

A description of South African readers reading in Sepedi and English: Implications for education

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Thesis accepted for the degree Doctor of Philosophy in
Linguistics and Literary Theory at the North-West University

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Graduation: May 2020

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ACKNOWLEDGEMENTS

This study is dedicated to the Glory of God that enabled me to embark on this research: **Deo gratias** and His **Favour**.

This study would not have been possible without the financial assistance of the following:

- **NRF-Thuthuka** grant 2017-2019
- Funding by the research focus area **Understanding and Processing Language in Complex Settings (UPSET)** at the North-West University's Vaal Triangle Campus
- The funding of the institutional office of the North-West University for emerging researchers and the financial support of the office of the **Deputy Dean for Research and Innovation** during my six months' leave to finish this study, and
- The **NWU staff discount** contributions that allowed me to enrol for this PhD

After an intensive period of five years, today is the day that I get to write a note of thanks to putting the finishing touches to my dissertation. Undertaking this research has been an invaluable learning experience. Writing this report has had a huge impact on me and it has given me the opportunity to learn that although research can sometimes be frustrating and tedious, it can also be an immensely rewarding experience. I would like to sincerely acknowledge the following people who have contributed towards supporting and helping me throughout this study:

- My academic advisor: **Prof. Kenneth Holmqvist** – from hating numbers to using R and RStudio to analyse data – all due to you. Thank you for taking an interest in my study and providing insight, patience, valuable support and encouraging words during confusing times when I couldn't figure out the meaning of "getwd" "setwd". Thank you for assisting with the statistics and data analysis.
- My co-academic advisor: **Prof Susan Coetzee-Van Rooy**. Apart from the two of us, the walls of 7-109 to 6-107 know how far we have come to make this study what it is today. All those meetings we had when I was still trying to figure out what I wanted to do and you held my hand. Thank you for letting me spread my wings and supporting me from the beginning of this study until the end of it. You truly have been more than a co-academic advisor to me.
- My co-academic advisor: **Dr Esté Hefer-Jordaan**. You have opened my eyes to so many things when it comes to eye movement research. Thank you for being a part of my journey, for reading all those drafts and giving valuable feedback, and lastly, for your encouraging words.
- A heartfelt thank you to all the **anonymous reviews**, whose contributions and suggestions have helped shape this final thesis.
- Our school technical advisor, **Dr Gordon Matthews**, for setting up the eye-tracking laboratory and always being there to support me with technical issues and your encouraging words
- Former UPSET research director, **Prof Bertus van Rooy**, for helping me with my NRF Thuthuka application which shaped my PhD proposal. Your support is greatly valued. I will not forget the final recommendations and suggestions that helped shape the thesis.
- **Prof Gustav Butler**, thank you for your insight and financial support in order to register for my final year in 2019.
- The staff of the North West University Vaal Campus in the School of Languages, especially in **Academic Literacy**, for your support and encouraging words. You guys "ROCK".
- The **Free State Department of Education** and the **District of Fezile Dabi**, for permitting me to conduct the study at the school.

- **All the learners**, parents, teachers and the school principal for allowing me to conduct the experiments with the learners. All your efforts are greatly acknowledged as this study would not have been possible without you.
- **All the students** who took the time to participate in the experiment – without you this study would not have been possible.
- My friend **Dr Nkhensani Maluleke**, having travelled on this road, you always knew what to say to me and thanks for proofreading my proposal and this final thesis.
- I extend my gratitude to my mother (**Rahaba**) and my mother-in-law (**Norah**) for their emotional support and especially my mother-in-law for taking care of my daughter in my absence. And also thank you **Tebogo** for babysitting.
- Saving the most important for last, I wish to give my heartfelt thanks to my husband, **Goodman**, whose unconditional love, patience and continued support of my academic endeavours over the past several years enabled me to complete this thesis.
- Finally, my daughter **Thandolwethu**, who has given me so much happiness and for those moments when you asked to watch “Boss Baby” movie while I was busy typing. Thank you for understanding that Mommy is still in school.

Bathuši, montshepetša bošego ke mo leboga bo sele!

“Reading is dreaming with open eyes”

Unknown

ABSTRACT

The Simple View of Reading (SVR) framework suggests that successful reading comprehension posits that readers must process both decoding and linguistic comprehension. The current study examined the role of decoding and linguistic comprehension within the SVR with a sample of 29 high school learners (Grade 8-9) and 28 first-year university students. The data sought to answer the following research questions: what characterises the school and university readers of Sepedi and English in the study? To answer this question, participants were given a questionnaire to capture information about their language history, perception and attitude towards using Sepedi as a language of teaching and learning. The second research question is: within the theoretical framework of the SVR, what characteristics of decoding and comprehension define the reading of the Sepedi and English school and university participants and what conclusions can be made about the reading behaviour of the participants in the study for education? To answer this question, participants read generic and academic texts in Sepedi and English while monitoring their eye movements using an SMI iViewX Hi-Speed eye tracker and answering comprehension tests. The study employed two measures of reading in Sepedi and English (i.e. participants read the same Sepedi and English texts and did 2 different comprehension tests within a 5 weeks interval). Additional measures that were incorporated in the study include measuring the oral reading fluency of the participants by investigating the miscues made by readers once during the study. Apart from reporting the frequencies of data to provide a description of the reading behaviour of the participants, the study made use of Mixed Effect Model Regression (LMER) to report word frequency and word length data across language, measures and text type in order to investigate the decoding and linguistic comprehension abilities of the participants. The findings of the study revealed that the majority of the school and university participants were very positive about the use of Sepedi as a language of teaching and learning in both the school and university contexts. The global reading measures of eye movement showed that both groups of the participants had shorter saccades, many regressions, and longer fixation durations. Both school and university participants showed similar but inconsistent eye movement behaviour. Furthermore, the study revealed that school participants struggled to decode and comprehend, while the university participants were able to decode to a larger extent but experienced problems with comprehension. The study indicates that deeper reading problems develop during early school levels. The study concludes by considering the implications of the findings of the descriptive study of school and university readers of Sepedi and English within the SVR and for using the data gathered to consider its effect for the use of languages in education.

Key words: decoding, linguistic comprehension, participant perception, fixation duration, saccadic amplitude, regressions, word skipping, word frequency and length, gaze duration, oral reading fluency

OPSOMMING

Die *Simple View of Reading*-raamwerk (SVR) stel voor dat suksesvolle leesbegrip postuleer dat lesers beide dekodering en linguistiese begrip moet prosesseer. Hierdie studie het die rol van dekodering en linguistiese begrip binne die SVR met 'n steekproef van 29 hoërskoolleerder (Graad 8-9) en 28 eerstejaar-universiteitstudente ondersoek. Die data het gepoog om die volgende navorsingsvrae te beantwoord. Eerstens, wat karakteriseer die skool- en universiteitlesers van Sepedi en Engels in hierdie studie? Om hierdie vraag te beantwoord is 'n vraelys aan die deelnemers gegee om sodoende inligting oor hul taalgeskiedenis, persepsie en houding jeens Sepedi as taal van onderrig en leer, vas te vang. Die tweede navorsingsvraag is: binne die teoretiese raamwerk van die SVR, watter kenmerke van dekodering en begrip definieer die lees van Sepedi en Engelse skool- en universiteitsdeelnemers en watter gevolgtrekkings kan gemaak word oor die leesgedrag van die studiedeelnemers vir onderwys? Om hierdie vraag te beantwoord het deelnemers generiese en akademiese tekste in Sepedi en Engels gelees terwyl hul oogbewegings met die SMI iViewX Hi-Speed oognaspeurder gemonitor is. Hul het ook begripstoetse beantwoord.

Die studie het van twee meetinstrumente van lees gebruik gemaak in Sepedi en Engels (deelnemers het dieselfde Sepedi en Engelse tekste gelees en twee verskillende begripstoetse binne 'n vyf-weekinterval voltooi). Bykomende meetinstrumente is geïnkorporeer deur die mondelinge leesvlotheid van die deelnemers te meet deur die foute wat lesers gedurende die studie gemaak het, te ondersoek. Buiten dat die studie verslag gee oor die frekwensies van data om 'n beskrywing van die leesgedrag van deelnemers te verskaf, het die studie ook gebruik gemaak van die gemengde effek modelregressie (LMER) om verslag te lewer oor die woordfrekwensie en woordlengtedata oor taal, meetinstrument en tekstipe heen om sodoende die dekoderings- en linguistiese begripsvermoë van die deelnemers te ondersoek.

Die bevindinge van die studie het getoon dat die meerderheid van skool- en universiteitsdeelnemers baie positief is oor die gebruik van Sepedi as taal van onderrig en leer in beide die skool- en universiteitskonteks. Die algehele leesmeting van oogbeweging het getoon dat beide deelnemergroepe korter sakkades, baie regressie en langer fiksasieduur het. Beide skool en universiteitsdeelnemers het soortgelyke wisselvallige oogbewegingsgedrag getoon. Voorts het die studie blootgelê dat skooldeelnemers gesukkel het om te dekodeer en te begryp, terwyl dit vir die universiteitsdeelnemers in 'n groter mate moontlik was om te dekodeer, maar hul het probleme met begrip ervaar.

Die studie toon dat dieper leesprobleme in die vroeë skoolvlakke ontwikkel. Die studie word afgesluit deur die implikasies te oorweeg van die bevindinge van die deskriptiewe studie van skool en universiteitslesers van Sepedi en Engels binne die SVR en vir die gebruik van data wat ingesamel is om die effek daarvan vir die gebruik van tale in onderrig te oorweeg.

Sleuteltermes: dekodering, linguistiese begrip, deelnemerspersepsie, fiksasieduur, sakkadiese omvang, regressies, oorslaan van woorde, woordfrekwensie en -lengte, fokusduur, mondelinge leesvlotheid

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LIST OF ACRONYMS

ANA	Annual National Assessment
DBE	Department of Basic Education
FFD	First Fixation Duration
LMEM	Linear Mixed Effects Model
ANOVA	Analysis of variance
IALS	Indigenous African Languages
LoLT	Language of Learning and Teaching
UNESCO	United Nations Educational, Scientific and Cultural Organization
LMER	Linear Mixed Effects Regression
CAPS	Curriculum and Assessment Policy Statement
SMI	Senso Motor Instruments
ORF	Oral Reading Fluency
WPM	Word Per Minute
WCPM	Word Correct Per Minute
IIAL	Incremental Introduction of African Languages
DHET	Department of Higher Education and Training
BICS	Basic Interpersonal Communication Skills
CALP	Cognitive Academic Language Proficiency
PANSALB	Pan South African Language Board
PIRLS	Progress in International Reading Literacy Study
BSALs	Black South African Languages
ANC	African National Congress
MTE	Mother-Tongue Education
AOI	Area of Interest
SRD	Specific Reading Disability
SSA	Statistics South Africa
TALL	Test of Advanced Literacy Levels
LIX	Läsbarhetsindex
Sep	Sepedi
Eng	English

CHAPTER 1 INTRODUCTION, CONTEXTUALISATION AND PROBLEM STATEMENT

1.1 Introduction and contextualisation

Multilingualism is defined as speaking two or more languages (Milambiling, 2011:18). Multilingualism is a growing worldwide phenomenon due to the increase of migration and mobility of people and closely linked economies. Many countries, including South Africa, currently have significantly multilingual populations in their workforces and educational systems. In Africa as a whole, where over 2 000 languages are spoken, few countries use indigenous African languages as a medium of instruction beyond primary educational level (Madiba, 2012:16) in disciplines other than specific language courses (Prah, 2009). Bunyi (1999) stated that Africa is a highly multilingual continent. According to Spencer (cited by Bunyi, 1999:339), individual African countries are rich in languages: Nigeria has 400, Zaire 206, Ethiopia 92, Tanzania 113 and Sudan 21 (Bamgbose, 1991), yet most of these languages are not widely used for schooling instruction. Tanzania, for example, uses an African language “Kiswahili” as the language of teaching and learning from primary education through to university. As a result of the implementation of this language policy, Kiswahili has attained prominent status as the language of power and symbol (Moshi, 2006:167). This means that the language is widely used as a tool for communication in all domains, including prestigious domains such as education and the public sphere. A similar approach to the use of indigenous African languages has been implemented by Somalia, which had been colonised for decades. When Somalia switched to Somali as the language of learning and teaching, it benefited the education system tremendously until the war broke out and schools were closed. According to Warsame (2001), “firstly, the language of instruction in school had to be Somali, which offered a great advantage to students, as previously for nearly a century they had had to acquire their education in foreign tongues”. Secondly, the schools that were owned by foreigners were closed down. Thus “for the first time in the history of the country, the whole of Somalia acquired a standardised educational system” (Warsame, 2001:348).

In contrast to Tanzania and Somalia, it has been over two decades since the South African Constitution made provisions for the promotion and use of indigenous African languages (IALs), yet these languages have not been used as languages of learning and teaching beyond Grade 4 (Heugh, 2002; Makalela, 2005; Makalela, 2009). According to the Constitution of South Africa (Act 108 of 1996, section 6), there is a range of spoken language varieties, 11 of which have been granted official status, namely Sepedi (Northern Sotho), Sesotho (Southern Sotho), Setswana (Tswana), isiSwati (Swati), Tshivenda (Venda), Xitsonga (Tsonga), Afrikaans, English, isiNdebele (Ndebele), isiXhosa (Xhosa) and isiZulu (Zulu), which makes South Africa a multilingual and multicultural country. Despite the Constitution’s provision for the equality of these 11 languages, English is widely preferred for use in the education field, irrespective of the fact that only 8.2% of the population are native English speakers (Statistics South Africa, 2004:8). This is not to say that English is not important and should be stopped from being the language of teaching and learning, but that African languages speakers should be given an opportunity to make use of their home language in academic institutions by fostering an additive approach. Multilingual countries such as South Africa face several challenges in terms of language management. An area that is mostly affected is education, where a number of different language groups do not receive equal treatment. In this context, the development of reading materials in a variety of languages could provide extensive support for the implementation of multilingualism in the country. Extended reading programmes in a variety of local languages could provide all language groups with the opportunity to access materials in their respective languages in the education context. However, reading materials in indigenous African languages are not readily available, in contrast to the huge number of materials available in English and Afrikaans.

Currently, Western countries are experiencing a wave of multilingualism due to transnational migration into megacities, especially due to political unrest (Makalela, 2014:2). South Africa is also experiencing an increase in transnational migration, and the latest wave of transnational and internal migration is adding to the already complex identity matrix of people in urban centres that were originally formed during the extended period of colonisation and the four decades of apartheid. South Africa has always been “a multilingual country in which between 24 and 30 languages are spoken” (Finlayson & Madiba, 2002:41). “In this time of unprecedented contact among different language groups and cultures”, being proficient in “two or more languages can enhance understanding” of how language works and help to determine educational choices as well (Milambiling, 2011:18).

The South African Department of Education issued a language policy for higher education in 2002 which stated that universities have “to include in their rolling plans the strategies they put in place to promote multilingualism and ensure the development of all the official languages as academic and scientific language” (Paxton, 2009:346). This policy was strengthened in the more recent *Revised Language Policy Framework in Higher Education* (Department of Higher Education, 2018: 2), which states that:

The aim of the revised policy framework is to enforce the use of all official South African languages across all institutional functional domains: including scholarship; teaching and learning; and wider communication.

In response to the language policy in higher education, some institutions reacted by developing different ways to implement multilingualism in higher education in South Africa. Paxton (2009:346), for example, “describes a multilingual glossary project in the Economics Department” at the University of Cape Town which involved “students learning economics concepts in their home languages to broaden and enrich their understanding”. In order to implement the strategy of giving access to African languages into an academic environment, students discussed economics concepts in their home language (Xhosa) with their tutor, who spoke the same language. Paxton (2009:356) concludes by saying that without scaffolding concepts to broaden the knowledge of the students, they resort to rote learning because they do not fully understand the English texts and memorising is seen as the only way to acquire the information. Several approaches to implement multilingualism have recently been introduced at different higher education institutions (see, for example, the recent work by Makalela, 2016 and Antia & Dyers, 2016).

The language policy for higher education “explicitly promotes an additive approach to bilingualism (i.e. developing the home language together with the additional language which is the Language of Learning and Teaching, or LoLT)” (Pretorius & Matjila 2004:1). An example of supporting the additive approach is the multilingual programme developed by Ramani and Joseph (2002) at the University of Limpopo. Northern Sotho is spoken by approximately 9.1% of South Africa's population and is one of the three major Sotho languages in South Africa (Mesthrie, 2002:25; Mojela, 2008). According to Ramani and Joseph (2002), the programme aims to give students a platform for using their home language as the medium of instruction. According to Hornberger and Link (2012), students' work relies on code alternation to study literacy traditions such as private speech. The private speech of words and phrases forms much of the major part of the reader's consciousness, and it later becomes invisible and appears in the form of inner speech that takes on the role of self-regulation (Lee & McDonough, 2015). The process of using a private speech by the students in the multilingual programme provides them with an opportunity to use multilingual spaces to discover their own culture (Makalela, 2014).

Although the policy implementation of a bilingual schooling programme can be successful, this is not always the case – sometimes such a programme can be successfully implemented, but at other times implementation can fail due to certain factors and is not carried out. Developing countries such as South Africa can benefit greatly from effective bilingual schooling

programmes. The use of the mother tongue provides the basis “for comprehensible content-area instruction and literacy skills upon which competence in the second language can be built” (Benson, 2005: 249). The above statement is based on the assumption by Cummins in his Linguistic Interdependence Hypothesis. The theory states that certain L1 knowledge can be transferred positively to the acquisition of L2 (Cummins, 1978). Benson (2005) states that in developing countries, bilingual education “has great potential for the quality of basic education” (Benson, 2005: 251). Benson (2005) conducted a study in Mozambique and Bolivia. She describes the “challenges and suggests some lessons that can be learned about implementing bilingual programmes in the context of educational development” (Benson, 2005:249). As is the case with South Africa, the failure to implement bilingual education as part of official policy is often blamed on economic factors, especially where there are a lot of socio-economic problems as in South Africa. The findings of Benson’s (2005) study revealed that attendance at school improved greatly, especially by girls who had previously dropped out of school, where bilingual programmes were implemented compared to monolingual programmes. Parents were involved and happy because their children would become “literate in a language familiar to them and at the same time would gain access to communication and literacy skills in the L2”. They would acquire a “language and culture valued by formal institutions, and most importantly would attend school and have an improved chance of succeeding” (Benson, 2005:254).

For bilingual schooling to work well, parents and other locals need to support it. Mtenje (2013) argues that the implementation of a multilingual language policy in Malawi is supported by several factors: the availability of language scholars who support the policy with research and other activities; the existence of language associations that are interested in promoting local languages; and among others developing standardised orthographies which will make it easy for such languages to serve as media of instruction. The situation in Malawi is similar to that in South Africa in the sense that both countries gained independence in 1994 and primary school learners learn in their mother tongue from Grades 1 to 4. However, even though Malawi claims to have strengths that support its use of African languages, it has failed to implement the language policy. One of the recommendations for Malawi is that a proper language situation analysis should be done before the policy is developed.

This brief introduction and contextualisation emphasise the general struggle by education institutions at various levels in Africa to implement multilingual education language policies. The specific focus of this study is to explore the nature and usefulness of reading in two languages (an indigenous African language and English) in the South African basic and higher education context. The purpose of the study is to describe the reading behaviour pattern of high school participants and university participants to explore and understand reading proficiency to fill the gap in reading research focused on bilingual reading with the aim to examine the role of decoding and linguistic comprehension within the Simple View of Reading framework among university and school participants.

1.2 Research problem

Reading in two languages remains an under-explored and under-theorised topic in South Africa. In general, there is a paucity of research on reading in African languages in South Africa, and there is no data specifically on eye-tracking studies in Sepedi and English. The proposed study sought to close the gap by providing data for reading while using an eye tracker to observe the eye movements of first-year students and Grade 8 and 9 high school learners, as well as to add a theoretical contribution within the frame of the Simple View of Reading (SVR) in a South African context. One of the biggest issues that South Africa is facing is illiteracy, which is estimated at 12% for people from the age of 15 years and above. However, even literate people in South Africa struggle because the level of their literacy is inadequate for the needs of education, both in high school and at university, and this poses an equally important challenge

to be overcome. Children or students who are inadequately exposed to reading are at risk of experiencing challenges coping with academic work at institutions of higher learning. It is commonly noted that Afrikaans and English bilinguals have balanced proficiency levels (de Sousa, 2016). However, the African language and English bilinguals have difficulties in decoding and comprehension (de Sousa, 2016). This study fills the gap by investigating reading proficiency in Sepedi and English through an eye-tracking experiment and pen-and-paper comprehension texts.

It is reported by the United Nations Educational, Scientific and Cultural Organization (UNESCO) (2009) that adults who are functionally illiterate amount to 30% of the population of South Africa. Of all the 11 official languages, the nine African languages seem to suffer as there is a lack of supplementary materials in indigenous African languages; the absence of reading materials is regarded as the cause of the low literacy rates in African languages by several scholars (Hoffmann, Sailors, Makalela, & Mathee, 2010). Phokungwana (2012) found that bilingual Sepedi-English readers were either struggling in both Sepedi and English or competent in both languages. In her study, Phokungwana (2012) examined the reading levels of Grade 7 Sepedi-English readers, and she concluded that more can be done to investigate the reading behaviour of the participants through experimental studies on resourced bi-literate development (Phokungwana, 2012:99). Other researchers such as Land, (2015), Van Rooy and Pretorius (2013) and Hefer (2011) agree that reading is an important achievement for school-going children. However, if students do not have a good foundation and lack a reading culture, they cannot compete in the world.

In South Africa, learners in the foundation phase are given an opportunity to acquire education in their home language. The “advantage of acquiring reading skills in the mother tongue should be given precedence” (Land, 2015:170). This is because if learners are good at their home language, their knowledge of L1 can be transferred to learning a second language. This is evidenced in the study conducted by Van Rooy and Pretorius (2013), who found that good and skilled readers performed well in both isiZulu and English and unskilled readers struggled, irrespective of the language that they read in. Pretorius and Matjila (2004:18) believe that more research is urgently needed in order “to obtain local data on literacy development and reading abilities in African languages”. The comments by these scholars indicate that the reading of African languages is under-researched, and therefore, the present study will benefit researchers, policymakers and educators who can create and revise policies based on the results of the study. Teachers may benefit if the results indicate a change in the implementation within educational institutions. Finally, the study will benefit educators to facilitate learning and help improve their teaching practices.

1.3 The Simple View of Reading Theory

Gough and Tunmer developed the Simple View of Reading (SVR) in 1986 in their article titled “Decoding, reading and reading ability” with over 3500 citations (Google scholar, October 2019). The next article that carried the theory for the SVR forward was published by Hoover and Gough (1990) with over 2600 citations (Google scholar, October 2019). The SVR was developed to end the “reading wars” that took place in the 1980s and which goes back as far as 200 years according to Castles, Rastles and Nation (2018). According to Kirby and Savage (2008), the reading “war” developed because of disagreements about the importance of phonic decoding strategies as an essential aspect for early reading and therefore, as the main goal of the teaching of reading. On the other hand, researchers who were in support of “whole language” development suggested that the role of natural language and learning the applicability of this general language capacity was more important. These “reading wars” played out during the “language movement in literacy education” that took place in the United States and Canada, according to Kirby and Savage (2008:75).

1.3.1 The basic components in the SVR are presented in Figure 1.1

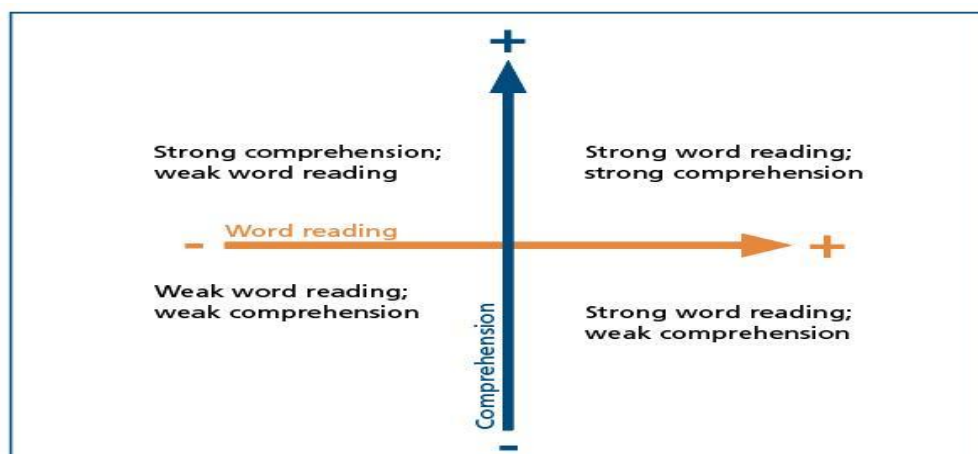


Figure 1. 1 The Simple View of Reading illustration as presented by Gough and Tunmer in 1986.

Reading is a pivotal and critical skill to acquire for a variety of reasons (Pardede, 2008). The SVR is a representation of a proposed structure for the development of skilful reading (Murray, 2016) as presented in figure 1.1. The SVR accounts for Reading Comprehension (RC) as comprising of Decoding (D) (presented as word reading in figure 1.1) and Linguistic Comprehension (LC) (presented as comprehension in figure 1.1) (Gough & Tunmer, 1986; Hoover & Gough, 1990; Savage, *et. al.*, 2015; Stott & Beelders, 2019). Reading comprehension (RC) is defined by Snow (2018) as a process whereby a reader extracts and builds word-meaning by interacting with the textual information. As can be seen from figure 1.1 strong comprehension requires that the reader has a strong decoding and strong linguistic comprehension skill. If learners have no decoding abilities, then it is impossible to achieve reading comprehension, even though they might be good at linguistic comprehension. Whereas lack of decoding skills is impossible to imagine (Kirby & Savage, 2008), the ability to recognise words (e.g. phonemic awareness, phonics) and to comprehend the text (e.g. vocabulary) results in successful reading comprehenders (Murray, 2016). The ultimate goal of reading is that when a person is taught how to read they should be able to read well and with comprehension. Reading comprehension can be predicted if decoding skills and linguistic comprehension skills are known. Decoding and linguistic comprehension are reading comprehension components that can be measured separately for their merits in investigating reading comprehension; however, they are both required for a successful reader. An individual can be a fluent speaker of any language (even a foreign language) without having the knowledge of the written form for the language. The only form of understanding will then be through listening comprehension. Therefore, through speaking and listening, one can be in a position to assign correct pronunciation but still experience problems with comprehension from print (Nation, 2019). Learners who have an outstanding understanding of the language orally still have no means of comprehending words from print if they cannot read.

1.3.2 Decoding (D)

Gough and Tunmer (1986) defined decoding (word reading as presented in figure 1.1) as the ability to read words “quickly, accurately and silently”. Gough and Tunmer (1986) explained that a skilled decoder is a reader who can read words that are isolated. The decoder should be able to read the words quickly, accurately as well as silently. Decoding (D) is one’s ability to apply

the alphabetical principle to crack the code that hide words behind letters and sounds. The process of Decoding is increasingly automatic as a person's reading abilities develop over their lifespan. Decoding goes beyond "sounding out words (Hoover & Gough, 1990) to the recognition of words" that are familiar and unfamiliar to the reader. Decoding then involves oral reading fluency, first fixation duration and gaze duration, word recognition (phonological awareness, decoding spelling, and sight recognition) phonemic proficiency, phonic decoding and letter-sound proficiency. Johnston and Kirby (2006) conducted a study by examining decoding as predictors of reading comprehension in SVR. The first measure was pseudo-word reading and the second measure was word identification. The findings of the study revealed that each measure (pseudo-word or word identification), when combined with linguistic word recognition, was a better predictor whereas pseudo-word reading was more related to sounding out words rather than whole-unit recognition (Santoro, 2012:16). Although the findings of this study are more relevant to younger and beginner readers, it is a good foundation for this study because, without these basics, it will be impossible for children to become successful reads.

1.3.3 Linguistic Comprehension (LC)

Gough and Tunmer (1986) define Linguistic comprehension as expressed in equation $D \times LC = RC$ as the process by which given information, sentences and discourse are interpreted (Santoro, 2012:17). Linguistic Comprehension (LC) (presented as comprehension in figure 1.1) is one's ability to understand complex narratives as they unfold over time using vocabulary skills and grammar skills. Linguistic Comprehension is defined by Gough and Tunmer (1986) as the ability to interpret information, sentences and discourse. Linguistic comprehension is regarded as complex because different people have different levels of comprehension and this is dependent on the types of texts they are reading and the reasons for reading the texts (Catts, 2018). It is, therefore, important to use different text types when one tests linguistic comprehension.

Linguistic comprehension is increasingly strategic, and it involves language comprehension, background knowledge, vocabulary, language structure, verbal reasoning and literacy knowledge. According to Perfetti and Stafura (2014), linguistic, orthographic and general knowledge are identified as the three constructs that underpin reading. This means that without any of the three constructs, reading becomes an impossible skill to possess or even groom. Researchers such as Johnston and Kirby (2006) and Tilstra *et al.* (2009) used measures of listening comprehension as predictors of reading comprehension. According to Cain and Oakhill (2006) and Catts *et al.* (2006), the relationship that exists between linguistic comprehension and reading comprehension is useful for both developing students as well as students with poor comprehension skills. This finding is very important and relates mostly to younger readers but it is very significant to the foundation of this study.

1.3.4 Reading comprehension (RC)

Measuring reading comprehension is a complex and broad construct (Santoro, 2012). Reading comprehension is defined by several measures namely: (a) reading a passage (that varies in length and text-type), and then responding to open-ended questions or multiple-choice items, (b) responding to cloze questions, by reading a passage and inserting words to complete a sentence and (c) reading sentences and pointing to an image that describes a sentence. Reading comprehension is operationalised by several measures; therefore, using two or more measures provide a more robust and reliable construct (Santoro, 2012:19). Also, Keenan *et al.* (2008) and Spear-Swerling (2004) stated that different types of tests measure different skills development levels of students. For example, if researchers want to measure reading comprehension that depends on decoding/word recognition skills then tests will be age-specific,

but the tests test differently. The article written by Castles, Rastle and Nation (2018) highlights the mismatch that exists between the knowledge about reading and the understanding of the public about reading. Their paper aimed to fill in the gap related to this mismatch.

To be successful in acquiring knowledge and for engagement in culture and democracy as well as to be successful in the workplace, it is essential to master reading (Castles *et al.*, 2018). In developed countries, there is an estimation of about 20% of 15-year-olds who are unable to attain a reading level performance that can allow them to function effectively in life (Organisation for Economic Cooperation and Development cited by Castles *et al.*, 2018:5). Reading means that one can understand the text, hence it goes beyond alphabetic skills. In this view, it is then significant for children to learn to recognise words and construct meaning to become successful readers. Therefore, it is of the utmost importance to understand how children advance beyond word decoding because reading comprehension is more than just word identification and hence, children who are unable to comprehend texts are illiterate.

Understanding a text is essential for reading. When beginners start to read they first learn to identify the individual words. In addition to word identification readers need to activate the meaning of the word appropriate for the context of the text. Secondly, the reader needs to have background knowledge of the word. Once the reader has background knowledge, they can make inferences. Reading has the potential to demand and require a “range of mental operations” that goes beyond recognising words (Castles *et al.*, 2018). Farrell *et al.* (2010) emphasise the fact that learners at every grade level must be provided with an opportunity to receive sufficient content knowledge to understand what they read.

1.4 Research objectives

The study aimed to examine the role of decoding and linguistic comprehension within the Simple View of Reading framework among university and school participants. The study was designed to investigate and describe the eye movement pattern of both university (first-year students) and school (Grade 8 and 9) participants. The objectives of the study are as follows:

- (i) The first objective of the study was to describe the university and school participants by firstly presenting information about their demographics which included gender, age, population ground and highest qualification of both mother and father. Secondly, the study presented data on the participants' language repertoires and their perceptions of home language, strongest language and second strongest, as well as data on the order in which they learnt the languages in their repertoires. Thirdly, the data present the participants' perceptions about their ability to speak, write, read and understand Sepedi and English as well as their perceptions on the importance and use of Sepedi in academia. Fourthly, the data present the perception based on learning and being exposed to a language and the contribution in different contexts. Lastly, the perceptions of the participants on their reading experiences in their strongest language, second strongest and third strongest language are documented and discussed.
- (ii) The second objective of this study was to present the characteristics of decoding and linguistic comprehension within the theoretical framework of the Simple View of Reading. To meet the objective, the study presented means and standard deviations of decoding variables (first fixation duration, gaze duration, regressions out of words, words skipped first, word per minute (WPM) and oral reading fluency) and linguistic comprehension (fixation duration, saccadic amplitude, regression percentage, words skipped totally and comprehension scores).

- (iii) The third objective of the study was to describe first fixation duration, gaze duration regressions out of a word, words skipped first, word per minute and oral reading fluency with relation to decoding.
- (iv) The fourth objective of the study was to describe fixation duration, saccadic amplitude, regression percentage, words skipped totally and comprehension scores concerning linguistic comprehension.
- (v) The fifth objective of the study was to present the implications of the findings for the Simple View of Reading.

A detailed description of the research objectives is presented in chapters 3 and 4.

1.5 Research questions

The following list presents the research questions for the study:

1. Overall research question: What characterises the university and school readers of Sepedi and English in the study?
1. Within the theoretical framework of the Simple View of Reading, what characteristics of decoding and comprehension define the reading of the Sepedi and English university and school participants in the study?
 - a) What conclusions can be made from describing first fixation duration, gaze duration, words skipped first, WPM and oral reading fluency with relation to decoding (word recognition)?
 - b) What conclusions can be made from describing fixation duration, saccadic amplitude, regressions, words skipped totally and comprehension scores with relation to linguistic comprehension?
2. What are the implications of the findings of the descriptive study of university and school readers of Sepedi and English for the Simple View of Reading and for using these languages in education?

1.6 Research approach

To achieve the objectives and the research questions outlined above, the study comprised a literature review and an empirical study.

1.6.1 Literature review

The literature review focused on the following components:

Part 1: Literacy and language policy

- Operationalisation of the definitions of bilingualism and multilingualism

- Providing an overview that situates Sepedi as a national and official language of South Africa
- Review of studies investigating the attitude of students towards learning through the medium of home language
- Providing an overview of language in educational arrangements in the context of basic and higher institutions
- Discussion of the CAPS policy document on languages of South Africa
- Providing an overview of the literacy levels in South Africa

Part 2: The Simple View of Reading (SVR)

- Introduction of the Simple View of Reading
- Gaps in the Simple View of Reading theory
- How SVR is used in the study

Part 3: Eye movement research

- Operationalisation of the definitions of reading and reading comprehension
- Definitions of eye-tracking measures that are used as indicators of reading performance in this study: fixation duration, first fixation duration, saccades, regressions, gaze duration, word skipped first, and word skipped totally
- Providing an overview of reading research using an eye tracker
- Providing an overview of the attributes of skilled and less skilled readers
- Providing an overview of oral reading fluency

1.6.2 Empirical research

The broad aim of the study was to gain insight and describe the reading of Sepedi-English multilingual university and school participants. This study made use of quantitative research methods (for example, a questionnaire with closed questions, eye-tracking measures and self-designed comprehension tests) by using a descriptive design. A descriptive study establishes associations between variables. The reading data were collected from two groups: university participants and school participants. A descriptive design is helpful to researchers when identifying “important variables to study quantitatively when the variables are unknown” (Creswell & Clark, 2007:75). In the next section, the components that were taken into consideration in the empirical part of the study are briefly described.

1.6.2.1 Participants

The participants in the study consisted of two different populations from which samples were drawn. Two populations participated in this study: population 1 consisted of a group of university participants consisting of first-year students and population 2 consisted of high school participants in Grades 8 and 9.

The University participants consisted of a sample of 29 first-year students who had started their Bachelor’s degrees and diplomas in 2017 at the participating university. The pre-requisite for the sample was that they should have graduated from Grade 12 with Sepedi as a Home Language subject. A questionnaire was administered to determine whether the participants had received primary and high school education for all their subjects in Sepedi or not. Furthermore, the purpose was to determine whether the participants had received their education through the medium of English from Grade 4 and that they still received training in Sepedi until they finished

high school. Sepedi, as stated in Statistics South Africa (2011), is a minority language with a population of 2.11% in the Vaal Triangle area where the study was conducted, amid Southern Sotho, which is the majority language in this area. The rationale behind choosing this site for research was that in this Southern Sotho-dominant area, Sepedi speakers are an interesting population because of their minority position of the language in the area. The findings of the study for this minority language would be useful for all minority languages in different contexts in South Africa. The second reason for working with Sepedi readers in the Vaal Triangle region was the feasibility and funding requirements. If the study was conducted in the Limpopo province, the author and promoters would have had to be relieved of their teaching duties, and replacements would have been required during the entire data collection process, which took six months in total. This was not possible due to a lack of funding during the conception of the study. Furthermore, in the Vaal Triangle region, the participants were very readily accessible to us, and they could be transported to the participating university's laboratory with relative ease, which also raised the quality of the data collection which could have been compromised by travelling a long distance with the equipment.

The university participants were selected from the Vaal Triangle area. They were first-year students at North-West University. The participants' home language was a minority within the surrounding area where they were exposed primarily to Southern Sotho, which is spoken by 73.13% of the population, with Sepedi being used by only 2.11% of the population. Since I was looking for Sepedi Home Language speakers, the participants came from other provinces and areas where Sepedi is a dominant language. There was no specific mean age of the participants; the only requirement was that the University students should have passed Grade 12 with Sepedi as the Home Language. First-year students were preferred to other levels since they were starting their degrees and thus provided an ideal population to supply reading patterns of bilinguals entering the university.

Furthermore, they had been recently exposed to Sepedi reading at school. Since the entire population was sufficiently small, the entire population could be used for the study. This type of research is called a census because data are gathered from every member of the population who meet the requirements of the study (see Chapter 3).

School participants comprised a population of 29 Grade 8 and 9 learners who were starting high school or who were in their second year of secondary school in 2017. The participants' home language was a minority language in the surrounding area in which they were exposed to Southern Sotho, which is spoken by 73.13% of the population, and where Sepedi is used by only 2.11% of the population. The participants were selected from the only school in the Free State that teaches Sepedi as a language. The rationale for selecting a school from the Free State was first because it was the only school in the province that teaches in Sepedi as a Home Language. Secondly, the school is a short distance from North-West University's Vaal campus, which was very convenient for data collection. There was no specific mean age of the participants; the only requirement was that the students should have passed Grade 7 with Sepedi as a Home Language. Grade 8 and 9 were preferred to any other level because these levels were the commencing levels for the senior phase. Another reason was that by the age of 12 learners are supposed to be proficient in the language that they use for schooling, and thus the Grade 8 and 9 population provide an ideal group to study reading behaviour patterns of bilinguals at the beginning of their senior phase level. For this group of participants, census sampling was also utilised. In other words, every learner who complied with the selection requirements was included in the study. The permission of their parents was obtained and they signed an assent form (see the discussion on ethical considerations in Section 1.7 of the study).

1.6.2.2 Equipment

The study used an SMI iView Hi-Speed eye-tracking system to monitor participants' reading behaviour while reading a text. "The Hi-Speed system is a dark pupil system which uses the pupil/corneal reflection method. It is an integrated module with a built-in high-speed camera and an ergonomic chin and forehead rest that keeps the participant's head in position in front of the camera" SMI (cited by Hefer, 2011:71). "The Hi-Speed eye-tracker used for the study was a 500 Hz monocular system. It has a sampling rate of 500 Hz, which means that it takes 500 images of the eye per second, calculating the pupil position, pupil size and relative head movement" (SMI, 2009:191). Eye movements were recorded from the dominant eye only with a binocular view.

1.6.2.3 Instruments

The following instruments were designed and used for data collection in the study:

In this study, two measures of reading in Sepedi and English were conducted for both groups of participants (from the university and the school) and for both text types (academic and generic text types) to address concerns by scholars that reading studies often use only one measure and that the inclusion of more measures provide more comprehensive insights into the reading behaviour of participants. The reading comprehension texts that were used on the eye tracker were designed to be appropriate for the two populations that participated in the study. In project 1 (involving first-year university participants at the participating university), 2 000 to 3 000-word texts (see Chapter 3) were used during measure 1 and measure 2. The participants were presented with both L1 (Sepedi) and L2 (English) texts, both generic and academic. After reading each of the texts on the eye tracker, the participants answered a brief comprehension test that comprised ten multiple-choice questions to determine whether they understood the texts.

For school participants, 500 to 1 000-word texts (see Chapter 3) were used during measure 1 and measure 2. The participants were presented with both L1 (Sepedi) and L2 (English) texts, both generic and academic, which were appropriate for high school level. After reading each text, the participants answered a brief comprehension test that comprised ten multiple-choice questions to determine whether they understood the texts.

All the participants also completed a questionnaire that included sections about their language history, and their attitudes towards and perceptions on the use of Sepedi as a language of teaching and learning. The questionnaire was designed by Coetzee-Van Rooy (2000, 2010, & 2012) and adapted from Bornman (1995). I also added sections relevant to the purpose of the study. The questionnaire was administered after the participants finished reading measure 1 of the texts.

The questionnaire (adapted from Coetzee-Van Rooy, 2012; 2013) consisted of three sections (Coetzee-VanRooy, 2012; 2013:185):

"In the first section, the participants were asked to give informed consent (by the university participants and by the parents of learners for the school participants; in addition, assent was obtained from the learners) allowing their data to be collected and reported anonymously. In the second section, the biographical data of the participants were gathered (e.g. gender, age, qualifications of parents). In the third section, questions were asked about the language history, experiences and perceptions of proficiency of

the strongest languages included in the multilingual repertoires of the participants (different languages that the participants knew and used)".

