithanda ibhola lezinyawo. Okwesibili, wayehlakaniphile ngendlela ayedlala ngayo lo mdlalo, futhi, okokugcina, wayengazidlaleli yena yedwa, wayedlalela iqembu.

UPele wayengeyena umdlali webhola lezinyawo omkhulu kuphela. Wasebenzela ngamandla amalungelo abadlali bebhola lezinyawo. Wayenza isiqiniseko sokuthi uma begula noma belimele babekhokhelwa.



Waphatheka kanjani uPele ngenkathi edlalela izwe lakhe umdlalo wakhe wokuqala?

UPele wayekholelwa ekuzigcineni ephilile. Ukwazi kanjani lokhu?

UPele wabuyela esikoleni eseshadile. Ucabanga ukuthi lokhu kwaba lula noma kwaba nzima kuye? Ukusho ngani lokho?

Kungani ucabanga ukuthi uPele wayengumdlali webhola lezinyawo omkhulu?

Ubani okhulumayo esigabeni sokuqala?

Ucabanga ukuthi uPele wayeziqhenya ngokudlalela iBrazil? Ukwazi kanjani lokhu?

Izingane ziyaye zikhase ngaphambi kokuba zihambe. UPele uthi izingane zaseBrazil zenzani?




"Ge ke ekwa Koša ya Setšhaba ya Brazil, ke ikwa eke ke a lora. Ke leka go **naganišiša** gabotse mabapi le ka fao ke tla ralokago ka gona, fela ke dula ke nagana gore: na go tla bjang gore ke be mo, ka gare ga sehlopha sa Brazil, lefaseng la Sweden? Re kgauswi le go thoma go ralokela naga ya gešo. E swanetše go ba e le toro …!"




Yo ke Pele, a na le mengwaga ye 17, a raloka papadi ya gagwe ya mathomo ka go dipapadi tša Mogopo wa Lefase tša Kgwele ya Maoto tša makgaolakgang. Na mošemane yo ke mang? Na o fihlile bjang ka go Dipapadi tša Mogopo wa Lefase? Na o ikwa bjang mabapi le kgwele ya maoto, papadi yeo e mo dirilego gore a **tume**?

Pele o be a dula torotswaneng ye nnyane kua Brazil. Lapa la gabo le be le itlhakela kudu. Pele e be e le mošemane yo a bego a raloka kgwele ya maoto ka nako ye a bego a swanetše go ba a le sekolong ka yona. O be a le mahlatse ka ge tatagwe le yena e be e le sebapadi sa kgwele ya maoto, ebile a mo rutile gore go kgoga motšoko le go nwa bjala ga se tša mo lokela.

Pele o re MaBrazil a rata kgwele ya maoto kudu. Ba ithuta go raga ge ba thoma go ema. Go sepela go tla ka morago.

O thomile sehlopha sa gagwe sa mathomo sa kgwele ya maoto sa *"The Shoeless Ones"* (Bao ba se nago Dieta) a na le mengwaga ye 10. O be a kgona kudu. Ge a na le mengwaga ye 14 o ile a ralokela sehlopha sa diatletiki sa tikologo.

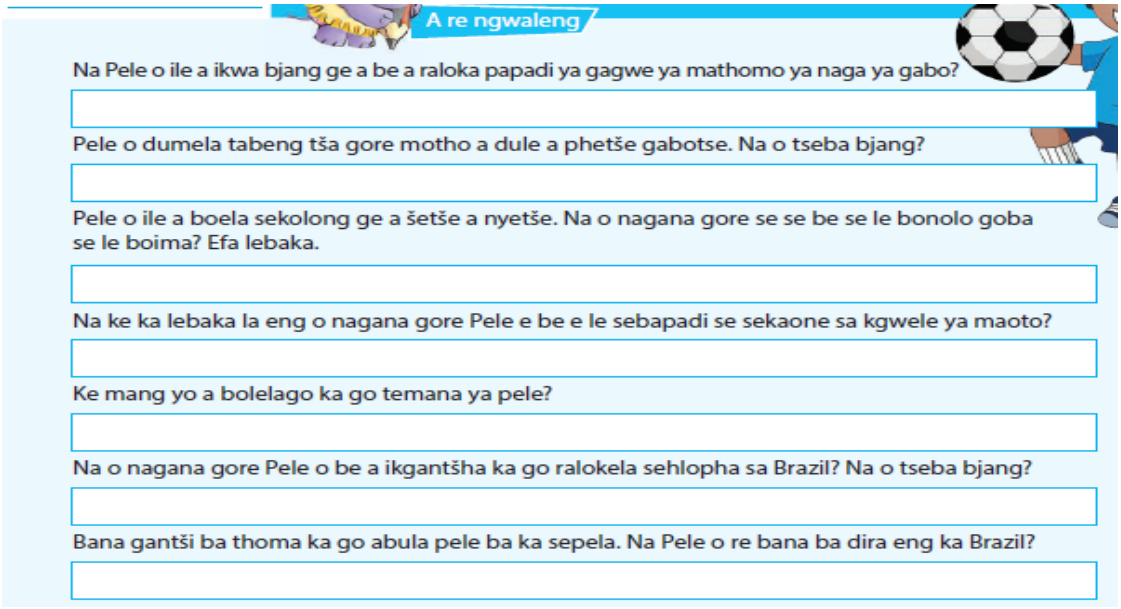
Mo lebakeng le o be a se sa šoma gabotse ka sekolong. O be a **rata** kudu go raloka kgwele ya maoto. O ile a palelwa dithutong tša gagwe mo ngwageng o tee. O tlogetše sekolo ge a na le mengwaga ye 14 gomme a thoma go šoma femeng ya dieta. Ge a šetše a godile o ile a thoma go itshola ge a ile a tlogela sekolo. O ile a boela sekolong gomme a ya yunibesiti ka morago ga ge a nyetše a bile a na le ngwana.