1.6.2.4 Data collection procedures

To set up and calibrate the experiment, the participants were seated in a chair facing a computer monitor while their head was placed in the chin rest of the eye tracker to minimise head movements. While the participant was seated, the height of the chair and the table, the position and focus of the camera were adjusted for optimal tracking. During the adjustments, the stability of the eye image, pupil threshold and corneal reflex were observed and set. The calibration of the eye tracker was done for all participants using a standard 9-point grid and calibration procedure; accuracy was checked with a 4-point grid. After calibration, the participants were instructed to read silently at their own pace. The text was split over a number of pages on the screen, and the participants continued to the next page by pressing the spacebar on the keyboard. After the participants had completed reading each text, they were given a pen-and-paper multiple-choice comprehension test.

The participants were informed before reading the text that they would be tested afterwards (in other words, they knew that they would have to write a comprehension test based on the comprehension text that they were to read on the computer), and that the eye tracker would record their eye movements. Because reading speed was not an important outcome measure, the students were not given a time limit for reading the text. Each participant completed the questionnaire right after completing the reading on the eye tracker and completed the comprehension test. The participants were not expected to complete all the comprehension tests in one day, but it was up to them to decide when to do the tests. In order to counterbalance the texts that were read, some participants started by reading English academic texts while others started with Sepedi academic texts. Another group started by reading English generic text, and others started with Sepedi generic text. The participants did four tests per day with sufficient breaks in between where possible.

1.7 Oral reading fluency test

As there is a lack of standardised tests to assess reading in African languages, I, therefore, used other assessments in my study, such as ORF (Oral Reading Fluency). I collected data on reading speed, although the aim was not to measure reading speed but to observe and describe the reading speed as part of the participants' reading behaviour because there is no available data for African language reading. To measure the oral reading proficiency of the university participants and school participants, they read a text aloud where I used an audio recorder. It is expected that students at tertiary level should have mastered reading materials at Grade 12 level, whereas Grade 8 and 9 learners are expected to have mastered these materials as well. This process was done after completing measure 1 of the reading tests. Since there are no standardised reading tests in South Africa for African languages, the study contributed data on reading speed.

1.8 Data analysis

The data analysis processes will be discussed in detail in Chapter 3. The processes are complex and to present a simplified description in this part of the thesis would be difficult and could result in unnecessary repetition in the thesis, therefore a detailed description is presented in Chapter 3. Apart from ordinary frequency measures used to summarise the findings from the

questionnaire, an LMER analysis was used to analyse the eye-tracking data. The data were organised in a Microsoft Excel file and later converted to a .txt file for analysis in R.

1.9 Additional empirical conditions: Providing an extended reading programme in Sepedi

An extended reading programme was created as an additional reading experience that supported the empirical conditions of the study. The purpose of making available an extended reading programme to the participants was to expose them to additional reading materials in Sepedi. It is noteworthy that there is a paucity of reading materials in African languages, Sepedi included. This study compiled booklets for both university and school participants, and as part of the research, they were requested to read and complete the booklet within five weeks. The information from the extended reading programme was examined together with the questionnaire items that documented the language attitudes of the respondents that asked participants how often and how proficient they are with reading different types of materials in Sepedi. The extended reading programme was not viewed as an intervention as no improvement in Sepedi reading was expected by the participants. The provision of an extended reading programme in Sepedi was introduced to support the experiences of the participants with the reading of Sepedi.

1.10 Ethical considerations

The participants who took part in the experiments were informed about the use and functions of the eye tracker equipment and were also informed about the expectations derived from the experiment that they would be taking part in (in other words they were told that they would read a static text, write a comprehension test, take a reading fluency test, and complete a questionnaire). The participants were informed that their participation was voluntary and that they can cease their participation at any time if they wish to do so. Before completing the experiment, the participants were given consent forms to sign that gave the researcher permission to:

- Record their reading of the static text, and also record their test scores
- Access their personal information that they provided in the questionnaire in order to view as well as to analyse the information
- Anonymously report the data that were gathered from the questionnaire as well as the test scores and the eye-tracking data of the static text reading in the thesis, in academic articles and at academic conferences

A detailed consent form was issued to the participants before the experiment was completed because it contained important information on the purpose of the study. For Grade 8 and 9 learners, the procedure was different because they were minors; therefore, their parents signed the consent forms on their behalf, and the learners signed an assent form for participation. The study received ethical clearance from the NWU ethics committee for Language Matters (ethics clearance number: NWU-00305-17-A8).

1.11 Chapter divisions

Relevant literature on the issues of literacy in South Africa will be discussed in **Chapter 2**. The review gives an overview of multilingualism and bilingualism as tools to develop languages. The chapter presents the Simple View Reading (SVR) framework as the driving theory that lays a foundation for the study. The chapter also gives an overview of eye-tracking research that pertains to reading. Emphasis is placed on reading and reading comprehension, measures using eye-tracking technology and oral reading fluency tests measured by an audio recorder.

Chapter 3 discusses the methods that were followed in the current study. The chapter discusses the setting and the participants of the study and the sampling method that was used in the study. Furthermore, the chapter gives information about the materials and instruments used, such as the reading texts, comprehension tests, oral reading fluency, the language attitude questionnaire and the extended Sepedi reading programme that was made available to participants. Chapter 3 further discusses the data collection procedure and data analyses.

In **Chapter 4**, the findings are presented, discussed and interpreted by using the research questions to guide the order in which the results are presented.

Chapter 5 gives a summary of the research findings, contributions of the study and implications for education. The chapter further presents recommendations for future research and limitations arising from the study that needs to be considered in future studies of this nature.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

In the context of South African education, there is a paucity of research on African languages and their usefulness in education. One gap in research is studies of the bilingual reading of students and learners in their home language (Sepedi in this study) and English. Studies of Sepedi and English reading are important because of the influence of reading competence on academic success. This chapter presents a comprehensive literature review of this field to provide developed and operationalised definitions to be used in the empirical study and to create a composite of significant concepts. This is necessary to gain a deeper understanding of the underlying issues that underpin this research. Furthermore, the literature review will also assist in the description and analysis of the data.

This chapter is divided into three parts. The first part includes the introduction and the operationalisation of the various concepts used in the study (e.g. bilingualism and multilingualism). In addition to these sections, part one of the chapter also includes further contextualisation of the position of Sepedi in South Africa. Furthermore, the literature will also look at Sepedi orthography. Also, the attitudes and motivations of learners to learn in home languages in South Africa, a review of the languages used in education in South Africa in basic and higher institutions, the CAPS policy document on languages in South Africa and an overview of the literacy levels in South Africa are presented. The second part of the chapter summarises the literature review examining and investigating word recognition (decoding) and linguistic comprehension as elements used in the Simple View of Reading (SVR) theory. Findings from other frameworks related to decoding and linguistic comprehension are also offered in the chapter to ensure that a comprehensive overview of existing findings is offered as background to the current study. The third part of the chapter explores eye-tracking reading research in detail. It begins by defining terminologies such as reading and reading comprehension that will be utilised in the study. Concepts of eye-tracking reading measures such as fixation duration, first fixation duration, saccades, regressions, gaze duration and word skipping are also defined. In addition to the discussion of these concepts, a review of the existing reading studies using eye trackers is presented. Furthermore, detailed findings that compare the differences and similarities of skilled and less skilled readers, findings from eye-tracking studies that use a variety of texts to measure eye movements, and an overview of oral reading fluency in different studies to examine how similar or different the data are in previous research, are presented in part two of the chapter. The final section of this chapter presents concluding remarks relevant to all the material presented in this chapter.

2.2 Concepts used in the study

Before reviewing the relevant literature for this study, it is of the utmost importance to operationalise some important concepts that pertain to the study. The section below provides an overview and definitions of bilingualism and multilingualism. It also provides an overview of work done on Sepedi as an official language, attitudes towards African languages as languages of instruction in schools and at university, languages in education, the CAPS policy document and literacy levels in South Africa.

2.2.1 Bilingualism

The concept of bilingualism is very complex as it means different things to different people. Franson (2009:1) states that bilingualism is the minimum to the maximum level of proficiency where a speaker can function fully with two languages. Franson (2009) defines four types of bilingualism:

- (i) People call themselves bilinguals because they can *communicate orally* in more than one language
- (ii) People call themselves bilinguals. After all, they can *read* in two languages
- (iii) People may be bilingual due to simultaneously learning two languages from birth. This is what Grant and Dennis (2017) refers to as the “early sequential bilingual.”
- (iv) Lastly, people may call themselves bilingual when they add a second language to the first language. This type of bilingualism can refer to a person speaking one language at home while learning to speak another language at school, also referred to as an “early sequential bilingual” (Grant & Dennis, 2017).

Bilingualism refers to the second language that is used for special purposes such as studying at school (Nagel, *et al.*, 2015:219). Functional bilingualism is sometimes called “dominant bilingualism” which refers to a person who possesses a greater proficiency in a language that he uses more often compared to other languages that he knows (Peal & Lambert, 1962). For this study, the concept “bilingualism” is operationalised as “functional bilingualism” which, according to Wei (2000:6), refers to “someone who can operate in two languages with or without full fluency for the task at hand”.

The South African Basic Education system supports additive bilingualism as a way to promote multilingualism (DBE, 2018). The language in the education policy framework for South African schools recommends that schools should maintain a home language while also providing access to English used as an important medium of instruction in education (DBE, 2018).

2.2.2 Multilingualism

Multilingualism is defined by Haugen (1956) as multiple bilingualisms. Multilingualism is common worldwide, and no country is linguistically homogeneous (Boakye, 2015). Africa is a multilingual continent ranging from two languages in Burundi and Rwanda to a maximum of about 400 in Nigeria. A majority of the countries in Sub-Saharan Africa have an African language spoken by more than 50% of the population (Ouane & Glanz, 2010). Currently, many universities promote multilingualism because it “is a necessity for many people worldwide, whether it is because their parents came from different language backgrounds because their home, regional, national or school languages are different, or for a variety of other” reasons (Milambiling, 2011:18). The South African language policy is said to be promoting multilingualism, although language practitioners of African languages are concerned that their languages are now being marginalised more than ever before (LANGTAG cited by Broeder, 1998). LANGTAG (cited by Broeder 1998) states that the policy should promote multilingualism, facilitate access to education, should use a student’s primary language as a language of teaching and learning by applying the additive multilingualism framework, and encourage language acquisition by adding one or two South African languages to their home language. The Department of Basic Education (DBE) is progressing with its programme for the Incremental Introduction of African Languages (IIAL) at primary schools. The DBE annual report for 2018 states that full implementation would be from 2018 (DBE, 2018:67). The implementation will take time as there are reports that schools are struggling to implement the programme due to, among other things, lack of learning and teaching materials and trained teachers who can present subjects such as Mathematics in Sepedi (DBE, 2018:70). For the participants in this study, there is a clear mismatch between what is happening at schools and what is happening at university. The participants in this study still used English as the language of teaching and learning at school. They are not used to a situation in which their schools actively use an African language informal teaching and learning contexts. But the institutions of higher learning were tasked to develop a language policy, which promotes a non-racial society

with respect to African languages (DHET, 2018). Mesthrie (2007:5) believes that if a language “lacks prestige, has low socio-economic value, and there is a lack of a systematic vernacular education” then it is threatened by English due to its high usage in all domains, especially among the youth. The educational language policies in South Africa clearly aim to address this potential risk.

African languages will not experience any threat if the additive bilingualism policy is utilised. Dyers (2008) stated that multilingualism has become the norm in South Africa. Dyers (2008) studied the use of languages in the intimate domains of families. The use of language in intimate settings refers to using a language among family members, friends and relatives. For example, a child that is born in a family where the mother uses both Sepedi and English and the father uses isiSwati and English for communication purposes is already exposed to three languages at home and in intimate situations, and that makes the child a trilingual (Hoffmann, 2001) because of his or her ability to use one or two languages for communication purposes. Since the family is located in an area where the child is exposed Sesotho as a dominant language, the child is exposed to a fourth language in addition to English at school. From this scenario, it shows that it is not uncommon for African language speakers today to know two or three African languages in addition to their home languages, and this is especially true for South Africans who grew up in townships and more urban settings.

English is regarded as the language of power due to its social, economic, political and educational influence (Reagan, 2004). We cannot deny that indigenous African languages continue to have a role in socio-cultural identities (Dyers, 2008:113). Indigenous South African languages have the potential to be maintained and to grow in the domains of cultural identity. In multilingual societies in South Africa, one or more language varieties may be used in one or several areas. For example, they are using a local African language in public services such as home affairs, municipalities and social development offices.

For this study, multilingualism is defined as the use of multiple languages for a variety of purposes.

2.3 The position of Sepedi as a national language

This section provides background information on situating Sepedi as one of the official languages in South Africa.

2.3.1 Sepedi or Sesotho sa Leboa or Northern Sotho?

Northern Sotho is a collection of approximately 30 related dialects that are mutually intelligible. Historically, Sepedi (one of the many dialects of Northern Sotho) was developed by the German missionaries who developed the Sepedi orthography because that is where they settled in South Africa. Sepedi, as used in the constitution as the name of a language, is not used correctly because Sepedi is a *dialect* and using Sepedi instead of Northern Sotho excludes other dialects. Currently, the Department of Basic Education acknowledges Sepedi as the official language and as noted in the constitution in 1996. For the purpose of this study, Sepedi is used instead of Northern Sotho as acknowledged in the constitution.

2.3.2 Sepedi Orthography

The orthographic development of Sepedi begun in 1861 by the Berlin Missionary Society when they started by translating the bible into the local vernacular of the communities where they settled during the 1900s in Limpopo among the Bapedi people. The Northern Sotho orthography followed the conventions of German. In 1928, there were more attempts to produce a Sepedi writing system. Before 1961, the three Sotho languages (Sepedi, Setswana and Sesotho) were

treated as one with regard to the orthographic matters. But after 1961, the three Sotho languages (Sepedi, Setswana and Sesotho) were treated as separate languages during the apartheid era. The division of the three languages is generally based more on historical and social factors than on linguistic factors.

The Sepedi language has seven vowel sounds: a, e, ê, i, o, ô and u compared to English with only five vowel sounds. Generally, in Sepedi a noun stem can never be used on its own; a valid prefix must prefix it. The noun stems take two types of prefixes for singular and plural. For example, the Sepedi noun stem for the door is “-bati”. The noun takes the singular prefix “le” to form “lebati”, and for “doors” it takes the plural prefix “-ma” to form “mabati”. In Sepedi, there are 14 noun classes. The formation of many grammatical constructions depends on the noun class of the noun being used. The agglutinating nature of Sepedi orthography influences the difficulty levels of texts in Sepedi because of the relationship between the length of words and reading difficulty (discussed further in Chapter 3). The table below provides an overview of the noun classes for Sepedi.

Table 2. 1 The noun classes for Sepedi

class	prefix	subject concord	emphatic/absolute pronoun	possessive pronoun	object concord	demonstrative			consecutive/narrative concord	possessive	verbal relative
						this/these	that/those	that/those (yonder)			
1	mo-	ó	yêna	gagwê	mo	yô (ê)	yôo (êo)	yôla (êla)	à	wá	yô a
2	ba-	ba	bôna	bôna	ba	ba	bao	balé	bà	bá	ba ba
3	mo-	o	wôna	wôna	o	wô (ô)	wôo (ôo)	wôla (ôla)	wà	wá	wô o
4	me-	e	yôna	yôna	e	yê (ê)	yêo (êo)	yêla (êla)	yà	yá	yê e
5	le-	le	lôna	lôna	le	lê	lêo	lêla	là	lá	lê le
6	ma-	a	ôna	ôna	a	a	ao	alê (ala)	â	á	a a
7	se-	se	sôna	sôna	se	sê	sêo	sêla	sâ	sá	sê se
8	di-	di	tšôna	tšôna	di	tšé	tšêo	tšêla	tšà	tšá	tšê di
9	n-/m-/	e	yôna	yôna	e	yê (ê)	yêo (êo)	yêla (êla)	yà	yá	yê e
10	di-	di	tšôna	tšôna	di	tšé	tšêo	tšêla	tšà	tšá	tšê di
14	bo-	bo	bjôna	bjôna	bo	bjô	bjôo	bjôla	bjà	bjá	bjô bo
15	go-	go	gôna	gôna	go	mô	môo	môla	gwà	gá	mô go
16	fa-	go	gôna	gôna	go	fa, mô	fao, môo, kua	falê, môla kuuua	gwà	gá	mô go
17	go-										
18	mo-										
1 p.s.		ke	nna	ka	n-				kà		
2 p.s.		ó	wêna	gago	go				wà		
1		o	yêna	gagwê	mo				â		
1 p.p.		re	rena	rena/gêšo	re				rà		
2 p.p.		le	lena	lena/gêno	le				là		
2		ba	bôna	bôna/gabô	ba				bà		

The focus of the rest of the section is on providing a spectrum of the positions that Sepedi fills as an official language used in South Africa. The South African Constitution of 1996 approved the following 11 languages as official languages: Sepedi, English, Setswana, SeSotho, siSwati, Tshivenda, Xitsonga, Afrikaans, isiNdebele, isiXhosa and isiZulu. Languages help people to foster a sense of belonging and self-identity (Magwa, 2015). In 1937, orthographies for both Setswana and Sesotho sa Leboa were devised in both South Africa and Botswana (Ribeiro, 2010). Sesotho sa Leboa, or Northern Sotho, is a home language to 9.1% of the South African population (or a total of 4 208 980 speakers according to Census 2011). According to the South African Constitution of 1996, the designation of Sesotho sa Leboa instead of Sepedi (which is the main dialect) was included in the Interim Constitution of 1993. Sesotho sa Leboa or Northern Sotho is a language spoken by 54.8% of the population in Limpopo (Census, 2011). There are about 11.2% in speakers of the language Gauteng and 10.2% in Mpumalanga. When the Constitution was published, Sepedi was recognised as the name of the official language instead of the term “Sesotho sa Leboa” or “Northern Sotho” as it was initially depicted in the South African Constitution of 1996. This was deemed incorrect because Sepedi is among the

30 recognised dialects of Sesotho sa Leboa or Northern Sotho. Previous studies conducted on African languages refer to Northern Sotho, while recent and current studies might refer to Sepedi. There is much debate regarding the designation of Northern Sotho as Sepedi (the dialect of Northern Sotho), which was initially stated in the Interim Constitution of 1993. In other words, Sepedi is recognised as the national language in place of Northern Sotho. Sepedi and Northern Sotho refer to one language, and they are used interchangeably by many researchers. The National Senior Certificate from UMALUSI (Quality Assurance Authority) recognises Sepedi as the national language and thus issues their certificates with Sepedi as the home language. Home language textbooks are also labelled as textbooks of Sepedi and not of Northern Sotho. According to PANSALB, the terms Sesotho sa Leboa or Northern Sotho must be promoted because, while there may be many people who speak Sesotho sa Leboa or Northern Sotho, not all people speak Sepedi. The Northern Sotho dialects, in addition to Sepedi, include Masemola (Masemula, Tau), Kgaga (Khaga, Kxaxa), Koni (Kone), Tswene (Tsweni), Gananwa (Hananwa, Xananwa), Pulana, Phalaborwa (Phalaborwa, Thephalaborwa), Khutswe (Khutswi, Kutswe), Lobedu (Khelobedu, Lovedu, Lubedu), Tlokwa (Dogwa, Tlokoa, Tokwa), Pai, Dzwabo (Thabine-Roka-Nareng), Kopa (Ndebele-Sotho), Matlala-Moletshi. The dialects Pai, Kutswe and Pulana are more divergent and are sometimes called “Eastern Sotho” (Erberhard *et al.*, 2019). It is in light of this situation that the current study opted to use Sepedi instead of Northern Sotho, seeing that Sepedi is used at school and learners will be familiar with this label for the language. The table below shows the population of Sepedi nationally, with the highest number of speakers in Limpopo (2 826 464) and the lowest in the Eastern Cape (2 431).

Table 2. 2 Population by first languages spoken and province (South African Census, 2011)

First Language	WC	EC	NC	FS	KZN	NW	GP	MP	LP	SA
Afrikaans	2 820 643	683 410	606 225	340 490	161 876	309 867	1 502 940	289 446	140 185	6 855 082
English	1 149 049	362 502	37 842	78 782	1 337 606	120 041	1 603 464	124 646	78 692	4 892 623
IsiNdebele	15 238	14 854	6 023	10 008	111 657	43 988	380 494	403 678	104 283	1 090 223
IsiXhosa	1 403 233	5 092 152	60 187	201 145	340 832	190 601	796 841	48 993	20 275	8 154 258
IsiZulu	24 634	31 634	8 501	118 126	7 901 932	84 835	2 390 036	965 253	62 424	11 587 374
Sepedi	8 144	14 299	2 431	7 395	20 555	83 999	1 282 896	372 392	2 826 464	4 618 576
Sesotho	64 066	158 964	14 136	1 717 881	79 416	201 153	1 395 089	138 559	80 299	3 849 563
Setswana	24 534	12 607	373 086	140 228	52 229	2 191 230	1 094 599	71 713	107 021	4 067 248
Sign language	22 172	42 235	3 933	32 910	48 575	14 924	52 744	8 932	8 230	234 655
SiSwati	3 208	2 020	648	2 246	8 347	12 091	136 550	1 106 588	25 346	1 297 046
Tshivenda	4 415	3 663	1 083	2 592	4 309	16 255	272 122	12 140	892 809	1 209 388
Xitsonga	9 152	3 092	1 201	8 039	8 936	127 146	796 511	416 746	906 325	2 277 148
Other	127 117	36 893	12 385	15 935	77 519	60 872	371 575	39 639	86 322	828 258
Total	5 675 604	6 458 325	1 127 683	2 675 777	10 153 789	3 457 004	12 075 861	3 998 726	5 338 675	50 961 443

Prior to 1994, African languages were not considered as official languages, nor were they considered equal to Afrikaans and English. Afrikaans and English were favoured as the languages of government (Chick & Wade, 1997). African languages were neglected and did not enjoy the same status as other languages such as Afrikaans and English.

Learning in one's home language is vital because it fosters inclusion in education (Smith & Baar, 2008). For this to take place, learners must have acquired basic interpersonal communication skills (BICS) in the language of teaching and learning before they begin school, and they must also develop cognitive academic language proficiency (CALP) as soon as they begin to read and write, which exposes them to a wide range of materials. It is noted that black South Africans generally do not have a reading culture but an oral culture or a story-telling culture (Pretorius, 2002). This prevailing factor is evident in various aspects of South African society, especially in socio-economic issues such as poverty and unemployment. The Progress in International Reading Literacy Study (PIRLS) that was done in 2006 reflected South Africa as the worst-performing country with an overall score of 302 at a benchmark of 500. In South Africa, Grade 4 learners were tested in their fourth year level of schooling on a population with a mean age of 10.9 years. The score for Sepedi learners was just above 200 (Howie *et al.*, 2008) with 9.1% of speakers in South Africa, and the lowest was Isindebele with 176, a language

spoken by about 2.1% of South Africans, while English scored 346, with 60% of the participants being second language speakers (South African Census, 2011). The international norm indicated that 78% of learners tested on the PIRLS could answer questions on explicitly stated information, while in South Africa, only 12% “could answer the questions at the first literal level and they could not answer questions when reading in their mother tongue” (Pretorius & Lephahala, 2011:2). According to De Vos *et al.* (2015), literacy levels in South Africa cut across race and class divisions because all South African language learners failed to reach the minimum benchmark of 400 when tested on PIRLS. Annual National Assessment (2011) tests (DBE 2010a) also indicated literacy and numeracy levels of less than 40%, which indicates that learners are reading below their expected reading proficiency.

Cummins (1981) and other scholars such as Makalela (2010; 2012), Pretorius and Mokhwesana (2009), Vesely (2000), Alexander (2000) and Makori (2005) support early mother-tongue education. According to Cummins (2000), mother-tongue education has benefits even for later developments:

(a) bilingualism confers linguistic advantages on children, and (b) abilities in the two languages are significantly related or interdependent. Bilingual children perform better in schools which effectively teach the mother tongue, and where appropriate, develop literacy in that language. By contrast, when children’s mother tongue is allowed to atrophy, and its development stagnates, the children’s personal and conceptual foundation for learning is undermined (Cummins, 2000:18).

Banda (1998) contends that it is hardly encouraging to say to black learners “learn through your mother-tongue because it is the language of your ancestors and culture”, because students primarily desire upward socio-economic development. If the mother-tongue language offers opportunities for education, jobs, accessibility to communication, and economic, political and industrial success, then it offers great motivation for students to consider appreciating that language more.

The student’s home language is supposed to provide “a strong curriculum to support the language of learning” (DBE, 2002:4). To be successful in their schooling years, Pretorius and Matjila (2004:3) state that:

All children must have acquired BICS (Basic Interpersonal Communication Skills) in their primary language by the time they start school. Using the home language as the LoLT (Language of Learning and Teaching) requires that learners develop CALP (Cognitive Academic Language Proficiency) in their home language. Therefore, learners start acquiring CALP when they learn to read and write, and are exposed to written forms of language, first via easy readers and then via a range of increasingly more complex narrative and expository texts.

Pretorius and Mokhwesana (2009:70) argue that if learners are not given early support when they start with readings in an African language as the home language, they will have a developmental trajectory deficit and will experience problems with their reading skills as they continue with school. According to Plüddemann (2015: 168), if children are to develop a strong foundation, then they should be taught in the language that they understand. In South Africa, the situation is rather different because the majority of South Africans are being taught in English, which is spoken as a home language by only 9.6% of the population (Census, 2011). Although it is good to understand and speak English fluently in South Africa, black communities are struggling to read in both their home language and English. Those who are good readers read well in both their home language and English. Shembe (cited by Pretorius & Matjila 2004:2) describe “how university participants who wrote their practical Chemistry examination in Zulu performed better than their peers, who studied the subject in English”. These findings

illustrate that African languages play a role in the success rate of the students if their home language is activated.

2.4 Perceptions towards African languages as Languages of Teaching and Learning

Attitude is defined by Gardner (1985) as a set of beliefs to act upon or to evaluate behaviour in a certain way. According to Todor and Degi (2016:124), the learners' attitude towards "language learning and their efficiency in learning the language is influenced by motivation". Measuring the level of motivation by examining learners' attitudes towards learning the language is a step in the right direction because it shows that attitude and motivation are interconnected.

Most of the time it is parents who contribute to the learners' attitude because they opt to send their children to an English-medium school in the hope that they will receive the best education. This attitude threatens the survival of many indigenous languages. In Nigeria, most parents send their children to English-medium schools where they learn in English and not their home language (Bamgbose, 2011). In a study conducted by Versfeld (1995:24), it was reported that parents send their children to English-medium schools because being able to speak standard English is associated with a class.

Among previous studies that investigated language attitudes is the study by De Klerk and Bosch (1994), which examined opinions about isiXhosa, English and Afrikaans as media of instruction and languages of success. The findings indicated that the isiXhosa students preferred to learn through English as a medium of instruction, and also chose English over isiXhosa and Afrikaans as the language of success. In 1996 De Klerk conducted another study among Rhodes university participants who also opted for English as the medium of instruction over their home language. Among all the African language speakers, isiXhosa speakers had the most positive attitude towards their home language compared to speakers of other languages, but they still preferred English as the medium of instruction. Other studies found that students wanted to be provided with the opportunity to use both their home language and English (Bangenji & Kapp, 2007).

In a study conducted by Dyers (1999:81), first and second-year isiXhosa speakers felt positive about isiXhosa compared to English, even though they felt that isiXhosa "did not receive much attention from the government". The study revealed that the students were in favour of African languages as the medium of instruction at tertiary institutions. They also felt that using isiXhosa for tutorials would provide them with additional support to further their success, but at the same time they felt that it would be unfair to non-isiXhosa speakers (Dyers, 2008). Another study conducted by Dyers (1999) investigated attitudes towards, and usage preferences for Black South African Languages (BSAL) among first and second-year isiXhosa students at the University of the Western Cape. The attitudinal studies of the use of Black South African Languages (BSALs) beyond the home and in informal situations are supported by Msimang (1993), Marivate (1993) and Gough (1998). There are fears that many of these languages may become marginalised and even extinct because of a lack of functional demand (Dyers, 1999). It is argued that it is too early to talk about the language shift, decline and extinction of BSALs because of the linguistic and cultural inheritance of South Africans, which are founded in historical development (Banda, 1998; Kamwangamalu, 1995; Dyers, 1999).

A study conducted by Dalvit and de Klerk (2005) examined the perceptions and attitudes of students towards the use of isiXhosa as the language of learning and teaching at Fort Hare University. The students were in favour of dual-medium (isiXhosa-English) teaching and learning. They felt that they should be given the opportunity to choose between English-medium and dual-medium instruction. In another study (Barkhuizen, 2001) isiXhosa speakers opted for

English-medium teaching and learning and would consider isiXhosa mainly for integration. The isiXhosa language was not side-lined because the students did not fully support an English-only policy, but they were in favour of isiXhosa as an additional language of instruction. Chick and Wade (1997) reported that isiZulu speakers retain their language and code-switch to English, thus ensuring that they preserve the isiZulu language. Phaswana (1994) investigated the attitude and perception of students at the University of Venda and found that students preferred English over African languages due to its economic, political and educational status. In a study conducted by De Wet (2002) the students opted for English because they thought that the right to education in the language of their choice meant learning through the medium of English. The students rejected African languages in favour of English. Magwa (2015) reported that students in Model C schools favoured the use of African languages, while students in rural areas favoured English over African languages. Langa (2005) asked Sepedi (Northern Sotho) speakers to give their opinion on using Sepedi (Northern Sotho) as the language of teaching and learning. The school learners felt that they would benefit by gaining more knowledge using English rather than Sepedi (Northern Sotho) as the medium of instruction. They did not regard Sepedi as having any value (Mabila, 2007) because they associated it with being inferior, poverty-stricken and backwards in life, suggesting that it could not be associated with excellence. Madadzhe and Sepota (2007) state that there is a decrease in the enrolment of students in the African languages departments of universities. This could be due to the fact that more and more parents are enrolling their children in English-medium schools rather than schools offering African languages from Grade 1 to 3. Ngungi wa Thiong'o (cited by Madadzhe and Sepota, 2007) states that English is classified as a measure of ability in various skills and other learning phases. When it comes to learning a language, factors such as a learner's motivation is regarded as important. According to Daskalovska *et al.* (2012:1187), achieving success in learning a language is related to both a positive attitude and motivation. Also, the intensity of the need to achieve a goal and the willingness to invest time and effort in reaching that goal depends on the environment. Learners who are motivated persevere because they invest in whatever projects they have to work on, and they do not let setbacks discourage them (Daskalovska *et al.*, 2012:1188). This is classified as one of the characteristics that build the character of a person who develops a positive attitude to life. Dedicated readers are intrinsically motivated to try to understand a text so that they will be able to understand information at a deeper level during the processing of information (Guthrie *et al.*, 2004).

2.5 Languages in education: Basic and Higher Education

In 1948, the National Party took it upon themselves to ensure that Afrikaans was used as the medium of instruction in South Africa together with English, while African languages were reduced to linguistic boundaries (classified according to tribe and language) (Brock-Utne, 2010). South African speakers of African languages need to be fluent in English to achieve a high level of education due to "its status as a global language" and "upward mobility" (Taylor & von Fintel, 2016: 76). According to Kriebler *et al.* (2016), academic success is made up of fluency, accurate reading and reading comprehension skills. Pennycook (1994) believes that English occupies a highly prestigious position in society. Learning English as an additional language is "seen as a factor in the creation of multilingualism today", and its educational programmes are in high demand (Jessner, 2006:2).

Ndlangamandla (2010) explored the language practices and views about indigenous languages of African learners attending two desegregated high schools in suburban Johannesburg. The study does not agree that there is a language loss and language shift of African languages; instead, the data indicated that students can integrate different languages for different purposes within an English-dominant school context. Students maintain their use of African languages through the use of code-switching and code-mixing. According to Ndlangamandla (2010:61), the

language in education policy was aimed at “promoting multilingualism, development of the 11 official languages as well as respect for all languages”. Ndlangamandla (2010:61) is of the opinion that, of all the official languages, English benefited the most from the policy. This is evident in education, media, government and administration, and the reason for the advantage of English is the non-implementation of the language policy. In South Africa, the inequality of languages is described by Kamwangamalu (2005), who stated that English is rated at the top, followed by Afrikaans, while African languages are at the bottom. In South Africa, different languages are learnt for a variety of reasons (Blommaert & Backus, 2012), because it is a country of diversity.

Mda (cited by Ndlangamandla, 2010:62) states that African language speakers prefer to speak English because of its promise of socio-economic and educational opportunities. Children who attend desegregated schools prefer not to speak their language in favour of English. There have been several debates recently on the topic of using indigenous African languages for instruction. The use of indigenous African languages as the languages of instruction is very costly because it involves resources in the target language and the need for competent facilitators of the language. UNESCO (cited by Moyo, 2002:152) contends that the majority of world languages did not have any written form and that many lacked sufficient works of literature to justify learning to read in these languages.

In Somalia, it took nine years for the education system to standardise the language for formal education. The Somali language was used as the medium of instruction for 12 years in formal education. The success prompted continuation at the tertiary institution level, but due to civil war in 1986, the process of introducing Somali in tertiary institutions was stopped (Ouane & Glanz, 2010). In Ethiopia, the education policy states that the mother tongue should be the medium of instruction for the first eight years of schooling, although in places such as Addis Ababa, English is introduced in year six. In this case, mother-tongue education appears to be very beneficial because students who were taught in the mother-tongue for eight years performed better in all subjects compared to students who were taught in their mother tongue for a short time (Ouane & Glanz, 2010). According to Alidou *et al.* (2006) and Cummins (2000), scholars report that students take six years to master abstract academic skills in a language, although learning conversational skills in a new language in a well-resourced environment is possible within one to two years. At a South African university, Ramani and Joseph (2008) introduced a programme called “Multilingual Studies and Contemporary English”. The module, called “multilingual studies”, was taught through the medium of Sepedi (Northern Sotho). Generally, universities do not offer degrees in African languages in South Africa, although more universities are currently exploring ways to use African languages at university.

2.6 CAPS policy on language: the development of education in South Africa

CAPS is the abbreviation for Curriculum Assessment Policy Statements. African language speakers use Sepedi and English in different contexts: they use Sepedi as an everyday language for social interaction, which enables children to develop and maintain relationships (Gibbons, 1999). According to Cummins (2000), children must be fluent in their everyday language because it is an important part of language development. In a school environment, children use a different language than the one they use for social interaction during games and daily activities. For decades Sepedi (as a home language) and English (as a second language) did not co-exist together, unlike Afrikaans and English, whose users learnt both Afrikaans and English at school because they were recognised as the two official languages of South Africa. Coetzee-Van Rooy (2010:15) refers to the relationship that exists between Afrikaans and English as the “phenomenon of Afrikaans/English bilingualism”, because Afrikaans L1 speakers are fully bilingual with English as the second language. African languages speakers were not

given the opportunity to develop high levels of proficiency in both their L1 and English. Sepedi-English bilinguals are part of the minority of indigenous African language speakers in South Africa. African language speakers have a choice of being taught in their L1 (e.g. Sepedi) at primary school from Grade 1–3, but from Grade 4 through university they do not have a choice of the language of learning and teaching. From an early age, Sepedi-English bilinguals are only exposed to their L1 in their homes and their second language (English) in an educational environment from Grade 1 when they are taught English as a subject and from Grade 4 when they transition from home language (Sepedi) to English as the medium of instruction. Skilled or successful readers can comprehend the texts that they read. In South Africa, learners transition from learning through their home language to learning in English where they are expected to move beyond “learning to read” to “reading to learn”. The success of learners is related to reading comprehension beyond the decoding level. The tables below give an overview of the components taught from Grade 1–3 at school together with the time allocation for each component. The table further shows that learners are taught handwriting in their home language and not in English, while language usage is taught in English but only from Grade 3.

Table 2. 3 Skills taught in Grade 1 home language (CAPS, 2011)

GRADE 1 HOME LANGUAGE		TOTAL PER WEEK
Listening & Speaking	15 minutes per day for 3 days	45 minutes
Reading & Phonics	Phonics: 15 minutes per day for 5 days (1 hour 15 minutes) Shared Reading: 15 minutes per day for 3 days (45 minutes) Group Reading: 30 minutes per day (2 groups each for 15 minutes) for five days (2 hour 30 minutes)	4 hrs 30 minutes
Handwriting	15 minutes per day for 4 days	1 hour
Writing	15 minutes per day for 3 days	45 minutes
	Total per week	7 hours

Table 2. 4 Skills taught in Grade 2 home language (CAPS, 2011)

GRADE 2 HOME LANGUAGE		TOTAL PER WEEK
Listening & Speaking	15 minutes per day for 3 days	45 minutes
Reading & Phonics	Phonics: 15 minutes per day for 4 days (1 hour 15 minutes) Shared Reading: 15 minutes per day for 3 days (45 minutes) Group Reading: 30 minutes per day (2 groups each for 15 minutes) for 5 days (2 hour 30 minutes)	4 hrs 30 minutes*
Handwriting	15 minutes per day for 3 days	45 minutes
Writing	15 minutes per day for 4 days	1 hour
	Total per week	7 hours

Table 2. 5 Skills taught in Grade 3 home language (CAPS, 2011)

GRADE 3 HOME LANGUAGE		TOTAL PER WEEK
Listening & Speaking	15 minutes per day for 3 days	45 minutes
Reading & Phonics	Phonics: 15 minutes per day for 3 days (45 minutes) Shared Reading: 20 minutes per day for 3 days (1 hour) Group Reading: 30 minutes per day (2 groups each for 15 minutes) for 5 days (2 hour 30 minutes)	4 hrs 30 minutes*
Handwriting	15 minutes per day for 3 days	45 minutes
Writing	20 minutes per day for 3 days	1 hour
	Total per week	7 hours

Table 2. 6 Skills taught in Grade 1–3 second language (CAPS, 2011)

FIRST ADDITIONAL LANGUAGE			
	GRADE 1	GRADE 2	GRADE 3
Listening & Speaking	1 hour 30 minutes	1 hour	1 hour
Reading & Phonics	1 hour 15 minutes	1 hour 30 minutes	1 hour 30 minutes
Writing	15 minutes	30 minutes	1 hour
Language Use			30 minutes
	3 hours per week	3 hours per week	4 hours per week

The education system prior to 1994 was “criticised as being overly content-based, too Eurocentric and too ideologically driven” (Jansen, 2004:202). The emphasis was more on the authoritative teacher and focused on rote learning which hinders the independence, self-reliance and development of the learner’s capabilities. Anti-discrimination of education started during the leadership of FW De Klerk. Before South Africa became a democratic country under the leadership of the African National Congress (ANC), radical transformation to eliminate all forms of discrimination had already been underway. The apartheid education system was characterised as “separate and unequal”, but with changes during the post-apartheid period, the dream is that the education system should be “equal” irrespective of race. The changes that took place in post-apartheid South Africa included access to education irrespective of race, and schools that were formerly reserved for whites opened their doors to all race groups. The education system was now dominated by democratisation, desegregation, decentralisation, equal educational opportunities and multicultural education. This was done to establish and promote a non-racial country, to provide quality and standardised education without compromise.

The national language in education is formulated on behalf of the government, but the implementation takes place within each layer of practice (Plüddemann, 2015). Although the government is associated with the allocation of languages and varieties, the schools still have to decide about the language use of the curriculum. Newman (1999) is of the opinion that language use development for children increases when there is an engagement of books and storytelling between parents and guardians. When choosing the language use of the curriculum most schools opt for English medium because of the availability of materials, resources and proper teaching methodology (Boakye, 2015). African languages remain underdeveloped despite having been in existence from the period of 1800–1957, written down by missionaries who provided black people with access to education in their languages. Before the Soweto uprising of 1976/1977, Afrikaans and English were regarded as the languages of power in

society, and Mother-Tongue Education (MTE) was only beneficial to Afrikaans and English-speaking people, while black Africans were taught in Afrikaans for eight years, and for the later non-MTE-based learners half of their subjects were in English and the other half in Afrikaans. After the Soweto uprising, many schools were forced to transition from home language to English because of the demotion of African languages to the status of language subject. The choice of Language of Learning and Teaching (LoLT) depends entirely on the parents, whereas responsibility for the school's language policy is handled by the governing body of the school (Taylor & Von Fintel, 2016:76) to promote multilingualism and obligations relevant to provincial or national laws. The school's governing body comprises parents, the school principal and other nominated teachers and school learners only in high schools (South African School Act, 1996). Although parents have the power to decide on the LoLT, teachers in the study conducted by Plüddemann (2015:195) supported MTE (Mother-Tongue Education) for six years of schooling as is done for Afrikaans-speaking children because it will provide a good foundation and boost their self-confidence as well as deepen their identity. Other schools opt for English as the medium of instruction from Grade 1 (De Klerk, 2000; Jansen, 2013) due to limited access to reading materials, poor resources and inappropriate teaching methods in African languages. This is to prevent Grade 4 children from experiencing disadvantages because they did not have a solid foundation in either their home language or English (Boakye, 2015).

In South Africa, from Grade 4 the home language is usually no longer the language of teaching and learning because most schools switch over to English at this point, which is a huge curveball for learners who have not yet fully mastered learning in their L1 or learning English as their L2 or another additional language (English is often L3, L4 or L5 in multilingual communities). An exit from MTE (Mother-Tongue Education) and transitioning to English medium in Grade 4 poses a possible threat to scholastic achievement because the learners have not had sufficient time to master the proficiency level in their L1 (Sepedi in the case of this study) (Malda, Nel & Van de Vijver, 2014:34). There is a mismatch between the school language and the language of the community, which creates a barrier in accessing school services because the majority of South African speakers have insufficient knowledge of the medium of instruction in education. It is apparent that many children in Africa walk through the doors of educational institutions without knowing the medium of instruction, and sadly the only available formal schooling is provided in a language of which the children have no or little knowledge. According to Smith *et al.* (2008), it is well known that a mismatch between the language used at school and the language children speak at home threatens the educational outcomes, schooling attainment and achievement of the learners. This suggests that learning through the home language is preferred because the learners learn faster and better than when they are taught in a second language.

With the aim of exploring learners' proficiency in isiXhosa and English, Brock-Utne (2007) gave learners Grade 4 and Grade 7 tasks that required them firstly to sequentially organise pictures and write stories in both isiXhosa and English; secondly to complete a reading comprehension task, and lastly to complete an expository writing task based on a topic already discussed in class. The findings of the study revealed that both Grade 4 and Grade 7 learners were fairly accurate when completing the tasks in isiXhosa but struggled when completing the tasks in English. The Grade 7 learners were better than the Grade 4 learners, and they were at such a proficiency level that they could learn through the medium of English. Grade 7 learners were better at expressing themselves in English than Grade 4 learners, but their English proficiency was not comparable to their isiXhosa proficiency (Brock-Utne, 2007). The same tests were administered to high school students in Form 1 and Form 4 in Tanzania, which is equivalent to Grade 8 and Grade 11 in South Africa. This was done because in Grade 8 there is a transition from home language to English as the medium of instruction in Tanzania, while in South Africa the transition starts from Grade 4. In Zanzibar, a similar study was conducted using similar instructions as the study conducted in South Africa. The tests were administered to students who were in transition from primary school to high school. The findings showed that in Kiswahili the stories were much longer and clearer. The learners showed that they related very well to the

story, and they used appropriate words and showed increased creativity when compared to English texts written for the task. The Kiswahili version of the stories showed sequences and was well-formed. Generally, the learners performed poorly in English, which translates to the fact that learners learn better when they are taught and given tasks in a language that they can relate to or understand. If the learners read and understand their home language very well, they can transfer their skills into English. This calls for educators to identify the reading gap between the poor and the good readers so that they can address the reading problem (Pretorius & Machet, 2003).

According to Malda *et al.* (2014:43), children who speak the school language at home may benefit or be at an advantage if they learn to read in the school language compared to children who speak one language at home and another at school. What this implies is that if children are taught and learn to read in a language they know and understand and speak at home, then they will benefit. In South Africa black children are mostly exposed to more than one language at home, and for the majority of children, English is their third if not fourth language. This is what Makalela (2018) calls multilanguaging, and he refers to moving back and forth or code-switching as translanguaging. It is apparent that these school participants will not pass their matric examinations if they do not pass both Sepedi and English because they are compulsory subjects at school. When the school participants transition from high school to university, they are not afforded an opportunity to learn through their home language. A study conducted by Boakye (2015) discovered that social interaction predicts higher reading proficiency. The study compared Indigenous South African Language speakers, Afrikaans and English speakers, and middle-class African language speakers. The Afrikaans and English speakers, together with the middle class, who had had advanced exposure to texts that were relevant to them socially, had a higher reading proficiency. Therefore, social literacy influences students' reading literacy.

2.7 Literacy in South Africa: Basic and Higher Education

In South Africa, the foundation phase promotes "learning to read", and from Grade 4 the learners "read to learn". If learners do not master the reading and do not acquire new information, they can fall behind as they move to higher grades. When learners are taught to read, the teachers focus on phonemic awareness. The first beginning of learning to decode written language is verbal because learners can relate sounds to the letters.

In Grade R, the focus is on developing oral language and the introduction of shared reading in the home language, where the children read together with the teacher. In Grade 1, learners are introduced to stories, and they begin by learning to identify the framework and the type of texts they are reading (CAPS, 2011). Grade 1 also focuses on a lot of listening and speaking and this is reduced in Grade 2 and Grade 3 as more reading is introduced. In Grade 1, shared reading is introduced to the first additional language. Also, Grade 1 learners develop phonemic awareness, and the foundation for oral activities is introduced in the additional language. On the other hand, vocabulary and grammar are learnt incidentally.

In Grade 2, more emphasis is placed on oral recounts, which shifts to written recounts in Grade 3. In Grades 2 and 3, more reading and writing are introduced and there is a strong focus on developing literacy, and the introduction of group guided reading in the first additional language. In Grades 2 and 3, learners are introduced to phonemic awareness in the first additional language, and they acquire vocabulary and grammar through reading in English.

The CAPS (Curriculum Assessment Policy Statements) document is very clear about what learners should be taught at school, but implementation is another story. Black South African schools experience reading difficulties in reading comprehension. Mzimane and Mantlana

(2017) conducted a study with the aim of examining the reading strategies that Foundation Phase teachers use to improve learners' reading. The study made use of semi-structured interviews to collect qualitative data. Four educators from each school in the district were interviewed: they taught isiXhosa home language speakers. The findings of the study revealed that not all educators were interested in teaching reading. Those who were interested in teaching reading made use of shared reading, reading aloud and independent reading. In Grade R, educators were experiencing difficulties teaching reading because, according to the study, it was found that they were gaining very limited knowledge when they attended workshops.

The ability to read is a hallmark of human civilisation. According to Kirstić *et al.* (2018:522), reading skills are "essential and necessary not just for learning and academic achievement, but also for various competencies needed in everyday life" as well as for personal development (Lionetti & Cole, 2004; Holloway, 1999). "Successful text comprehension is a cross-curricular competency, essential for learning in the various subject areas but also in everyday social life" (Alexander & Fox, 2008; Broughton & Sinatra, 2010; Otero *et al.*, 2002; Sinatra & Broughton cited by Krstic *et al.*, 2018:522). As stated in the European Commission report (2001:17) "on the quality of formal education, reading literacy skills are key to all areas of education and beyond, facilitating participation in the wider context of lifelong learning and contributing to individuals' social integration and personal development".

In the South African context, reading in more than one language in African languages remains under-researched and under-theorized; and the use of more than one language as a language of teaching and learning is a universal practice at universities worldwide (Makalela & McCabe, 2013). Reading scores or levels in both indigenous African languages and English are staggeringly low in South Africa. Reading research in African languages has already been established by the following researchers: Makalela (2010; 2012); Phokungwana (2012); Fakude (2014); Pretorius and Mampuru (2007); and Pretorius and Currin (2010). Black South African students enter universities at tremendous disadvantages about their reading levels.

Poor reading levels are evident at the university level. Several researchers have reported low reading levels (Perkins, 1999:232). For example, a study conducted by Pretorius (2002) on "English as a second language reported that only 13.8% of students at the University of Transkei who were given the Stanford Diagnostic Reading Test had the reading skills necessary to comprehend their textbooks, while 26% were found to be unable to cope without assistance". Generally speaking, literacy levels at South African universities are inadequate. Webb (cited by Pretorius, 2002:174) "reported that many of the Academic Literacy first-year students at the University of Pretoria who were tested had reading levels of Grade 7 to 8 learners". In addition, Pretorius (2000) found that many first-year Psychology and Sociology students were struggling to read.

Furthermore, Pretorius (2002) investigated the relationship between reading skills and academic performance at the undergraduate level. The investigation was done among 81 MEDUNSA students (53 medical students and 28 occupational therapy students). The participants were asked three types of questions, e.g. literal questions, paraphrase questions and inference questions. The students' reading ability was assessed using a series of five tests completed over four weeks using a norm-referenced standardised language proficiency test (Pretorius, 2002:177-178). The findings indicated that the "students had serious reading comprehension problems, which may mean that they had ineffective and limited access to the rich sources of declarative knowledge provided by print-based materials" (Pretorius & Klapwijk, 2016) in the learning context; hence it is of utmost importance to create a culture of reading (Pretorius, 2002:178).

Nel *et al.* (2004:100) claim that many first-year university participants are not generally prepared to read regularly and critically because they are often illiterate (Kubheka, 2017) and they have a

wide gap in their prior knowledge. In their investigation Nel, Dreyer and Kloppe (2004:95) conducted a diagnostic study/experiment to determine the scope of the reading problem by assessing the strengths and weaknesses of the reading assessment of one efficient and one inefficient student, and the study enabled them to provide recommendations for the kind of support they need. The study comprised 62 Afrikaans and Setswana Communication studies and Psychology students ranging from 18 to 22 years of age. Baseline data were collected through a vocabulary test (Communication and Psychology specific), Visagraph II eye movement recording system, a Reading Performance Test and a Reading Strategies Questionnaire. The main findings report that the participants experienced problems across all of the reading assessments conducted. When reading, the students seemed to focus on summarising texts after reading while they focused on identifying main ideas and making notes as well as paraphrasing, which indicates a poor knowledge base of reading strategies. When comparing the efficient and inefficient reader, the inefficient reader is reading at the level of a Grade 7 and 8 learners, while the efficient reader is at the level of a Grade 12 learner. These findings are supported by eye movement data, which indicate that efficient readers made short fixations and fewer regressions, which was the opposite of what the inefficient reader was doing. According to the findings drawn from the study, unskilled readers struggle with automaticity and accuracy, which are vital for the comprehension of reading materials, while skilled readers have the potential to use a variety of reading strategies to monitor their comprehension at all times.

To promote the culture of reading, Pretorius (2002) states that reading should not be confined to the classroom, but should be a lifestyle even outside the classroom. She further stated that if literacy were practised, it would prevent the aversion to the culture of reading, which is realised at the advanced stage of Grade 12 (Mahala, 2010). The prevailing lack of a culture of reading manifests itself in various aspects of South African's lives, especially with regard to socio-economic issues such as poverty and unemployment. If the cultivation of the culture of reading is a national imperative, then initiatives by various entities need to be harmonised and properly coordinated, because, without a national strategy that is integrated, the efforts to eradicate illiteracy and also to promote a culture of reading will not materialise. Good reading habits should begin at an early age if the objective of the country is to create a nation of readers (Phokungwana, 2012; Sisulu, 2004). The overall focus should be on bilingual readers in both the home language and English because of their impact on reading in academic competency.

The purpose of this section is to summarise the literature examining word recognition/decoding and linguistic comprehension as it is relevant to the SVR. However, the review is not limited to the theoretical framework of the SVR for the sake of comprehensiveness.

2.8 Simple View of Reading (SVR)

Given the discussion above, it is important to consider the Simple View of Reading (SVR) as the framework that underpins this study. The Simple View of Reading framework allows researchers to investigate a variety of skills that readers require in order to comprehend the text. The relationship between decoding and linguistic comprehension contributed widely in studies investigating the reading ability of young children (Kendeou, Savage & Van der Broek, 2009). On the other hand, linguistic comprehension and reading comprehension gets stronger as children get older (Adlof, Catts & Little, 2006). In a study conducted by Adlof *et al.* (2006) it was revealed that word recognition and listening comprehension made a huge contribution of 62.2% that explained reading comprehension among fourth-grade readers. On the contrary, grade 8 reading comprehension was explained by listening comprehension accounting 17% of the variance, which was an increase from the fourth grade. This is because, by fourth grade, readers have already passed the word recognition stage and have moved to listening and answering comprehension questions. Previous research has established that there are children

who possess good decoding skills and poor comprehension skills, while other children possess poor decoding skills and good comprehension skills (Catts, Hogan & Fey, 2003; Healy, 1982; Nation & Snowling, 1997,1998).

The Simple View of Reading has been supported and validated by several studies. Hoover and Gough (1990) conducted a study with 250 participants measuring cognition, language and reading. The study was administered from the years 1978-1985. The longitudinal study began from kindergarten, which is equivalent to Grade R in South Africa through Grade one, two, three and the fourth grade. The study had participants read nonsense words and for language comprehension participants were required to listen to a story with the expectation of re-telling and answering questions based on the story that they listened to. To measure reading, comprehension, participants read the story, re-told the story and answered questions based on the story that they read. Reading comprehension scores were correlated with decoding multiplied by language comprehension scores ($D \times LC$) and showed a strong correlation of 0.8 for each grade level that was tested. This result validates and support the Simple View of Reading because the reading comprehension outcomes from this study is the result of decoding and linguistic comprehension scores.

In addition to the studies that validated the Simple View of Reading is a study conducted by Catts, Adlof and Weismer (2006). The study examined the language abilities of children's reading comprehension abilities and compared them with typical readers as well as children with decoding abilities/deficits. The participants of the study were all (182) 8th graders divided into three groups categorised according to their language abilities: (i) 57 participants with comprehension, (ii) 27 participants with poor decoding skills and (iii) 98 participants with normal word recognition and reading comprehension. The project was divided or split into two studies. The first study involved grade 8 poor comprehenders and typical readers to measure reading achievement. The second study involved kindergarten, second and fourth graders. The study measured language comprehension and phonological processing. The second study extended its measurements by adding word recognition and reading comprehension. The findings of study 1 revealed that poor comprehenders experienced difficulties in language comprehension but their phonological processing was normal while good comprehenders experienced difficulties in phonological processing and language comprehension.

The following three studies conducted by Chen and Vellutino (1997), Verhoeven and Leeuwe (2008), and Keenan *et al.* (2008) examined the relationship between listening and reading comprehension. Chen and Vellutino (1997) examined the relationship between listening and reading comprehension, to validate the SVR among a group of poor and normal readers who were in their 2nd, 3rd, 6th and 7th grades. The purpose of the study was to extend the study conducted by Hoover and Gough (1990) among bilinguals. The study analysed the relationship between decoding (using both phonetic decoding and word identification), listening comprehension and reading comprehension. The results showed a variance in reading comprehension for all grades. The study revealed that correlations between listening and reading comprehension increase with age. This is because as children get older, reading comprehension becomes the result of good decoding and good linguistic comprehension as opposed to listening comprehension.

Furthermore, Verhoeven and Leewe's (2008) study examined the effects of listening comprehension with decoding and vocabulary on the development of reading comprehension (Santoro, 2012:23). The results of the study showed that listening comprehension influenced reading comprehension across grades. Word decoding had a strong influence on early reading comprehension and the effects decreased by sixth grade. The data supported the SVR in that it showed that word recognition/decoding and listening comprehension significantly predicted reading comprehension. Also, Keenan, Betjimam and Oslon (2008) examined the relationship between word recognition/decoding and listening comprehension, non-word decoding and reading comprehension. The researchers made use of four different tests to determine if the

tests measured different skills. The results revealed that listening comprehension accounted for variance in each reading test. The researcher acknowledged that different types of reading comprehension tests measure different skills. Global measures of listening comprehension and oral language have the potential to affect what reading comprehension is measuring. The results from these studies revealed a relationship between listening comprehension (using listening comprehension tests) and reading comprehension from the first to seventh grade. This is consistent with findings in Adlof *et al.* (2006). In addition, using a variety of different measures, including text types to define reading comprehension influenced the relationship between listening and reading comprehension (Santoro, 2012:24).

The following studies investigated oral reading fluency and listening comprehension with reading comprehension as a dependent variable. The study by Goff *et al.* (2005) used word reading, language and memory variables to identify a strong independent predictor of using reading comprehension. The study was conducted among 180 participants from grades 3-5. The participants were presented with a reading comprehension text to read with a set of questions (extraction of information from a text and integration of information). Furthermore, the participants were expected to read word lists accurately, and the reading was discontinued after six consecutive errors. Participants were also presented with non-words, and they also read a passage and errors were noted. Orthographic processing, receptive vocabulary and verbal working memory were hypothesised to be strong and independent contributors to reading comprehension. The findings revealed that word reading and language variables had a stronger relationship with reading comprehension as compared to memory variables. The study also revealed that working memory is not a crucial predictor of reading comprehension provided that learners are presented with ample opportunities to review texts at their own pace.

In addition, Cutting and Scarborough (2016) used comprehension scores that were collected using Wechsler Individual Achievement tests, the Gates-MacGinitie reading test and the Gray Oral Reading Test. The study was done to examine the contribution of word recognition/decoding, oral language and other cognitive skills to children's reading comprehension. This was done in relation to measures of reading, language and other cognitive skills that account for or contribute to comprehension. The study revealed that word recognition/decoding and oral language skills predicted reading comprehension. The results further revealed that reading comprehension is predicted by word recognition/decoding skill, but it cannot be improved based on the decoding skills of the readers. In other studies, Ricketts, Nation and Bishop (2007) investigated vocabulary and literacy among 81 children aged 8 to 10 years. The participants completed measures of reading, language and general cognitive ability. Decoding was measured using a phonemic decoding component of the Test of Word Reading Efficiency (TWRE) where participants read a list of words ranging from short to long words with required speed. Findings of the study revealed that oral vocabulary skills predicted reading comprehension. Another measure was the test of reading accuracy and reading comprehension. The text reading was assessed using Neale's Analysis of Reading Ability-II (Neale *et al.* cited by Ricketts *et al.*, 2007:243). Participants read passages aloud and answered questions (testing verbatim memory and inference). The findings revealed that vocabulary and reading comprehension are highly correlated and that vocabulary accounted for variance in reading comprehension (Ricketts *et al.*, 2007:254).

The review below is based on studies that used a variety of measures using the SVR framework. The study conducted by Spear-Swerling (2004) investigated single word reading receptive vocabulary, listening comprehension as well as naming, a possible predictor using the simple view of reading components reading measures of reading comprehension among fourth graders. Spear-Swerling (2004) wanted to examine the difference in the impact of reading comprehension performance and how components of reading abilities are influenced by using multiple-choice option and question-answering formats to measure comprehension. The findings of the study revealed that language comprehension accounted for 56% of the variance and reading comprehension accounted for 52%. According to Nation and Snowling (1997), oral

reading fluency is more highly correlated with the question-answer format as compared to cloze measure test. This differs from Spear-Swerling's (2004) findings. The variations in the findings, according to Spear-Swerling (2004) can be explained by the sample being older because linguistic comprehension is much more dependent on developed and strong word recognition/decoding skills for reading comprehension.

In measuring fluency, Silverman *et al.* (2013) investigated if oral reading fluency can fit into the SVR model or if it should be viewed as an additional component. Syntax, semantic and linguistic comprehension were used as measures of reading comprehension. The study made use of reading a passage and answering questions. Participants were expected to select one of the possible three words to complete the gaps. The study used latent variable regression and found that decoding and linguistic comprehension are significant predictors of reading comprehension.

Further findings revealed that fluency and linguistic comprehension predicted reading comprehension, with 55% of the variance and decoding was not significant because decoding is more important for younger readers. Similar to what Silverman *et al.* (2013) did, Adlof *et al.* (2006) also wanted to determine if fluency should be added as a component to the existing SVR. Measures such as word recognition accuracy, fluency, listening comprehension and reading comprehension were administered to second, fourth and eighth-grade students. Relationships within and across grades between listening comprehension (consisting of vocabulary, sentence-level semantic and syntax and listening comprehension measures), word recognition accuracy (consisting of real word, non-word, and connected text reading measure), fluency (consisting of two-level fluency measures as well as a connected text fluency measure) and reading comprehension (consisting of cloze task, passage reading/multiple-choice, passage reading/open-ended responses measures) were taken. In the fourth grade, word recognition and listening comprehension accounted for 62.2% of the variance that explained reading comprehension in the reading development.

Furthermore, Tilstra, McMaster, Broek, Kendeou and Rapp (2009) examined fluency and verbal proficiency as an additional component to the simple view of reading (SVR). The study investigated reading comprehension processes of good, average and struggling readers among fourth, seventh and ninth graders. The study used multiple regression analysis to examine the relationship between listening comprehension, verbal fluency, decoding, reading fluency and reading comprehension. The participants read three texts that had missing gaps. The missing gap in the texts was presented with three options for the participants to circle the correct option. The results showed that the learners on average, had a higher verbal fluency in their home language. Findings of the study revealed that it is important to add cognitive-linguistic measures in addition to the listening comprehension. This suggestion arises from the following findings from the study. Listening comprehension accounted for 19% (fourth grade), 35% (seventh grade) and 21% (ninth grade) of reading proficiency after decoding was controlled. Variance in reading comprehension explained by listening comprehension compared between grades was significantly greater in grade 7 than grade 4. Verbal proficiency accounted for reading comprehension, 5% in the fourth grade, 8% in seventh grade and 12% in ninth grade. Taking the above studies into consideration, it is necessary to consider that the linguistic comprehension component might need to be expanded beyond listening comprehension in order to include additional measures of comprehension skills.

Moreover, Makalela (2010; 2012) adopted the Simple View of Reading model in order to understand biliteracy development. The study assessed the relation between phonemic awareness, visual recognition and graphology among fourth graders. The study obtained data from the fourth grade by using comprehension scores from listening comprehension and word-picture mapping. The results of the study showed that a quarter of the participants' listening comprehension and spelling proficiencies were slightly higher than visual recognition proficiency. According to Makalela (2012), this could be due to the mismatch between what the

learners hear, what they see and what they write. Word recognition (decoding) and linguistic comprehension components of the SVR are found to be significant and useful in this study, which focuses on the description of Sepedi and English readers.

2.8.1 Gaps in the Simple View of Reading theory

Scholars who support the “whole language” capacity approach are of the view that the SVR is one-sided and that the focus of the SVR was more on decoding and that there were no details on what comprises language competence (Kirby & Savage, 2008:75). In contrast, according to Kirby and Savage (2018: 75), scholars like Goodman (1967) and Smith (1971) noted the strength of word-level processes and were less focused on the nature of decoding, in support of the importance of decoding. This criticism of the SVR is therefore too harsh.

Most studies that used the Simple of View of Reading theory focused on the lower levels of school (Hoover & Gough, 1990; Catts, *et al.*, 2006; Kendeou, Savage & Broek, 2009; Nation, 2019). According to Catts (2018), the lower grade levels of school is entirely focused on word recognition abilities in explaining variances in reading comprehension, whereas in the higher grades it is the language comprehension component accounting for the majority of the variables. The language comprehension component is more important to skilled readers as compared to less skilled readers (Catts, 2018). According to Catts (2018), previous researchers considered the possibility of whether there was a need to expand the Simple View of Reading (SVR) theory and couple it with fluency or word reading accuracy. Catts (2018) contents that word reading accuracy is a good predictor for younger readers between the ages of 5-8 years, while for older children beyond 8 years, word reading fluency was a good predictor. Castle *et al.* (2018:27) appreciate the Simple View of Reading framework as useful for having classified reading disabilities. Gough and Tunmer (1986) defined three types of readers: (i) readers who experience decoding problems, (ii) readers who experience language comprehension problems and (iii) readers who experience both decoding and language comprehension problems. Catts (2018) also notes that it lacks a detailed explanation of how decoding and linguistic comprehension operate. This means that the SVR does not provide detailed information about the roles played by the subcomponents of reading comprehension, namely decoding and comprehension.

Also, there is inconsistency in how “key constructs” are defined and measured (Castle *et al.*, 2018:27) in reading studies in general. According to Gough and Tunmer (1986) measures used to predict the Simple View of Reading vary accordingly. For example, to predict decoding, measures ranged from sounding out words to properly recognising words. While measures for linguistic comprehension consisted of vocabulary to storytelling, making inferences as well as verbal short term memory tests. According to Catts (2018), vocabulary may account for variables in reading comprehension, and therefore, vocabulary is said to be a part in language comprehension. From the review of studies in this research project, none of the studies made use of the measures that are proposed in this current study. This study will be the first of its kind to measure reading comprehension using eye movement measures in order to examine the reading comprehension of older readers.

2.8.2 How SVR is used in the study

In a study by Pearson *et al.* (2014) there is an argument that if researchers want to measure reading comprehension, they should consider the abilities to comprehend a variety of texts. The elements of the SVR theory was operationalised for the purpose of the study. The current study

used the Simple View of Reading (SVR) framework in order to examine decoding and linguistic comprehension. Decoding is operationalised in this study by measuring first fixation duration, gaze duration, oral reading fluency, word per minute, words skipped first and regressions out of words. Linguistic comprehension is operationalised by measuring fixation duration, saccades, regression percentage, words skipped totally and comprehension scores. In addition, the study will provide a contribution to existing studies that investigated reading comprehension in both school participants and university participants because there is a paucity of research in a South African context that describe the reading of African languages, in this case, Sepedi within the Simple View of Reading (SVR) by using eye-tracking measures. The current study will make use of decoding (first fixation duration, gaze duration, regressions out of word, words skipped first, word per minute and oral reading fluency) and linguistic comprehension (fixation duration, saccadic amplitude, regression percentage and words skipped totally) as measured by eye movement research of the reading data to describe the relationship between decoding and linguistic comprehension with reading comprehension in Sepedi and English.

The rationale for choosing the Simple View of Reading (SVR) framework is that this is one of the first eye-tracking studies of Sepedi reading. The SVR provides a theoretical framework that focuses attention on the two most fundamental issues in reading: decoding and linguistic comprehension. This is an appropriate theoretical view for a study that is documenting the eye-movements of people reading Sepedi for the first time. The SVR approach has garnered a substantial body of knowledge within which the data for this project could be situated. From all the studies that have used the SVR, we know that learners can have an outstanding understanding of the language orally, but they may experience problems with comprehending words from print (Nation, 2019). From the few of the above studies, it is clear that word identification is a better predictor of reading comprehension (Johnston & Kirby, 2006). Also, listening comprehension also became one of the measures that contributed a lot to reading comprehension (Johnston & Kirby, 2006; Tilstra *et al.*, 2009). According to Castles *et al.* (2018), it is essential to provide learners with content knowledge to equip them so that they can develop an understanding when reading texts (Castles *et al.*, 2018). Word recognition and listening comprehension predict reading comprehension in younger readers, whereas linguistic comprehension predicts reading comprehension in older readers (Adlof *et al.*, 2006). Also, oral vocabulary skills predicted reading comprehension when participants were requested to read word lists (Ricketts *et al.*, 2007). This body of knowledge provides a good frame of reference in which to situate the first-ever documentation of the eye-movements of people that read Sepedi.

2.9 Reading research and the use of eye-tracking technology

The study of eye movement started more than 140 years ago in 1878 when Javal used the afterimage method to observe the eye movement of subjects while reading. Jacob and Karn (2003), Wade and Tatler (2009:2) and Starr and Rayner (2001) also made use of the “afterimage method” to “determine the approximate location of the fixations along the line of print” (Tinker, 1936:242). Erdmann and Dodge (cited by Wade & Tatler, 2009) pioneered the corneal reflection technology that became dominant for 60–80 years. Eye-tracking produces extensive data that indicate the reading behaviour of the participants. The data show where and for how long the participants fixate their eyes on a word and indicate the direction in which the participant is reading (saccade direction) as well as the distance between fixations (saccadic amplitude). The eye-tracking data also provide information on the number of times that the participants look at words (including the number of times the participants return to re-read parts of the text); the number of times words are skipped during the reading process; the number of times words are first-skipped, and the words totally skipped during the reading process.

Eye-tracking is defined by Poole and Ball (2006:221) as “a technique whereby an individual’s eye movements are measured so that the researcher knows both where a person is looking at any given time and the sequence in which the person’s eyes are shifting from one location to

another.” Eye-tracking research pre-dates the widespread use of the computer by a hundred years, for example, Javal in 1878/1879. Although eye-tracking research started in the 1800s elsewhere in the world, it has only recently been researched in South Africa (Blignaut *et al.*, 2008). According to Starr and Rayner (2001), the benefit of eye movement data is that it can be relied on for understanding the on-line processing of reading, and therefore makes eye movement a reliable predictor of reading problems. The benefit of using eye movements as a method to study reading is that “it is a non-intrusive, online-way to study language processing” (Reichle *et al.*, 2003:469). According to Pollatsek and Rayner (2006:613), eye movements are reliable when studying language comprehension processes. However, they explain only a small part of the reading process, although eye tracking is noted to be a practical way of providing evidence of how people read (Hefer, 2011; De Linde & Kay, 1999:59).

Eye movement recording has a long history in experimental psychology. Eye movement data have been widely used for studying the moment-to-moment cognitive process during reading. Information about a reader’s focus on words and how long they focus provides invaluable information about the mental processing associated with understanding words in a text (Just & Carpenter, cited by Rayner & Pollatsek, 1992). Eye movement is also used to explore many areas of reading research. According to Rayner (2009:1457), eye movements are widely used to investigate cognitive processing during reading. Cattrysse *et al.* (2018) investigated individual differences in cognitive processing and found that students who were highly interested in the topic they were reading used deep levels of processing and re-read key sentences in the text for a longer period compared to detailed sentences. This is consistent with what Hyönä, Lorch and Kaakinen (2002:52) found in their study when “they investigated adults who read multi-topic expository texts”. The findings confirmed that “topic processing strategy is an effective strategy for processing expository texts”. Cattrysse *et al.* (2018) found that there is a relationship between topic interest, cognitive processing and eye movement measures. This means that if students are interested in the topics of the text they read, they are likely to process the text deeply.

Reading research that aims to investigate full texts has been extensively conducted (MacNamara, 2012). In reading research, oculomotor behaviour provides valuable insight into the linguistic processing that takes place during reading (Joseph *et al.*, 2009). Eye movements reflect the struggle to comprehend the text; for instance, if words are low-frequency, then fixations become longer (Inhoff & Rayner, 1986; Rayner & Duffy, 1986). If the word is predictable from the context, fixations are shorter (Ehrlich & Rayner, 1981; Rayner & Well, 1996). Rayner *et al.* (2006) found that eye movements are sensitive to global text (Hyönä & Lorch, 2004) and text difficulty and that inconsistencies between an anaphor and its prior antecedent also influence eye movements. If readers are given a more difficult text genre, such as mathematics or physics texts rather than newspaper articles and novels, fixation durations and saccadic amplitudes adapt to give the reader more time to process the difficult text (Rayner & Pollatsek, 1989). When the text is difficult, more long-range regressions occur to more distant words earlier in the text. Different texts vary in levels of difficulty, and when skilled readers encounter difficult words such as low-frequency words and homophones, and if the sentences are syntactically complex, they fixate longer than usual. As the text gets more difficult, fixations get longer, saccades get shorter, and more regressions are made (Rayner, 1998). Eye movement measures are also affected by individual differences, text difficulty and the topic of the text (Bayat & Pomplum, 2016). Factors such as “typographical variables like font difficulty can influence eye movement; fonts that are more difficult to encode will yield longer fixations, shorter saccades and more regressions” (Rayner, Reichle, Stroud, Williams & Pollatsek, 2006b; Rayner, 2009: 1460). Other factors that influence eye movements are word frequency, word length, familiarity, global texts, text difficulty and inconsistency. For this study, word frequency and word length are of particular importance, and the effect thereof on eye movement measures are briefly discussed in the various sub-sections below.

2.9.1 Reading

According to Reichle, Rayner and Pollatsek (2003:445) “reading is a complex skill that involves the orchestration of many different stages of information”. Reading is a continuous skill that needs to be learned and mastered (Doignon-Camus & Zagar, 2014). The process includes converting “visual features of the text into orthographic and phonological patterns” that guide the understanding of the text. Radvansky and Ashcraft (2006:376) state that “as we read, we begin to build a mental structure” that stores the meaning of the sentence in working memory (Joseph, Nation & Liversedge, 2013). This means that during sentence processing as new information is learnt, it is captured as part of the already formulated mental structure. Rayner and Pollatsek (1989) view reading as the coordinated execution of a number of processing stages, such as encoding, lexical, assigning semantic notes, and relating the information in a given sentence to previous sentences and previous knowledge. This process leads to the comprehension of the text being read. They further define reading as the ability to extract visual information from the page and comprehend the meaning of the text. They add that reading occurs in different stages and with different meanings when the reader is reading in a different context, e.g. reading a newspaper or a novel. Depending on what the reader is presented with, the reading will differ in various contexts. Garcia and Cain (2014) describe reading as the end product of the reader’s ability to read written words accurately and fluently; while Cop *et al.* (2016:1) state that reading is comprised of three components namely: “word forms, retrieval of meaning and integration of meaning in the context of the sentence”. Reading is a highly automated behaviour that makes it possible to make very precise eye movement on the text while keeping your full conscious focus on the content matter (Rayner *et al.*, 2003). A systematic way of reading requires readers to read from left to right across a page (Lefton *et al.*, 1979), although not all languages or writing systems are from left to right. For example, Arabic, Hebrew, etc. are written and read from right to left and others are written and read from top to bottom (Ibrahim *et al.*, 2002:322). The automatising of eye movements during reading is learnt during childhood (Logan, 1997). For automaticity to take place, subjects need extended practice especially when subjects are presented with complex tasks that require more attention (Makalela & Fakude, 2014). Vorstius *et al.* (2014) show that learners’ comprehension benefits from reading aloud up until about Grade 4, but they later comprehend texts better when reading silently. It is important that learners become fluent before they can read silently (Lyytinen *et al.*, 2015).

2.9.2 Reading comprehension

According to Perfetti *et al.* (2005), the process of reading comprehension begins with learning how “to decode and identify words”. Until the reader is able to recognise and decode words and retrieve their meaning, comprehension will not be able to take place. Reading comprehension requires working memory, because “understanding a sentence involves remembering words within the sentence, retrieving information from preceding text, parsing the sentence and other processes that require resources” (Perfetti *et al.*, 2005:238). Nation (2005) states that reading comprehension is not only a matter of word identification or even knowing and understanding individual words, but goes beyond that by building up a mental representation of text, which is a process that requires integration across a range of sources of information. Working memory is very important during reading comprehension because sometimes readers may not be familiar with concepts or words, but they can infer the meaning based on their previous knowledge of learning new vocabulary and their meaning. Perfetti *et al.* (2005:240) state that “a reader should understand at least 90% of the words in a text for comprehension to take place”. This process happens when decoding and linguistic comprehension take place, which can sometimes become a challenge to the reading and understanding of the texts that are being read

(Eldredge, 1988). Hence, reading comprehension is viewed as the end-product of decoding and linguistic comprehension, which is the ultimate goal for reading. To ensure that readers understand at least 90% of the text they are reading, they need to make sure that they do not get distracted by external factors (Smallwood & Schooler, 2006). Nel *et al.* (2004) view reading comprehension as an association between decoding words and their meaning.

The National Reading Panel (2000) identified four major components of reading instruction, but for this study, only two of the components identified by the panel (fluency and reading comprehension) are utilised and explored. Although one could add more components to ensure that one spots weaknesses, strengths and needs for instruction, the two components that were included in the study provided enough data that to obtain a comprehensive and wide range of information concerning the reading abilities of Grade 8 and Grade 9 learners, as well as university participants so that the research questions could be answered.

There are **two** major components in eye movement reading research, as reviewed by Rayner *et al.* (2006b:241), namely fixations and saccades. While saccades and fixations are labelled as the **two** basic components of eye movements, regressions are a type of saccade and perform a particular function during reading. Other eye-tracking measures that are important in reading research include gaze duration and word skipping. These components of eye movement studies are described for the purpose of the study in the rest of the section.

2.9.3 Fixation duration

The Fixation duration is classified as a measure of comprehension within the Simple View of Reading (SVR). In fixation duration, the eye does not make smooth movements during reading, whether on a printed page or on a screen. The eye makes movements that are interrupted by pauses are called fixations (Radvansky & Ashcraft, 2006:69). A fixation is defined by Rayner *et al.* (2005) as periods during reading when the eyes are relatively stable, and during which visual information is acquired from the text, whereas saccades are defined as rapid, ballistic movements of the eyes around the visual field that occur between fixations (Rayner, 2009) (see Section 2.9.6). "It is during fixation that visual information is extracted from the printed page", because the eye is stable and briefly at a stationary position (Reichle, Rayner & Pollatsek, 2003:446). During a fixation, it is important to note the amount of time that the eye focuses on a word. According to Rayner *et al.* (2006a), during fixations, new information is encoded because "vision is suppressed during saccades". Fixation durations can be much shorter than 200 ms and much longer than 250 ms. Average fixation durations during reading are often in the range 200–250 ms (Reichle, Rayner & Pollatsek, 2003). According to Rayner (2009:1460) "the average duration of reading is in the order of 225–250 ms, whereas the average saccade's length (see Section 2.9.6) is 7–9 letter spaces for readers of English and the alphabetic writing system". Fixation duration "can be as short as 50–75 ms and as long as 500–600 ms or more, and a saccade's length (see Section 2.11.6) can be as short as one letter space and as long as 15–20 letter spaces or more". These measures are important as touchstones against which the data obtained in this study would be interpreted.

2.9.3.1 First fixation duration

The first fixation duration is classified as a measure of decoding within the Simple View of Reading (SVR). In order to determine the influence of word frequency and word length, the first

fixation variable is investigated. First fixation duration is defined as the duration of the first fixation on a word (Whitford & Joannis, 2018:325). According to Whitford and Joannis (2018), the first fixation duration, gaze duration and word skipping rate are classified as the early-stage local measures that reflect lexical access. Lexical access refers to the new information that is acquired while the participants are reading a text, while regressions out of words are classified as late-stage local measures that reflect post-lexical integration, which refers to thinking about what they have accessed while reading. The duration of the first fixation on a word is seen to reflect lexical activation processes (Rayner, 1998). This happens when the reader makes a connection with previous knowledge while reading a particular text. In eye movement research, fixations are affected by factors such as word frequency (Rayner, 1998; Liversedge & Findlay, 2000). First fixation duration measures lexical activation and recognition (Rayner & Pollatsek, 1989). In previous studies, research showed that word frequency showed an effect on first fixation duration (Schuster *et al.*, 2016). According to Joseph *et al.* (2013:216), there is an enormous amount of research which addresses the frequency effects of adult eye movement during reading, but very little for children. It is well known that word length affects fixation duration during eye movements (Just & Carpenter, 1980; Rayner, Sereno & Raney, 1996). Readers tend to fixate for a longer period when the word is longer (Rayner *et al.*, 1998; Liversedge *et al.*, 2004). First fixation duration shows an effect which is typically between 20–30 ms for word frequency (Pollatsek *et al.*, 2008:1).

In the introductory section (Section 2.11), factors that influence eye movement measures were discussed. The section below reviews studies that investigate whether eye movement measures are influenced by the length and frequency effects. Word length and word frequency are regarded as two factors that directly influence eye movement measures during text reading (Rayner, 1998; 2009). Eye movement studies are reported to have used and compared two levels of frequency (White *et al.*, 2016:46). In the current study, I used low- and high-frequency and short and long word length.

Word frequency affects reading. According to Liversedge and Findlay (2000) and Rayner (1998), word frequency affects the number and duration of fixations. Longer words have longer fixation duration (Liversedge *et al.*, 2004; Rayner *et al.*, 1995; Shuster *et al.*, 2016). In a study conducted by Rayner *et al.* (1996), participants read a text and completed a comprehension test. Findings revealed that low-frequency words had more fixations than high-frequency words for first fixation duration and gaze duration (Ashby, 2006). Word length influences fixation duration; in the present study, longer words were fixated more than short words. High-frequency words were more likely to be skipped than low-frequency words. These findings are akin to those reported in this literature review.

Previous research has proved that word frequency influences the processing of a word because high-frequency words are more recognisable than low-frequency words (Whitford & Titone, 2012). If readers are exposed to low-frequency words, it speeds up the time for lexical access, while exposure to high-frequency words does not influence the time for lexical access (Whitford & Titone, 2012). Reichle *et al.* (2003) monitored participants reading sentences containing high and low-predictability target words. The results of the study revealed that there was no effect of word length on the first fixation duration. In another study, Ashby (2006) had participants read sentences embedded with a mean length of both low and high-frequency words. Participants made shorter fixations on low-frequency words in the congruent syllable condition than on the incongruent syllable condition.

2.9.4 Gaze duration

Gaze duration is classified as a measure of decoding within the Simple View of Reading (SVR). Dwell time as it is also known as the sum of all fixations during a dwell in an Area of Interest (AOI) (Holmqvist *et al.*, 2011:387). Dwell time starts the moment the word or area of interest is fixated and ends the moment the last fixation on the AOI ends for each visit to the word or AOI. Dwell time also refers to gaze duration; therefore, for this study “gaze duration” will be used. Gaze duration is defined by Rayner (1998:377); Foulsham *et al.* (2013); and Joseph *et al.* (2009) as “the sum of all fixations made on a word before a saccade to another word” or “the sum of all fixations on a word before moving to another word” (Clifton *et al.*, 2007:5). Other researchers such as Whitford and Joannis (2018:325) define gaze duration as the sum of durations of all fixations on a word during the first pass of reading.

In gaze duration, there are also word frequency effects and word length effects. The frequency effect for gaze duration was first reported in the 1980s. Just and Carpenter (1980) and Rayner *et al.* (1996) reported that the increase of gaze duration is caused by word length. Rayner *et al.* (1996), Ashby (2006), Joseph *et al.* (2013) (see the next paragraph) and Foulsham *et al.* (2013) reported that readers made longer gaze durations on low-frequency words than on high-frequency words. In other studies, (Reichle *et al.*, 2003) gaze duration had a marginally significant effect. Frequency effects were also observed in a study conducted by Whitford and Titone (2014), who examined the difference of frequency effect for L1 and L2 participants who read the first paragraph in English and the second paragraph in French. The main effect of the paragraph showed that gaze duration was shorter during L1 than L2 reading. Frequency effects showed that gaze duration was shorter for high-frequency words than for low-frequency words. Although high-frequency words received shorter gaze durations, there were differences between L1 and L2.