Ge a na le mengwaga ye 15 o ile a ya go raloka kgwele ya maoto, a ralokela sehlopha sa go tuma sa go bitšwa Santos. Mengwaga ye mebedi ya go latela a ralokela Brazil ka go Mogopo wa Lefase wa 1958 go la Sweden. O ile a nweša dino tše lesome ka go **makgaolakgang**, moo Brazil e ilego ya fenya.

Morago ga fao a raloka dipapadi tše dintši gomme a nweša dino tše dingwe gape tša go feta tše 1 300.

Na ke ka lebaka la eng Pele a ile a **atlega** ka tsela ye? Go na le mabaka a mantši. Sa pele, o be a rata kgwele ya maoto. Sa bobedi, o be a le bohlale kudu mabapi le ka fao a bego a raloka papadi ka gona gape, sa mafelelo ke gore o be a sa ithalokele: o be a ralokela sehlopha.

Pele e be e se sebapadi se sekaone fela sa kgwele ya maoto. O šomile gape kudu go lwela ditokelo tša baraloki ba kgwele ya maoto. O ile a kgonthiša gore ge ba be ba lwala goba ba gobetše ba tšwele pele go hwetša megolo ya bona.


A re ngwaleng
Na Pele o ile a ikwa bjang ge a be a raloka papadi ya gagwe ya mathomo ya naga ya gabo?
Pele o dumela tabeng tša gore motho a dule a phetše gabotse. Na o tseba bjang?
Pele o ile a boela sekolong ge a šetše a nyetše. Na o nagana gore se se be se le bonolo goba se le boima? Efa lebaka.
Na ke ka lebaka la eng o nagana gore Pele e be e le sebapadi se sekaone sa kgwele ya maoto?
Ke mang yo a bolelago ka go temana ya pele?
Na o nagana gore Pele o be a ikgantšha ka go ralokela sehlopha sa Brazil? Na o tseba bjang?
Bana gantši ba thoma ka go abula pele ba ka sepela. Na Pele o re bana ba dira eng ka Brazil?

## Appendix F: English DBE Comprehension Excerpts And Questions

My life so far

1. My name is Peter Green and I am 11 years old. I live with my family. They are my parents and my two sisters. I'm the middle child, like the cheese in the sandwich, as my grandmother says.

2. My older sister, Kate, thinks she is a pop star. You should hear her sing in the shower! She sounds more like a frightened cat than anything human. When she sings, even the cat runs and hides.

3. Then there is my little sister, Jane, the most irritating person in the world. Why do I say that? Well, wouldn't you get irritated if you had to live with someone who has two imaginary friends? All day long she talks to these friends, as if she can really see them. Living with two sisters is bad enough- but four girls in the house!

4. My father, Jake Green, is big and strong. He drives a big truck at the local municipality. When he isn't at work, my father reads the newspaper or watches television. Sometimes I can persuade him to play soccer with me in the backyard.

5. My mother's first name is Christine, although I call her Mom. My dad calls her Tina or Sweetie Pie when he's feeling happy, like after Sunday lunch. Mom is very pretty and works hard at the grocery store in our own town. She is really in charge of the house. We all have to do jobs, even my father. My job is to wash up after supper and feed the dog.

6. We have lived in the same house in Senekal since I was born, so I know our house very, very well. For example, I know which floorboard creaks in the passage, where there is a crack in the garden wall to sneak through, and how to open the front door when it gets stuck when it rains.

7. I am in Grade 5 in Senekal Primary School, and Mr. Grey is our teacher. I like our school, because there are soccer fields and netball courts for us to play on. I'm in the soccer team. So is my best friend, Fred. We often beat the other schools in soccer matches because we practice every afternoon. I can read and write quite well, but I am not as clever as Jason and Lydia in our class. I think that they know even more than Mr. Grey does.