At what age is the lexicon used in reading organised in the mind of the reader? To answer this question, Joseph *et al.* (2013) examined how young skilled readers process written language as compared to adult readers. Joseph *et al.* (2013:207) report that young readers show a longer gaze duration to low than high-frequency words. This means that the linguistic characteristics of the text drive children. Joseph *et al.* (2013:212) conducted a study with two types of participants: 22 children (8-year-olds) and 28 adults. Their findings reveal frequency effects in gaze duration. These results indicate that after three years of exposure to reading acquisition, children already have lexicons organised. These findings suggest that exposure to reading material must be introduced early in the schooling system. These findings are in line with what needs to take place in South Africa if we want children to be successful in their reading. Exposure to reading material and a conducive environment is also important for learning to take place.

2.9.5 Word skipping

In word skipping, the word skipped first relates better to measures of decoding for the Simple View of Reading (SVR), and on the other hand, words skipped relates better to the linguistic comprehension measure of the Simple View of Reading (SVR). Word skipping is defined by Whitford and Joannis (2018:325) as the probability of fixating a word during the first pass (i.e. the probability of a word being fixated or skipped during reading). Word frequency is known to influence the probability of skipping words (White, 2008). Words skipped first refers to words that are skipped the first time during a natural reading of the text, while words skipped refers to words that are skipped, even during a re-reading. On average, a normal reader fixates 85% of words and skips 35% of non-words (Starr & Rayner, 2001). Rayner and Fischer (1996) reported

that word skipping occurs more often for shorter words than longer words. Longer words with eight or more characters are skipped less compared to shorter words and are probably even re-fixated while 2–3 letter words are fixated 25% of the time (Starr and Rayner, 2001). Readers typically skip about two-thirds of the words that they fixate on, with short words and predictable words often skipped as well. This process results in an irregular eye movement pattern which is normal in skilled readers (Rayner *et al.*, 2006:243).

Most skipped words are short-function words and other words are predictable. That is, more predictable words are likely to be skipped as well as words that are high frequency: often prepositions, pronouns or even repetitive words (Starr & Rayner, 2001). Brysbaert and Vitu (1998) and Reichle *et al.* (1998) state that word length influences word skipping for both adults and children even though the two groups may be using different reading strategies to process the text. In a study by Cop *et al.* (2017), if the proficiency scores of the participants were higher in L2, students were likely to skip words (Cop, *et al.*, 2017). This means that if participants were proficient in both L1 and L2 (Dutch and English), the skipping probability is greater when they were not proficient. Reichle *et al.* (2003) and Ashby (2006) found length effects: word skipping showed that shorter words were skipped more than longer words.

2.9.6 Saccadic amplitude

Whereas fixations are the period when the eye remains fairly still, and new information is acquired from the visual array (see Section 2.11.3), saccades are the movements of the eyes from one fixation to the next, and they are short and rapid (Reichle, Rayner and Pollatsek, 2003:446). Other related movements are called “smooth pursuit”, which are slow compared to saccadic amplitude (Holmqvist *et al.*, 2011). During the saccade, there is no extraction of visual information from the text. These rapid movements happen when the eye moves from one fixation point to another (Radvansky & Ashcraft, 2006:69), and are reported to be as short as 20–25 msec, depending on the amplitude (length) of the saccadic movement. Some saccades only move the eyes across a single character, whereas other movements are as large as 15–20 characters. According to Starr and Rayner (2001), saccade sizes in reading are measured either in degrees of visual angle or in the number of letter spaces. The saccade length is influenced by the length of the fixated word and the properties of the previous word from the left to the right. During eye movements, skilled readers on average move their eyes from about seven to nine letter spaces with each saccade. The seven to nine spaces with each saccade comes with considerable variability, which is related to the level of difficulty of the text (Rayner *et al.*, 2006:242).

2.9.7 Regressions

Regressions out are defined by Whitford and Joanisse (2018:325) as the probability of regressing out of a word to a word that occurred earlier in the text. Whitford and Joanisse (2018) describe a probability which is a logical yes/nowhere a word has either been regressed out or not. This takes place when a reader reads a particular word and then goes back to a previously encountered word. This can take place several times when the reader goes back to read a word multiple times. Whitford and Joanisse’s implicit assumption is that no-one would regress out of a word more than once. The data in this study, as reported below, show that a regression out is a count number, and it ranges up to eight. That is, some readers regressed out of the same word eight times. This is a highly unusual finding. Skipping words for the first time increases the probability of making a regression back to the skipped word (White, 2008:216).

During reading, when words are skipped readers normally saccade backwards to process the same or a previous word again (White, 2008), and these saccades are termed regressions. When readers experience the complexity of the text, they often regress to the position where they experienced the difficulty to re-interpret or translate the point stated. The complexity is often related to linguistic processing (Reichle *et al.*, 2003). According to Rayner *et al.* (2006), readers regress to read material that they have previously encountered about 10% to 15% of the time. Skilled readers make short fixations and fewer regressions than unskilled readers, and there are more regressions in simple texts than in more difficult texts (Rayner & Pollatsek, 1989). Dürrwächter *et al.* (2010) reported that low word frequency received a high percentage of regressions, while a variety of words with different length size did not.

When children first start learning to read, their fixations tend to be over 350 ms, and they make two to three fixations per word (depending on the length of the word). Furthermore, up to 30% of their fixations are regressions (backward movements to re-read earlier text) (Rayner & Pollatsek, 1989). Fixation duration decreases with age (Helo *et al.*, 2014), hence when most children have reached 12 years of age, fixation durations and saccadic amplitudes have stabilised (Buswell, 1922; Rayner, 1986; Rayner & Pollatsek, 1989). The percentage of regressions continues to decline among high-school and university readers. Unless the text is difficult, typical average fixation durations for adult readers are around 250 ms, with a regression rate of 10% and a saccade amplitude of about eight characters (Rayner & Pollatsek, 1989).

2.10 Learning to read and skilled readers

It is known that as readers become proficient, their eye movement behaviour adjusts to accommodate the complexity or simplicity of the text (Starr & Rayner, 2001). During reading, fixations of a skilled reader can be between 100 ms and 400 ms for a normal read. The fixation depends on whether the words are predictable or unpredictable. Predictable words are often skipped more than unpredictable words (Reichle *et al.*, 2003). Skilled readers make about 94 fixations per 100 words, whether they make more than two fixations or more on a word. In some readers fixating every word is normal, but in other cases, some words can be skipped, whereas other words can be fixated more than once (Starr and Rayner, 2001). Less skilled readers make longer fixation durations, shorter saccades, and they produce more fixations and regressions than skilled readers (Starr & Rayner, 2001:158). Less skilled participants do not often change their reading behaviour based on a task, but their reading patterns remain similar (Baker, 1984).

According to Reichle *et al.* (2003), the reader's decisions of where to look and when to look in the text are independent but are mostly determined by word length and spaces between words. The length of the saccade is influenced by the length of the fixated word and the word to the right. When readers are unaware of the information that is in a sentence, the length of the saccade decreases and that results in the slowing down of the reading process. Previous research reported that most participants fixate from the left to the middle (Bindemann, 2010), although this can vary in other participants.

In other studies, there was no effect of frequency. Balling (2017) conducted a study which included 27 Danish high school students who were asked to read four authentic texts. There were two types of texts: an original version and a revised version. Participants later completed eight mixed open and closed comprehension questions. The measure of comprehension was focused on gaze duration on relevant constructions. The findings revealed that there was no effect irrespective of whether there was a construction or not. There was no effect in reading time between recommended and problem construction texts. The study indicated that linguistic manipulations are not vital for text comprehension.

Apart from normal readers experiencing difficulties reading texts due to several other factors, other children experience reading problems due to the central part of the vision that threatens the process of learning to comprehend reading materials. About 15% of normally intelligent boys and 5% of girls fail to learn to read and write as well as would be expected from their general intelligence (specific reading disability, SRD) (Stein & Walsh, 1997). Similar to young children, poor readers (Hulme & Snowling, 2011) who often rate themselves as highly proficient (English *et al.*, 2010) and dyslexic readers at all ages exhibit longer fixations (Blythe *et al.*, 2009), shorter saccades and more regression, relative to normal readers comparable in age (Ashby, Rayner, & Clifton, 2005). There is no single explanation for dyslexia. For instance, the magnocellular theory is based on the observation that many readers with dyslexia report words moving around, which could be attributed to central parts of the vision system that drive the eye movements (Stein & Walsh, 1997). In contrast, the phonological theory of dyslexia argues that people with dyslexia have difficulty with the phonological activation from the words, which is believed to be a prerequisite for comprehension (Ramus, Pideon & Frith, 2003). It is important to note that in rural townships schools, educators are hardly aware of their learners have dyslexia, and hence, it is important to note view from the literature.

2.11 Reading in L1 and L2

There are not many reading studies of users of two languages, but Whitford and Titone (2014:9) found that:

Bilinguals exhibited reduced L2 compared with L1 reading fluency, which was modulated by individual differences in current L2 exposure. Specifically, global measures of reading difficulty were reduced during L2 compared with L1 reading in all bilinguals (slower reading rates, shorter forward saccade lengths, longer forward fixation durations, and more regressive saccades).

In other studies, Van Rooy and Pretorius (2013) found different results from those of Whitford and Titone (2014), showing that learners who had difficulty comprehending a passage in isiZulu also performed poorly when reading in English, which means that there was no differential performance between L1 (isiZulu) and L2 (English). The findings also revealed that weak readers remained weak irrespective of the language in which they read, while skilled readers tended to perform relatively well in both languages. Land (2015) also explored isiZulu and English; the findings indicate that isiZulu texts take more time to read compared to other alphabetic languages, with participants making shorter saccades and thus more frequent fixations and more frequent regressions throughout texts.

2.12 Oral vs. silent reading

Oral reading fluency (ORF) is a reliable predictor for a skilled reader Canine *et al.* (cited by Makalela & Fakude, 2014: 71). Oral reading fluency measures word read correctly per minute (WCPM) as well as accuracy and rate in reading texts. In the present study, oral reading fluency was not tested on the eye tracker. The studies below review oral reading fluency by exploring other studies that investigated oral reading fluency with or without the use of an eye tracker.

Researchers, policymakers, teachers and curriculum implementers have been discussing the concept of Oral Reading Fluency (ORF) for more than “30 years in the developed world” to determine whether oral reading fluency can be used as a diagnostic mechanism for placement

in the classroom (according to Keijzer (2013) and Reschly *et al.*, cited by Makalela and Fakude (2014: 71)). In the 1970's it was discovered how important fluency is when measuring how skilled a reader is (Canine *et al.*, 1990) and that it can also be regarded as a reliable predictor for measuring the reading proficiency of children (Samuels, 2006b; Fuchs *et al.*, 2001).

According to Bell (2001) skilled readers read at 350 wcpm, fair readers achieve 250 and slow readers attain 150 wcpm. ORF "involves accuracy and rate of reading connected texts or correct words per minute" (Roehrig *et al.*, 2008:345). "Fluent reading, therefore, requires the automatised grouping of words into grammatical and meaningful units or chunks" for easier comprehension (Breznitz cited by Makalela & Fakude, 2014:71). According to Samuels (cited by Makalela & Fakude, 2014:71), "if one is automatic in the ability to decode text, texts can be decoded with ease, speed, and accuracy".

Oral reading fluency tests can be used as a diagnostic tool to measure the reading fluency of readers. Makalela and Fakude (2014) provide a detailed description when they explain "barking the text" as the inconsistent sounds which the struggling readers make when they read. This is characterised by rote learning of phonemes which is done immediately when children start with schooling. The problem is that the behaviour is not unlearned when the children move up to the higher grades. They fail or struggle to move from learning to read to reading to learn. The study explored oral reading fluency among Grade 4–7 primary school learners. The findings from the study revealed that learners read very slowly and not on the instructional level. The data reveal that Grade 7 learners from this study were reading at a level of Grade 1–3 of 50–70 ORF scores in their home language.

The Department of Education in South Africa state in their education policy document that learners from Grades 1 to 3 are taught letters of alphabets, short stories and poems primarily as a communicative language approach (De Sousa & Broom, 2011). According to Malda *et al.* (2014:35), reading skills refer to print-based skills and meaning-based skills. The study investigated text fluency and reading comprehension. The participants read either of the three comparable stories of Setswana, English and Afrikaans children. Findings revealed that children who were using a language that did not match the medium of instruction obtained lower scores, but a mismatch between home language and school language did not necessarily mean that there was a subtractive bilingualism, because possibilities of positive effects can be evident at a later stage when the second language continues to develop.

When comparing oral reading fluency and silent reading, the study by Rayner (2009) reports findings that state that fixations are longer in oral reading than silent reading because: (a) the reader has to produce each word as it is read, and (b) the eyes, which move faster, stay in place longer so that they do not get too far ahead of the voice. This is consistent with Vorstius *et al.* (2014), who found that oral reading slows down by 30% in adult readers. According to Rayner and Pollatsek (1989), children read more slowly when reading aloud. Previous studies have analysed fixation duration and saccade size, where fixation is defined as a period when the eyes are relatively still and during which important and new visual information is encoded from the text (Pollatsek & Rayner, 2006). The duration of a fixation on a word (duration of a focus on a word) is associated with how easy or difficult understanding a word during reading is. Fixation duration and saccade sizes are related to the processing of activities where readers make longer fixations and shorter saccades when the text is very difficult. Fixations are important because it is during fixations that information is obtained from the visual stimulus. There is a relationship between overt attention (where the eyes are fixating) and covert attention (where the mind is attending). During reading, the eye location and attention may be separated or dissociated, and when that happens, it is generally the consequence of programming an eye movement.

Reading speed is an attempt to read faster than you can, with the knowledge that it will save time by being fast, but one loses comprehension in the process. When normal and speed

readers were given the same amount of time to read a passage, the speed readers recalled more idea clusters, but they recalled fewer details about the idea (Hansen, 1975). For speed reading to work, it will depend on what is meant by work. If the purpose of reading is to identify the main ideas or to get an overview of the text, the reading speed will be slower (Balota, 2016), because reading speed is not a reliable activity for comprehension (Wallot *et al.*, 2014), but the two concepts (reading speed and comprehension) are related (Gates, 1921; Bell, 2001). The comprehension level of speed readers was found to be below that of normal readers when they were reading for the same amount of time (Just, Carpenter & Masson, 1982). This means that the speed readers lost comprehension along the way; hence their comprehension level was low. Normal readers spent as much time as they needed to, to comprehend what they were reading. More than 30 years ago studies that tested speed reading mostly did not test what the readers learned from the text, but they often used easy multiple-choice items to test comprehension (Just & Carpenter, 1987).

According to Hyönä and Nurminen (2006:31), skilled adult readers are aware of their general reading speed as well as reading behaviour. To come to this conclusion, they conducted a study to investigate individual differences in reading styles among competent adult readers and examining whether readers were aware of their reading style. Data for this study were collected from 44 Finnish native students who were requested to read a Finnish text. During reading the participants were supposed to identify main points from the text. In addition to reading the Finnish text, the participants were requested to complete a questionnaire that was designed to identify individual reading styles. Slow reading does not mean that the readers are inefficient nor that they are efficient when they read faster (Berkoff, 1979). Findings revealed that the slow linear readers exceeded the other clusters (fast linear readers and topic processors). The slow readers showed an increase in progressive fixation time, while the fast linear readers showed less progressive fixation time. Slow linear readers, compared to fast linear readers, have a smaller working memory capacity and lower general linguistic skills (Sackstein *et al.*, 2015). Topic processors seem to make more re-reading fixation times, with more re-reading for paragraph-final sentences and more for section-final sentences. Overall the participants who favour the topic structure processing reading strategy seem to perform much better than the linear readers, especially for remembering the main text.

2.13 Conclusion

From the discussion above, it is clear that until African languages are used in the various domains where government officials speak the languages, write in the languages and keep records in the languages, they will continue to have low status (Desai, 2001). It is noted that in Africa as a whole, English is spoken by few people, although it is widely used by a population of over 50% as the language of teaching and learning. English is preferred as a language of teaching and learning by many countries, including South Africa for its social, economic, political and educational privileges. While many parents prefer English as the LoLT for their children, indigenous South African languages cannot be disregarded because they are part of the community's socio-cultural identities (Dyers, 2008). In the majority of townships, it is very common to find children speaking two or more indigenous South African languages, which makes English their third, fourth or fifth language. Furthermore, scholars like Cummins (2000) already demonstrated conclusively that reading in two languages is beneficial in education.

The reading of full texts has been widely studied for many years to investigate reading comprehension texts (McNamara, 2012). Eye-tracking studies in other fields of research that have been widely investigated include neurology, cognitive and experimental psychology, text reading and subtitling. Regarding the research that has been conducted on the reading and comprehension of texts, this section highlighted that there are variables characterised as the

major components that tell us more about why people struggle with comprehension. Decoding and linguistic comprehension variables influence eye movements while reading. How the participants move their eyes over the text is an indication of whether they are skilled or less skilled. Furthermore, fixation duration can inform us whether the readers experience processing difficulties while fixating their eyes on a word. Also, this section also indicates that there are different limitations that the readers experience when reading comprehension texts (i.e. the length and frequency of the words).

This section also indicated that a number of studies that reported on reading comprehension showed that there are factors that influence the reading of the text when studied with an eye tracker. Many studies indicated that the reading of texts is affected by the length and the frequency of the words. Other factors are word predictability and word difficulty. Many studies have established that when words are of low frequency (Inhoff & Rayner, 1986; Rayner & Duffy, 1986), readers struggle to comprehend the text. Similarly, when words are longer (Ashby, 2006; Liversedge *et al.*, 2004; Rayner, 1998; Schuster *et al.*, 2016) the duration of the fixation increases because the processing of longer words takes a while. Although the findings of the previous research are valuable for the present study, there is a gap in investigating reading comprehension in African languages. None of the existing studies worked with Sepedi and English readers in South Africa. Therefore, there is a gap in the research that could be filled by investigating the eye movements of participants reading full texts in both their home language, Sepedi, and their second language, English.

In the introduction to this study, several research questions were stated.

The literature review discussed in this chapter is not sufficient to fully and adequately provide information that enables the reader to answer the research questions of the study. To answer the research questions, empirical data are required, and currently, the literature presented could not provide evidence through eye-tracking research.

With the aim of answering the research questions, the measures and findings from previous studies that used eye-tracking were applied to the present study. Insights that were gained from learning about the methodology with regard to the interpretation of the data include fixations, saccades and regressions, which are the major components of eye movement. In this regard, the literature survey unearthed a great deal of information about fixations that are longer and more frequent and how these are an indication of the fact that readers are experiencing processing difficulties. The literature review provided information about shorter saccades and that could also be an indication that readers are struggling to read by fixating on almost every word. Lastly, the literature review provided information about regressions, which could be an indication that readers regress to get a clear idea of what they are reading if they are struggling to comprehend when reading the text during the first fixation. Previous studies were taken into consideration when interpreting the data collected for this study.

Overall, all of these eye-tracking measures are situated within the SVR framework to enable meaningful interpretation. The local-early measures such as the first fixation duration, gaze duration, regressions out of word and words skipped first enable this study to explain the decoding measure of the Simple View of Reading (SVR). Also, the average fixation duration, average saccadic amplitude and average regression percentage can also enable this study to interpret the linguistic comprehension measure with the Simple View of Reading (SVR).

The next chapter presents the research methodology of the study.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Introduction

Chapter 2 stated that numerous reading research studies that used eye-tracking as a method to measure the eye movement behaviour of participants were conducted. The overall aim of Chapter 3 is to present the methodological processes followed in the present study that were used to explore and provide answers to the research questions presented in Chapter 1. The purpose of the study was to examine the role of decoding and linguistic comprehension within the Simple View of Reading (SVR) framework among university and school participants when they read Sepedi and English. The study uses the SVR framework to situate the findings by collecting decoding and linguistic comprehension data.

This study made use of a quantitative research design that aimed at describing the reading behaviour of the participants. A descriptive study establishes only associations between variables. The reading data were collected from two groups: university participants and school participants. The primary set of data comprised silent reading data collected using an eye tracker because the main focus of the present study was to describe the reading behaviour of the participants when they read in Sepedi and English. The secondary data comprised oral reading fluency, answers to the attitude questionnaire, and answers to a comprehension test.

Chapter 3 is structured as follows: Section 3.2 describes the setting for the study by giving information about where the research took place. It furthermore provides the rationale for selecting the research site. The participants are described as university participants and school participants. Section 3.3 describes the sampling method used in the study. Section 3.4 describes the materials and instruments used to collect data for the study. Section 3.5 describes the eye-tracking equipment used to collect eye movement data. The materials and instruments used for the study include comprehension texts for silent reading, reading comprehension tests, oral reading fluency tests and responses to an attitude questionnaire. The additional Sepedi reading material that was made available to the participants to support their experiences of reading a variety of texts more regularly in Sepedi will also be described as it provides background information about the experiences of the participants. Section 3.6 presents information on the data collection method by outlining the procedures used to collect the eye-tracking data. Section 3.7 describes the data analysis processes and procedures for all the collected data. Section 3.8 describes the ethics care applied to see the study through, and Section 3.9 offers concluding remarks on the methodology of the study.

3.2 Setting: Description of setting and participants of the study

The two settings in which the study was conducted are described in this section.

3.2.1 Setting: university participants

The study was conducted at the North-West University's Vaal Triangle Campus, which is located in Vanderbijlpark, approximately 70 km south of Johannesburg in Gauteng, South Africa. The campus is situated on the banks of the Vaal River which divides Gauteng and the Free State. The North-West University was established on 1 January 2004 and was part of the transformation of the higher education landscape in South Africa (Coetzee-Van Rooy, 2012:92). The merger between the former Potchefstroom "University for Christian Higher Education, the University of North-West and the Sebokeng Campus of the former Vista University was part of

government's attempts at integrating segregated higher education institutions" (Oliver, 2014:610). In 2017 when the data for the study were gathered the Vaal Triangle Campus had 7 925 registered students both full-time and in distance learning programmes. The Vaal Triangle Campus "contributes to the skills and knowledge of the Gauteng region and acts as a catalyst for economic growth" (Coetzee-Van Rooy, 2012:92). The North-West University had a population of 72 994 in 2017, with 42 218 students studying full time and 30 776 studying part-time. The racial composition of both contact and distance students in 2017 is presented in Table 3–1 below:

Table 3. 1 The racial composition of contact and distance students at NWU in 2017 (NWU profile, 2016/2017)

Race	Number and Percentage (%)
African	50 712 (69%)
Coloured	3 519 (4.8%)
Indian/Asian	606 (1.2%)
White	18 145 (25%)

Population groups in South Africa are usually defined as Black African, Coloured, Indian/Asian or White (see Census Metadata, Statistics South Africa, 2011: 31); government requires that universities in South Africa also document the racial composition of their students to ensure that planning focused on the broadening of access to higher education can be monitored.

Table 3. 2 Number of enrolment of students at NWU by home language from 2016-2019

Campus ► Hemis Language	2016 Enrolments	2017 Enrolments	2018 Enrolments	2019 Enrolments
Vaal Triangle	7511	7580	7632	7678
Afrikaans	1033	934	867	796
English	885	852	1457	1387
isiNdebele	38	45	51	47
isiXhosa	385	406	403	438
isiZulu	1046	1083	967	947
Other Language	496	467	610	757
seSotho	1937	2168	2162	2137
seSotho sa Lebowa	73	78	94	108
Setswana	465	471	451	517
siSwati	102	117	140	156
Tshivenda	114	107	108	101
Unknown	780	672	142	72
Xitsonga	157	180	180	215
Total	7511	7580	7632	7678

According to Statistics South Africa (SSA) (2011), nationally, Sepedi is reported as a home language used by 4 618 576 (9.1%) as part of the total population. Gauteng province had a total population of 12 272 263 people in 2011 (Statistics South Africa, 2011). Two dominant home languages are reported in the 2011 Census for Gauteng: Afrikaans and Sesotho. The table (Table 3.4) below presents the population in Vanderbijlpark according to the reported home languages spoken in the region.

Table 3. 3 Population of Vanderbijlpark and the percentage of home languages spoken in the region (Statistics South Africa Census, 2011)

First Language	Afrikaans	Sotho	English	isiZulu	Other	isiXhosa	Setswana	Sepedi	Xitsonga	Tshivenda	Sign Language	isiSwati	isiNdebele
People	47 682	18 652	9 365	4557	3 038	2 870	2 154	1915	1 048	828	569	444	383
%	50.99	19.95	10.02	4.87	3.25	3.07	2.30	2.05	1.12	0.89	0.61	0.47	0.41

From this table, one can see that Sepedi is not very well represented in the area. However, there was a good reason for choosing this area as the research setting for this study, as will be discussed below.

3.2.2 Rationale for choosing the setting: university participants

The rationale behind choosing North-West University as the research site when there is, in fact, another area where the majority speaks Sepedi of the population (Limpopo province) was because the university participants were easily accessible. Furthermore, there is an eye-tracking laboratory situated on the campus where I work, and this created easy access to the participants as well. The initial plan was to travel to Limpopo, which is 360 km from the Vaal Campus. The first challenge to the initial plan was the practicality of setting up a new laboratory in another province and to reserve the space for five months. The other challenges were travelling a long distance with the equipment, replacement of teachers and logistics issues such as accommodation and transportation without confirmation of funding. I then decided to investigate the reading proficiency among a group of participants who were speakers of a language that is considered a minority in the area of the Vaal Triangle Campus and to work with students who study on this campus. Choosing this group of participants simplified the logistical arrangements: the participants would be able to come to the eye-tracking laboratory instead of me having to drive to Limpopo with the equipment and go to the trouble of setting up a research laboratory in a new location. Therefore, the participants were selected from the Vaal Triangle area. Since I was looking for Sepedi readers, the participants included students who came from various provinces and areas where Sepedi is a dominant language and who had come to Gauteng to further their studies at a university. The participating students came from different backgrounds and were exposed to only one of the dialects listed below, namely Masemola (Masemula, Tau), Kgaga (Khaga, Kxaxa), Koni (Kone), Tswene (Tsweni), Gananwa (Hananwa, Xananwa), Pulana, Phalaborwa (Phalaborwa, Thephalaborwa), Khutswe (Khutswi, Kutswe), Lobedu (Khelobedu, Lovedu, Lubedu), Tlokwa (Dogwa, Tlokoa, Tokwa), Pai, Dzwabo (Thabine-Roka-Nareng), Kopa (Ndebele-Sotho) and Matlala-Moletshi. Dialects such as Pai, Kutswe, and Pulana are more divergent and sometimes called “Eastern Sotho”. The only requirement for selection to participate in the project was that the students must have passed Grade 12 with Sepedi as the Home Language. I preferred first-year students to any other level since they were fresh from high school and thus provided an ideal population to enable the study of the reading patterns of bilinguals at the end of high school as these students had studied Sepedi at the high school level.

3.2.3 Setting: school participants

The data collection for school participants was initially done at a secondary school situated in the Zamdela location in Sasolburg. The term “location” used here is an informal reference to a township. A township is defined as follows: “Historically, ‘township’ in South Africa referred to an urban residential area created for black migrant labour, usually beyond the town or city limits” (Census metadata, 2011: 20). Sasolburg is in the province of the Free State in the district of Fezile Dabi at the Metsimaholo municipality situated on the banks of the Vaal River. It was established in 1954 and occupied a total area of 30.9 square miles (about 49 square kilometres). The language make-up of Zamdela, according to Statistics South Africa (2011) is presented in the table below.

Table 3. 4 Population of Zamdela and the (%) of home languages spoken in the region (Census, 2011)

First Language	Sotho	isiXhosa	isiZulu	Sepedi	Sign Language	English	Afrikaans	Setswana	Other	Xitsonga	Tshivenda	isiNdebele	isiSwati
People	60 188	8 354	5 537	1 737	1 285	1 238	1 170	828	592	486	419	289	182
%	73.13	10.15	6.73	2.11	1.56	1.50	1.42	1.01	0.72	0.59	0.51	0.35	0.22

A specific high school was identified from which to sample participants. The high school selected is a state secondary school located in the Dikgutsaneng Section of Zamdela. The school was established in 1977 as the first Black secondary school in the area of Zamdela. At the time of inception, Southern Sotho (Sesotho) was the only African language catered for in the school, because it was the predominant language in the area. Currently, the school offers Southern Sotho, Zulu and Sepedi so that it can cater to diverse groups in the community who send their children to the school. For the study, the participants who took part in this research were Grade 8 and 9 learners, and they were currently taking Sepedi as a Home Language.

3.2.4 Rationale for choosing the setting: School participants

The rationale for selecting the Free State as a site for the school population to participate in the study was, firstly, because the province had only one school that taught Sepedi as a language subject from Grades 8 to 12. There were no schools in Vanderbijlpark or the neighbouring towns that offered Sepedi as a language subject in schools, although Sepedi was the reported home language and strongest language of the participants in the study. Secondly, the school was a short distance from North-West University’s Vaal Campus, so I could drive to the school every day to collect the data.

The initial plan was to travel to the school with the equipment. This could be done, but my team and I experienced problems with the stability of the electricity supply during data collection at the school site. In addition to the problem of a steady supply of electricity, we had heavy rains for a few days during data collection. A few days after the heavy rain had ended, we experienced a problem with the computer to which the eye tracker was connected. These challenges delayed data collection by almost three weeks. A week later, the computer was fixed and I then decided to ask permission from the Department of Education and the school principal to transport the learners from the school to the NWU Vaal campus. I received permission from

the Department of Education and the school principal. The school participants were transported from the school to the campus after school to ensure that they did not miss any school work.

Grade 8 and 9 learners were selected because they could be treated as a homogeneous group. According to the South African education system, learners in Grade 8 and 9 have comparable cognitive capabilities and are classified into one curriculum category as belonging to the senior phase, and thus provide an ideal population to supply data on the reading literacy of learners in high school.

3.3 Sampling procedure

The sampling procedures used in the study are discussed in this section.

3.3.1 Sampling: University participants

During the reading of measure 1 texts, only twenty-nine ($n = 29$) participants were recruited from the Vaal campus of North-West University in Vanderbijlpark due to some participants who dropped out of the study (17 (58.6%) females and 12 (41.2%) males participated in the end). The average age of the participants was 20.0 years. At the beginning of the year during an orientation programme, first-year students complete the Test of Advanced Literacy Levels (TALL) which is used for placement in the Academic Literacy Development module offered by the university. While taking the tests, the students were issued with consent forms that indicated that they could voluntarily provide their personal details if they would like to be contacted to take part in a research project. After the test, I collected all the consent forms and only selected the forms of the students who indicated that they were home language speakers of Sepedi. The students came from all faculties and seven academic schools on the Vaal Triangle Campus of NWU. All the participants shared the basic educational level of Grade 12 schooling and all of them were enrolled in different undergraduate programmes. All but one student reported Sepedi to be their home language, and all the students reported that they spoke three to five languages, including English and Sepedi. They reported using several of their languages daily but in different contexts. English was their university language – the language that they used for all the modules they were registered for in the undergraduate programme they were completing. They used Sepedi as their home language. In social media, among friends and on the campus, the students' mix languages, for example, Sepedi, English, isiZulu, isiXhosa, etc. The participants used mostly English with their peers, and they used Sepedi less in general because they spent most of their time on campus with other students. The table below presents the distribution of participants across different fields of study:

Table 3. 5 Bachelor's degrees of participating students at the NWU-Vaal Triangle Campus (university participants)

Bachelor's degrees that the participants are registered for	Percentage (%) of students enrolled
Bachelor of Education	6 (21 %)
BCom Accounting	5 (18 %)
BSc in Information Technology	5 (18 %)
BA in Languages and Psychology	5 (18 %)
BCom Marketing, BA Communication, B Com Industrial Psychology and University preparation course	4 (14 %)
BA in Development and Management	3 (11 %)

None of the participants had any advantage by the virtue of being registered for a particular degree. From the questionnaire, questions about the level of education of the parents of the participants were mainly used to approximate the socio-economic status of the participants. Questions about the level of education of the participants' parents were necessary in order to establish the kind of background the participants came from whether they came from a potentially more literate or less literate background.

The distribution of data for the highest qualifications of the parents of the participants show a double bulge: i.e. about 40% of the participants' parents did not complete Grade 12 or have a tertiary qualification, and 20% of the participants' parents completed Grade 12. One can cautiously infer from the data that about 60% of the participants were raised in households with literate to highly literate parents (see chapter 4 for detailed description).

3.3.2 Sampling: school participants

The data were collected from 29 children (n=29) from a secondary school in the Zamdela location in the province of the Free State of South Africa. The participants included 14 females (48.3%) and 15 males (51.7%) with an average age of 14.4 years. The school participants were enrolled in Grades 8 and 9. In the classroom, there was a combination of Sepedi and Zulu speakers in both grades. These participants had the reading abilities of students who completed primary school education. In other words, they had completed Grade 7 and progressed to Grade 8. The Grade 9 learners had the reading abilities of learners who are in the secondary school senior phase. For this study, Grades 8 and 9 were treated as a homogenous group.

Very few of the school participants' parents completed tertiary education, and 32% of the fathers and 36% of the mothers did not complete Grade 12. In total, 63% of the fathers of the participants completed Grade 12, while about 45% of the mothers of the participants completed Grade 12. One can cautiously assume that the school participants were raised in homes with literate parents which is similar to university participants (See Chapter 4 for detailed description).

All but four learners reported Sepedi to be their home language, and all the participants spoke three to five languages, including English and Sepedi. They reported using several of their languages daily but in different contexts. English was the school language for all their school subjects, while Sepedi was both a school subject and a home language. In social media, among friends and at school, the learners mixed languages, for example, Sepedi, English, isiZulu, isiXhosa, etc. The participants' home language was a minority in the surrounding area where

they were exposed mainly to Southern Sotho (Sesotho), which is spoken by 64% of the population, whereas Sepedi is not listed in the census data as an official language of the province.

3.4 Materials and instruments

Eye-tracking as a reading measure was complemented with comprehension tests to measure eye movements and comprehension of the text during the empirical component of this study. Other measures that were used included comprehension texts and tests, as well as additional performance measures such as oral reading fluency protocols and also an attitude questionnaire. The additional performance measures were added because they provided crucial information related to the research questions posed in the thesis that cannot be answered via eye-tracking data alone. For example, eye-tracking data do not reveal “anything about the successes and the failure of comprehending the relevant piece of information” (Hyönä, 2010:173). Hyönä (2010:173) states that the participant may spend a lot of time working on a task, “without adequately comprehending its relevance or the underlying principle it denotes”.

The present study made use of comprehension texts and comprehension tests, oral reading fluency tests, questionnaire data and the participants experienced additional opportunities to read a variety of texts in Sepedi that were supplied by the researcher.

3.4.1 Comprehension texts: Selection and readability of the texts

The study comprised four comprehension texts: two texts in English (one generic text and one academic text) and two texts in Sepedi (one generic text and one academic text). For the study, I obtained texts from different sources (see Table 3.6), and I developed the comprehension tests myself. The Sepedi texts that I used for university participants were translated from English because there is a great paucity of Sepedi texts for academic purposes, especially for university participants.

The Sepedi texts used for school participants were sourced from the textbooks used by educators in previous years. I made sure that the textbooks used were not prescribed for both the Grade 8 and 9 learners in 2017. The textbooks that were used to extract the Sepedi texts used in the project were relevant for the level of study (Grade 8 and 9), which was the target group in this study for school participants. The teacher reported that the learners had no access to the texts used in the experiment and also the books were not for sale because they belonged to the Department of Education. Therefore, school learners in general (and the participants in particular) did not have access to and could not have read the texts that were used for the eye-tracking experiment used in the study.

In order to determine the level of the text, it is important to keep in mind the complexity and difficulty of the texts in a reading study. According to Rayner (2013), lexical variables such as the frequency of words in the language, the length of words, syntactic variables measuring the complexity of sentences (such as the length of a sentence, number of phrases in a sentence and number of clauses in a sentence), and lastly semantic variables and the complexity of the causal structure are crucial when choosing a text.

Four different texts were used for the reading experiment. Although Sepedi texts were translated, they were not the same texts used for the English texts. Each text had different

content, but the texts were similar in structure. The length of the texts was roughly the same (the Sepedi academic text had 2 897 words after translation from English, the English academic text had 2 000 words, the Sepedi generic text had 2 198 words, and the English generic text had 2 000). It was not possible to display the texts in full on the computer screen, and therefore each text was spread over several screens. The shortest text was presented across 16 screens and the longest text across 19 screens on the stimulus computer. The participants progressed to each new screen by pressing the space bar key on the computer keyboard.

The texts appeared on the screen in paragraphs, with a maximum of 120 words in a font size of 28 on one screen. Table 3-6 and Table 3-7 below present summaries of the texts that were used to collect eye-tracking data for university and school participants respectively and a short description is given below.

Table 3. 6 Texts used to collect eye movement data for university participants

Text type	Title of the text	Text description
Generic Sepedi	Bohwa bja rena ke eng? (What is our heritage?)	This text gives a description of what is meant by the concept of heritage to the people of South Africa. It highlights events of South African culture and heritage. It further reflects on the history of the public holiday that was declared "Heritage Day".
Academic Sepedi	Naa dinaga tša Afrika di ka kgona go phela bjang ka tlhalelo ya dijo? (How can African countries cope with local food shortages?)	This text provides strategies on how African countries can cope with overcoming the challenges of food production in Africa.
Generic English	Why are textbooks a crucial part of every child's learning journey?	This text describes an event that took place in Limpopo province where a number of schools did not receive textbooks for the entire year. It reflects on the challenges the children and educators had to overcome because of a lack of textbooks.
Academic English	Africa's agenda in the coming decade	This text discusses the sustainability of food production and social issues that need to be addressed in Africa.

For university participants, both the Sepedi and English texts rated as academic were taken from a book titled *Poverty, hunger and democracy in Africa: potential and limitations of democracy in cementing multi-ethnic societies* by David Bigman. In a review by Bagwe (2014) the book is described as one of the works that integrate poverty, hunger and democracy as the three challenges that Africa is facing, which indicates that it is a typical text used in the undergraduate programmes for economics and development students at university. The text for Sepedi was a translation from an English text from the same book. It had to be translated since there is a lack of educational and academic materials in Sepedi that are relevant and at the same academic level of the selected English texts.

Table 3. 7 Comprehension texts used to collect eye movement data for school participants

Text type	Title of the text	Text description
Generic Sepedi	Mafula ke eng? (What are floods?)	This text describes how the heavy rains that caused the floods that occurred in South Africa and Mozambique in 2000 caused a lot of damage and led to many people losing their properties and their lives towards the end of 1999 and beginning of 2000.
Academic Sepedi	Ditšhupetšo mešomong (Protests at work)	This text describes an incident that happened at Lonmin mine when miners held a protest for better salaries and better working conditions in 2017.
Generic English	Worker warned before the bloodbath	The text describes protests that took place at one of the mines in South Africa in 2012 which led many people losing their lives.
Academic English	High drama in floods rescue	This text describes the floods that occurred within the borders of Limpopo and Mpumalanga in 2012 and how the victims were rescued. The events were so hazardous that one of the rescuing team members had to have a leg amputated during the floods.

For school participants, English texts were generated online while Sepedi texts rated as academic and generic were taken from the following books: (i) *Sepedi polelo ya gae* written by Mabelebele (2013), (ii) *Sepedi polelo ya gae* written by Mabitsela *et al.* (2013) and (iii) *Re nwa a mokgako* written by Shuter and Shooter (2005). The books were relevant because they were prescribed by the Department of Basic Education and used in previous years before this study was conducted.

To assess the level of difficulty, the readability index “Läsbarhetsindex” (LIX) was used to get an indication of how easy or difficult the texts were to read. LIX generated the score of a text; therefore, all the texts I used for the eye-tracking reading went through LIX. LIX is based on the average number of words per sentence and the number of long words with more than six letters and was developed in 1960 by education researcher Carlo-Hugo Björnsson. The agglutinating nature of Sepedi orthography influences the difficulty level of texts in Sepedi because Sepedi words are on average potentially longer than English words on average.

The following two tables below (Tables 3.8 to 3.9) provide detailed information about the properties of the texts that the participants read on the eye tracker during silent reading. The interpretation and classification of the texts are presented below. The calculations and interpretation of the readability index (LIX) score are presented below. The LIX only gives an indication of how easy or difficult a text is. The interpretation of the LIX score is not an exact science but rather an indication of the level at which the text is.

Interpretation and classification of the texts:

<30 Very easy to read, children's books

30-40 Easy to read, fiction, popular magazines

40-50 Intermediate, normal newspaper text

50-60 Normal value for official texts

The next table provides information about the texts that were read by university participants:

Table 3. 8 Texts properties for university participants

Sepedi text	English text
Naa dinaga tša Afrika di ka kgona go phela bjang ka tlhaelelo ya dijo? (How can African countries cope with local food shortages?)	Africa's agenda in the coming decade
Number of sentences (M): 86 Words (O): 2 897 Words with more than 6 characters (L): 605 Average sentence length ($L_m = O / M$): 33.69 Share of long words ($L_o = L / O * 100$): 20.88 Readability Index score ($LIX = L_m + L_o$): 55	Number of sentences (M): 87 Words (O): 2 000 Words with more than 6 characters (L): 547 Average sentence length ($L_m = O / M$): 22.99 Share of long words ($L_o = L / O * 100$): 27.35 Readability Index score ($LIX = L_m + L_o$): 50
Sepedi text (generic text)	English (generic text)
Bohwa bja rena ke eng? (What is our heritage?)	Why textbooks are a crucial part of every child's learning journey
Number of sentences (M): 96 Words (O): 2198 Words with more than 6 characters (L): 460 Average sentence length ($L_m = O / M$): 22.9 Share of long words ($L_o = L / O * 100$): 20.93 Readability Index score ($LIX = L_m + L_o$): 44	Number of sentences (M): 109 Words (O): 2000 Words with more than 6 characters (L): 592 Average sentence length ($L_m = O / M$): 18.35 Share of long words ($L_o = L / O * 100$): 29.6 Readability Index score ($LIX = L_m + L_o$): 48

From the table above, I can state that the Sepedi orthography which classified as an agglutinative language is not very different from English to an extent that it can be classified as difficult to read. Unlike IsiZulu which uses the conjunctive orthography where words are grouped or clustered into one word, Sepedi uses the disjunctive orthography when smaller words make up meaning (Hendrikse & Poulos, 2006). The written IsiZulu words tend to look dense and contain long linguistic units while Sepedi is written separately from the linguistic units which make it less difficult to read and can be comparable to English. From the above table, the number of sentences from both English and Sepedi is almost the same. Based on the word length, it is expected to have lower scores in English than Sepedi because Sepedi uses a lot of small units that are essential to the understanding of the sentences. Overall, the readability scores are comparable, given the length and type and language for both academic and generic

texts. Generally, English indicates more long words compared to Sepedi for both academic and generic texts (see the share of long words).

The next table provides information on the texts read by school participants:

Table 3. 9 Texts properties for school participants

Sepedi text (academic text)	English text (academic text)
Ditšhupetšo mešomong (Protests at work)	High drama in floods rescue
Number of sentences (M): 43 Words (O): 835 Words with more than 6 characters (L): 176 Average sentence length ($L_m = O / M$): 19.42 Share of long words ($L_o = L / O * 100$): 21.08 Readability Index score ($LIX = L_m + L_o$): 40	Number of sentences (M): 48 Words (O): 932 Words with more than 6 characters (L): 251 Average sentence length ($L_m = O / M$): 19.42 Share of long words ($L_o = L / O * 100$): 26.93 Readability Index score ($LIX = L_m + L_o$): 46
Sepedi text (generic text)	Sepedi text (academic text)
Mafula ke eng? (What are floods?)	Worker warned before the bloodbath
Number of sentences (M): 32 Words (O): 646 Words with more than 6 characters (L): 97 Average sentence length ($L_m = O / M$): 20.19 Share of long words ($L_o = L / O * 100$): 15.02 Readability Index ($LIX = L_m + L_o$): 35	Number of sentences (M): 42 Words (O): 597 Words with more than 6 characters (L): 134 Average sentence length ($L_m = O / M$): 14.21 Share of long words ($L_o = L / O * 100$): 22.45 Readability Index ($LIX = L_m + L_o$): 37

From the above table, the number of sentences from both English and Sepedi has a small difference. Looking at the word length it is expected to have lower scores in English than Sepedi. As mentioned above, Sepedi uses a lot of small units that are essential to the understanding of the sentences, but the academic text was longer in English compared to Sepedi. Overall, the readability scores are comparable, given the length and type and language for both academic and generic texts. Generally, English indicates more long words compared to Sepedi for both academic and generic texts (see the share of long words). Both English and Sepedi texts are comparable because the Sepedi orthography did not result in all the Sepedi texts ending up with the longest words in terms of characters. Some of the English texts had more words with more characters than the Sepedi texts.

3.4.2 Reading comprehension tests

In order to identify the strengths and weaknesses of reading in students, reading assessments are vital (Nel, Dreyer & Kopper, 2004). The reading comprehension data were collected through a pen-and-paper assessment procedure. Immediately after the participants had completed the eye-tracking reading assessment, they did a printed comprehension test comprising ten multiple-choice questions of the text they had just read. The multiple-choice test questions had four options to choose from to limit chance level to 25%. The administration of texts for both Sepedi and English were randomised and was not the same for every participant. I graded all the comprehension tests and converted the marks to a percentage score for the sake of further analysis.

The complete texts and comprehension tests are included as Appendices A to H to the thesis.

3.4.3 Oral reading fluency test

To investigate the reading capabilities of the participants and to determine whether they were fluent readers or not, I administered an oral reading fluency test using texts that were different from the texts used for the eye-tracking experiment. The fluency data were recorded per individual participant. The participants read two texts in both Sepedi and English. Each text varied in terms of the number of words, as stated above. Oral reading fluency data were recorded with an audio recorder while the participant read the text. The participants were told just to read and that they would not be tested on the text that they were reading. There was no time limit for the participants, and they were required to read normally.

3.4.3.1 Oral reading fluency test: university participants

After completing the silent reading task that was administered using an eye tracker, participants were given a printed copy of two new texts (one in Sepedi and one in English) for the reading aloud task. The participants were free to decide which text they would like to read first. The majority of the university participants opted to start by reading the English text first. Each participant sat in a test room for the oral reading task, and an audio recorder was used to record their reading. The oral reading fluency test was done in the eye-tracking laboratory, and because the room is soundproof, there were no distractions from the outside area. The participants were not expected to answer any questions based on the texts that they read. The texts that were used for the reading aloud task for both Sepedi and English are described in Table 3-10. The texts for Sepedi were taken from a book written by David Bigman (2011) and translated, while the English text was taken online.

Table 3. 10 Oral reading fluency texts for Sepedi and English used university participants

Language	Title of the text	Description
English	Diversity issues children need to be aware of	The text is based on the importance of introducing children to different racial groups. It further describes different types of family set-up and furthermore elaborates on food in different cultures.
Sepedi	Naa balemi ba Afrika ba ka tšweletša dijo tše di lekanego bjang (How can African farmers produce enough food?)	The text describes food shortages experienced by African farmers. It explains that due to food production shortage Africa imports a lot of their food from Europe.

The complete oral reading fluency texts for university participants and school participants are included as Appendices I to L to the thesis.

The following table below (Tables 3.11) provide detailed information about the properties of the texts that were used to collect eye movement data from university participants (see section 3.4.1 above for the description of the texts and their properties).

Table 3. 11 Readability index scores and properties of the text for oral reading fluency read in Sepedi and English for university participants

Sepedi Text	English Text
Naa balemi ba Afrika ba ka tšweletša dijo tše di lekanego bjang?	Diversity issues children need to be aware of
Number of sentences (M): 18 Number of words (O): 575 Number of words with more than 6 characters (L): 122 Average term length ($L_m = O / M$): 31.94 Proportion of long words ($L_o = L / O * 100$): 21.22 Readability Index ($LIX = L_m + L_o$): 53	Number of sentences (M): 20 Words (O): 350 Words with more than 6 characters (L): 93 Average mean length ($L_m = O / M$): 17.5 Proportion of long words ($L_o = L / O * 100$): 26.57 Readability Index ($LIX = L_m + L_o$): 44

3.4.3.2 Oral reading fluency test: school participants

To investigate the oral reading fluency, the school participants were provided with Sepedi and English texts. Due to the challenges experienced at the school during the initial eye-tracking data collection (electricity cuts, heavy rains and the breakdown of the computer that was used), I decided to conduct the oral reading fluency test first. The test was done at the school in the office of one of the teachers who kindly allowed me the space to use for the data collection. The participants came into the room one at a time to complete the read-aloud task. A voice recorder

was used to record the participants' reading. The additional texts used for the read-aloud task in both Sepedi and English are described in Tables 3–12.

Table 3. 12 Oral reading fluency texts for Sepedi and English used for school participants

Language	Title of the text	Description
Sepedi	Šireletša mmele wa gago (Protect your body)	The text states the importance of protecting one's body at all times. It further elaborates that children should refrain from sexual activities and protect themselves until they are old enough and well-informed so that they can make responsible choices about sexual activities. The text also states that healthy eating and exercise is very important when a person commits to taking care of themselves.
English	Health is wealth	The text highlights the importance of health, stating that building wealth starts with building a healthy lifestyle. The text states that a healthy lifestyle is very important because it keeps people physically, socially, mentally and psychologically sane.

The Sepedi texts were selected from textbooks that were used by Grade 8 and 9 learners in previous years. None of the school participants had seen the texts before. This ensured that there was no prior learning when they read these texts as part of the thesis experiments. The table below (Tables 3–13) provide detailed information about the properties of the texts that were used to collect eye-movement data from university participants (see section 3.4.1 above for the description of the texts and their properties).

Table 3. 13 Readability index and properties of oral reading fluency texts used for school participants

Sepedi Text	English Text
Šireletša mmele wa gago (Protect your body)	Health is wealth
Number of sentences (M): 16 Number of words (O): 372 Words containing more than 6 characters (L): 64 Average term length ($L_m = O / M$): 23.25 Proportion of long words ($L_o = L / O * 100$): 17.2 Readability Index ($LIX = L_m + L_o$): 40	Number of sentences (M): 19 Words (O): 336 Words with more than 6 characters (L): 66 Average term length ($L_m = O / M$): 17.68 Proportion of long words ($L_o = L / O * 100$): 19.64 Readability Index ($LIX = L_m + L_o$): 37

3.4.4 Questionnaire data

The questionnaire was adapted from Coetzee-Van Rooy (2000, 2010 & 2012) and more questions were added for the purpose of the present study. The questionnaire consisted of four sections (Appendices M and N for university participants and school participants). The following description of the questionnaire used in this study was adapted from Coetzee-Van Rooy (2012: 91):

In the first section, “the participants were informed about the purpose of the study, and they were requested to provide informed consent that their data could be reported anonymously. In the second section, questions that would provide biographical data of the participants (for example age, gender, fictional name, home language, level of schooling currently enrolled) and measures of socioeconomic status (for example, the highest qualifications of the mother and father of the participants) were asked. In the third section, questions about the language history, experiences and perceptions of proficiency were asked. Also, information on all the languages known to the participants was requested. For example, knowledge of the languages, how well the participants used the languages and also the order in which they acquired the languages. This section included sets of questions about the age of acquisition and the age when fluency was attained in language skills (i.e. in speaking, reading and writing) for all the languages known by the participants. The participants were also asked to reflect on their perceived levels of proficiency related to specific language skills for Sepedi and English. To explore the use of languages in particular domains, the participants were asked to rate the importance of identified contributing factors (for example interaction with the family) to the learning and current use of the languages included in their language repertoires.

In the fourth section, questions about their attitudes towards Sepedi as a language of teaching and learning in schools and universities were asked. The participants were also asked to reflect on whether they would prefer using Sepedi in various subjects such as Mathematics and Science.

3.4.5 Providing additional reading materials in Sepedi

As part of the study, I prepared additional reading materials in Sepedi that I provided to all the participants. The main idea with the additional reading materials in Sepedi was to provide both the university participants and the school participants with additional reading exposure to materials presented in Sepedi. I provided the additional reading material in Sepedi to support the reading experiences in Sepedi of the participants during the project. One of the questions in the language attitude questionnaire asked of the participants if they would participate in reading Sepedi or even using it as the language of teaching and learning. The additional reading material in Sepedi was to provide an opportunity for the participants to get access to Sepedi texts. The rationale for introducing materials in Sepedi and not in English was that the participants were already widely exposed to English materials, but exposed less for Sepedi academically, except in the classroom during a Sepedi lesson. This is apart from using Sepedi outside classroom in social interactions for school participants, whereas university participants had no formal exposure to Sepedi at university. The idea was to create a context in which Sepedi is used more extensively so that the participants could have a real experience of where Sepedi texts were used.

After completing four comprehension tests (generic and academic texts) in both Sepedi and English, the oral reading fluency test and the language attitude questionnaire, the participants were provided with a booklet that contained the texts of the additional reading material in Sepedi. The variety of texts included newspaper articles, short stories and academic texts which were sourced from websites such as <https://www.jw.org/nso/>. The texts compiled covered topics such as “re-naming of streets”, “Origin of Africans”, “Knowledge is power” “Service delivery”, etc. for university student participants and “Mother’s love”, “Respecting constitutional rights”, “Making a living” and “Our heritage” for school participants. The booklet contained only Sepedi texts, and each text was followed by at least one to four comprehension questions. The types of questions ranged from literal questions to inferential to factual questions. University participants received the booklet immediately after they had completed reading the comprehension texts, orally reading fluency texts and the questionnaire. The participants were requested to return the booklet to the researcher on the day scheduled for measure 2 of the eye-tracking experiment. The participants were given five weeks to complete reading the booklet, which comprised 61 texts. School participants were given the booklets at school immediately after they had completed the reading comprehension texts on the eye tracker, the oral reading fluency test and the questionnaire. The School participants were also given five weeks to complete reading the booklet, which comprised 40 texts. After five weeks I went to the school to collect the booklets. The university participants were in charge of their own reading; for the school participants, the educator was in charge of the school participants and supported them with the completion of their reading.

University participants

The data indicated that only 34 university participants were issued with booklets because they completed measure 1 of the eye-tracking reading of the texts. The majority of the participants did not complete reading the 61 texts in the booklet. of the 34 participants, five did not return their books, and about six did not provide any evidence to show that they had completed reading the texts. This evidence indicates that although participants might be positive about reading more texts in Sepedi, they do not necessarily act on this desire – even in the case when additional Sepedi texts were available.

School participants

Compared to the university participants’ data, the majority of the school participants did, in fact, read the booklets; therefore, 17 out of the 29 participants completed the reading. Two participants did not provide proof of any reading. One participant reported that he had lost his book when he visited his family, and another reported that his house had been flooded and his book had been destroyed. These issues were only reported on the day that I went to the school to collect the books and not immediately when they happened. The school context and the additional help of a teacher that monitored and inspired the school participants to read the additional Sepedi reading material could explain the better uptake of reading the Sepedi texts by the school participants.

3.5 Eye-tracking system

The eye tracker used for data recording was an SMI Hi-Speed 500 Hz monocular system running Experiment Center version 3.6.53, and iViewX version 3.6.53 on a Windows XP computer (Asus, Intel core 2 Duo E85003, 3.16 GHz, 2 GB RAM). The monitor was a 60 Hz 378 x 303mm MODEL TFT set at a resolution of 1 280 x 1 024 pixels, placed centrally at a distance of 700 mm from the participant’s face. Data were viewed and exported from BeGaze 3.6.53 and data files were organised in a Microsoft Excel sheet and analysed using the lmer function of R

version 3.1.2. The Hi-Speed system is a dark pupil system using the pupil/corneal reflex method. It is an integrated module with a built-in high-speed camera and an ergonomic chin and forehead rest that keeps the person's head in position in front of the camera (SMI, 2009 cited by Hefer, 2011). The eye movement data were recorded from the dominant eye only.

When conducting any eye-tracking experiments to study reading behaviour, there are standard procedures that need to be taken into consideration. The information presented below outlines these standard procedures for data collection.

3.6 Data collection procedure

This section provides an outline of how the data collection progressed from the beginning to the end.

All the participants were issued with the materials (booklet and attitude questionnaire) which they needed for completing the projects. The experiment was conducted over a period of five months, with the university participants booking sessions during their free periods. In the eye-tracking laboratory, only one session could be conducted at a time. Each participant completed all the tests in one session, depending on their daily schedule. The reading comprehension texts were completed first, followed by the oral reading fluency test, the completion of the language attitude questionnaire and the completion of the booklets where participants had to answer the comprehension questions after reading the additional Sepedi texts over five weeks. At the school, oral reading fluency was prioritised during electricity cuts and computer breakdown events. The oral reading fluency test was then followed by the completion of the language attitude questionnaire, followed by the comprehension text, then the reading of texts in the booklets with additional Sepedi texts over five weeks. Before the data were collected, university participants and school participants were familiarised with the laboratory environment. They were informed about what was expected of them for the duration of the study. Data were collected using several instruments mentioned earlier (see Section 3.4 above).

3.6.1 Preliminary explanations

Before conducting the reading experiment, the participants were given a tour of the eye-tracking laboratory to explain to them what an eye tracker is and how it works. Before the recording session, the participants were given printed (as detailed in the consent form) instructions about the task. According to Holmqvist *et al.* (2011:134), "a written instruction is usually more similar between participants than a verbal instruction".

When the university participants visited the eye-tracking laboratory, I welcomed them and tried to put them at ease. I then explained which eye tracker was going to be used and the basic procedure for using the Hi-Speed eye tracker. The participants were told that the study was about reading in both Sepedi and English. However, the study details were not discussed. This was done because I did not want the information to influence the participants' beliefs in their ability to read. As part of the preliminary explanations, the participants were each given a consent form to sign. They were also informed that the data that would be recorded would be anonymised, and also that they could withdraw from the study at any point in time. The participants were given an information sheet, which had contact details where they could contact me at any time.

University participants scheduled appointments for their reading sessions during free periods in their class timetables. They could come at a time convenient for them. At the school, the teacher gathered the school participants at the temporary location where the eye tracker was set-up for data collection. All the participants of the study were told briefly what the study was about, but not what it entailed. The participants were later invited one at a time, and they were made familiar with the eye tracker and how the data were going to be collected. The initial recording of the school participants was planned to take place at the school to ensure that they did not have to miss out on schoolwork. This was also emphasised by the Department of Education, which stated that it was important for the learners to stay in school. However, the plan did not work well and only four participants completed the reading at the school because the school experienced several power cuts for a week, among other challenges mentioned earlier. I asked the principal whether the experiment could be moved to the North-West University eye-tracking laboratory, and the principal supported the idea, but we agreed that the gathering of data would take place after school hours. I then provided the participants with letters to give to their parents or guardians to authorise the trip to the University (the letter is attached as Appendix O). The school participants were brought from the school in groups of two to four learners per day to the North-West University's, Vaal Triangle Campus in Building 7 where the eye-tracking laboratory is located.

3.6.2 Primary data: eye-tracking of silent reading

The first step that was carried out was the experimental set-up. It was of the utmost importance to make sure that all the equipment had been refreshed and switched on at least 20 minutes before data collection. Before starting with the data collection I ensured that the participants had switched off their cellphones, the air-conditioner was switched off, and all distracting sounds had been removed from the laboratory. Furthermore, I also ensured that there were no visual distractions in front of the participants or visible in their peripheral vision.

The next step was to open the experimental platform on the computer and to calibrate the eye tracker. In order to set up the experiment and calibrate the equipment, the participant was seated in a chair facing the computer monitor while his or her head was placed in the chin rest of the eye tracker. The participant supported the head on the chin rest to minimise head movements. While the participant was seated, the height of the chair and table, the position and focus of the camera were adjusted for optimal tracking. During the adjustments, the stability of the eye image, pupil threshold and corneal reflex were noted and set. When seated in front of the eye tracker, participants were told that it was essential to maintain and coordinate both eyes and move only the eyes and not the head. The participants were told not to swivel the chair, not to remove their chin from the chin rest of the eye tracker and to minimise their body movements while they were reading. Figure 3-1 is a photograph of the typical set-up experienced by the participants.



Figure 3. 1 A participant seated at the Hi-Speed eye tracker in front of the stimulus screen

Before the calibration, the participants were informed that the experiment was about to start to ensure that they were ready. The experimental instructions were displayed and explained to confirm that the participants understand how they should conduct themselves during the experiment. The calibration of the eye tracker was done for all participants using a standard 9-point grid and calibration procedure; accuracy was checked with a 4-point grid (see Figure 3.2 below). During the calibration procedure, I explained to the participants how calibration works and the validation screen was checked for accuracy. The calibration was repeated until an accuracy of $<0.5^\circ$ had been achieved. After calibration, the participants were instructed to read silently at their own pace. They were told to press the space bar on the keyboard to continue reading as the text was presented over several screens. Once the participants had completed the reading of each text, they completed a printed multiple-choice comprehension test on the text they had just read. The test was presented as a pen-and-paper assessment, and the participants used a pencil to provide answers to the multiple-choice questions.

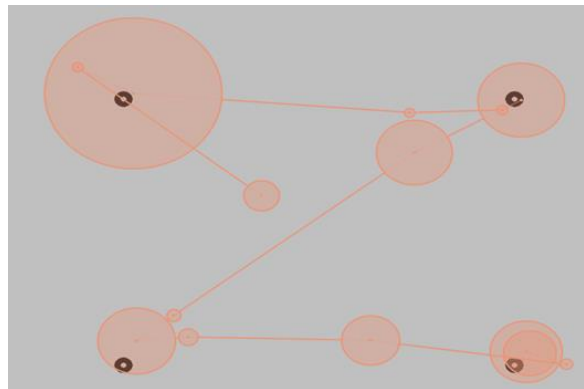


Figure 3. 2 Screenshot of the calibration validation of a 4-point grid showing the fixations and saccades of a participant

Before the first page of the text, there was a blank page with an X at the beginning of the page where the text should start (see Figure 3.3). This was to ensure that the participants did not start reading the next page by looking at the centre of the screen. The participants were instructed to look at the X until the next screen appeared. The participants were instructed to press the space bar on the keyboard to display the text and to move to the next screen of the text and to continue reading until the experiment was completed.

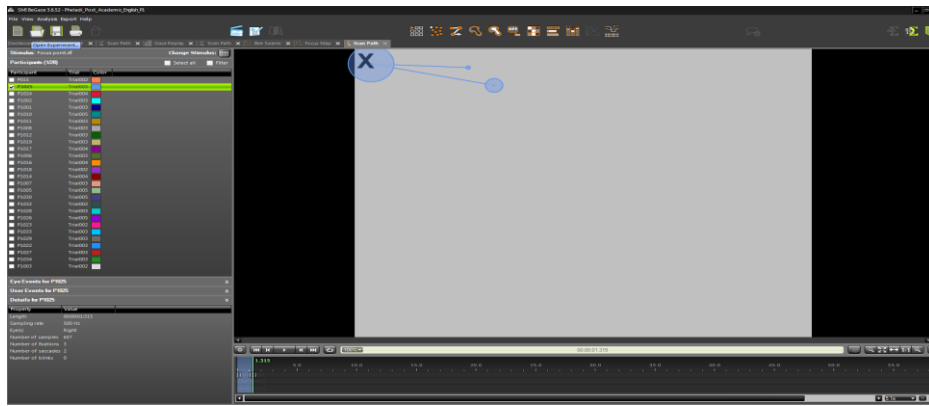


Figure 3.3 Screenshot indicating the "X" that participants had to look at before the text appeared on the screen

Although reading speed was observed as well, the participants did not have a limit on the time they could spend on reading the text. The participants were instructed to read the texts silently while the eye tracker recorded their eye movements. The participants were informed that they would be presented with multiple-choice questions about the texts that they were going to read. This was emphasised to ensure that they read to understand what they were reading.

When the participant finished reading the text on one screen, he or she had to press the space bar on the keyboard to continue reading the text. Once the participant had pressed the space bar, he or she could not go back to the previous screen to read. After a text was read, the participant had to answer 10 multiple-choice comprehension questions given on paper immediately.

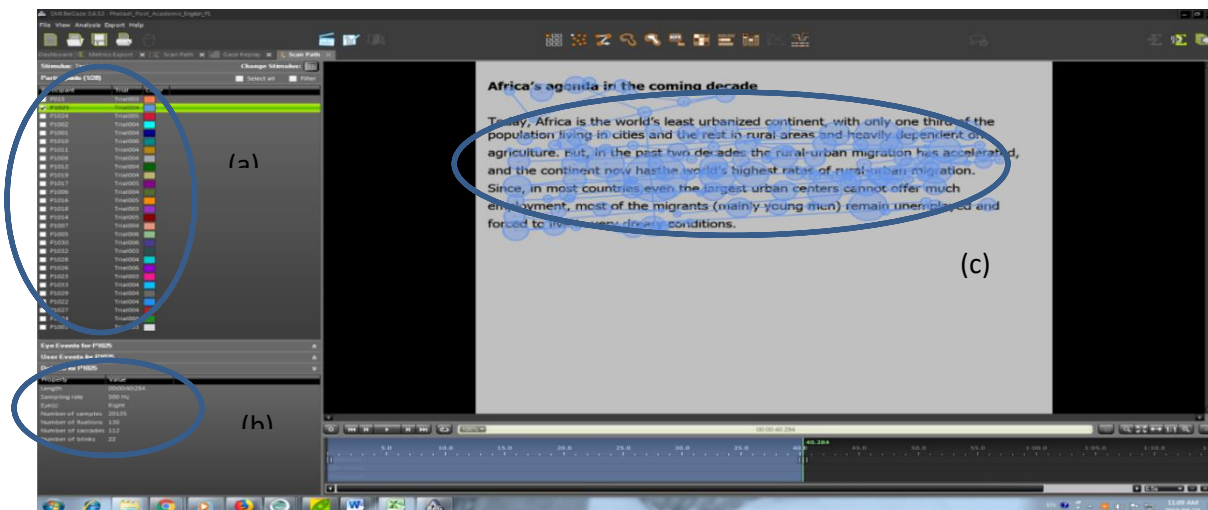


Figure 3.4 Screenshot of the BeGaze 3.6.52 indicating (a) all the participants who read the text, (b) eye movement properties, (c) the first page of the text taken from an English text for university participants with an overlaid scanpath consisting of fixations and saccades of one participant

The above figure 3.4 is data collected on the first screen with the title of the text on top and as it is described in the figure above, it indicates all the participants who read the text and their raw data. In reading the text, the first instrument that was used to collect data was the comprehension text that was presented on the Hi-Speed eye tracker for both university participants and school participants. Each participant had to read four texts, two in English and two in Sepedi. For both languages, one text was generic, and one was academic. The order in which the texts were read was randomised for the participants to remove a potential source of bias in the experiment as is usually done in experiments of this nature.

All except four participants read all four texts in one session. The four university participants who did not read the four texts in one session had to attend lectures, and they either came later after their class or arranged to come the following day to complete the reading.

The data collection at the school for school participants started with the comprehension texts on the eye tracker. Due to unforeseen circumstances described earlier, the school experienced a power cut and other challenges such as heavy rains and the breakdown of the PC. Only four participants completed the reading of the comprehension texts on the eye tracker at the school. To avoid wasting time, I decided to conduct oral reading fluency tests at the school since these tests did not require the use of electricity-powered equipment. The comprehension text reading was carried out later at the Vaal Triangle Campus of the North-West University with the permission of the principal (Appendix R) and the parents or guardians as described earlier.

3.6.3 Oral reading fluency test

The oral reading fluency test was conducted immediately after the comprehension texts on the eye tracker for university participants. The oral reading fluency tests only required reading of two texts (different from the texts read on the eye-tracker) and the participants had the choice of whether they wanted to read the English or Sepedi text first. The oral reading fluency tests were recorded in the eye-tracking laboratory using an audio recorder. As described above, the oral reading fluency test for school participants was done at the school.

3.6.4 Questionnaire data

The university participants were given the questionnaire to complete in their own time and submit to me when they came to complete phase two of the reading. Although 25 participants submitted the completed questionnaires, four participants never returned the questionnaires and five had already dropped out before completing the study. The completion of questionnaires for the school participants was done at school. I was given an opportunity to gather all the school participants together and they all completed the questionnaires at the same time with my help as I guided them through the process. Once they had completed the questionnaires I collected them.

3.6.5 Additional reading material in Sepedi: booklets

Once the participants completed measure 1 of the text, they collected the booklets with the additional reading material in Sepedi immediately after completing their reading, while the

school participants received them at the same time at school. The participants were asked to read the entire booklet and answer all the comprehension questions in the booklet over five weeks. Therefore, measure 2 was completed after 5 weeks of introducing additional reading materials in Sepedi. At the school, the teacher was asked to keep reminding the school participants to complete their reading and to answer the comprehension questions in the booklet.

3.7 Data analysis

This section discusses the method of data analysis that was used for the eye movement measures and other components of the study and is presented for both university participants and school participants for primary and secondary data. The primary data comprised silent reading data collected on the eye tracker, which was the main focus of the present study. The secondary data comprised an oral reading fluency test, a questionnaire, comprehension tests, practice scores (how many texts they read from the booklet) and a frequency word list (described in Chapter 4 for word-level analysis using LMER).

3.7.1 Primary data: silent reading

Data were recorded with the use of the SMI iViewX 3.6.53 system. The reading data were processed and exported using the SMI BeGaze Reading package version 3.6.52. I exported fixation and saccade data, overall regression data, and word per minute data from the eye movement data. Other data included the data for the oral reading fluency task and the questionnaire data for language attitudes.

The data were analysed on two different levels:

Level 1: For the questionnaire data, age and other variables for which there was only one data point per participant, the variables which correlated strongly with one another were averaged in order to have fewer variables.

Level 2: For the comprehension data, reading speed, proportion of regressions and other data for which each participant had eight data points (this refers to the total number of eight texts included in the experiment on silent reading: four texts for measure 1 and four texts for measure 2, linear mixed effect models with reading measures and comprehension as dependent variables were built). Furthermore, separate final linear mixed effect models were built with saccade amplitude, fixation duration, oral reading fluency, comprehension and word per minute (AOI hits) as dependent variables.

The figures below (figures 3.5-3.8) show outputs for the texts read by one university participant. I selected scan paths of one participant to show an example of the raw data for both Sepedi and English for different text types (academic and generic text). The scan paths show fixations (circles) and saccades (lines) made by the participants during the reading of the texts. The presentation and interpretation of the full data sets are reported in detail in Chapters 4.

Nyalo go ya dijo e tla tswela pele go angwa ke mphetho sa United States le sa European Union go tswela pele ka tsweletsong ya dipelelele go tihlanga le go fano go fao, hlophisa ya go duma le go fano go ya ntsi ya dijo go tswela pele le go di loketsego mmele ka di ageng tse di tswelatlago le go di nia le go di tla ha seemo se sekaone. Kabo ya dijo e tla tswela pele go nia go ya ka go tswela se tsa mokatlo wa dijo le Temo (MDT) wa mokatlo wa Dimagakorano, go tla nola le go phuhlama go connyane ka tsweletsong ya dijo lefaseng ka bophara ka 2009 le ka 2010 go tswa ka dipegong tsa ntwaga wa 2008.

Today, Africa is the world's least urbanized continent, with only one third of the population living in cities and the rest in rural areas and heavily dependent on agriculture. But, in the past two decades the rural-urban migration has accelerated, and the continent now has one of the highest rates of rural-urban migration. Since, in most countries, even the largest urban centers cannot offer much employment, most of the migrants (mainly young men) remain unemployed and forced to live in very dreary conditions.

Figure 3. 5 Scan paths indicating the reading pattern of university participant reading academic texts (top: Sepedi, bottom: English)

South Africa's education system is widely accepted to be in crisis. An alarming number of its children are functionally illiterate and innumerate. Many schools lack equipment, infrastructure and even basic necessities like furniture. In this context, could improving access to textbooks make any real difference? The answer is yes. Textbooks matter. That's why their absence from one South African province's classrooms made headlines in 2012. The country's Department of Basic Education failed to deliver textbooks to learners in the Limpopo province that year. This led to a court battle between the organisation I work for, Section27 – a public interest law centre focusing on health and education rights – and the government.

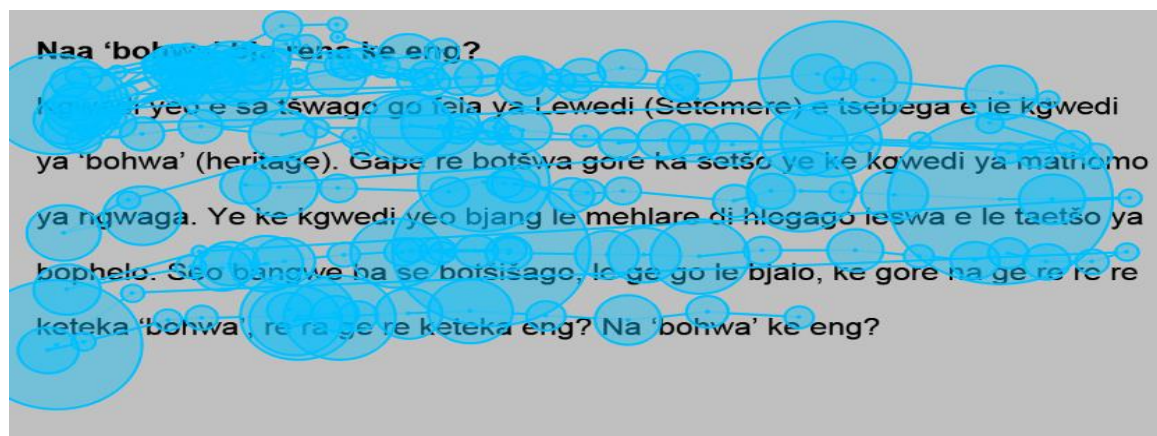


Figure 3. 6 Scan-paths indicating the reading pattern of university participant reading generic texts (top: Sepedi, bottom: English)

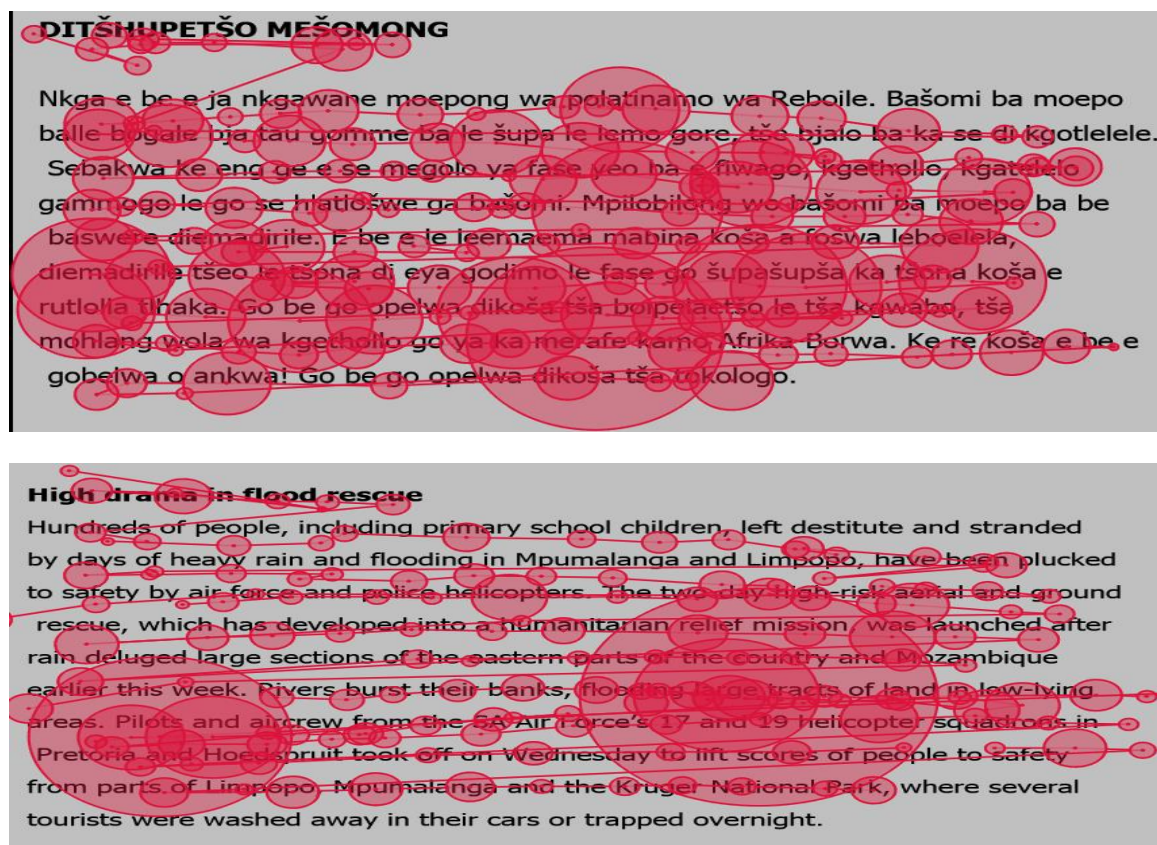


Figure 3. 7 Scan-paths indicating the reading pattern of a school participant reading academic texts (top: Sepedi, bottom: English)

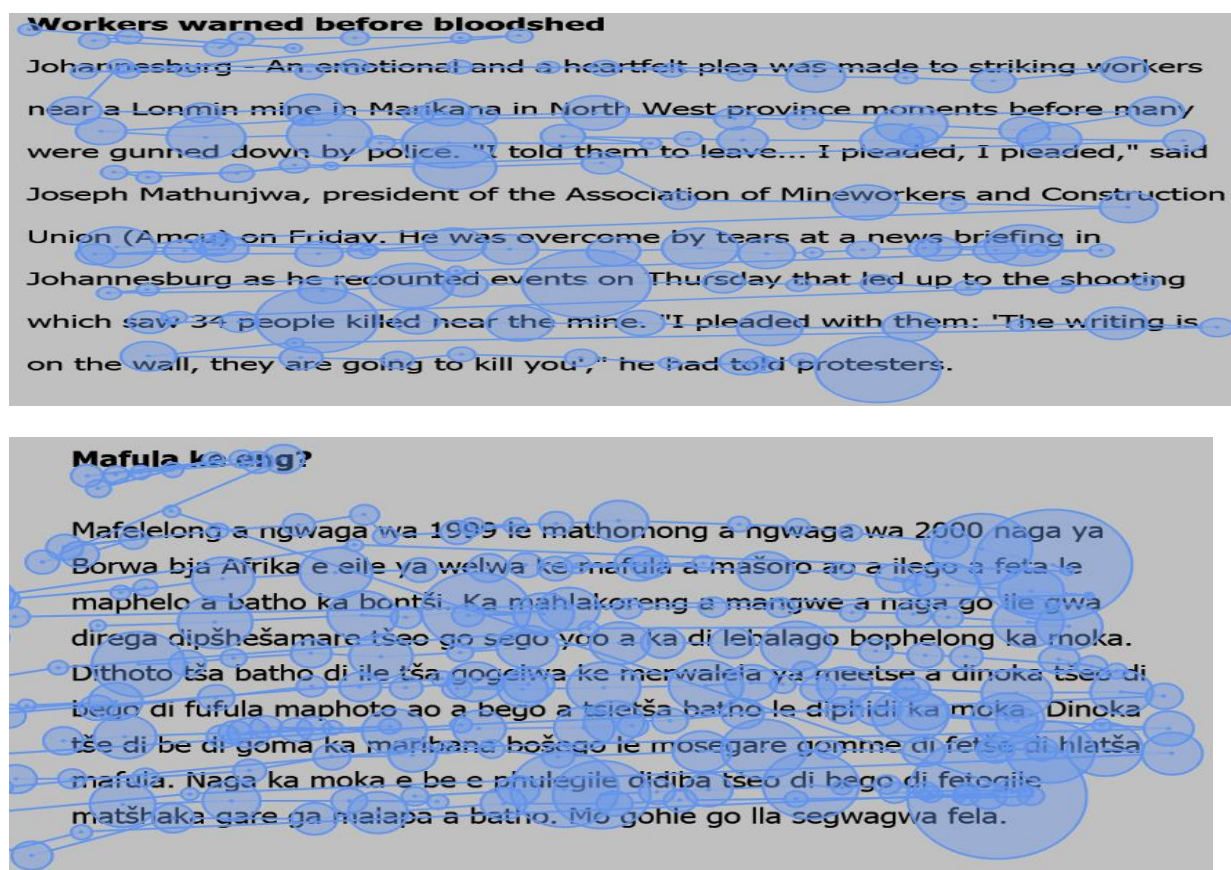


Figure 3.8 Scan-paths indicating the reading pattern of a school participant reading generic texts (top: English, bottom: Sepedi)

3.7.2 Eye movement data analysed on a word level

To analyse eye movement data on a word level, I first had to offset-correct the eye movement data. Offset-correction of eye movement data means aligning fixations and saccades directly on the words if there was a clear shift during reading, for example, if there is a shift one line up or down. Before doing the area of interest (AOI) analysis for the word level analysis, I checked whether the data from any of the participants exhibited systematic offset in parts of the sentences. I identified whether the data coordinates had shifted slightly, which meant that a portion of the samples that belong to a specific AOI would be allocated to another AOI. The data for a few of the participants indicated that one line of the text had shifted to the line right above or below. In order to avoid rendering a statistical result that could undermine the validity of my study, I decided to shift the data so that the offset was neutralised by ensuring that the data covered the correct part of the text where the AOI was. This was very easy to do but time-consuming because it had to be done carefully as the stimulus material was text. Data offset to move fixations manually is often done in reading research, and seldom reported, and is offered by both SMI and EyeLink software.

To analyse eye movement data on a word level, I used a word frequency list from the Sepedi Text Corpus V2.0 for Sepedi and English. The corpus was developed by the South African Department of Arts and Culture and the Centre for Text Technology (C-Text North-West

University, South Africa). The materials compiled are based on various documents from the South African Government domain from gov.za websites and all the 11 official languages. The various documents were combined into one file. The word frequency list of the data was log-transformed. The log-transformation was used in this study to normalise the data because the range for the word frequency list was 1-38588 (English) and 1-95975 (Sepedi) adapted from NCHLT Text Corpora. According to Feng *et al* (2014:105), log-transformation removes the skewness of the data and brings it to a normal distribution.

Eight sets of data files were created on Microsoft Excel sheet (containing the primary and secondary data outlined above) for the word level analysis. The eight data sets comprised data for text types (academic and generic) in both Sepedi and English for university participants as well as school participants. The data were recorded in BeGaze 3.6.52 before being exported to an Excel file. The word frequency was created for all the texts used for the eye movement measures. The data for the word frequency list was log-transformed. The log-transformation was used in this study to normalise the data. Other measures on the data file included word skipping, regressive fixations, first fixation duration, and gaze duration per word of the text read. The Excel files were converted to txt in order to read into lmer function of R version 3.1.2 to run the linear mixed effect models. A detailed description and presentation of the word-level data analysis is presented in Chapter 4.