1.2. Write down the name of the speaker in the first paragraph. (1)

_____

_____

1.3. Why does the speaker compare himself to a cheese sandwich? (1)

_____

_____

1.4. Explain what happens to the family's pet when Peter's sister sings in the shower. (2)

_____

_____

1.5. What does Peter's baby sister have that irritates him? (paragraph 3) (2)

_____

_____

1.6. Where does Peter's father work? (1)

_____

_____

1.7. Write two chores that need to be done by Peter every day. (paragraph 5) (2)

_____

_____

## Appendix G: Isizulu and Sepedi Amended Comprehension Text and Questions

### IsiZulu Pilot Question Paper

Igama _____

Usuku _____

Ibanga lesi- 5

**<u>Ukufunda nokuzwisisa</u>**

Funda lendatsana bese uphendula imibuzo elandelayo

**UPele - umdlali omkhulu webhola lezinyawo**




"Uma ngizwa Iculo Lesizwe LaseBrazil, ngizizwa sengathi ngisephusheni. Ngizama ukucabangisisa ukuthi ngizodlala kanjani kepha ngiqhubeke ngokucabanga: Kwenzeke kanjani ukuthi ngibe lapha, eqenjini laseBrazil, eSweden, sengizodlalela izwe lami? Kufanele ukuba yiphupho!"




Lona nguPele ngenkathi eneminyaka eyi-17, edlala umdlalo wakhe wokuqala wamanqamu webhola likanobhutshuzwayo leNdebe Yomhlaba. Ngubani lo mfana? Ufinyelele kanjani eNdebeni Yomhlaba? Uzizwa enjani ngebhola likanobhutshuzwayo, umdlalo owamenza waduma? UPele wayehlala edolobheni elincane laseBrazil. Umndeni wakhe wawumpofu kakhulu. UPele wayeyilo mfana owayedlala ibhola lezinyawo noma kwakufanele abe sesikoleni. Wayenenhlahla ngoba ubaba wakhe wayengumdlali webhola lezinyawo, wabe esemfundisa ukuthi ukubhema nokuphuza akumlungele.

Waqala iqembu lakhe lebhola lokuqala, iThe Shoeless Ones, eneminyaka eyi-10. Wayenekhono. Eneminyaka eyi- 14 wayedlalela iqembu lasekhaya labasubathi.

Ngaleso sikhathi wayengasebenzi kahle esikoleni. Wayekhathalele kakhulu ukudlala ibhola lezinyawo. Wawuphinda unyaka owodwa esikoleni. Wasiyeka isikole eneminyaka eyi-14 wase eqala ukusebenza embonini yezicathulo. Uthe esekhulile waphatheka kabi ngokuyekela isikole. Wabe esebuyela esikoleni futhi waya nasenyuvesi emva kokuba eseshadile futhi esenengane.

Eneminyaka enyi-15, waya kodlalela iqembu elidumile elalibizwa ngokuthi iSantos. Emva kweminyaka emibili wadlalela iBrazil eNdebeni Yomhlaba yango-1958 eSweden. Washaya amagoli ayishumi emidlalweni yobushampeni, eyanqotshwa yi-Brazil.

Emva kwalokho wadlala emidlalweni eminingi, washaya amagoli angaphezu kwayi-1 300.

Kungani uPele wayephumelela kangaka? Kunezizathu eziningi. Okokuqala, wayelithanda ibhola lezinyawo. Okwesibili, wayehlakaniphile ngendlela ayedlala ngayo lo mdlalo, futhi, okokugcina, wayengazidlaleli yena yedwa, wayedlalela iqembu.

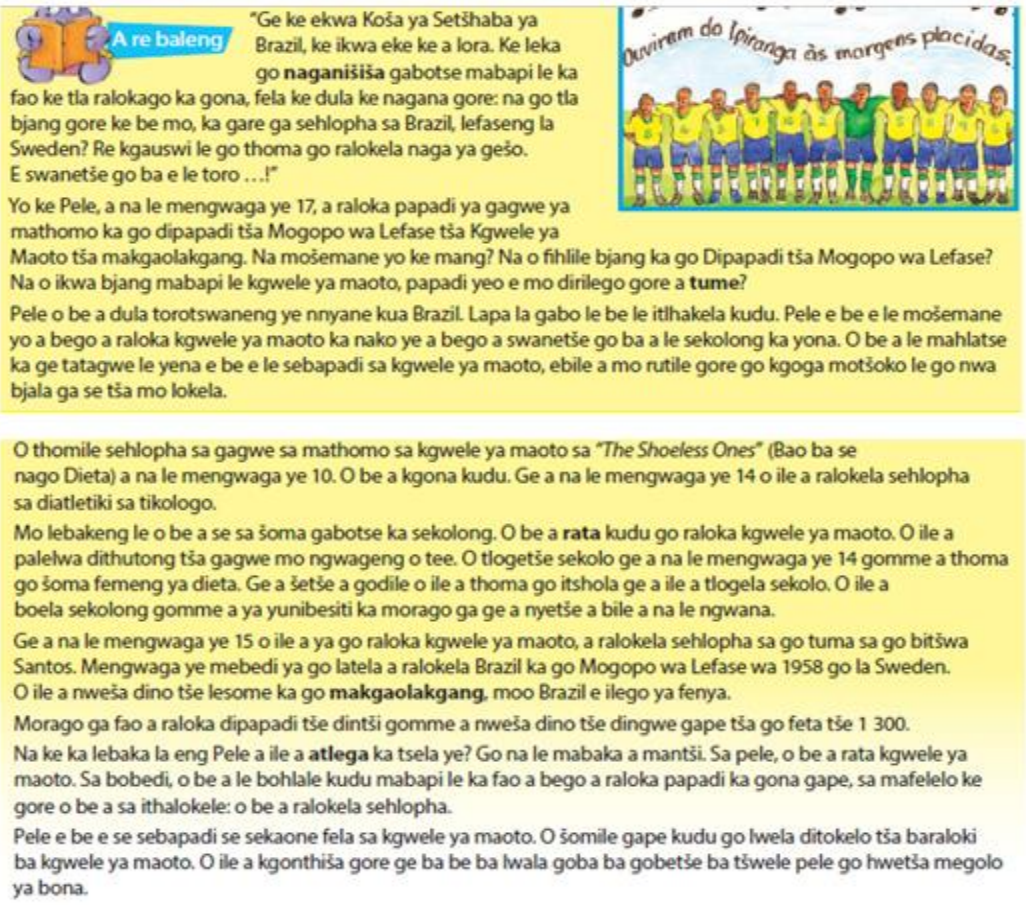
UPele wayengeyena umdlali webhola lezinyawo omkhulu kuphela. Wasebenzela ngamandla amalungelo abadlali bebhola lezinyawo. Wayenza isiqiniseko sokuthi uma begula noma belimele babekhokhelwa.