3.7.3 Secondary data: oral reading fluency data

After the oral reading fluency data were recorded, they were analysed using guidelines adapted from Shinn (1989). These adapted guidelines were also used in a study conducted by Makalela and Fakude (2014) in which they recorded fluency data from 57 Grade 4 to 7 learners (see Chapter 2 for a detailed discussion of this study). In Shinn cited by Makalela & Fakude (2014:74) the guidelines adapted from Shinn (1989) were used “to determine which words were counted as correct. These included 1) words read correctly, which included a) self-corrections, 2) words read incorrectly, which included the following types of error (a) mispronunciation, (b) substitutions, and (c) omissions. Once the oral reading fluency data collection had been completed, the number of words which were mispronounced, substituted and omitted were subtracted from the total number of words in the text, and a score of words read correctly was documented”. Also, the duration of each text read was recorded on a voice recorder for each participant. The data were recorded on an Excel sheet together with the eye-movement measures and the questionnaire data. In addition to the analysis guidelines adapted from Shinn (1989), the types of errors were classified according to the type of miscue made. A miscue is, according to Wixson (1979) referring to the oral reading errors. It is labelled a miscue because the errors are not random but “they are cued by an interaction between thoughts and language” (Wixson, 1979:163). One set of the instruments were used to evaluate the oral reading, and it is called counting miscues. Miscues coding was used by Goodman and Burke (1973). It has limitations because it was impossible to know whether the miscues occurred due to mispronouncing unknown words or known words to the student.

The study conducted a miscue analysis which, according to Goodman (2015) is a way of getting authentic information regarding the strength of the students and weaknesses of their reading abilities. The following type of errors were noted or identified for miscue analysis: (a) corrections: readers correct themselves within 5 seconds. In addition, I determined whether the miscue was due to fast reading; (b) Insertion: Includes adding words that are not in the text. I also examined if the insertion was due to incomplete reading of the words e.g. finish instead of finishing; (c) Omission: Omitting words that change the meaning of the text. Here I examined if

the omission affects the meaning of the text; (d) Repetition: Repeating words or a portion of the text. I examined if the readers repeated due to text difficulty or uncertainty for the meaning of the words; (e) Reversal: Reversing the order of the word. Is the reversal due to difficulty in scanning or word recognition failure? (f) Substitution: Substituting words that may or may not make sense; Lastly, (g) Misspelling: Mispronouncing the words incorrectly. Here I examined if a misunderstanding of the word caused the substitution or if the substitution made sense or not (Watson, 2019). One aspect that I decided to add to the list is the misspelling of the word. This means that the reader is unable to put the alphabet letters together in order to make decode the word and this means that the meaning of the word is also lost.

For readers to be able to cope with the content of the school, they are required to meet a certain level of reading speed which, according to Hudson *et al.* (2005:702), is an important threshold for skilled readers. Previous studies reported that oral reading fluency correlates with comprehension. A study conducted by Hasbrouck and Tindal (2006) reported that Grade 3 learners are expected to read between 50 – 70 WPM without errors, while Grade 4 learners are supposed to read between 100 – 160 WPM without any errors. Data for Grade 8 and 9 have never been reported for Sepedi and English, or for university participants who read in Sepedi and English. For this study, reading speed was not tested and measured, but observed and considered for data analysis. This was done to record data of the participants reading naturally without rushing through the text. Grade 8 and 9 learners are expected to have mastered the required reading abilities mentioned above because they are at a stage where they are required to master a lot of content to comprehend school material. The oral reading fluency test reported the WPM data, which are discussed in detail in Chapter 5.

3.7.4 Secondary data: questionnaire data

Data gathered from the questionnaire were analysed by reporting frequencies for relevant items and answers to questions related to reading proficiency and data that could explain the eye-movement data. The secondary data that is detailed and presented in chapter 4 is as follows:

3.7.4.1 Demographic details of the university and school participants

In this section, I present information with regard to the number of participants that took part in the study. Included in the demographic details is the split in terms of gender, showing how many males and females participated in the study. The population group which shows that only black African participants took part in the study. Lastly, I present details of the qualifications of the parents indicating at what level they completed their education.

3.7.4.2 Number of languages included in the repertoires of both university and school

Information presented for this section indicates on average how many languages the participants know. This information is important to give an idea of how multilingual the participants are.

3.7.4.3 Perceptions of strongest language, second strongest and third strongest language of the participants

Information presented here shows what the participants consider as their home language and strongest language and determine if their home language and strongest language is different or similar.

3.7.4.4 The order in which the languages were learnt in their repertoires

The information presented here indicates which language the participants consider as a home language and if that language was learnt first or not. In addition, it indicates all the additional languages that the participants learnt in the order until the fifth language. Here, the university and school data is split and presented separately.

3.7.4.5 Perceptions of university and school participants about their language abilities

The data presented here is the participants' self-rated perceptions in terms of how good they think they are in English and Sepedi. They also provide their views of whether they are satisfied with the current abilities or not. Participants were asked to rate their language abilities themselves by choosing on a scale of 1 to 5, with 5 being the most positive score. Again here, the university and school participants' data is split and presented separately.

3.7.4.6 Attitude of university and school participants towards Sepedi

Another category of items was language attitudes towards Sepedi. The frequencies of the participants' responses to the items that investigated their attitudes towards Sepedi were reported first of all. In additional analyses, all the questions related to attitudes towards Sepedi as the language of teaching and learning were categorised together to result in one score. The participants were asked to rate how often they used Sepedi, and whether they would like to learn school subjects (school participants) or university modules (university participants) using Sepedi as the language of teaching and learning.

3.7.4.7 Perceptions of university and school participants based on factors that contributed to their learning and current use of language

The data presented in this section presents information on factors such as friends, family, reading, self-instruction, TV, radio and school that contributed to learning and using the languages presented in their repertoires.

3.7.4.8 Perceptions of university and school participants on their frequencies and experiences in their strongest language, second strongest and third language

The data here present frequencies of data on how frequent they read a variety of texts, as well as how proficient they are at reading the variety of texts. The data looks at how often the participants read texts and how proficient they are at reading the different text types.

The questionnaire data correlated strongly within each group. Therefore, I calculated averages in each group, so I had a manageable number of variables in the statistical analysis. Other participant demographics were used for data analyses. Demographic aspects such as age and gender influenced other variables (details are described in the analysis chapters). The responses of the participants were used to determine whether the variables from the questionnaire could have influenced the silent reading to explain the differences found in the eye-movement data and also to determine whether language or text type influenced the eye-movement data (see chapter 4 for data analysis).

3.8 Ethical considerations

To proceed with the collection of data at both the school and university, I applied for ethical clearance which was granted by the North-West University ethics committee for Language

Matters and the Free State Department of Basic Education. At the university, the students were provided with consent forms at the beginning of 2017 during the University's orientation programme. The students voluntarily provided personal details, and those who indicated that Sepedi is their home language and that they are willing to be contacted for any research being done in the School of Languages were contacted. I made use of the contact details provided by the students on the consent forms to request permission from individual students to participate in the study. I received 63 consent forms from participants who met the requirements, but only 34 students indicated their interest and willingness to participate.

To invite school participants, I went to the school to meet with the principal to request permission to conduct research after receiving the letter of ethical clearance from the Department of Education. The principal accepted my request to conduct the research at the school and assigned me a teacher to accompany and support me during the data collection processes at the school. At the school, I issued 35 assent forms that had to be completed by the school learners to indicate that they were interested and willing to take part in the study because it was voluntary. The school participants were given assent forms to complete because they were under the age of 18 years, and legally they needed their parents' permission to participate in the study. In addition to the assent form, the school participants were issued with a consent form which had to be signed by their parents in order for them to participate in the study. The consent forms from the parents were considered crucial because, without consent from the parents, I could not allow the school participants to take part in the study. Of the 35 assent and consent forms, only 29 were completed and submitted to me. Learners who did not submit the consent form from their parents were not considered for participation in the study. In between recordings, the school participants were provided with light lunches and refreshments during their participation. When the initial plan to collect data at the school did not work out, I decided to issue a consent form for the participants to obtain permission from the parents to be transported to the Vaal Triangle Campus of the NWU to attend the eye-tracking laboratory on campus. I requested permission for this from the parents after speaking to the principal. After all the data had been recorded, each participant (school learners) was rewarded with a t-shirt, bag, stationery pack and water bottle for participating, while the university participants received R200 vouchers each to spend at an identified shopping centre (excluding a liquor store).

All of these ethical considerations discussed above were presented in an application to the NWU ethics committee for approval. The research project for the study was approved with ethics clearance (NWU-00305-17-S8; November 2017; Project leader: A.S. Coetzee-Van Rooy). All ethical requirements (briefly summarised above) were observed during the study.

Informed consent form(s) for students (appendix P), assent forms for learners and consent forms for learners'parents (Appendix Q), Letter to the school principal (Appendix R), Letter of permission to the Department of Education (Appendix S), the permission letter from the Department of Education (Appendix T) and NWU ethical clearance certificate (Appendix U) are attached

3.9 Conclusion

Taking everything into account, the following exploratory measures were applied: using an SMI iViewX Hi-speed eye tracker to measure the eye movements of the participants while reading a comprehension text silently; measuring the participants' comprehension of texts with a multiple-choice comprehension test; measuring oral reading fluency with a test using a voice recorder while the participants read the texts aloud; to attain a deeper knowledge of the participants' reading proficiency, language use and language attitudes by using a questionnaire; providing additional reading material in Sepedi to allow access to more reading material in the language

by using comprehension texts compiled in a booklets. All the data were exported from BeGaze 3.6.52 into Excel, prepared for statistical analysis in R version 3.1.2.

The participants' oral reading fluency, comprehension scores, answers to the comprehension questions and responses to the comprehension questions in the booklet with the additional reading material in Sepedi were all part of the data that were used in the analyses for this study. For this purpose, the eye-tracking data were categorised as primary data while the comprehension tests, oral reading fluency test, language attitude questionnaire responses and responses to the comprehension questions in the Sepedi booklet with additional reading material were categorised as secondary data. The primary data, along with the secondary data, were analysed by means of statistica 13.3 to present frequencies and descriptive analysis and LMER global measures analysis (to determine which variables predicts which variables) and LMER word-level analysis (to determine which variables are predicted by word frequency and word length) using R software using the lme4 package version 3.1.2 (R Development Core Team, 2009).

The next chapter provides a detailed presentation and discussion of the empirical findings of this study as well as all the results from the analyses. Chapter 4 focuses on presenting and interpreting the findings of the study for school participants and university participants. Chapter 5 provides the limitations, implications, recommendations and conclusions of the study.

CHAPTER 4 FINDINGS OF THE STUDY

4.1 Introduction

The purpose of this descriptive study was to answer three main research questions and two sub-questions. The overall research question of the study is 1) What characterises the reading behaviour of the university and school readers of Sepedi and English in the study? The sub-questions are: 2) Within the theoretical framework of the Simple View of Reading (SVR), what characteristics of decoding and comprehension define the reading of the Sepedi and English university and school participants in the study? a) What conclusions can be made about the decoding skills of the participants from describing first fixation duration, gaze duration, words skipped first and oral reading fluency with relation to word recognition (decoding)? b) What conclusions can be made about the comprehension skills of the participants from describing fixation duration, saccadic amplitude, regressions, words skipped totally and comprehension scores with relation to linguistic comprehension? 3) What are the implications of the findings of the descriptive study of university and school readers of Sepedi and English for the SVR and for using these languages in education?

This chapter starts by presenting the descriptive statistics related to the instruments used in the study. The presentation is structured according to the research questions posed in the study. The means (M) and standard deviation (SD) scores on all measures taken for both university and school participants are summarised first in this chapter.

The rest of the chapter is organised into three sections. Section 4.2 presents descriptive data describing the demographics of the university and school participants, and their perceptions about the number of languages they know, the identification of their strongest languages, perceptions with regard to the order in which they learnt the languages in their repertoire. It also presents their perceptions with regard to their abilities to use Sepedi and English, their perceptions towards using Sepedi as a medium of instruction, perceptions about the contribution of factors to the learning and current use of their strongest languages and perceptions with regard to their reading experiences in the languages that they know.

Section 4.3 presents descriptive data describing the characteristics of decoding and linguistic comprehension that defines the reading of Sepedi and English among the university and school participants. The section will include tables for means (M) and standard deviations (SDs) for decoding measures (operationalised as oral reading fluency, first fixation duration, gaze duration and words skipped first) and linguistics comprehension measures (operationalised as average fixation duration, saccadic amplitude, regression percentage, words skipped totally and comprehension scores). In addition to the decoding and comprehension variables that are discussed at the beginning of this section, a linear mixed-effects model regression (LMER) analysis for the global reading measures is also presented.

Section 4.4 presents the results of the word-level analysis of the eye-tracking data to examine whether there are any differences with respect to the first fixation duration, gaze duration, and word skipped first. This was done in order to provide information about the kind of readers the participants are in relation to decoding (word recognition) in the context of the SVR during measure 1 and 2. The main aim of the current chapter is to determine whether the participants (from university and school) display the well-established pattern of shorter fixations on high-frequency words and longer fixations on low-frequency words, referred to as the “frequency effects” in reading research (Tiffin-Richards & Schroeder, 2015) for measure 1 and 2. This chapter reports on the main effect of word length and word frequency on reading behaviour.

In Section 4.5, plots (scatter plots and box plots) based on the analysis of variance of type III with Satterthwaite approximation for degrees of freedom, based on the LMER analysis are presented. All these analyses and plots were made in R, version 3.1.2. I carefully looked at those variables that had a significant and strong relationship with each other for both the university and school participants and generated plots which are presented in this chapter in order to make conclusions in relation to linguistic comprehension in the context of the SVR framework. The interpretation and discussion of results are integrated in the discussion of the findings in chapter 4, and the conclusions and recommendations that follow from the findings are presented in chapter 5.

Research Question One

What characterises the university and school readers of Sepedi and English in the study?

In order to answer research question one, the following section provides demographic descriptive statistics and findings related to the perceptions about the languages in the repertoires of the university and school participants. The demographic and perception data reported in this section provide important background information that contributes to the overall description of the characteristics of the participants as readers that should be taken into account when the eye-movement data are interpreted.

4.2 Descriptive statistics describing the university and school participants

In this section, descriptive statistics related to the demography, size of the language repertoires of the participants, the perceptions of the participants about the languages in their repertoires and the perceptions of the participants about Sepedi as a language specifically are reported.

4.2.1 Demographic details of the university and school participants

The demographic data gathered for this study include gender, population group, age and information about the highest qualifications of the parents of the participants.

Table 4. 1 Demographic details of the participants

Participants	Gender		Population Group	Age	Highest Qualification Father								Highest Qualification Mother								
	Female	Male			African	Did not know	Gr 5 / lower	Gr 6/7	Gr 8/9	Gr 10/11	Gr 12	Degree / diploma not completed	Degree / diploma completed	Missing responses	Did not know	Gr 6/7	Gr 8/9	Gr 10/11	Gr 12	Degree / diploma not completed	Degree / diploma completed
University	18	10	28	20	10	2	1	2	2	2	1	8		2	1	2	6	4	1	10	2
School	14	15	29	14	3			2	4	10	1	2	7			2	6	7	2	5	7
Totals	32	25	57		13	2	1	4	6	12	2	10	7	2	1	4	12	11	3	15	9

The demographic details of the university participants show that 64% (18/28) of the participants were female, and 36% (10/28) were male. This distribution corresponds with the gender distribution of the students enrolled at the university. In 2017, at the time of data collection, the total enrolment of females at the North West University was 48 189 (out of 72 994, or 66%); and a total of 24 805 (out of 72 994, or 34%) male students were enrolled (Student Statistics for NWU, 2017). The mean age for university students is 20, which is a typical mean age for first-

year students at university. Most of the university participants (10/28) had no knowledge about their father's highest qualification; while 8 (out of 28) of the participants indicated that their fathers had completed a university degree or diploma. Most of the mothers of the university participants hold a university degree (10/28) and a sizable group of the mothers (6/28) completed grade 10 or 11. Taking into consideration that the qualifications of mothers are linked to advanced linguistic development in sociolinguistics (Hoff, 2006), the relatively high number of degrees among the mothers of the university participants could be seen as an indicator of potential good reading skills among the university students. The educational level of mothers has been reported as a powerful predictor of children's development and more especially during the early years of development (Hoff, 2006).

The gender distribution for the Grade 8 and 9 participants also shows an even spread: 48% (14/29) of the school participants are female and 52% (15/29) are male. The mean age for the school participants is 14 years of age which is the typical age for participants in grades 8 and 9 in South Africa. Most of the school participants' parents hold a Grade 10, 11 or 12 qualification.

Overall, the university and school participants are typical in terms of their populations. The difference between the qualifications of the parents of the university participants and the school participants is understandable when one takes into account that the university participants are from different parts of the country and therefore represent a small percentage of Grade 12 graduates who made it to university in South Africa. The school participants are located in a specific area and there is no surety that they will be able to enter university one day. From the parents' qualifications, it can be assumed that their qualifications reflect the socio-economic status of the population in the study. The majority of both the university and school participants comes from families that are educationally and socio-economically disadvantaged. However, one can cautiously assume that the university participants were raised in homes with literacy levels of the parents that are comparable to their qualifications after school, in contrast to the parents of the school participants whose parents mostly completed Grades 10, 11 and 12.

Table 4. 2 Descriptive statistics of the number of languages included in the repertoires of the university and school participants

Number of languages	Valid N	Mean	Minimum	Maximum	Std.Dev
University participants	28	4.39	2.00	9.00	2.01
School participants	29	3.48	3.00	5.00	0.63

The data above indicate that the university participants knew an average of 4 languages and a minimum of 2 languages and a maximum of 9 languages were reported for some participants; while the school participants knew an average of 3 languages and a minimum of three languages and a maximum of 5 languages were reported. The language repertoires of the university students are typical for an urban population where most people are multilingual (also reported by Coetzee-Van Rooy (2012) for this region). The school participants go to a high school which offers three home languages as subjects: Sepedi, Sesotho and Zulu; with English as the first additional language, therefore it is not surprising that these participants are

multilinguals. The language repertoires of the university and school participants are typical for this region in South Africa.

4.2.2 Perceptions of home language, strongest language and second strongest language of university and school participants

The participants' perceptions of the languages in their repertoires provide some indication of the self-reported proficiency levels or relative strength of the languages known.

Table 4. 3 Perceptions of home language, strongest language and second strongest language of the participants

University students								School participants						
Home language	Strongest language		Second strongest language					Home language	Strongest language			Second strongest language		
	SL is Sepedi	SL is English	2nd SL English	2nd SL Sepedi	2nd SL Southern Sotho	2nd SL Tswana	2nd SL Zulu		SL is English	SL is Sepedi	SL is Southern Sotho	2nd SL English	2nd SL Sepedi	2nd SL Southern Sotho
English		1		1				English	1	0	0	0	0	1
Sepedi	19	4	17	3	1	1	2	Sepedi	2	23	0	18	3	4
								Southern Sotho	1	1	1	1	2	0
Total	19	5	17	4	1	1	2	Total	4	24	1	19	5	5

The data above indicate the perceptions of the university and school participants concerning their strongest and second strongest languages. First of all, one needs to note that 1 university participant perceives English as her or his home language; and that for 4 of the participants who perceive Sepedi as their home language, English is perceived as strongest language. A similar trend is documented for the school participants: 1 participant reports that he or she perceives English as home language; 2 participants report that they perceive Sepedi as their home language, but English as their strongest language and 2 participants perceive Southern Sotho as their home language, but 1 perceives Sepedi as strongest language, and 1 perceives English as strongest language. The participants from university and school were selected because of the presence of Sepedi in their repertoires. However, as is well-known in the South Africa context, the concept of the home language is complex in deeply multilingual settings (Makoni, 2005). Despite using a language most often as a home language, some South Africans perceive English as their strongest language. In other words, a discrepancy between the home language and strongest language in the South African context is not strange and has been reported in this region by, for example, Coetzee-Van Rooy (2012). A discrepancy between Sepedi as the participants' home languages and perceptions that English or Southern Sotho as their strongest language does not deter from the fact that the participants are Sepedi home language users.

As is expected due to the selection criteria, 19 university participants (80%) felt that Sepedi was their strongest language, while 4 participants (20%) felt that their strongest language was English. The same trend is true for the school participants: 23 school participants (92%) felt that Sepedi was their strongest language while only 2 participants (8%) felt that English is their strongest language. English is regarded as the second strongest language by 70% of the university and school participants. These perceptions are typical for African home languages users in this region.

4.2.3 Perceptions of university and school participants about the order in which they learnt the languages in their repertoires

Information about the order in which the participants learnt the languages in their repertoires provides a perspective on the discrepancies between the perceived home language and strongest language discussed above.

Table 4. 4 Perceptions of university participants about the order in which they learnt languages

Home languages	Languages learnt 1st			Languages learnt 2nd						Languages learnt 3rd						Languages learnt 4th						Languages learnt 5th							
	English learnt 1st	Sepedi learnt 1st	Tswana learnt 1st	English learnt 2nd	Ndebele learnt 2nd	Sepedi learnt 2nd	Southern Sotho learnt 2nd	Tswana learnt 2nd	Zulu learnt 2nd	Afrikaans learnt 3rd	English learnt 3rd	Sepedi learnt 3rd	Southern Sotho learnt 3rd	Tsonga learnt 3rd	Tswana learnt 3rd	Venda learnt 3rd	Zulu learnt 3rd	Afrikaans learnt 4th	English learnt 4th	German learnt 4th	Southern Sotho learnt 4th	Swati learnt 4th	Tswana learnt 4th	Xhosa learnt 4th	Zulu learnt 4th	Southern Sotho learnt 5th	Tswana learnt 5th	Venda learnt 5th	Zulu learnt 5th
English	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0
Sepedi	1	22	1	16	1	0	3	1	3	0	3	1	5	1	2	3	3	2	3	1	2	1	4	0	5	2	3	1	4
Other	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	

The complexity of the concept of home language in the South African context is also clear from the table above: 92% of the university participants learnt their home language Sepedi first in their lives. The participants who indicated Sepedi as their strongest language learnt Sepedi first while one participant learnt English first. This is likely a case of going to an English nursery school as an infant. One participant who indicated English as the home language learnt Sepedi second. Again, this is not uncanny in the multilingual South African context where children are sometimes raised by family (that may use another home language in the Sotho language family as the main language like Tswana) or go to daycare centres from a very early age where English (or even Afrikaans) is the main language used.

Table 4. 5 Perceptions of school participants about the order in which they learnt languages

Home languages	Languages learnt 1st		Languages learnt 2nd			Languages learnt 3rd					Languages learnt 4th			Languages learnt 5th		
	Sepedi learnt 1st	Southern Sotho learnt 1st	English learnt 2nd	Sepedi learnt 2nd	Southern Sotho learnt 2nd	Afrikaans learnt 3rd	English learnt 3rd	Southern Sotho learnt 3rd	Tswana learnt 3rd	Xhosa learnt 3rd	Zulu learnt 3rd	English learnt 4th	Southern Sotho learnt 4th	Tswana learnt 4th	Southern Sotho learntn 5th	Zulu learnt 5th
English	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
Sepedi	24	1	13	1	8	1	9	6	2	2	5	3	3	4	1	1
Southern Sotho	2	1	1	1	1	0	1	1	0	0	1	0	0	2	0	0

The data for the school participants are similar to that of the university participants. The data shows that 24 school participants who indicated Sepedi as the home language learnt the language first. One participant who indicated English as the home language learnt Sepedi first and English second; 13 participants who indicated that their home language is Sepedi learnt English second while 8 participants learnt Southern Sotho second. Even in cases where some of the school participants perceived English and Southern Sotho as their home languages, Sepedi was the language that they learnt first. This finding supports the decision to include all the participants in the study despite their perceived home languages as reported in the questionnaire. If one learns Sepedi first, despite perceiving English as your home language, Sepedi is used as a home language.

4.2.4 Descriptive statistics of perceptions of university participants about their abilities to speak, read and understand Sepedi and English; and their general satisfaction with their ability to speak Sepedi and English

This section focuses on the self-reported perceptions of proficiency in the languages included in the repertoires of the participants.

Table 4. 6 Perceptions of university participants about their language abilities

	Valid N	Mean	Minimum	Maximum	Std.Dev.
Speak Sepedi	28	4.50	1.00	5.00	0.88
Write Sepedi	28	4.29	1.00	5.00	0.94
Read Sepedi	28	3.79	1.00	5.00	0.88
Understand Sepedi	28	4.61	2.00	5.00	0.69
#Satisfied speak Sepedi	28	1.57	1.00	5.00	0.88
Speak English	28	4.04	3.00	5.00	0.79
Write English	28	4.18	3.00	5.00	0.77
Read English	28	4.18	3.00	5.00	0.77
Understand English	28	4.14	3.00	5.00	0.76
#Satisfied speak English	28	2.07	1.00	5.00	0.94

Scale: 1=Very poorly; 5=Very successfully

#Scale: 1=Strongly agree; 5=Strongly disagree

The study asked participants to rate their perception for Sepedi proficiency by asking them to rate how well they think they can speak, write, read and understand the language, as well as how satisfied they are with speaking Sepedi. The majority of the university participants were confident about their ability to speak, write and understand Sepedi. The lowest mean is reported for the perception of the university participants to read Sepedi. The fact that Sepedi is not used at the university in textbooks or teaching and learning material might influence this perception. Sepedi students at school have to take Sepedi as a home language, and therefore they would read Sepedi more regularly than university students. Moreover, the majority of the university participants were satisfied with their ability to speak Sepedi.

Also, the study also asked participants to rate their perception of their proficiency in English by reporting how well they think they can speak, write, read and understand as well as how satisfied they are with speaking English. The majority of the university participants were confident about their ability to speak, write, read and understand English. The university participants were also satisfied with their ability to speak English.

The mean for reading in Sepedi as compared to speaking, writing and understanding Sepedi, is low ($M=3.79$, $SD=0.88$). In other words, the university participants perceive their ability to read Sepedi as their weakest skill in the language. However, the mean for reading in English ($M=4.18$, $SD=0.77$) is comparable to the means for speaking, writing and understanding English. Although the data show that the participants are generally positive about their ability to speak, write, read and understand Sepedi and English, one should note that the university participants are less confident about their abilities to read Sepedi.

Table 4. 7 perceptions of school participants about their language abilities

	Valid N	Mean	Minimum	Maximum	Std.Dev.
Speak Sepedi	29	4.00	3.00	5.00	0.80
Write Sepedi	29	4.03	3.00	5.00	0.82
Read Sepedi	29	3.72	2.00	5.00	0.96
Understand Sepedi	29	4.55	3.00	5.00	0.69
#Satisfied speak Sepedi	29	2.10	1.00	4.00	0.86
Speak English	29	3.55	1.00	5.00	0.95
Write English	29	3.72	2.00	5.00	0.80
Read English	29	3.79	2.00	5.00	1.01
Understand English	29	4.07	2.00	5.00	0.84
#Satisfied speak English	28	2.25	1.00	5.00	1.00

Scale: 1=Very poorly; 5=Very successfully

#Scale: 1=Strongly agree; 5=Strongly disagree

The majority of the school participants were confident about their ability to speak, write and understand Sepedi. The majority of the participants were confident about their reading abilities, however, the mean for the perception of proficiency in Sepedi reading is the lowest of all the perception scores. The Sepedi school participants are least confident in their ability to read Sepedi (compared to, e.g. writing and understanding). However, some of the participants who were confident about their ability to understand Sepedi were not satisfied with their abilities in Sepedi.

The majority of the participants felt confident about their ability to understand, read, write and speak English. The mean for the school participants' perception of reading proficiency is higher than the mean for writing proficiency. These participants, therefore, feel very confident in the ability to read English. Also, the majority of the participants felt confident about their ability to understand English, but some of them were not satisfied with the current ability to speak English. The data show that the participants are generally positive about their ability to speak, write, read and understand Sepedi and English; although the mean that expresses the participants' perception of their skills in reading Sepedi is consistently lower than the means for speaking, writing and understanding Sepedi and English among the university and school participants. This finding should be taken into account when the eye-movement data are interpreted.

4.2.5 Descriptive statistics on the attitude of university and school participants towards Sepedi

A comprehensive set of questions tested the participants' attitudes towards the use of Sepedi in the education and socio-cultural domains.

Table 4. 8 Attitude of university and school participants towards Sepedi: Part 1

	University participants					School participants				
	Valid N	Mean	Min	Max	Std.Dev.	Valid N	Mean	Min	Max	Std.Dev.
19_1_prefer @ uni	29	3.55	2.00	5.00	0.83	29	3.55	2.00	5.00	0.83
19_2_education	28	3.64	1.00	5.00	0.95	28	3.64	1.00	5.00	0.95
19_3_textbooks	29	3.52	1.00	5.00	1.24	29	3.52	1.00	5.00	1.24
19_4_enrichment	29	3.41	1.00	5.00	1.15	29	3.41	1.00	5.00	1.15
19_5_confident	27	3.93	1.00	5.00	1.14	27	3.93	1.00	5.00	1.14
19_6_maintenance	28	4.11	3.00	5.00	0.63	28	4.11	3.00	5.00	0.63
19_7_decline	29	2.97	1.00	5.00	1.21	29	2.97	1.00	5.00	1.21
19_8_understand English	29	3.55	1.00	5.00	1.12	29	3.55	1.00	5.00	1.12
19_9_test and exam	28	3.93	2.00	5.00	1.02	28	3.93	2.00	5.00	1.02
19_10_more material > interest	29	3.79	1.00	5.00	1.15	29	3.79	1.00	5.00	1.15

Scale 1=strongly disagree; 5=strongly agree

Table 4. 9 Attitude of university and school participants towards Sepedi: Part 2

	University participants					School participants				
20_1_important to know	29	1.72	1.00	5.00	1.33	29	1.72	1.00	5.00	1.33
20_2_id	29	1.86	1.00	5.00	1.16	29	1.86	1.00	5.00	1.16
20_3_value	28	2.14	1.00	5.00	1.18	28	2.14	1.00	5.00	1.18
20_4_no interest alive	29	2.24	1.00	5.00	0.99	29	2.24	1.00	5.00	0.99
20_5_taught at school	29	1.93	1.00	5.00	1.25	29	1.93	1.00	5.00	1.25
20_6_work	29	2.38	1.00	5.00	1.05	29	2.38	1.00	5.00	1.05
20_7_community gathering	29	2.31	1.00	4.00	0.93	29	2.31	1.00	4.00	0.93
20_8_trad ceremonies	29	2.17	1.00	5.00	1.39	29	2.17	1.00	5.00	1.39
20_9_Gov	29	2.38	1.00	3.00	0.73	29	2.38	1.00	3.00	0.73
20_10_support community	29	2.55	1.00	5.00	1.15	29	2.55	1.00	5.00	1.15
20_11_support SA	28	2.46	1.00	5.00	1.00	28	2.46	1.00	5.00	1.00
20_12_succeed	29	2.07	1.00	5.00	1.22	29	2.07	1.00	5.00	1.22
20_13_difficult to read	26	2.31	1.00	4.00	1.09	26	2.31	1.00	4.00	1.09
20_14_LoLT School	29	2.48	1.00	4.00	0.91	29	2.48	1.00	4.00	0.91
20_15_LoLT Univ	29	2.69	1.00	5.00	1.00	29	2.69	1.00	5.00	1.00

Scale 1=strongly agree; 5=strongly disagree

Table 4. 10 Attitude of university and school participants towards Sepedi: Part 3

	University participants					School participants				
21_1_read newspaper	29	2.34	1.00	3.00	0.55	29	2.34	1.00	3.00	0.55
21_2_TV	29	2.48	1.00	3.00	0.57	29	2.48	1.00	3.00	0.57
21_3_Radio	27	2.37	1.00	3.00	0.69	27	2.37	1.00	3.00	0.69
21_4_concerts	28	2.21	1.00	3.00	0.69	28	2.21	1.00	3.00	0.69
21_5_Web	29	2.07	1.00	3.00	0.53	29	2.07	1.00	3.00	0.53
21_6_Math & science	29	2.48	1.00	22.00	3.80	29	2.48	1.00	22.00	3.80
21_7_Hist & geography	29	1.86	1.00	3.00	0.64	29	1.86	1.00	3.00	0.64
21_8_Life Orientation	29	1.86	1.00	3.00	0.64	29	1.86	1.00	3.00	0.64
21_9_record speakers	29	2.14	1.00	3.00	0.58	29	2.14	1.00	3.00	0.58
21_10_children learn Sepedi	28	2.32	1.00	3.00	0.61	28	2.32	1.00	3.00	0.61
21_11_children use Sepedi school	29	1.93	1.00	3.00	0.59	29	1.93	1.00	3.00	0.59
21_12_children use Sepedi Univ	29	1.83	1.00	3.00	0.71	29	1.83	1.00	3.00	0.71

Scale 1=I would not participate; 2=I would participate; 3=I already participate

The data in the above three tables indicate that university and school participants were positive about the idea of using Sepedi as a medium of instruction for all subjects at university and they also felt positive about Sepedi being used for education. The majority of the participants were positive that more textbooks should be made available in Sepedi. In addition, the majority of the participants indicated that they would take an extra Sepedi subject for self-enrichment. Both the university and school participants were confident about using Sepedi in the midst of other people. They also believe that they are maintaining their skills in Sepedi well. School participants felt that their Sepedi will decline if they use it less while university participants did not think that using Sepedi less will have decrease their abilities in using Sepedi. Both the university and school participants thought that using Sepedi will help them understand their English learning materials. Furthermore, the university and school participants felt that they would increase their performance in English subjects if they are granted an opportunity to make use of Sepedi to answer questions in tests and examinations. They also felt that if more materials are made available in Sepedi, then a lot more people would take in interest in learning Sepedi.

In the case of both university and school participants, the majority of the participants felt that it is important for them to learn Sepedi. Furthermore, the participants felt that Sepedi was important to their identity as well as valuable. For both university and school participants, the majority felt that most people in their communities are not interested in keeping Sepedi alive. In addition, the participants felt that it was important for Sepedi to be used as a school language and that it should also be used in the workplace. Lastly, the majority of both university and school participants felt that it was important for Sepedi to be used in community gatherings, traditional ceremonial gatherings and government activities. While the school participants felt that enough is being done to support Sepedi, university participants felt that not enough is done to support the use of Sepedi in their communities. Although the school participants felt that enough is being done to support Sepedi in the country, the university participants disagreed. The difference in perceptions about the support for Sepedi between the university and school participants is understandable. The school participants still take Sepedi as a school subject and therefore experience how the school uses it regularly. At the university, students come from a variety of home language backgrounds and the formal language policy of the university support the development of Southern Sotho and Tswana, in addition to English and Afrikaans. In other words, at the university, students do not experience the use of Sepedi regularly in formal contexts. Both groups felt that Sepedi helps them and others to succeed in their studies. The school participants expressed the opinion that Sepedi is difficult to read, and the university

participants felt differently about it. The majority of the school participants were positive about using Sepedi as a medium for teaching and learning for all subjects at school. The university participants presented a mixed view with a large portion of the participants agreeing with the statement and an equally large group disagreeing. For both the university and school participants, there was a neutral feeling about using Sepedi as a medium for teaching and learning at university.

The table above presents information about the attitudes of the university and school participants towards participating in activities carried out in Sepedi. The majority of the participants (from university and school) indicated that they would be interested in reading newsletters or newspapers in Sepedi. Both university and school participants indicated that they would participate and others indicated that they would participate in watching Sepedi TV programmes. The school participants indicated that they would participate or that they already participated in listening to Sepedi radio stations, although the majority of the university participants indicated their interest to participate. In addition, both the university and school participants indicated that they would participate in attending Sepedi concerts. The majority in both university and school participants indicated that they would view Sepedi websites. Also, the majority of the school participants indicated that they would participate in learning Mathematics and Science in Sepedi, although a large number indicated that they would not participate. On the other hand, an equal share of the university participants indicated that they would participate in learning Mathematics and Science, while the other half said they would not participate. The majority of both university and school participants indicated that they would learn History, Geography and Life Orientation in Sepedi and that they would be interested in recording people speaking Sepedi.

The majority of the participants in both university and school indicated that if ever they have children, they would make sure that their children learn Sepedi. Furthermore, both groups indicated that they would make sure that their children learn Sepedi at least until Grade 12. Moreover, while the majority of both university and school participants indicated that they would take their children to university to learn in Sepedi, a large number of participants indicated that they would not. There is clear ambivalence among the university and school participants about the use of Sepedi at university.

Overall, the university and school participants reported positive attitudes towards the use of Sepedi in the education and socio-cultural domains.

4.2.6 Perceptions of university and school participants based on the factors that contributed to their learning and current use of languages

In this section, the perceptions of the participants about specific factors that contributed to their learning of the language in their repertoires and the contribution of factors that support their current use of languages are reported.

Table 4. 11 Perceptions of university participants based on the factors that contributed to their learning and current use of languages

Sepedi as a strongest language						English as the strongest language					Zulu is third strongest					Sotho is third strongest				
Factor	Valid N	Mean	Min	Max	Std. Dev	Valid N	Mean	Min	Max	Std. Dev	Valid N	Mean	Min	Max	Std. Dev	Valid N	Mean	Min	Max	Std. Dev
Contribute LEARN_Friends	19	3,16	2,00	4,00	0,69	17	2,94	1,00	4,00	0,90	6	3,33	2,00	4,00	0,82	5	3,20	2,00	4,00	1,10
Contribute LEARN_Family	19	3,74	3,00	4,00	0,45	17	2,47	1,00	4,00	0,94	6	1,83	1,00	3,00	0,98	5	2,00	1,00	3,00	1,00
Contribute LEARN_Reading	19	3,37	2,00	4,00	0,76	14	3,86	3,00	4,00	0,36	6	1,83	1,00	3,00	0,98	5	2,20	1,00	3,00	1,10
Contribute LEARN_Self	19	2,11	1,00	4,00	0,81	17	2,94	1,00	4,00	0,97	6	1,83	1,00	3,00	0,98	5	1,60	1,00	2,00	0,55
Contribute LEARN_TV	19	2,95	2,00	4,00	0,91	17	3,53	1,00	4,00	0,80	6	3,33	3,00	4,00	0,52	5	2,00	1,00	3,00	1,00
Contribute LEARN_Radio	19	3,32	2,00	4,00	0,75	17	3,29	1,00	4,00	0,92	6	3,17	2,00	4,00	0,75	5	2,60	1,00	4,00	1,14
Contribute LEARN_School	19	3,11	1,00	4,00	0,99	16	3,81	3,00	4,00	0,40	6	2,17	1,00	4,00	1,17	5	3,20	2,00	4,00	0,84
Contribute CURRENT USE_Friends	19	2,89	1,00	4,00	0,94	17	3,00	2,00	4,00	0,79	6	3,50	2,00	4,00	0,84	5	3,20	2,00	4,00	0,84
Contribute CURRENT USE_Family	19	3,63	3,00	4,00	0,50	17	2,29	1,00	4,00	0,99	6	1,83	1,00	3,00	0,98	5	2,00	1,00	3,00	1,00
Contribute CURRENT USE_Reading	18	2,56	1,00	4,00	0,92	17	3,65	1,00	4,00	0,79	6	2,00	1,00	3,00	0,89	5	2,60	1,00	4,00	1,14
Contribute CURRENT USE_Self	18	1,67	1,00	3,00	0,59	17	2,71	1,00	4,00	0,99	6	1,50	1,00	3,00	0,84	5	1,60	1,00	3,00	0,89
Contribute CURRENT USE_TV	19	2,68	1,00	4,00	0,82	17	3,18	2,00	4,00	0,73	6	3,00	2,00	4,00	0,89	5	2,00	1,00	3,00	1,00
Contribute CURRENT USE_Radio	19	2,79	1,00	4,00	0,98	17	3,24	2,00	4,00	0,75	6	2,83	1,00	4,00	1,17	5	1,60	1,00	2,00	0,55
Contribute CURRENT USE_School	19	1,89	1,00	4,00	1,05	16	3,63	1,00	4,00	0,81	6	1,83	1,00	3,00	0,75	5	3,20	3,00	4,00	0,45

Scale=items 1= did not contribute at all, 2=small contribution, 3 medium contribution, 4= large contribution

Scale items 1=not exposed at all, irregular exposure, regular exposure, constant exposure

The data above present the perceptions of university participants on how factors such as interaction with friends, family, reading, self-instruction, TV, radio and school contributed to **learning** of the languages present in their repertoires

The university participants who perceive Sepedi as their home language and strongest language indicated that interacting with family members, reading, listening to the radio, interacting with friends and school made a large contribution in learning Sepedi. Self-instruction and watching TV had a small contribution in learning Sepedi.

The factor that contribute the most to the university participants' current use of Sepedi is the family. All the other factors contribute to a smaller extent to the current use of Sepedi.

For the university students who perceive Sepedi as their home language and strongest language and English as their second strongest language, the majority indicated that reading and the school contributed the most to their learning of English. All the other factors contributed to a smaller extent to their learning of English.

The university students who perceive Sepedi as home language and strongest language and English as second strongest language, believe that interacting with friends contributed the most to their learning of Zulu as third strongest language. The other factors made smaller contributions. University students who perceive Sepedi as their home and strongest language, English as their second strongest language and Southern Sotho as their third-strongest language believe that friends contributed the most to their learning of Southern Sotho and the other factors contributed less.

Interacting with friends and use at school contribute the most to the learning of Southern Sotho in the case of the university students who perceive Sepedi as a home language and strongest language. The other factors contribute less. This finding is understandable in the context where Southern Sotho is the dominant language in the region (Census 2011) and where the university attended by the participants selected Southern Sotho as one of the languages that will be developed as an academic language.

Overall the data are similar to other data sets that indicate a diglossic context for language-use by these multilingual speakers, also in this region. The home language is learnt to communicate with the family; English is learnt and used in school contexts especially for reading, and additional third languages are learnt and used to interact with friends. The importance of reading in the learning of Sepedi as a home language also indicates that a form of English-Sepedi biliteracy is developing in the repertoires of the participants.

Table 4. 12 Perceptions of school participants based on the factors that contributed to their learning and current use of languages

Factor	Sepedi is the strongest language					English is second strongest language					Sotho is the third strongest language				
	Valid N	Mean	Min	Max	Std.Dev	Valid N	Mean	Min	Max	Std.Dev	Valid N	Mean	Min	Max	Std.Dev
Contribute LEARN_Friends	23	2,39	1,00	4,00	0,84	17	2,65	1,00	4,00	0,93	12	2,75	2,00	4,00	0,87
Contribute LEARN_Family	22	3,73	3,00	4,00	0,46	18	3,00	2,00	4,00	7,26	12	2,08	1,00	3,00	0,90
Contribute LEARN_Reading	21	3,43	2,00	4,00	0,68	17	3,59	2,00	4,00	0,62	12	2,42	1,00	4,00	0,90
Contribute LEARN_Self	23	2,78	1,00	4,00	0,90	16	2,81	1,00	4,00	1,05	12	2,00	1,00	4,00	1,13
Contribute LEARN_TV	23	2,91	1,00	4,00	0,95	18	3,44	2,00	4,00	0,62	12	3,00	1,00	4,00	0,95
Contribute LEARN_Radio	21	3,24	1,00	4,00	0,83	18	3,28	2,00	4,00	0,67	12	2,67	1,00	4,00	1,07
Contribute LEARN_School	22	3,55	3,00	4,00	0,51	18	3,22	2,00	4,00	0,65	12	2,67	1,00	4,00	0,89
Contribute CURRENT USE_Friends	23	2,70	1,00	4,00	0,97	18	2,83	1,00	4,00	0,99	12	2,83	1,00	4,00	0,83
Contribute CURRENT USE_Family	23	3,57	1,00	4,00	0,79	18	3,44	2,00	4,00	0,62	12	2,58	1,00	4,00	0,79
Contribute CURRENT USE_Reading	22	3,36	2,00	4,00	0,58	17	3,47	2,00	4,00	0,62	11	2,82	2,00	4,00	0,75
Contribute CURRENT USE_Self	23	2,61	1,00	4,00	0,89	18	3,00	2,00	4,00	0,84	12	2,50	1,00	4,00	1,00
Contribute CURRENT USE_TV	22	2,73	2,00	4,00	0,63	18	3,11	1,00	4,00	0,83	12	2,92	2,00	4,00	0,51
Contribute CURRENT USE_Radio	22	3,09	1,00	4,00	0,92	18	3,28	2,00	4,00	0,67	12	3,17	2,00	4,00	0,58
Contribute CURRENT USE_School	23	3,09	2,00	4,00	0,73	18	3,28	1,00	4,00	0,89	12	2,92	2,00	4,00	0,79

Scale=items 1= did not contribute at all, 2=small contribution, 3 medium contribution, 4= large contribution

Scale items 1=not exposed at all, irregular exposure, regular exposure, constant exposure

The data above present the perceptions of school participants on how factors such as friends, family, reading, self-instruction, TV, radio and school contributed to the **current use** of languages in the language repertoires of the participants.

In the case of school participants' perceptions of the factors that contribute to the current use of Sepedi perceived as a home language and strongest language, interaction with the family, school and reading contributed the most. The other factors contributed less to the learning of Sepedi. Interacting with the family and reading contribute the most to the current use of the Sepedi by the school participants. In the case of school participants' perceptions of the factors that contribute to the current use of English as the second strongest language, reading and watching TV contributed the most. Factors like listening to the radio and use at school also contributed to the current use of English while the other factors contributed less. In the case of school participants' perceptions of the factors that contribute to the current use of English perceived as second strongest language, all factors contributed a lot.

In the case of the factors that contribute the most to the current use of Southern Sotho perceived as the third strongest language by the school participants, watching TV contributed the most. When the factors that contribute to the current use of Southern Sotho are considered, listening to the radio contribute the most. In the case of Southern Sotho perceived as a third strongest language, it seems that the entertainment sphere in the form of TV and radio contribute the most.

4.2.7 Perceptions of university and school participants on their reading experiences in their strongest language, second strongest and third strongest language

In this section, the findings related specifically to the attitudes and experiences of the university and school participants in reading their strongest, second strongest and third strongest languages are reported.

Table 4. 13 Perceptions of university participants on their reading experiences in their strongest, second strongest and third strongest languages

	Strongest language is Sepedi					2 nd strongest language is English					3 rd strongest language is Zulu					3 rd strongest language is Southern Sotho				
Factor	Valid N	Mean	Min	Max	Std.Dev	Valid N	Mean	Min	Max	Std.Dev	Valid N	Mean	Min	Max	Std.Dev	Valid N	Mean	Min	Max	Std.Dev
SL Freq read magazine	18	2,00	1,00	4,00	1,08	17	3,65	1,00	5,00	1,06	6	1,17	1,00	2,00	0,41	5	1,40	1,00	2,00	0,55
SL Freq read newspaper	18	2,11	1,00	4,00	0,90	17	3,65	1,00	5,00	1,11	6	1,17	1,00	2,00	0,41	5	2,20	1,00	3,00	0,84
SL Freq read textbooks	18	3,78	2,00	5,00	0,94	16	4,83	3,00	5,00	0,82	6	1,50	1,00	3,00	0,84	5	2,00	1,00	3,00	1,00
SL Freq read story books	19	3,53	1,00	5,00	1,22	16	3,69	1,00	5,00	1,08	6	2,00	1,00	4,00	1,26	5	2,00	1,00	3,00	1,00
SL Freq read Bible	19	3,89	2,00	5,00	1,10	16	3,44	1,00	5,00	1,46	6	1,50	1,00	3,00	0,84	4	3,75	3,00	5,00	0,98
SL Freq read Social Media	18	4,17	2,00	5,00	0,99	16	4,38	3,00	5,00	0,72	6	3,33	2,00	4,00	1,03	4	3,25	2,00	4,00	0,98
SL Freq read cell phone texts	19	4,00	3,00	5,00	0,88	17	4,41	3,00	5,00	0,71	6	2,83	1,00	4,00	1,17	5	2,80	1,00	4,00	1,14
SL Freq read Internet	19	2,16	1,00	5,00	1,30	17	4,59	2,00	5,00	0,80	6	1,67	1,00	4,00	1,21	5	1,60	1,00	3,00	0,89
SL Freq read Other	4	3,25	3,00	4,00	0,50	1	4,00	4,00	4,00											
SL proficiency read magazine	17	3,24	1,00	5,00	1,48	15	4,33	3,00	5,00	0,72	4	2,25	1,00	4,00	1,50	5	3,20	1,00	4,00	1,30
SL proficiency read newspaper	17	3,35	1,00	5,00	1,27	15	4,27	3,00	5,00	0,70	4	2,25	1,00	4,00	1,50	5	3,80	3,00	4,00	0,45
SL proficiency read textbooks	17	4,12	3,00	5,00	0,70	15	4,33	3,00	5,00	0,82	4	2,25	1,00	4,00	1,50	5	3,40	1,00	5,00	1,52
SL proficiency read story books	17	4,18	1,00	5,00	1,01	14	4,38	3,00	5,00	0,74	4	2,75	1,00	4,00	1,26	5	3,20	1,00	4,00	1,30
SL proficiency read Bible	16	4,00	2,00	5,00	0,97	14	3,93	3,00	5,00	0,83	4	2,25	1,00	4,00	1,50	4	4,25	4,00	5,00	0,50
SL proficiency read Social Media	17	4,59	3,00	5,00	0,71	15	4,47	4,00	5,00	0,52	5	3,60	2,00	5,00	1,14	4	3,75	2,00	5,00	1,26
SL proficiency read cell phone texts	18	4,50	3,00	5,00	0,71	16	4,50	3,00	5,00	0,83	5	3,20	2,00	4,00	0,84	5	3,40	1,00	5,00	1,52
SL proficiency read Internet	16	3,69	1,00	5,00	1,40	16	4,31	3,00	5,00	0,70	5	2,40	1,00	4,00	1,34	5	3,00	1,00	4,00	1,22

Scale for frequency: 1=Never, 2=Seldom, 3=Sometimes, 4=Often, 5=Very Often

Scale for proficiency: 1=Very poor,2=Poor,3=Average, 4=Good, 5=Very good

4.2.7.1 Sepedi perceived as strongest language

Generally, university participants read more on social media and texts on their cellphone in Sepedi. They also indicated that they read a bible and social media posts often, and read text messages on their cellphone in Sepedi sometimes, but others indicated that they read often. Also, they indicated that they often read school textbooks in Sepedi. The majority indicated that they are good at reading textbooks, storybooks and a bible in Sepedi. In addition, the

participants also indicated that they are good with reading Sepedi posts on social media and text messages on their cellphone.

4.2.7.2 English perceived as the second strongest language

The majority of the university participants indicated that they read textbooks, posts of social media, texts on their cellphone and the internet in English and indicated that they are good at it. In addition, they read a bible very often in English, and they are good at it, but they read magazines in English sometimes and also mentioned that they are also good at it.

4.2.7.3 Zulu perceived as the third strongest

The majority of the university participants indicated that they often read texts and posts on social media in Zulu and that they are good at it. There is a widespread of opinion concerning reading isiZulu texts on a cellphone; some participants indicated that they read sometimes, while others indicated that they read often. There is also a spread in their perceived proficiency ability; some participants indicated that they are average and others indicated that they are good at reading in Zulu. Generally, the participants use isiZulu on social media, and they believe that they are good at it.

4.2.7.4 Southern Sotho perceived as third strongest language

Generally, the university participants read a bible and social media posts more in Southern Sotho and they believed that they are good at reading a bible as compared to social media posts in the language. A few participants indicated that they sometimes read Southern Sotho textbooks. Those who read textbooks in Southern Sotho indicated that they believe that they are good at it. The majority of the participants indicated that they never read magazines in Southern Sotho and that they seldom read newspaper articles in Southern Sotho; however, they believe that they are good at reading magazines and newspaper articles in Southern Sotho.

Table 4. 14 Perceptions of school participants on their reading experiences in their strongest, second strongest and 3rd strongest languages

	Strongest language is Sepedi					Second strongest language is English					Third strongest language is Southern Sotho				
	Valid N	Mean	Min	Max	Std.Dev	Valid N	Mean	Min	Max	Std.Dev	Valid N	Mean	Min	Max	Std.Dev
SL Freq read magazine	22	2,73	1,00	3,00	0,70	16	3,56	3,00	5,00	0,73	11	2,09	1,00	3,00	0,94
SL Freq read newspaper	23	2,70	1,00	4,00	0,82	16	3,25	1,00	4,00	0,77	11	2,18	1,00	3,00	0,98
SL Freq read textbooks	19	4,32	3,00	5,00	0,75	16	4,06	2,00	5,00	0,85	11	2,55	1,00	4,00	1,13
SL Freq read story books	18	3,67	1,00	5,00	1,19	16	4,50	3,00	5,00	0,82	10	2,00	1,00	3,00	0,94
SL Freq read Bible	19	3,32	1,00	5,00	1,11	16	3,44	1,00	5,00	1,09	11	2,18	1,00	4,00	1,08
SL Freq read Social Media	21	3,33	1,00	5,00	1,35	16	3,63	1,00	5,00	1,59	11	2,73	1,00	5,00	1,62
SL Freq read cell phone texts	21	3,62	1,00	5,00	1,43	15	4,07	1,00	5,00	1,10	11	2,00	1,00	4,00	1,26
SL Freq read Internet	21	2,62	1,00	5,00	1,32	15	3,00	1,00	5,00	1,20	11	1,73	1,00	4,00	1,10
SL Freq read Other	2	3,50	3,00	4,00	0,71	16	3,69	2,00	5,00	0,79	0				
SL proficiency read magazine	18	3,56	1,00	5,00	1,10	17	3,59	1,00	5,00	0,94	8	2,75	1,00	4,00	0,89
SL proficiency read newspaper	17	3,76	3,00	5,00	0,75	16	4,00	3,00	5,00	0,82	7	2,86	2,00	4,00	0,69
SL proficiency read textbooks	21	4,10	3,00	5,00	0,83	15	4,47	3,00	5,00	0,64	8	3,13	3,00	4,00	0,35
SL proficiency read story books	17	4,18	3,00	5,00	0,73	16	4,06	2,00	5,00	1,00	8	3,13	3,00	4,00	0,35
SL proficiency read Bible	20	3,80	1,00	5,00	1,15	15	4,13	1,00	5,00	1,06	9	2,78	2,00	4,00	0,67
SL proficiency read Social Media	21	4,05	1,00	5,00	1,20	16	4,50	2,00	5,00	0,82	9	3,22	1,00	5,00	1,56
SL proficiency read cell phone texts	20	4,05	1,00	5,00	1,23	15	3,53	1,00	5,00	1,19	8	2,88	1,00	4,00	0,83
SL proficiency read Internet	19	3,16	1,00	5,00	0,96	1	5,00	5,00	5,00		7	2,43	1,00	3,00	0,79

Scale for frequency: 1=Never, 2=Seldom, 3=Sometimes, 4=Often, 5=Very Often

Scale for proficiency: 1=Very poor, 2=Poor, 3=Average, 4=Good, 5=Very good

4.2.7.5 Sepedi perceived as the strongest language

The school participants mostly read textbooks as compared to other materials and they believe that they are proficient when they read these textbooks in Sepedi. Additionally, they read storybooks, the bible, social media posts and cellphones, and they believe that they are proficient in reading Sepedi in this context. Generally, the participants read textbooks more often as compared to the other resources that they were asked about in the study. However, they indicated that they are good at reading textbooks, social media posts and texts on their cellphones in Sepedi.

4.2.7.6 English perceived as the second strongest language

Generally, the school participants read textbooks, storybooks, texts on cellphone more, and they believe that they are good at reading these texts in English. The majority of the school participants indicated that they very often read social media posts in English and that they believe that they are good at it. Lastly, they search for information on the internet sometimes, and they are average in their reading of this information in English in their view.

4.2.7.7 Southern Sotho perceived as the third strongest language

Generally, the school participants do not read much in Southern Sotho, as is evident from the table above. The majority of the school participants indicated that they sometimes read magazines, newspapers and textbooks in Southern Sotho and that they believe that they are average in reading these types of Southern Sotho materials. Some participants indicated that they sometimes read Southern Sotho textbooks and that they believe that they are average at this task. In addition, there was also a spread of data for bible reading, where some of the participants said they never read and others said they sometimes read a Southern Sotho bible.

4.2.8 Summary of descriptive findings in this section

This section aimed to provide a summary of the demographic, language repertoire, perception of language proficiency and language attitude findings of the participants. The university and school participants in this study know between 3 and 5 languages with Sepedi as the strongest language and English as the second strongest for most of the participants. This makes them Sepedi-English bilinguals, but because the majority of the participants know more than two languages, their language repertoires are similar to the typical profile of multilingual South Africans that use an African language as a home language. The participants in this study grew up in families with limited opportunities to read, taking into consideration the level of education for the parents of the participants. Where participants did have information about the highest levels of education of their parents, we note that very few of the parents of the participants finished school, and the parents that did move on after school did not complete their college university degrees. A substantive number of university participants indicated that they had no knowledge of their father's qualification or they did not know their fathers. It is notable that in 2002, 39% of children in South Africa were raised by single mothers, and this figure decreased to 34% in 2017. In Gauteng, where the participants are based, 34% of children are raised by single mother (Hall *et al.*, 2018). The participants in this study, therefore, come from typical households in this region.

Generally, the university participants in this study were not confident about reading in Sepedi but were confident about reading in English, while the majority of the school participants were the least confident in their ability to read Sepedi whereas the majority of the participants felt confident about reading English. Both the university and school participants were positive about using Sepedi as the medium at school. The participants felt that Sepedi is important for them to learn and also that it was important for their identity. Although they acknowledged that their communities do not embrace Sepedi, they felt that it is because there isn't enough done to use and develop the language. However, they believed that if development efforts are made for Sepedi, more people would want to learn and use the language. Both university and school participants were not confident about Sepedi as a medium of instruction at university. This could be because the language does not currently offer opportunities beyond university, such as job opportunities. Although the participants were not confident about using Sepedi at university, they, however, indicated that they would take part or that they are already taking part in using Sepedi for reading and to learn scientific subjects, but a fair number disagreed with the idea. Generally, the participants indicated that reading had a major contribution in learning Sepedi and English, while the majority indicated that reading did not contribute to the learning of isiZulu and Southern Sotho for university participants and school participants felt the same for the languages that they know. The data indicated that both university and school participants did not read a lot of Sepedi materials as compared to English. School participants read textbooks

more compared to other materials, but university participants, in general, do not read a lot of materials in Sepedi.

Overall, the university participants rated themselves highly in speaking, reading, writing and understanding English. Keeping the scores reported for this study in mind, those who rated themselves as less proficient in speaking, reading, writing and understanding English were less fluent. English *et al.* (2010) stated that children who are poor comprehenders showed inaccuracy in their self-awareness assessment compared to the better comprehending of a text. This means that the children in English's study were not accurate about their reading comprehension ability. This is consistent with Coetzee-Van Rooy and Verhoef (2000), who found that Southern Sotho participants received low scores for a standardised English proficiency test, although they rated themselves as highly proficient in English. Coetzee-Van Rooy (2011) also reported a mismatch between the perception of students with regard to their proficiency level and their actual comprehension scores. In her findings, she found that Southern Sotho home language students over-estimated their level of proficiency in English compared to Afrikaans home language students (Coetzee-Van Rooy, 2011:181).

Positive attitudes towards language lead to increased motivation, which then contributes to a positive attitude towards learning the language (Todor & Degi, 2016). It is, however, difficult to support the notion that positive attitudes to, for example, read a language directly leads to increased motivation to read the languages that they know. The data revealed that the participants were positive about reading Sepedi and English, but despite this positive attitude, they still did not read a lot of Sepedi or English in general. In addition, they did not finish reading the additional texts that they were provided with as support. The study conducted by Todor and Degi (2016) reported that the participants were very positive about their home language (Hungarian) because they felt that the language needed to be preserved and that it must be protected. They were also of the opinion that acquiring language skills seems to be important and that the most effective strategy is direct language use. The data in this study support Todor and Degi (2016) in that the participants in this study also viewed their home language as important, but when presented with an opportunity, most of them did not complete the reading in the booklet provided to them.

4.3 Descriptive statistics related to decoding and comprehension measures for the university and school participants

Research Question Two (2)

Within the theoretical framework of the SVR, what characteristics of decoding and comprehension define the reading of the Sepedi and English university and school participants in the study?

To answer research question two, this section presents descriptive statistics (means and standard deviations) for all the reading and eye-movement measures used in this study. These descriptive statistics provide the background against which the inferential statistics can be interpreted. Readers are reminded that the same texts were read during measure 1 and measure 2; and that a period of about five weeks passed between the two reading measures.

4.3.1 WPM (Word Per Minute)

The table below presents means and standard deviations on word per minute results for the university participants.

Table 4. 15 Means and standard deviations on Word Per Minute results for university participants

Word per Minute (WPM)				
	English academic 1 st measure (2000 words)	English academic 2 nd measure (2000 words)	Sepedi academic 1 st measure (2897 words)	Sepedi academic 2 nd measure (2897 words)
Mean (M)	79.5	32.1	54.8	65.2
Standard Deviation (SD)	33.4	48.8	19.1	26.6
	English generic 1 st measure (2000 words)	English generic 2 nd measure (2000 words)	Sepedi generic 1 st measure (2198 words)	Sepedi generic 2 nd measure (2198 words)
Mean (M)	33.8	55.5	64.9	29.2
Standard Deviation (SD)	48.8	52.5	34.9	36.6

The importance of taking more measures during reading experiments emerges as an important finding based on this data. The biggest impression that one gets from the reading speed measures for academic and generic texts read by the university participants is the variance in the reading speeds, even with same text types and acknowledging that the same texts were read in measure 1 and measure 2. The large standard deviations also indicate that there is a lot of variance in the reading speeds of the university participants.

The table below presents means and standard deviations on word per minute results for school participants.

Table 4. 16 Means and standard deviations on WPM results for school participants

Word per Minute (WPM)				
	English academic 1 st measure (932 words)	English academic 2 nd measure (932 words)	Sepedi academic 1 st measure (835 words)	Sepedi academic 2 nd measure (835 words)
Mean (M)	56.3	62.6	49.5	56.7
Standard Deviation (SD)	21.2	25.5	18.4	19.2
	English generic 1 st measure (957 words)	English generic 2 nd measure (597 words)	Sepedi generic 1 st measure (646 words)	Sepedi generic 2 nd measure (646 words)
Mean (M)	75.7	61.8	63.6	70.9
Standard Deviation (SD)	38.8	24.7	23.7	29.5

In general, the reading speed of the school participants is more consistent. The findings show that the reading pattern of the school participants was fairly consistent when reading academic texts and generic texts (see the smaller standard deviation than that of the university students).

Overall there is less variance in the reading speeds of the school participants across languages and text types.

As stated at the beginning of the section, the importance of having as many as possible measures of reading across time emerges as an important finding from this set of data. The present data set simply indicates that there is a lot of variance in the reading speed of the university students and less so among the school participants. More reading measure moments are needed before one could discuss any trends in reading speed for these participants with confidence. This limitation (not enough measures of reading the same texts by the same participants across time) is true for almost all reading studies, and it detracts from our ability to make strong statements about reading speed as a characteristic of reading behaviour for the participants.

4.3.2 Miscue coding as an indicator of oral reading fluency

Miscue coding is operationalised as an indicator of decoding in this study. It is used as a measure of decoding because it provides immediate feedback to the researcher of the reading habits of the participating readers in terms of oral fluency. The occurrence and analysis of miscues describe the accuracy, smoothness, ability to read with expression, and the ability of the participants to recognise words automatically. All of these measures are aspects of oral reading fluency. Oral reading fluency is operationalised as an aspect of decoding because it bridges word recognition and comprehension, which is vital because it demonstrates if students understand what the text is communicating.

The study made use of one instrument to evaluate the oral reading fluency of the participants, namely miscue coding, developed by Goodman and Burke (1973). The nature of miscue coding was described in the methodology chapter, but for the purposes of this section, miscue coding is defined as errors that are found in each word as it is been read aloud by the reader. The most prominent types of miscue coding include correction (this refers to when the readers correct themselves within three seconds in the process of reading), insertion (adding words that are not in the text and sometimes irrelevant to the sentence), omission (omitting words in the texts that later changes the meaning of the text), repetition (that mostly refers to re-reading a word, phrase or even a complete sentence more than once), reversal (this refers to the reversing the order of the word), substitution (this refers to substituting words in the text with words that are irrelevant and not fitting in the sentence) and misspelling (this refers to mispronouncing the word or failing to read the word correctly). Miscue coding has limitations that are well-known in the literature. Its main limitation is that it is impossible to determine if the miscues occur due to the mispronunciation of unknown words or known words to the student. This is a problem because it could mean that the readers have limited vocabulary and that they do not read a lot of books. Despite this problem, miscue coding is a useful measure of reading fluency because teachers can be able to diagnose the cause for miscue and provide relevant support to the learners in need. The means presented in the next four tables (table 4.17-4.20) below were calculated by determining the average number of miscues across a text (English and Sepedi). One reading measure was used for oral reading fluency, and the tables below present the average number of miscues that were made by the university and the school participants.

Table 4. 17 Means and standard deviations for English oral reading fluency results for the types of miscues demonstrated by university participants (350 words)

	<i>Correction</i>	<i>Insertion</i>	<i>Omission</i>	<i>Repetition</i>	<i>Reversal</i>	<i>Substitution</i>	<i>Misspelled</i>	<i>Total</i>
Mean	2,3	3,2	2,8	1,3	0,0	2,7	3,5	15,8
SD	1,9	1,4	1,9	1,2	0,0	1,4	2,4	10,2
Min	0	0	0	0	0	0	1	1
Max	8	8	11	3	0	6	11	47

The findings in the above table (table 4.17) show that the university participants made a different kind of miscue errors while reading the English text. The most prominent miscues are misspelling and insertion. An example of misspelling demonstrated by the university participants is for the word “playgroup” and “distinction”. These words were read incorrectly as “playground” and “distance” respectfully. An example of insertion demonstrated by the university participants is for the word “enrichment” where the participants inserted “environment”. This means that the participants were more concerned with speed than word cognition and accuracy, which can alter comprehension. None of the participants demonstrated reversal as a miscue, suggesting that they have no difficulties with scanning texts from left to right. The findings indicate that participants misspell and omit words more than any of the other miscues. This means that they mostly struggle with accuracy and spelling, and that can alter comprehension.

The figure below (figure 4.1) presents a visual representation of the miscue data for the reading of the English texts by the university participants.

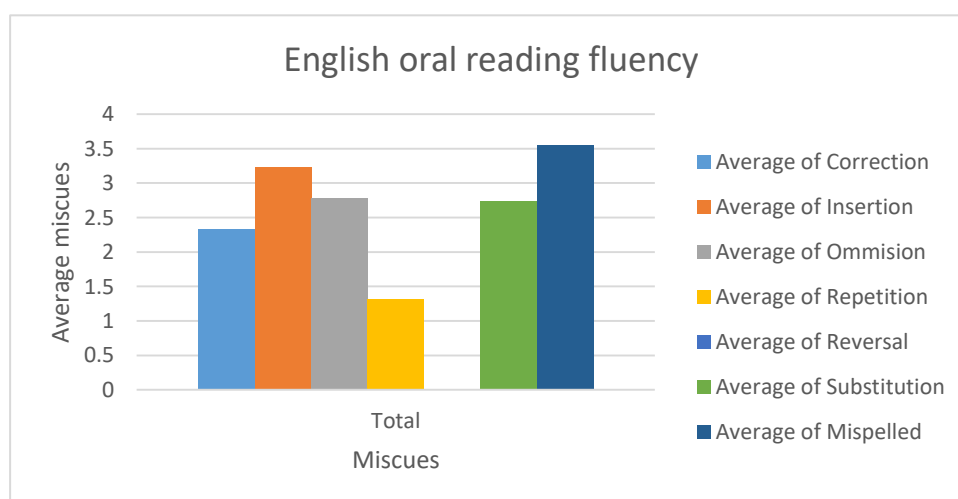


Figure 4. 1 Average miscues for English oral reading fluency factors for university participants

Table 4. 18 Means and standard deviations for Sepedi oral reading fluency results for the types of miscues demonstrated by university participants (575 words)

	<i>Correction</i>	<i>Insertion</i>	<i>Omission</i>	<i>Repetition</i>	<i>Reversal</i>	<i>Substitution</i>	<i>Misspelled</i>	<i>Total</i>
<i>Mean</i>	2,4	2,9	3,3	2,4	0,8	3,9	4,5	20,2
<i>SD</i>	2,1	2,0	6,2	1,6	1,3	3,6	3,0	19,8
<i>Min</i>	0	0	0	0	0	0	1	1
<i>Max</i>	10	7	35	5	4	17	18	96

The findings in the above table (table 4.18) show that the university participants are making different kinds of errors while reading the Sepedi text. The most prominent miscues are misspelling, substitution and insertion. A miscue performed by all the participants is that of misspelling. This means that the participants omitted words which suggests that the participants are either not focused or that they have a weaker sight vocabulary. An example of misspelling is mostly with longer words such as “mengwagašomeng” (many years) and “tšweletšego” (that were produced) which participants read erroneously as mengwageng (recent years) and tšweletšwe (arrived) respectfully. An example of substitution was for the word “ditšweletswa” (produce/products) which participants substituted with “ditšweletše” (arrived). These two words look almost the same, but they differ in meaning. An example is of an insertion of the word “le” (with). even when the text did not have that word in the sentence. This suggest that the participants struggled to comprehend some portions in the text while reading due to misspelling, substitution and insertion.

The figure below (figure 4.2) presents a visual representation of the miscue data for the reading of the Sepedi texts by the university participants.

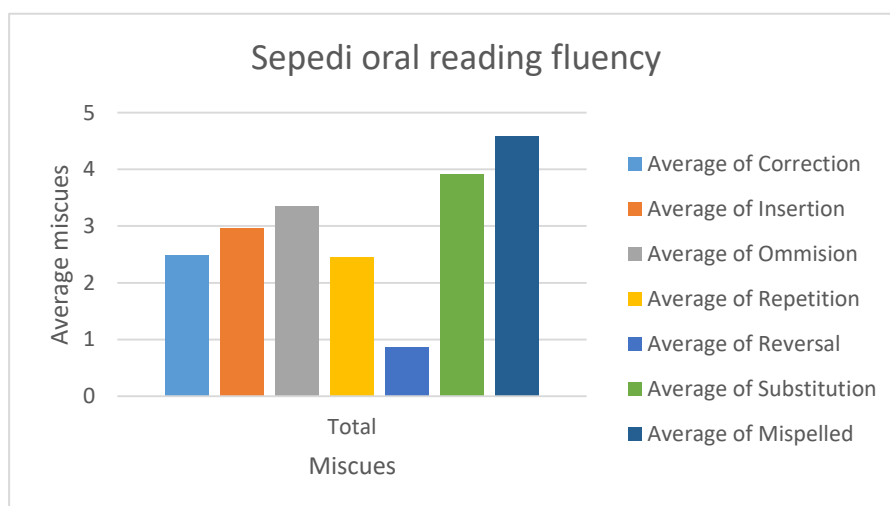


Figure 4. 2 Average miscues for Sepedi oral reading fluency factors for university participants

Table 4. 19 Means and standard deviations for English oral reading fluency results for the types of miscues demonstrated by school participants (372 words)

	<i>Correction</i>	<i>Insertion</i>	<i>Omission</i>	<i>Repetition</i>	<i>Reversal</i>	<i>Substitution</i>	<i>Misspelled</i>	<i>Total</i>
<i>Mean</i>	2,0	3,6	4,1	1,0	0,3	2,2	4,3	17,5
<i>SD</i>	1,9	2,6	3,6	1,2	0,7	1,7	2,9	14,6
<i>Min</i>	0	0	0	0	0	0	0	0
<i>Max</i>	6	10	20	4	2	6	12	60

The findings in the above table (table 4.19) show that the most prominent miscues are misspelling and omission. The participants misspelt words suggesting that they struggle with sounding out or pronunciation or word identification. An example of the words commonly misspelt are “throughout” and “complications”. In addition, the participants omitted words which suggest that the participants are either not focused or that they have a weaker sight vocabulary. An example of omission was observable in the use of prepositions such as “or”, “of”, and sometimes the use of personal pronouns such as “she” or “he”. The findings show that the participants misspelt words and omitted words in general. This indicates that the participants focused more on reading quickly to finish, and also that they do not take their time to recognize the word and decode it for later comprehension. A few of the participants generally struggled to read all types of words, and that indicates a decoding dilemma that influence comprehension because these participants read so poorly that they needed a guide (the researcher) to read the words that they struggled with to them so that they could repeat these words after the researcher to finish reading.

The figure below (figure 4.3) presents a visual representation of the miscue data for English reading by the school participants.

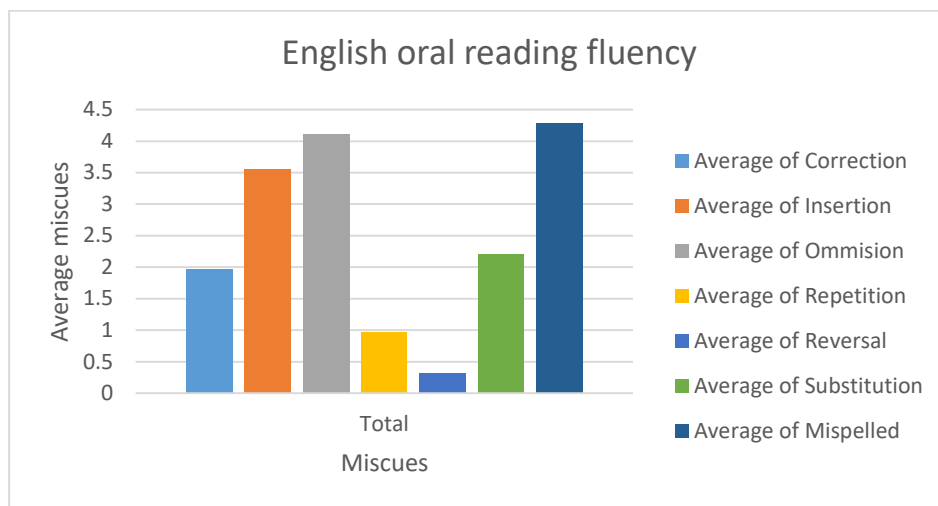


Figure 4. 3 Average miscues for English oral reading fluency factors for school participants

Table 4. 20 Means and standard deviations for Sepedi oral reading fluency results for the types of miscues demonstrated by school participants

	<i>Correction</i>	<i>Insertion</i>	<i>Omission</i>	<i>Repetition</i>	<i>Reversal</i>	<i>Substitution</i>	<i>Misspelled</i>	<i>Total</i>
<i>Mean</i>	3,0	2,6	3,5	1,6	1,5	3,2	4,9	20,3
<i>SD</i>	1,7	1,6	2,2	1,6	1,5	1,3	4,9	14,8
<i>Min</i>	0	0	1	0	0	1	2	4
<i>Max</i>	7	6	12	6	4	6	28	69

The findings in the above table (table 4.20) show that the school participants misspelt words while reading and omitted words. An example of misspelling involved words such as “tseneletšego” (in-depth) and “mosepelakadinao” (pedestrian). Furthermore, the participants omitted words which suggest that the participants are either not focused or that they have a weaker sight vocabulary. An example of words they omitted where mostly non-words such as “lo” or “ba”. Omitting these words can hinder the comprehension of the reader. Generally, the participants misspelt and omitted words more than the other miscues.

The figure below (figure 4.4) presents a visual representation of the miscue data for Sepedi reading by school participants.

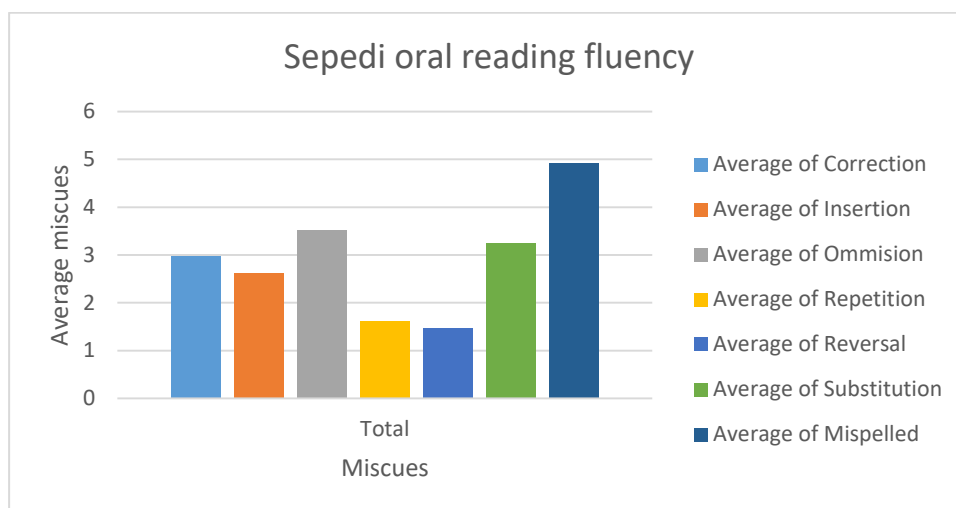


Figure 4. 4 Average miscues for Sepedi oral reading fluency factors for school participants

4.3.3 Summary of the results for miscues

Overall, the findings related to miscues are the same when one compares the university and school data. In both groups, the participants misspelt longer words and omitted mostly shorter words in both languages. Oral reading fluency requires that the participant reads every single word in the text and across the groups; this was not the case. This means that the participants applied a silent reading approach when reading the text aloud and progressed through the reading texts by skipping words they recognized as difficult to pronounce. The findings related to the reading of English and Sepedi are the same looking at the data above. This means if participants struggle to read, it does not matter in which language they read in. That is, if they struggle with decoding and comprehension in Sepedi, there is a likelihood that they struggle to decode and comprehend even when reading in English. Overall, the miscue coding data can be used as a way of getting authentic information regarding the strength of the students and identifying the weaknesses of their reading abilities (Goodman, 2015). This type of coding can assist the teacher in the foundation and intermediate phase to identify reading problems early on the reading development of their pupils so that they could design appropriate intervention tools.

The oral reading fluency miscue analysis highlights the following:

Listening to the participants read a text aloud provide the researcher with an idea into the thinking and the construction of the meaning-making process of the reader. Therefore, using a miscue analysis provides an opportunity for the researcher to understand the reading process of the reader. For example, listening to a large number of both university and school participants revealed that many of them made several attempts at pronouncing words correctly, which was not successful sometimes. Many of the students engaged in some self-correction, which indicated that these participants were monitoring their reading. Other times the reader continued reading after the miscue and did not go back to correct the word. The data revealed that for university participants reading an English text, misspelling and insertion of words were done very often as compared to self-correction, omission, repetition, reversal and substitution. While misspelling and substitution were done very often as compared to self-correction, insertion, omission, repetition and reversal of words in university participants reading a Sepedi text. For school participants reading an English and Sepedi text, misspelling and omitting was done very often as compared to self-correction, insertion, repetition, reversal and substitution.

Previous researchers (Goodman, 1969:15; Chall, 1996) discovered that the number of miscues in oral reading fluency increase with age and grade. Goodman (1969) found that the higher the grade, the more miscues they make. For example, Grade 6 learners in Goodman's (1969) study made more miscues as compared to grade 4 learners. This is the result of the increased attention that is paid towards semantic and syntactic concerns. According to Chall (1996), readers process a text through word identification and guessing words from the text, and this can cause a higher level of miscues. According to Rayner and Pollatsek (1989) eye movement gives an accurate picture of the reading process. Repeated reading is well-known for increasing oral reading fluency (Samuels, 1979). Samuels (2002) found that if many words are shared with the repeated passage, then there is the value of transfer in repeated reading.

The findings of this study are different when compared to what we know about miscues in the literature, and the different miscues does not rule out the fact that in this study the school participants made more miscues that are associated to difficulties in decoding, whereas the university participants made miscues that were associated with speed reading and not correctly identifying word and meaning which meant that they did not comprehend some parts of the text where the miscue occurred. According to Chall (1996), miscues are as a result of word identification and guessing words in context, and this can alter the meaning of words and phrases. Previous research (Goodman, 1969) found that miscues increase with age, but in this study, school participants made more miscues compared to university participants. This may be most prevalent in primary school readers, as it is the case in Goodman (1969)'s study.

4.3.4 First fixation duration results for university and school participants

The first fixation duration results for the university and school participants are used as an indicator of decoding in this study. First fixation duration is an indicator of decoding because it relates to word recognition, and it is regarded as the first measure of eye movement (Whitford & Joannis, 2018).

The table below presents the means and standard deviations of the first fixation duration for the university participants.

Table 4. 21 Means and standard deviation for first fixation duration results for university participants

	First Fixation Duration (FFD)			
	English Academic 1st measure	English Academic 2nd measure	Sepedi Academic 1st measure	Sepedi Academic 2nd measure
Means (M)	254,1	249	284,9	267
Standard Deviation (SD)	32,43	42,3	48,8	54,26
	English Generic 1st measure	English Generic 2nd measure	Sepedi Generic 1st measure	Sepedi Generic 2nd measure
Means (M)	247,5	239,2	279,4	267
Standard Deviation (SD)	36,64	40,36	52,07	54,25

The findings in the table (table 4.21) above indicate that the first fixation duration means for measure 1 and 2 do not differ substantially for the university students. The participants performed similar first fixation durations across measures (1 and 2), across languages, and across genre types of text (academic and generic). These results are expected in a context where participants read the same texts during two measuring times. The university participants have more or less similar means and standard deviations for reading the Sepedi academic text and the Sepedi generic text for the second measure. Two measures are not a lot, but the consistency of the results indicate that a fairly long duration of the first fixation is a characteristic of the reading behaviour of the university students when they read Sepedi and English.

The table below presents the means and standard deviation of the first fixation duration for school participants.

Table 4. 22 Means and standard deviation on first fixation duration results for school participants

	First Fixation Duration (FFD)			
	English Academic 1st measure	English Academic 2nd measure	Sepedi Academic 1st measure	Sepedi Academic 2nd measure
Means (M)	152,5	168	219,9	229,4
Standard Deviation (SD)	59,31	56,28	86,86	68,12
	English Generic 1st measure	English Generic 2nd measure	Sepedi Generic 1st measure	Sepedi Generic 2nd measure
Means (M)	205,4	159,8	222,8	237,9
Standard Deviation (SD)	65,5	61,31	79,12	69,5

The findings in the table (table 4.22) above indicate that the first fixation duration (FFD) for the reading of the English and Sepedi academic texts is higher during measure 2 than in measure 1. This means that on average, the participants have long first fixation durations. More measures are needed before one would be able to discern any trends for first fixation duration in the reading of English and Sepedi texts for these participants. The FFD for the reading of the English generic text is less for measure 1 when compared to measure 2. This is unexpected in a context where the participants read the same texts at two different measure times. Again, more measures are needed if one wants to identify patterns related to the first fixation duration behaviour of the participants. This means that the participants read and fixated on words less during their second reading of the English generic text which could be because they were more familiar with the text because they read the same texts during measure 1. The FFD for the Sepedi generic text increased between measures 1 and 2. This could mean that the participants modulated their reading because they were reading the text for the second time, and they were more aware that they had to prepare for the comprehension test after reading on the eye-tracker. In general, the FFD for English texts is lower than those performed for reading in Sepedi. This suggests that the fixations, in general, are longer in Sepedi compared to English. Also, text length could also be a contributing factor for the longer average first fixation duration in Sepedi compared to English. The FFD measures are less consistent than the miscue results.