**<u>Imibuzo</u>**

1. Ubani okhulumayo esigabeni sokuqala?

2. Waphatheka kanjani uPele ngenkathi edlalela izwe lakhe umdlalo wakhe wokuqala?
3. Yini ubaba kaPele amfundisa yona ukuthi ahlale aphilile?
4. Yini eyenza uPele ukuthi abe umdlali oqeqeshile kakhulu?
5. uPele wabuyela esikoleni eseshadile. Ucabanga ukuthi lokhu kwaba lula noma kwaba nzima kuye? Ukusho ngani lokho
6. Yikuphi okunye afakangakho isandla esadlala ibhola uPele?

**Sepedi Pilot question paper**



A re baleng

"Ge ke ekwa Koša ya Setšhaba ya Brazil, ke ikwa eke ke a lora. Ke leka go **naganišiša** gabotse mabapi le ka fao ke tla ralokago ka gona, fela ke dula ke nagana gore: na go tla bjang gore ke be mo, ka gare ga sehlopha sa Brazil, lefaseng la Sweden? Re kgauswi le go thoma go ralokela naga ya gešo. E swanetše go ba e le toro ...!"




Yo ke Pele, a na le mengwaga ye 17, a raloka papadi ya gagwe ya mathomo ka go dipapadi tša Mogopo wa Lefase tša Kgwele ya Maoto tša makgaolakgang. Na mošemane yo ke mang? Na o fihlile bjang ka go Dipapadi tša Mogopo wa Lefase? Na o ikwa bjang mabapi le kgwele ya maoto, papadi yeo e mo dirilego gore a **tume**?

Pele o be a dula torotswaneng ye nnyane kua Brazil. Lapa la gabo le be le itlhakela kudu. Pele e be e le mošemane yo a bego a raloka kgwele ya maoto ka nako ye a bego a swanetše go ba a le sekolong ka yona. O be a le mahlatse ka ge tatagwe le yena e be e le sebapadi sa kgwele ya maoto, ebile a mo rutile gore go kgoga motšoko le go nwa bjala ga se tša mo lokela.

O thomile sehlopha sa gagwe sa mathomo sa kgwele ya maoto sa *"The Shoeless Ones"* (Bao ba se nago Dieta) a na le mengwaga ye 10. O be a kgona kudu. Ge a na le mengwaga ye 14 o ile a ralokela sehlopha sa diatletiki sa tikologo.

Mo lebakeng le o be a se sa šoma gabotse ka sekolong. O be a **rata** kudu go raloka kgwele ya maoto. O ile a palelwa dithutong tša gagwe mo ngwageng o tee. O tlogetše sekolo ge a na le mengwaga ye 14 gomme a thoma go šoma ferneng ya dieta. Ge a šetše a godile o ile a thoma go itshola ge a ile a tlogela sekolo. O ile a boela sekolong gomme a ya yunibesiti ka morago ga ge a nyetše a bile a na le ngwana.

Ge a na le mengwaga ye 15 o ile a ya go raloka kgwele ya maoto, a ralokela sehlopha sa go tuma sa go bitšwa Santos. Mengwaga ye mebedi ya go latela a ralokela Brazil ka go Mogopo wa Lefase wa 1958 go la Sweden. O ile a nweša dino tše lesome ka go **makgaolakgang**, moo Brazil e ilego ya fenya.

Morago ga fao a raloka dipapadi tše dintši gomme a nweša dino tše dingwe gape tša go feta tše 1 300.

Na ke ka lebaka la eng Pele a ile a **atlega** ka tsela ye? Go na le mabaka a mantši. Sa pele, o be a rata kgwele ya maoto. Sa bobedi, o be a le bohlale kudu mabapi le ka fao a bego a raloka papadi ka gona gape, sa mafelelo ke gore o be a sa ithalokele: o be a ralokela sehlopha.

Pele e be e se sebapadi se sekaone fela sa kgwele ya maoto. O šomile gape kudu go lwela ditokelo tša baraloki ba kgwele ya maoto. O ile a kgonthiša gore ge ba be ba lwala goba ba gobetše ba tšwele pele go hwetša megolo ya bona.

**<u>Dipotšišo</u>**

1. Ke mang yo a bolelago ka go temana ya Pele?
2. Na Pele o ile a ikwa bjang ge a be a raloka papadi ya gagwe ya mathomo ya naga ya gabo?
3. Ke eng seo Papago Pele a mo rutileng ka go phela bophelo bja maleba?
4. Ke eng seo se dirilego Pele gore a tswelele go ba sebapadi sa kgwele ya maoto se hlwahla?

5. Pele o ile a boela sekolong ge a šetše a nyetše. Na o nagana gore se se be se le bonolo goba se le boima? Efa lebaka.
6. Ke eng tse dingwe tseo Pele a ditlaleleditsego mo kgweleng ya maoto?

## Appendix H: English Amended Comprehension Text and Questions

### English Pilot Question Paper

Name and Surname _____

Date _____

Grade _____

**Comprehension Activity**

Read the story below and then answer the questions that follow.

**My life so far**

My name is Peter Green and I am 11 years old. I live with my family. They are my parents and my two sisters. I'm the middle child, like the cheese in the sandwich, as my grandmother says.

My older sister, Kate, thinks she is a pop star. You should hear her sing in the shower! She sounds more like a frightened cat than anything human. When she sings, even the cat runs and hides. Then there is my little sister, Jane, the most irritating person in the world. Why do I say that? Well, wouldn't you get irritated if you had to live with someone who has two imaginary friends? All day long she talks to these friends, as if she can really see them. Living with two sisters is bad enough- but four girls in the house!

My father, Jake Green, is big and strong. He drives a big truck at the local municipality. When he isn't at work, my father reads the newspaper or watches television. Sometimes I can persuade him to play soccer with me in the backyard.

My mother's first name is Christine, although I call her Mom. My dad calls her Tina or Sweetie Pie when he's feeling happy, like after Sunday lunch. Mom is very pretty and works hard at the grocery store in our own town. She is really in charge of the house. We all have to do jobs, even my father. My job is to wash up after supper and feed the dog.

We have lived in the same house in Senekal since I was born, so I know our house very, very well. For example, I know which floorboard creaks in the passage, where there is a crack in the garden wall to sneak through, and how to open the front door when it gets stuck when it rains.

**Questions**

1. What is the name of the person telling the story?
2. What happens to the cat when Peter's sister Kate sings in the shower?
3. Why does the speaker compare himself to a cheese sandwich?
4. Explain why Peter knows how to open the front door when it gets stuck?
5. Why do you think Peter is irritated by his baby sister?
6. What can you point out about the chores that need to be done by everyone compared to the activities that Peter's father does when he is not at work?

## Appendix I: L2 (Isizulu and Sepedi) Main Study Question Paper

### IsiZulu comprehension and questions

Igama _____

Usuku _____

Ibanga lesi- _____

**Ukufunda nokuzwisisa**

Funda lendatsana bese uphendula imibuzo elandelayo

**UPele - umdlali omkhulu webhola lezinyawo**

"Uma ngizwa iculo Lesizwe LaseBrazil, ngizizwa sengathi ngisephusheni. Ngizama ukucabangisisa ukuthi ngizodlala kanjani kepha ngiqhubeke ngokucabanga: Kwenzeke kanjani ukuthi ngibe lapha, eqenjini laseBrazil, eSweden, sengizodlalela izwe lami? Kufanele ukuba yiphupho!"

Lona nguPele ngenkathi eneminyaka eyi-17, edlala umdlalo wakhe wokuqala wamanqamu webhola likanobhutshuzwayo leNdebe Yomhlaba.

Wayenenhlahla ngoba ubaba wakhe wayengumdlali webhola lezinyawo, wabe esemfundisa ukuthi ukubhema nokuphuza akumlungele.

**Imibuzo**

1. Waphatheka kanjani uPele ngenkathi edlalela izwe lakhe umdlalo wakhe wokuqala?
2. Yini ubaba kaPele amfundisa yona ukuthi ahlale aphilile?

**Sepedi comprehension and questions**

Leina _____

Letšatšikgwedi _____

Mphato wa _____

**A re baleng**

Bala temana ye o arabe dipotšišo tše di latelago

**Pele – O hlakana hlogo ka ga kgwele ya maoto**

"Ge ke ekwa koša ya Setšhaba ya Brazil, ke ikwa eke ke a lora. Ke leka go naganišiša gabotse mabapi le ka fao ke tla ralokago ka gona, fela ke dula ke nagana gore: na go tla bjang gore ke be mo, ka gare ga sehlopha sa Brazil, lefaseng la Sweden? Re kgauswi le go thoma go ralokela naga ya gešo. E swanetše go ba e le toro …!"

Yo ke Pele, a na le mengwaga ye 17, a raloka papadi ya gagwe ya mathomo ka go dipapadi tša Mogopo wa Lefase tša kgwele ya maoto tša makgaolakgang.

O be a le mahlatse ka ge tatagwe le yena e be e le sebapadi sa kgwele ya maoto, ebile a mo rutile gore go kgoga motšoko le go nwa bjala ga se tša mo lokela.

**Dipotšišo**

1. Na Pele o ile a ikwa bjang ge a be a raloka papadi ya gagwe ya mathomo ya naga ya gabo?
2. Ke eng seo papago Pele a mo rutileng ka go phela bophelo bja maleba?

## Appendix J: L3 (English) Main Study Question Paper

### English comprehension and questions

Name and Surname _____

Date _____

Grade _____

**Comprehension Activity**

Read the story below and then answer the questions that follow.

**My life so far**

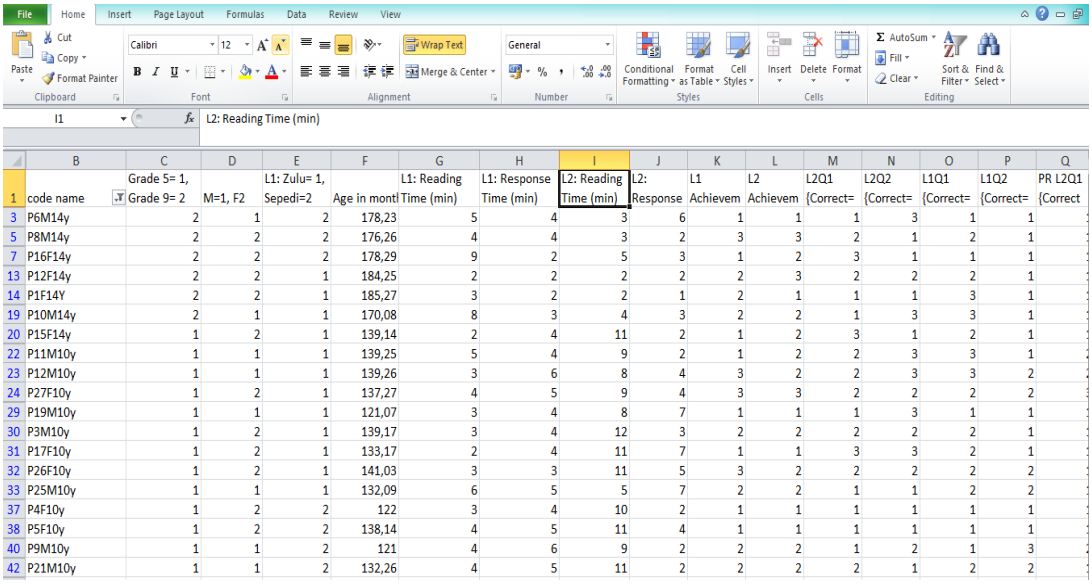
My name is Peter Green and I am 11 years old. I live with my family. They are my parents and my two sisters. I'm the middle child, like the cheese in the sandwich, as my grandmother says.

My older sister, Kate, thinks she is a pop star. You should hear her sing in the shower! She sounds more like a frightened cat than anything human. When she sings, even the cat runs and hides.

**Questions**

1. Why does the speaker compare himself to a cheese sandwich?
2. Explain what happens to the family's pet when Peter's sister sings in the shower.

## Appendix K: Microsoft Excel Data Sheet Sample



| | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | code name | Grade 5= 1, Grade 9= 2 | M=1, F2 | L1: Zulu= 1, Sepedi=2 | Age in montl | L1: Reading Time (min) | L1: Response Time (min) | L2: Reading Time (min) | L2: Response | L1 Achievem | L2 Achievem | L2Q1 {Correct= | L2Q2 {Correct= | L1Q1 {Correct= | L1Q2 {Correct= | PR L2Q1 {Correct |
| 3 | P6M14y | 2 | 1 | 2 | 178,23 | 5 | 4 | 3 | 6 | 1 | 1 | 1 | 3 | 1 | 1 | |
| 5 | P8M14y | 2 | 2 | 2 | 176,26 | 4 | 4 | 3 | 2 | 3 | 3 | 2 | 1 | 2 | 1 | |
| 7 | P16F14y | 2 | 2 | 2 | 178,29 | 9 | 2 | 5 | 3 | 1 | 2 | 3 | 1 | 1 | 1 | |
| 13 | P12F14y | 2 | 2 | 1 | 184,25 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | |
| 14 | P1F14Y | 2 | 2 | 1 | 185,27 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 3 | 1 | |
| 19 | P10M14y | 2 | 1 | 1 | 170,08 | 8 | 3 | 4 | 3 | 2 | 2 | 1 | 3 | 3 | 1 | |
| 20 | P15F14y | 1 | 2 | 1 | 139,14 | 2 | 4 | 11 | 2 | 1 | 2 | 3 | 1 | 2 | 1 | |
| 22 | P11M10y | 1 | 1 | 1 | 139,25 | 5 | 4 | 9 | 2 | 1 | 2 | 2 | 3 | 3 | 1 | |
| 23 | P12M10y | 1 | 1 | 1 | 139,26 | 3 | 6 | 8 | 4 | 3 | 2 | 2 | 3 | 3 | 2 | |
| 24 | P27F10y | 1 | 2 | 1 | 137,27 | 4 | 5 | 9 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | |
| 29 | P19M10y | 1 | 1 | 1 | 121,07 | 3 | 4 | 8 | 7 | 1 | 1 | 1 | 3 | 1 | 1 | |
| 30 | P3M10y | 1 | 2 | 1 | 139,17 | 3 | 4 | 12 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | |
| 31 | P17F10y | 1 | 2 | 1 | 133,17 | 2 | 4 | 11 | 7 | 1 | 1 | 3 | 3 | 2 | 1 | |
| 32 | P26F10y | 1 | 2 | 1 | 141,03 | 3 | 3 | 11 | 5 | 3 | 2 | 2 | 2 | 2 | 2 | |
| 33 | P25M10y | 1 | 1 | 1 | 132,09 | 6 | 5 | 5 | 7 | 2 | 2 | 1 | 1 | 2 | 2 | |
| 37 | P4F10y | 1 | 2 | 2 | 122 | 3 | 4 | 10 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 38 | P5F10y | 1 | 2 | 2 | 138,14 | 4 | 5 | 11 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 40 | P9M10y | 1 | 1 | 2 | 121 | 4 | 6 | 9 | 2 | 2 | 2 | 1 | 2 | 1 | 3 | |
| 42 | P21M10y | 1 | 1 | 2 | 132,26 | 4 | 5 | 11 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | |

## Appendix L: Ethics Certificate

Research Office

**HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)**
R14/49 Ntull

| | |
|---|---|
| **CLEARANCE CERTIFICATE** | **PROTOCOL NUMBER:** H18/03/23 |
| **PROJECT TITLE** | An investigation of how multilingual learners process questions during evaluations |
| **INVESTIGATOR(S)** | Miss N Ntull |
| **SCHOOL/DEPARTMENT** | School of Literature, Language and Media/ |
| **DATE CONSIDERED** | 15 March 2018 |
| **DECISION OF THE COMMITTEE** | Approved |
| **EXPIRY DATE** | 08 May 2021 |
| **DATE** 08 May 2018 | **CHAIRPERSON** (Professor J Knight) |

cc: Supervisor : Dr R Kunene-Nicolas

**DECLARATION OF INVESTIGATOR(S)**

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

Signature

Date

**PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES**

## Appendix M: Gauteng Department of Education Approval Letter

**GAUTENG PROVINCE**
Department: Education
REPUBLIC OF SOUTH AFRICA

8/4/4/1/2

### GDE RESEARCH APPROVAL LETTER

| | |
|---|---|
| **Date:** | **16 January 2018** |
| **Validity of Research Approval:** | **05 February 2018 – 28 September 2018**<br>**2018/01** |
| **Name of Researcher:** | **Ntuli N** |
| **Address of Researcher:** | **27695 Mashiloane Street** |
| | **Mamelodi East** |
| | **0122** |
| **Telephone Number:** | **0878 801 3589** |
| **Email address:** | **Nonhlanhla.ntuli254@gmail.com** |
| **Research Topic:** | **An investigation of how multilingual learners process questions during evaluations** |
| **Number and type of schools:** | **Five Primary Schools and Five Secondary Schools** |
| **District/s/HO** | **Tshwane West, Tshwane North and Tshwane South** |

***Re: Approval in Respect of Request to Conduct Research***

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

**The following conditions apply to GDE research. The researcher may proceed with the above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted:**

19/01/2018

1



**Office of the Director: Education Research and Knowledge Management**
7th floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

**Appendix N: Assent Form**

SLLM
SCHOOL OF LITERATURE LANGUAGE AND MEDIA

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

## Child Participant Assent Form



**Title of Project:** An Investigation of how multilingual learners process questions during evaluations

**Name of Researcher: Nonhlanhla Ntuli**

I want to invite you to take part in a research study I am doing. A research study is a special way to find out about something. I am trying to find out more about what children understand from questions given to them at school. You are being asked to join the study because I need children of your age, who speak more than two South African indigenous languages (like Zulu, Sotho, Tsonga ) to help me find out some information.

If you decide that you want to be in this study, this is what will happen:

- I will give you a comprehension form your school textbook to read.
- After you read it, I will give you questions about the comprehension. And I will ask you to write out the answers for me.
- I will then give you another comprehension from your school textbook to read.
- After you read it, I will give you some questions about the comprehension. But this time I will ask you to tell me the answers verbally. When you do this I will video you so I can have a look at it later.
- I will have a discussion with you about the first and the second comprehensions tasks. In this discussion I will ask you about what you understood in both tasks.

- Lastly, I will ask you to watch a wordless cartoon video that takes about 3 minutes. After you watch it, I will ask you to tell me the story of what happened in the cartoon. When you do this I will video you so I can have a look at it later.

**Can anything bad happen to me?**

If you do this study, you will not get hurt. If you feel too shy or uncomfortable you don't have to do it. There are no right or wrong answers and this work will not be part of your school report.

**Can anything good happen to me?**

I don't know if being in this research will help you with your learning. But I hope to learn something that will help other people someday.

**Do I have other choices?**

Yes! You can choose not to be in this study and that is allowed.

**Will anyone know I am in the study?**

I won't tell anyone you took part in this study. When I am done with the study, I will write a report about what I found out. I won't use your name in the report.

**What if I don't want to do this?**

You don't have to be in this study. It's up to you. If you say yes, but you change your mind later, that's okay too. All you have to do is tell me. If you want to be in this study, please tick YES and sign or print your name. If you do not want to be part of this study just tick NO and you don't have to sign or write your name. You may keep a copy for future references.

**Do you understand this research study and are you willing to take part in it?**

| **YES** | **NO** |
|---|---|

_____ _____

Child's name Signature of child

_____ _____

Person obtaining Assent Signature

_____

Date

SLLM
SCHOOL OF LITERATURE LANGUAGE AND MEDIA

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

## Child Participant Assent Form



**Isihloko sesifundoi**: Ukuphenya ukuthi abafundi abaningi benza kanjani imibuzo ngesikhathi sokuhlolwa

**Igama lomcwaningi: Nonhlanhla Ntuli**

Ngifuna ukumema ukuthi uhlanganyele ocwaningweni locwaningo engikwenzayo. Ucwaningo lokucwaninga luyindlela ekhethekile yokuthola okuthile. Ngizama ukuthola okwengeziwe ngalokho izingane eziyiqonda emibuthanweni abanikezwa esikoleni. Ucelwa ukuba ujoyine isifundo ngoba ngidinga abantwana beminyaka yakho, okhuluma ngaphezu kwezilimi ezimbili zendabuko zaseNingizimu Afrika ukuze angisize ngithole olunye ulwazi

Uma unquma ukuthi ufuna ukuhlala kulolu cwaningo, yilokhu okuzokwenzeka:

- Ngizokunika umsebenzi wesitori esiphuma eincwadi yakho yesikole.
- Ngemva kokusifunda, ngizokunika imibuzo mayelana nokuqonda. Futhi ngizokucela ukuba ubhale phansi izimpendulo.
- Ngizokunikeza omunye umsebenzi ovela encwadini yakho yesikole ukufunda.
- Ngemva kokufunda, ngizokunika imibuzo ethile mayelana nokuqonda. Kodwa manje ngizokucela ukuba ungitshele izimpendulo ngezwi. Uma wenza lokhu ngizokwenza ividiyo ukuze ngiyibuke kamuva.
- Ngizoxoxa nawe mayelana nemisebenzi yokuqala nokubili yokuqonda. Kule ngxoxo ngizokubuza ngalokho okuzwakalayo emisebenzini yombili.
- Okokugcina, ngizokucela ukuthi ubuke ividiyo engabhaliwe ye-cartoon ethatha imizuzu engaba ngu-3. Ngemva kokubukela, ngizokucela ukuthi ungitshele indaba yalokho okwenzekile ku-cartoon. Uma wenza lokhu ngizokwenza ividiyo ukuze ngiyibuke kamuva.

**Ngabe kukhona okubi okungenzeka kimi?**

Uma wenza lolu cwaningo, ngeke ukwazi ukulimala. Uma uzizwa unamahloni noma ungakhululekile awudingi ukukwenza. Azikho izimpendulo ezilungile noma ezingalungile futhi lo msebenzi ngeke ube yingxenye yombiko wesikole sakho.

**Ingabe kukhona okuhle okungenzeka kimi?**

Angazi ukuthi umu kulesi cwaningo kuzokusiza ngokufunda kwakho. Kodwa ngithemba ukufunda okuthile okuzosiza abanye abantu ngolunye usuku.

**Nginezinye izinqumo?**

Yebo! Ungakhetha ukungabi kulolu cwaningo.

**Ingabe kukhona owaziyo ukuthi ngisesifundweni?**

Ngeke ngitshele noma ubani owahlanganyela kulolu cwaningo. Uma sengikwenzile ngesifundo, ngizobhala umbiko ngalokho engikutholile. Ngeke ngisebenzise igama lakho kulo mbiko.a

**Kuthiwani uma ngingathandi ukwenza lokhu?**

Akudingeki ube kulolu cwaningo. Kuphuma kuwe. Uma uthi yebo, kodwa ushintsha ingqondo yakho kamuva, lokho kulungile. Okufanele ukwenze nje ungitshele. Uma ufuna ukuba kulolu cwaningo, sicela uthinte i-YEBO bese ubhalisa noma uprinte igama lakho. Uma ungafuni ukuba yingxenye yalolu cwaningo nje umkhawulo CHA futhi akudingeki ubhalise noma ubhale igama lakho. Ungagcina ikhophi yezinkomba ezizayo.

Uyawuqonda yini lolu cwaningo lokucwaninga futhi uzimisele ukuhlanganyela kulo?

| **Yebo** | **Cha** |
|---|---|
| | |

Ingabe umcwaningi uphendule yonke imibuzo yakho?

| **Yebo** | **Cha** |
|---|---|
| | |

Uyaqonda ukuthi ungakwazi ukukhipha isifundo nganoma yisiphi isikhathi?

| **Yebo** | **Cha** |
|---|---|
| | |

_____ _____

Igama lengane Isignesha yengane

_____ _____

Igama lomcwaningi Isignesha yomcwaningi

_____

Usuku