This means there are differences between reading orally and silently that we need to take note. Overall, the FFD results cannot be concluded in isolation without considering word frequency and word length which are described later in this chapter to provide FFD measures as an aspect of decoding and a characteristic of the reading behaviour of the university and school participants when they read in Sepedi and English.

4.3.5 Gaze duration results for university and school participants

Gaze duration is used as an indicator of decoding in this study because it is classified as an early measure of reading comprehension (Whitford & Joanisse, 2018).

Table 4.23 below presents the means and standard deviations for university participants.

Table 4. 23 Means and standard deviation of Gaze Duration results for university participants

	Gaze Duration (GD)			
	English Academic 1 st measure	English Academic 2 nd measure	Sepedi Academic 1 st measure	Sepedi Academic 2 nd measure
Means (M)	324,9	314,3	413,3	366,6
Standard Deviation (SD)	55,44	65	83,01	86,15
	English Generic 1 st measure	English Generic 2 nd measure	Sepedi Generic 1 st measure	Sepedi Generic 2 nd measure
Means (M)	311,4	283,2	405,1	367,1
Standard Deviation (SD)	57,83	55,83	88,53	86,24

The findings in the table (table 4.23) above indicate that the means for Gaze Duration decreased between measure 1 and 2 for reading the academic text in English by the university participants, with measure 1 indicating a higher mean as compared to measure 2. These results are similar to the other measures as well. This means that the total reading duration in measure 1 for both academic texts in English and Sepedi was higher across as compared to measure 2 with lower total gaze duration. This finding could be explained as a result of text familiarity if we keep in mind that the participants read the same texts during the two different moments of measurement.

Table 4. 24 Means and standard deviation of Gaze Duration results for school participants

	Gaze Duration (GD)			
	English Academic 1st measure	English Academic 2nd measure	Sepedi Academic 1st measure	Sepedi Academic 2nd measure
Means (M)	225,3	230,8	379,8	376,6
Standard Deviation (SD)	91,9	83,43	154,64	118,45
	English Generic 1st measure	English Generic 2nd measure	Sepedi Generic 1st measure	Sepedi Generic 2nd measure
Means (M)	297,1	222,1	371,5	363,3
Standard Deviation (SD)	101,76	95,65	135,1	129,31

The findings in the table (table 4.24) above indicate that the Gaze Duration for English and Sepedi reading of academic texts by school participants did not change substantially between measures 1 and 2. This means that the participants were reading at the same level. Surprisingly the English generic text shows a higher gaze duration compared to the academic text given that the length of the text was shorter in the generic text, and also that generic texts have a low readability score compared to academic texts.

In general, the Gaze Duration results indicate that a struggle with decoding characterises the English and Sepedi reading of academic and generic texts by the university and school participants.

4.3.6 Regressions out of word results for university and school participants

Regressions out of word are used as an indicator of decoding in this study because the amount of time a participant regress out of a word can tell us whether they experience issues with decoding the words and processing or not.

Table 4.25 below presents the means and standard deviations of regressions out of word for the university participants.

Table 4. 25 Means and standard deviation of regressions out of word results for university participants

	Regressions out of words			
	English Academic 1 st measure	English Academic 2 nd measure	Sepedi Academic 1 st measure	Sepedi Academic 2 nd measure
Means (M)	0,18	0,17	0,16	0,13
Standard Deviation (SD)	0,09	0,05	0,08	0,06
	English Generic 1 st measure	English Generic 2 nd measure	Sepedi Generic 1 st measure	Sepedi Generic 2 nd measure
Means (M)	0,13	0,17	0,18	0,13
Standard Deviation (SD)	0,06	0,06	0,07	0,06

The findings in the table (table 4.25) above indicate that the means for regressions out of word for measure 1 is higher compared to measure 2, expect for English generic text measure 1 with low regressions out of word scores. This result is unexpected, and it could mean that the participants realised they missed certain words in measure 1 that they needed for comprehension and then decided to modulate their reading behaviour.

Table 4. 26 Means and standard deviation of regressions out of word results for school participants

	Regressions out of words			
	English Academic 1 st measure	English Academic 2 nd measure	Sepedi Academic 1 st measure	Sepedi Academic 2 nd measure
Means (M)	0,11	0,11	0,19	0,19
Standard Deviation (SD)	0,04	0,05	0,07	0,05
	English Generic 1 st measure	English Generic 2 nd measure	Sepedi Generic 1 st measure	Sepedi Generic 2 nd measure
Means (M)	0,25	0,11	0,23	0,22
Standard Deviation (SD)	0,09	0,04	0,08	0,07

The findings in the table (table 4.26) above indicate that the means for regressions out of words is similar for English academic text (between measure 1 and 2) and Sepedi academic text (measures 1 and 2). However, measure 1 results indicate that the regressions out of words were higher compared to measure 2. This means that the text was less difficult for the

participants and that whatever issues they had, were resolved when reading the texts as part of measure 2.

4.3.7 Words skipped first results for university and school participants

Words skipped first are regarded as an indicator of decoding in this thesis because they are regarded and classified by Whitford and Joannis (2018) as early measures when readers start to read sentences in a text that can determine if the reader is struggling to recognise the important words they decided to skip for the first time they encounter them. Words skipping can provide us with information about word recognition leading to the comprehension of a text.

Table 4. 27 Means and standard deviations on words skipped first results for university participants

Words skipped first				
	English academic 1 st measure	English academic 2 nd measure	Sepedi academic 1 st measure	Sepedi academic 2 nd measure
Mean (M)	0.61	0.65	0.68	0.71
Standard Deviation (SD)	0.08	0.07	0.07	0.08
	English generic 1 st measure	English generic 2nd measure	Sepedi generic 1 st measure	Sepedi generic 2nd measure
Mean (M)	0.62	0.92	0.65	0.78
Standard Deviation (SD)	0.09	0.03	0.11	0.06

The findings in the table (table 4.27) above indicate that the means for “words skipped first” are similar across languages, measures, and text types. This suggests that the reading pattern for “words skipped first” is similar across the eight conditions measured in this study. The results for “words skipped first” mean that the difficulty in word identification during the first encounter characterises the reading of English and Sepedi texts by the university participants.

Table 4. 28 Means and standard deviation on words skipped first results for school participants

Words skipped first				
	English academic 1 st measure	English academic 2 nd measure	Sepedi academic 1 st measure	Sepedi academic 2 nd measure
Mean (M)	0.60	0.58	0.65	0.62
Standard Deviation (SD)	0.14	0.11	0.11	0.06
	English generic 1 st measure	English generic 2 nd measure	Sepedi generic 1 st measure	Sepedi generic 2 nd measure
Mean (M)	0.64	0.62	0.63	0.65
Standard Deviation (SD)	0.11	0.13	0.12	0.11

The findings in the table (table 4.28) above indicate that the means for “words skipped first” are similar across languages, measures, and text types for the school participants. This suggests that the reading pattern for “words skipped first” is similar across the eight conditions measured in this study. The results for “words skipped first” mean that difficulty in word identification during the first encounter characterises the reading of English and Sepedi texts by the school participants seeing that the participants have a higher skipping rate.

In general, the results for “words skipped first” are similar for the university and school participants across languages, text types and measures. This means that the participants show a similar reading pattern concerning “words skipped first”. Although the level of decoding might differ due to grade and reading difficult level of the texts, the skipping rate of “words skipped first” is similar across text types, languages and participants.

4.3.8 Comprehension scores for university and school participants

The comprehension scores in this section are classified under the linguistic comprehension aspects of the Simple View of Reading (SVR). The table below presents the means and standard deviations for the comprehension scores per language and measure. All the comprehension scores across the text types were averaged.

Table 4. 29 Means and standard deviations on comprehension scores for university participants

University participants	English comp-measure 1	English comp-measure 2	Sepedi comp-measure 1	Sepedi comp-measure 2
Mean	62,3	54,3	56,7	41
Standard Deviation	14,19	12,72	7,25	8,05
Min score	25	35	40	25
Maxi score	85	80	75	55

Overall, the university participants achieved average scores on the comprehension tests. The scores for the Sepedi comprehension tests during measure 2 are markedly lower than the other comprehension scores. This is an unexpected finding because the participants read the same Sepedi texts, but they did different comprehension tests in measure 1 and measure 2. The decrease in the scores for measure 2 could be as a result of the different tests.

Table 4. 30 Means and standard deviations of comprehension scores for school participants

School participants	English-comp-measure 1	English comp-measure 2	Sepedi comp-measure 1	Sepedi comp-measure 2
Mean	43,4	44,9	52,1	44,4
Standard Deviation	11,23	12,89	14,00	14,65
Min score	24,56	20	24,34	25,88
Max score	60	70	80	69,23

The table (table 4.30) above presents the means and standard deviation for comprehension test scores for school participants. From the table, it is clear that the mean for English remained the same for measure 1 and 2, while the scores for the Sepedi comprehension decreased between measures 1 and 2. This is an unexpected finding, as the participants read the same Sepedi texts, although the comprehension tests during measure 1 and 2 were different, which could be a possible reason for the different scores. Since the participants read similar texts, it was expected that measure 2 would present increase scores because of the second exposure, but this was not the case.

4.3.9 Global reading measure results of eye movements for university and school participants

Global reading measure results of eye-movements are used as an indicator of comprehension because they provide detailed information on the reading pattern of skilled and less skilled readers. In addition, they can categorise readers as proficient or struggling during reading comprehension. The global reading measures included in this study are the average saccadic amplitude (saccades are defined as the movements of the eyes from one fixation to the next, and they are short and rapid (Reichle, Rayner & Pollatsek, 2003:446; see section 2.9.6); fixation duration defined by Rayner *et al.* (2005) as periods during reading when the eyes are relatively stable, and during which visual information is acquired from the text (see Section 2.9.3) and lastly, regressions which are defined as a process of going back to a previously read or encountered or even skipped word to either translate or interpret the point stated (see Section 2.9.7) for university and school participants.

The global eye-movement of fixation duration results for university and school participants are presented in the next two tables (table 4.31 and table 4.32).

Table 4. 31 Means and standard deviation on fixation duration results for university participants

Fixation duration				
	English academic 1 st measure	English academic 2 nd measure	Sepedi academic 1 st measure	Sepedi academic 2 nd measure
Mean (M)	219.3	229.3	238.3	248.2
Standard Deviation (SD)	23.45	22.35	29.36	30.46
	English generic 1 st measure	English generic 2 nd measure	Sepedi generic 1 st measure	Sepedi generic 2 nd measure
Mean (M)	223.3	226.2	223.4	237.2
Standard Deviation (SD)	24.32	19.41	27.30	28.39

The findings in the table (table 4.31) above shows that the fixation duration for measures 1 and 2 are fairly consistent. In all cases, the fixation duration for measure 2 is higher compared to measure 1 for both the reading of English and Sepedi in the case of academic and generic texts. This means that the reading was modulated in the second measure for comprehension.

The table (table 4.32) below presents the means and standard deviation on fixation duration results for school participants.

Table 4. 32 Means and standard deviation on fixation duration results for school participants

Fixation duration				
	English academic 1 st measure	English academic 2 nd measure	Sepedi academic 1 st measure	Sepedi academic 2 nd measure
Mean (M)	239.4	229.9	250.1	240.6
Standard Deviation (SD)	39.59	146.00	180.00	44.33
	English generic 1 st measure	English generic 2 nd measure	Sepedi generic 1 st measure	Sepedi generic 2 nd measure
Mean (M)	241.5	231.4	248	237.5
Standard Deviation (SD)	40.62	149.42	177.46	37.45

The findings indicated in the above table (table 4.32) are the reverse of what was observed with university participants. The findings of the study show that the participants had longer fixation durations for measure 1 compared to measure 2. This could be as a result of familiarity with the text when students read the same texts during measure 2.

The table below presents the means and standard deviation for saccadic amplitude results for university and school participants are presented in the next two tables (table 4.33 and table 4.34).

Table 4. 33 Means and standard deviations on saccadic amplitude results for university participants

Saccadic amplitude				
	English academic 1 st measure	English academic 2 nd measure	Sepedi academic 1 st measure	Sepedi academic 2 nd measure
Mean (M)	3.62	3.76	2.92	3.22
Standard Deviation (SD)	0.51	0.39	0.37	0.44
	English generic 1 st measure	English generic 2 nd measure	Sepedi generic 1 st measure	Sepedi generic 2 nd measure
Mean (M)	3.44	3.52	2.86	3.12
Standard Deviation (SD)	0.63	0.37	0.33	0.36

The findings in the above table (table 4.33) show that the saccadic amplitude for English was longer compared to Sepedi. This is an expected finding, and this could be due to language structure because Sepedi has more short words that add meaning to many words throughout the text. This means that the participants adjusted their eye-movements to each language type.

The table below presents the means and standard deviation on saccadic amplitude for school participants

Table 4. 34 Means and standard deviations on Saccadic amplitude for school participants

Saccadic amplitude				
	English academic 1 st measure	English academic 2 nd measure	Sepedi academic 1 st measure	Sepedi academic 2 nd measure
Mean (M)	4.36	4.16	3.46	3.26
Standard Deviation (SD)	0.72	0.82	0.44	0.33
	English generic 1 st measure	English generic 2 nd measure	Sepedi generic 1 st measure	Sepedi generic 2 nd measure
Mean (M)	4.42	3.89	3.34	2.96
Standard Deviation (SD)	0.81	0.76	0.31	0.27

The findings in the above table (table 4.34) show that the saccadic amplitude length was longer for English in for both academic and generic text for measure 1 and 2. The results for the school participants are similar to the results for the university participants. This means that the school participants and the university participants have similar reading patterns.

The table below presents the means and standard deviations on the regression percentage for university participants.

Table 4. 35 Means and standard deviations on Regression percentage for university participants

Regression percentage				
	English academic 1 st measure	English academic 2 nd measure	Sepedi academic 1 st measure	Sepedi academic 2 nd measure
Mean (M)	0.22	0.24	0.12	0.13
Standard Deviation (SD)	0.07	0.9	0.03	0.04
	English generic 1 st measure	English generic 2nd measure	Sepedi generic 1 st measure	Sepedi generic 2nd measure
Mean (M)	0.24	0.22	0.16	0.17
Standard Deviation (SD)	0.09	0.07	0.07	0.07

The findings in the above table (table 4.35) show that that regression percentage was more for English compared to Sepedi. This could suggest that the participants read through their Sepedi text slowly with longer fixations, and they do not need to make more regressions.

The table below presents means and standard deviation for regression percentage for school participants.

Table 4. 36 Means and standard deviations on regression percentage for school participants

Regression percentage				
	English academic 1 st measure	English academic 2 nd measure	Sepedi academic 1 st measure	Sepedi academic 2 nd measure
Mean (M)	0.23	0.26	0.24	0.29
Standard Deviation (SD)	0.05	0.03	0.06	0.06
	English generic 1 st measure	English generic 2nd measure	Sepedi generic 1 st measure	Sepedi generic 2nd measure
Mean (M)	0.21	0.22	0.22	0.25
Standard Deviation (SD)	0.03	0.04	0.03	0.04

In general, the findings for the regression percentages are fairly stable across languages, participant groups and measures. The findings in the above table (table 4.36) show that the regression percentage for the school participants was more for measure 2 in both English and Sepedi. For generic texts both Sepedi measure 2 and Sepedi measure 1 were similar. This shows that the reading patterns were different for individual texts when it comes to regression percentage. The findings indicate that the reading pattern related to the regression findings mean that were associated with textual features and content as well.

4.3.10 Words skipped totally for university and school participants

“Words skipped totally” is used as an indicator of comprehension in this thesis. “Words skipped totally” means the total number of words that were skipped during reading a text from beginning to finish.

The table below presents means, and standard deviation on words skipped totally for university participants.

Table 4. 37 Means and standard deviation on “words skipped totally” results for university participants

Words skipped totally				
	English academic 1 st measure	English academic 2 nd measure	Sepedi academic 1 st measure	Sepedi academic 2 nd measure
Mean (M)	0.37	0.37	0.47	0.48
Standard Deviation (SD)	0.08	0.09	0.07	0.10
	English generic 1 st measure	English generic 2 nd measure	Sepedi generic 1 st measure	Sepedi generic 2 nd measure
Mean (M)	0.45	0.89	0.37	0.82
Standard Deviation (SD)	0.08	0.03	0.11	0.04

The findings in the table above (table 4.37) indicate that the results for “words skipped totally” is similar for both measure 1 and 2 for an academic text, while Sepedi academic texts showed a difference of 0.1% which is negligible. The generic texts showed that the participants skipped more words in total during measure 2 when compared to measure 1 for both English and Sepedi. This means that the participants approached the texts differently. This means that the participants’ skipping rate was possibly determined by textual properties of the text and content as well. The percentage of regressions could have been affected by the other eye movement measures.

The table below presents means, and standard deviations on words skipped totally for school participants.

Table 4. 38 Means and standard deviations on “words skipped totally” results for school participants

Words skipped totally				
	English academic 1 st measure	English academic 2 nd measure	Sepedi academic 1 st measure	Sepedi academic 2 nd measure
Mean (M)	0.43	0.44	0.32	0.33
Standard Deviation (SD)	0.14	0.12	0.14	0.08
	English generic 1 st measure	English generic 2 nd measure	Sepedi generic 1 st measure	Sepedi generic 2 nd measure
Mean (M)	0.26	0.45	0.24	0.28
Standard Deviation (SD)	0.09	0.14	0.09	0.11

Overall, the findings for “words skipped totally” are fairly consistent across text types, language and participant types. The findings in the table above (table 4.38) indicate that the results for mean for “words skipped totally” is similar for the English academic text for both measure 1 and 2, while the similarity can also be observed between Sepedi academic texts measure 1 and 2 as well. The mean for English generic text indicates that the skipping rate increased in measure 2 and the same can be observed for the Sepedi generic text but with a small difference of 0.4% which is negligible. This means that words skipped in a text characterises the reading behaviour of the school participants. This means the properties and the content of the text might have been a contributing factor to the number of words that were skipped totally.

The results in this section indicate that the reading behaviour of the university and school participants are different across the measure instances, the language of texts and types of participants. This means that the reading patterns of the students were mostly influenced by the following measures: fixation duration, saccadic amplitude and regression percentage characterise the reading behaviour of university students and school participants for this measure which explains comprehension proficiency better.

4.3.11 Summary of results for descriptive statistics

In this study, the following aspects of reading were classified as decoding skills measures: oral reading fluency, word per minute, first fixation duration, gaze duration, words skipped first and regressions out of words. Linguistic comprehension measures included: fixation duration, saccadic amplitude, regression percentage and comprehension scores.

When taken together, the descriptive statistics firstly reported miscue analysis results which indicated that the most prominent miscues in the English reading by the university participants were misspelling and insertion. For the Sepedi reading by the university participants, the misspelling was also prominent, and also, the participants made substitutions. For the school participants, the most prominent miscues for both English and Sepedi reading are noted as misspelling and omission. Both the university and school participants commonly misspelt words. Secondly, the first fixation duration for measure 1 was longer compared to measure 2 for both the text type and language for university participants, whereas, for school participants, the results are consistent with what is reported for the university participants except for the shorter fixation duration in measure 2 for English generic text. This means that there was no consistency in the reading of the texts because they were different in content.

In a nutshell, gaze duration for university participants is consistent with the first fixation duration where the duration was longer for measure 1 compared to measure 2. On the other hand, the school participants’ results are consistent with the university participants’ results, except for the shorter gaze duration in measure 1 for the reading of English academic texts. Regressions out of word results for the university participants is consistent with the first fixation duration where more regressions out of words were made in measure 1 compared to measure 2, except for the English generic text. On the contrary, for the school participants, the regressions out of words for the academic texts (measure 1 and 2) in English and Sepedi were similar per language, but the generic texts showed that more regressions were made in measure 1 compared to measure 2. This means that the participants approach texts differently, that is their reading goal influences the pattern of reading that determines the duration for gazes, fixations and regressions out of words.

The results for words skipped first indicated that the university participants skipped more in measure 2 as compared to measure 1 across language and text type. On the other hand, the

school participants' results are consistent with words skipped first for university participants, except for higher skipping in measure 2 compared to measure 1 for Sepedi generic text. The comprehension scores for university participants were higher in measure 1 compared to measure 2, while the school participants' results indicated that the scores for measure 1 and 2 for English were comparable, but for Sepedi measure 1 is higher compared to measure 2. This means comprehension scores were not consistent as was with the global measures of eye movement. In addition, the reading comprehension tests must have had a greater influence as well whereas the texts were similar.

The global measures such as fixation duration, saccadic amplitude and regressions were also reported and for university participants' fixation duration in measure 2 was higher compared to measure 1 to all text type and language. On the other hand, the fixation duration results for school participants is consistent with the scores for university participants, with higher fixation duration for measure 2 than measure 1 results. The saccadic amplitude results for the university participants was longer in measure 2 compared to measure 1 across language and text type. On the contrary, the saccadic amplitude for the school participants was the reverse of the university participants' results were the saccadic amplitude length was longer in measure 1 compared to measure 2. Generally, regressions were higher in English than Sepedi in both measure 1 and 2 for university participants, while the school participants showed that regressions were higher in measure 2 compared to measure 1. This means irrespective of language and text type, the texts were read differently, which was not consistent. Therefore, it is not easy to pinpoint what contributed to the reading patterns except to make speculations. Lastly, the words skipped totally is similar for English academic measure 1 and measure 2, higher for Sepedi academic measure 1 than for measure 2 and also higher for Sepedi generic texts in measure 2 compared to measure 1. This again means that reading approaches for the participants was influenced by each text type, language and content because it does not provide consistency in the reading patterns, whether it was measure 1 or measure 2 for both English and Sepedi.

Research Question 2(a)

What conclusions can be made from describing first fixation duration, gaze duration, words skipped first and oral reading fluency with relation to word recognition (decoding)?

To answer research question 2(a), this section provides findings for these decoding measures below in detail.

4.4 Decoding (word recognition) measures

4.4.1 Oral reading fluency

When measuring the fluency-index over oral reading fluency, it was not possible to make the fluency-index LMER converge, and therefore I calculated a linear regression ($F(16, 139) = 10.95$, $P < 2.2 \times 10^{-16}$, $R^2 = 0.5575$). This means I will report standard errors, the t-value, as well as the p-value in this case. In the rest of this section, I will provide the linear regression results for the decoding measures as they relate to the fluency-index. The data in this section should be viewed against the descriptive findings discussed above. Overall, the university students were more fluent as it can be expected due to their longer experiences as readers and their obvious academic acumen demonstrated by their access to university; and the school participants were less fluent as compared to the university participants (in terms of fluency), but their reading patterns are similar as can be observed later in the fixation duration and the length

of the saccades. Although inconsistent in various text types, measures and language, the data show irregular patterns that are not easy to pinpoint and speculate the possible causes.

4.4.1.1 The effect of regression percentage, saccadic amplitude, fixation duration and comprehension scores on fluency-index

The table below presents descriptive statistics values for oral reading fluency

Table 4. 39 The effect of regression percentage, saccadic amplitude, fixation duration and comprehension scores for university and school participants

Oral Reading Fluency												
	Regression Percentage			Saccadic amplitude			Fixation duration			Comprehension scores		
	SE	t-value	P-Value	SE	t-value	P-Value	SE	t-value	P-Value	SE	t-value	P-Value
University	2.186e-00	6.141	8.12e-09	1.850-01	4.427	1.92e-05	3.647e-03	0.232	0.816	5.211e-03	2.666	0.008580
School	7.211909	3.367	0.00	0.568253	1.818	0.070	0.006091	3.433	0.000721	0.017255	0.585	0.559

Figure 4.5 below shows the effect of the regression percentage on the fluency-index for university and school participants.

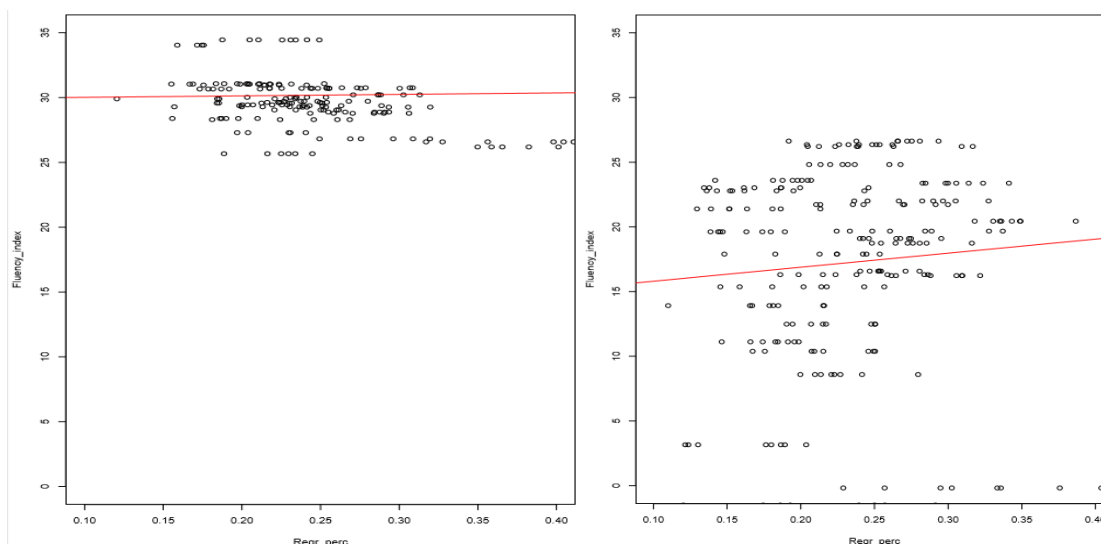


Figure 4. 5 Fluency-index (oral reading fluency) as predicted by regression percentage (left, university; right, school)

The data above show that the university participants do not differ in their overall reading fluency of the text in both measure 1 and 2. In addition, the data show that the number of regressions made by the participants did not determine their fluency level. On the other hand, the school participants' data indicate that more regressions can be used to describe and determine the overall fluency of the participants. It shows that the higher the fluency score, the higher the number of regressions in the case of the school participants.

4.4.1.2 The effect of saccadic amplitude on fluency-index

Figure 4.6 below shows the effects of saccadic amplitude on the fluency-index for university and school participants.

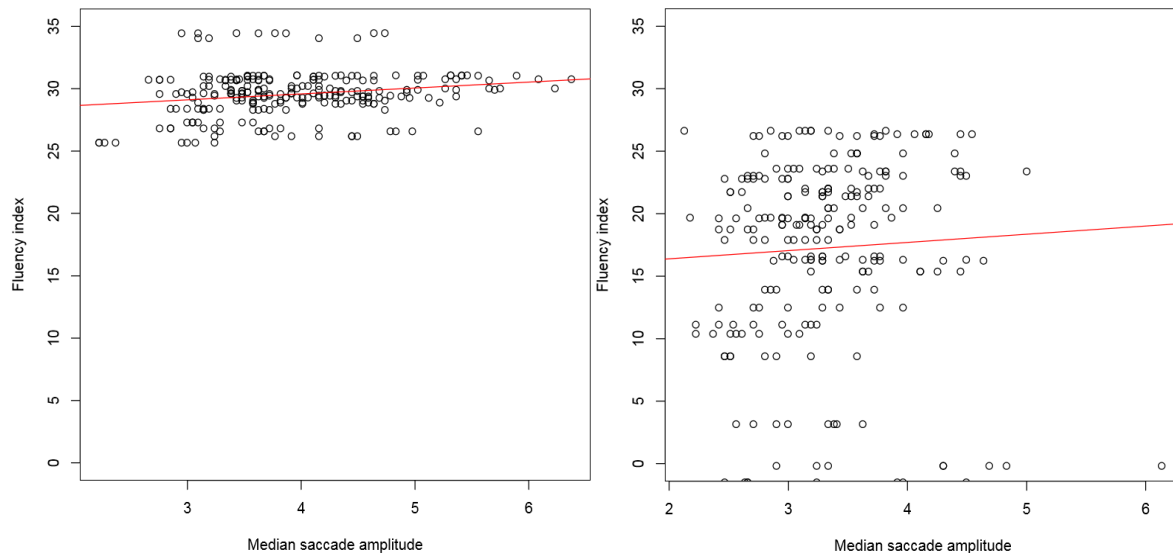


Figure 4.6 Fluency-index (oral reading fluency) as predicted by saccadic amplitude (left, university; right, school)

Oral reading fluency predicted saccadic amplitude for university participants, while for the school participants it did not. The data for university participants showed that participants who were fluent made longer saccades, while the data for school participants showed that the participants present expected shorter saccades despite not being fluent readers. This means that the saccadic amplitude cannot predict whether the university participants are fluent on its own.

4.4.1.3 The effect of comprehension scores on fluency-index

Figure 4.7 below shows the effects of comprehension scores on the fluency-index for university and school participants.

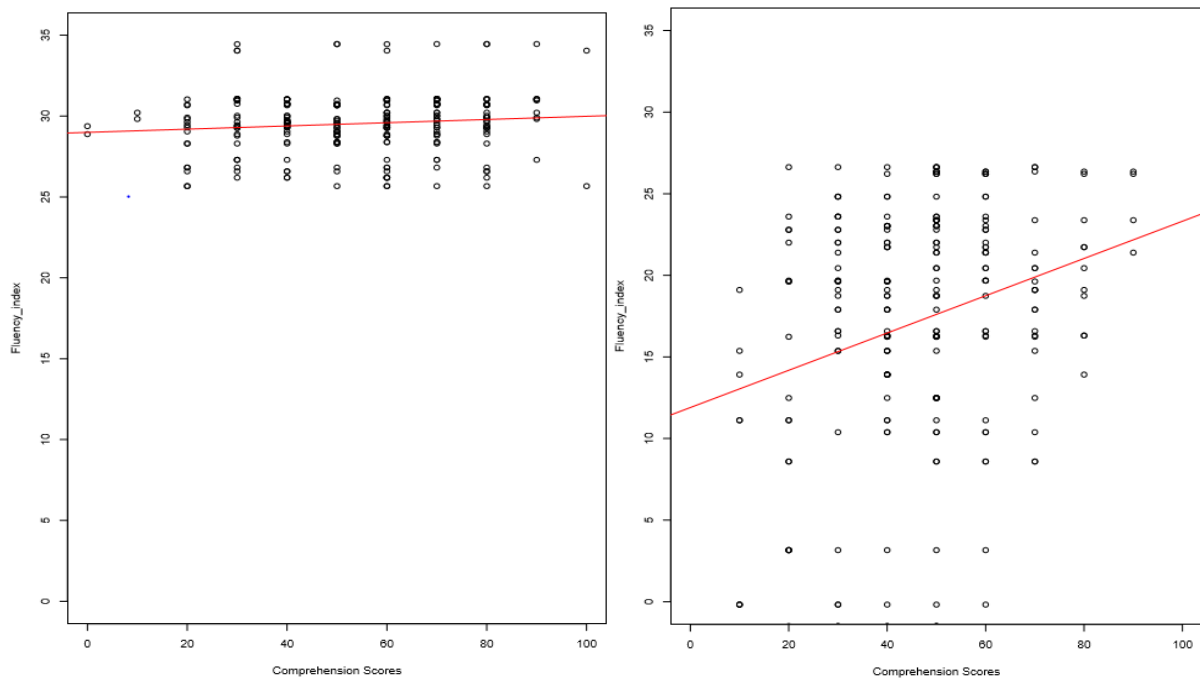


Figure 4.7 Fluency-index (oral reading fluency) as predicted by comprehension scores (left, university; right, school)

Oral reading fluency was predicted by comprehension scores for university participants, which is an expected finding. One would expect that effective comprehension would co-vary with fluency because if one comprehends what one reads, one's reading would be effortless and smooth. The comprehension scores for the school participants indicate that the participants were less fluent, although their reading scores showed a different story. This means that for school participants, comprehension scores did not predict reading fluency. The data also show that university participants who achieved high scores for the comprehension test were more fluent than the participants who achieved low scores for the comprehension tests. This could suggest that the university participants who achieve low comprehension test scores are experiencing reading challenges because they are less fluent or their overall reading ability was affected by the difficulty level of the texts they read. For the school participants, the data show that comprehension scores did not affect fluency. This means that if a participant is fluent, it does not necessarily mean that they received higher comprehension scores. This is an unexpected finding that is difficult to interpret.

4.4.1.4 The effect of fixation duration on fluency-index

Figure 4.8 below shows the effects of fixation duration on the fluency-index for university and school participants.

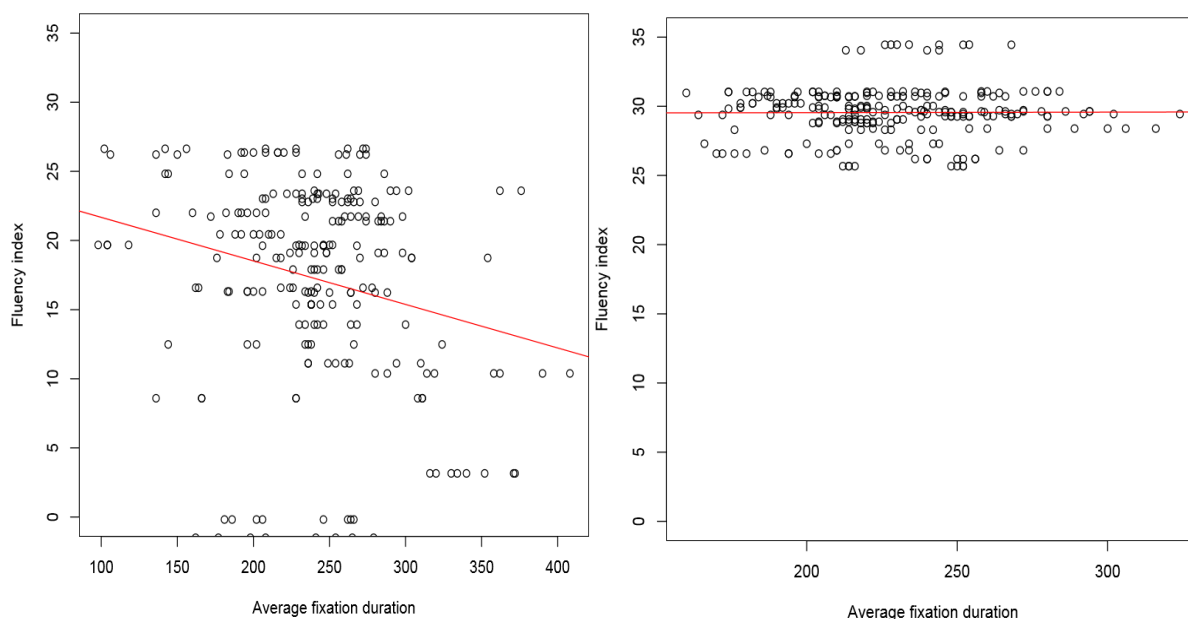


Figure 4. 8 Fluency-index (oral reading fluency) as predicted by fixation duration (left, university; right, school)

Oral reading fluency predicted fixation duration in school participants, but there was no effect at all for university participants as reported in the above figure (figure 4.8). For university participants, this means fixation duration cannot at this stage describe whether the participants are struggling or whether they are skilled because there was no correlation at all. In school participants, shorter fixation durations correlated with a high rate of oral reading fluency, while longer fixation durations correlated with a low rate, which indicates a negative relationship. This means that if a participant makes longer fixation durations it slows down reading speed, whereas shorter fixations correspond with higher reading speed. The findings for the school participants are not unexpected.

4.4.1.5 Summary of the findings

The results for the oral reading fluency analysis revealed that regression percentage predicted oral reading fluency in both university and school participants. This suggests that making more regressions were beneficial for the participants, and the more they regressed, the more it helped with comprehending the texts they were reading. For university participants, variables such as saccadic amplitude and comprehension scores significantly predicted oral reading fluency, while with the school participants, fixation duration significantly predicted oral reading fluency.

Furthermore, the data show that although fluent readers make longer saccades and shorter fixations compared to their counterparts, the difference among the groups is very small. The data reported in this study is contrary to the data in the study conducted by Kriebler *et al.* (2016), which reported that fluent readers showed shorter fixation durations and fewer regressions than the average readers. The oral reading fluency data showed that school participants struggle to read aloud. Fluent, accurate reading and reading comprehension are key abilities for academic success (Kriebler *et al.*, 2016). A lack of fluency characterises a poor reader and gives rise to lack of comprehension.

The oral reading fluency data indicated that less fluent readers are more positive towards the use of Sepedi as the language of teaching and learning. The positive attitude of the less fluent readers suggests that they believe that using Sepedi as the language of teaching and learning could help them to improve their performance at school. However, the fact that the participants

did not complete the additional reading in Sepedi that formed part of the research project shows a positive attitude towards reading in Sepedi does not necessarily translate into the desired reading behaviour which would include reading the additional Sepedi texts provided. Furthermore, the data show that less fluent readers rated themselves as highly proficient in Sepedi compared to fluent readers, while only fluent readers rated themselves proficient in English compared to less fluent readers. This suggests that the participants are unable to accurately self-rate themselves. This is consistent with what Schlösser *et al.* (2013) found in their study. They report that poor performers showed little insight into their performance shortcomings – they were not able to accurately evaluate their performance (Schlösser *et al.*, 2013). This could be due to their deficiency in knowledge and lack of self-awareness. Coetzee-Van Rooy (2011) reported that African language students compared to Afrikaans students obtained lower scores on an English standardised reading test. This is also consistent with Oshse (2005), who also found that African students over-estimated their academic success. Attitudinal data related to language attitudes should, therefore, be interpreted with great caution and should be juxtaposed with real reading behaviour as was the case in this study.

4.4.2 WPM (Word per Minute)

The word per minute (WPM) analysis tells us which predictors significantly affect reading speed. Reading speed becomes automatic when decoding and comprehension have been well-established. Although the participants were not tested on reading speed while silently reading texts on the eye tracker, the data is presented to establish if reading speed could predict decoding and comprehension for these participants or not.

The table below shows that the regression percentage, saccadic amplitude, fixation duration and text-type all significantly predicted WPM (reading speed) in both university and school participants.

Table 4. 40 The effect of regression percentage, text type, language and fixation duration of university and participants

Word Per Minute (WPM)												
	Regression Percentage			Text Type			Language			Fixation duration		
	DF	F-Value	P-Value	DF	F-Value	P-Value	DF	F-Value	P-Value	DF	F-Value	P-Value
University	65.569	21.570	1.691e-05	120.141	123.850	<2.2e-16	108.107	3.725	0.056230	23.391	12.795	0.0045
School	176.029	11.835	0.00	190.561	36.773	6.99e-09	190.550	0.027	0.869250	193.056	6.197	0.0136401

4.4.2.1 The effect of the percentage of regressions on WPM

Figure 4.9 below presents the effect of WPM as predicted by regression percentage

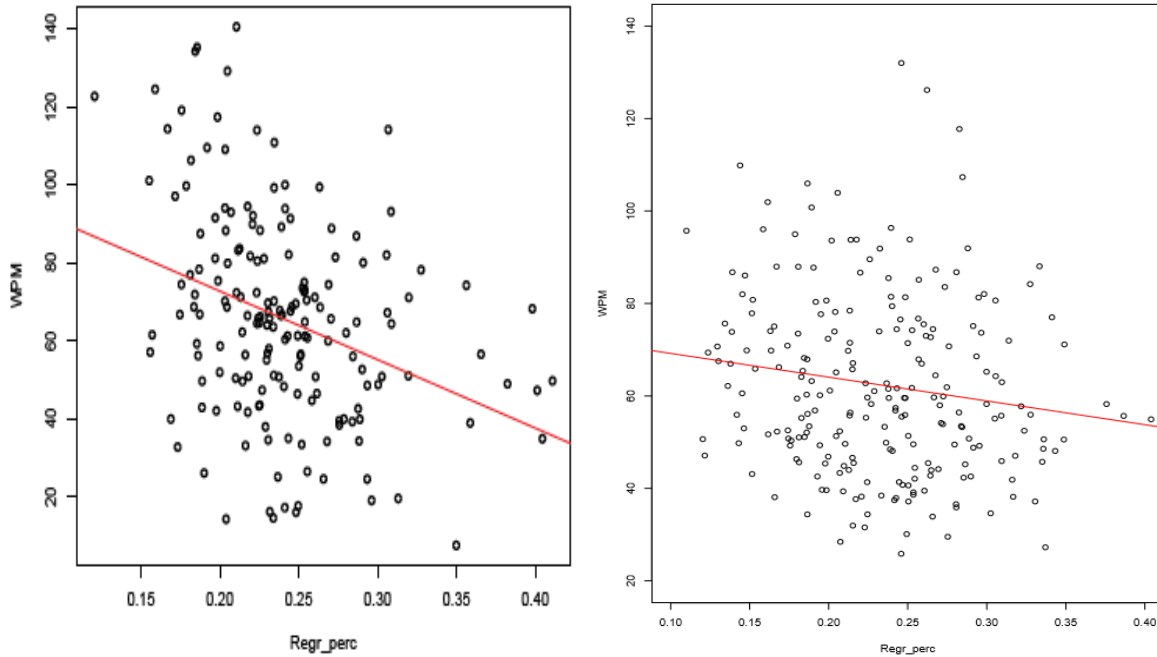


Figure 4. 9 WPM as predicted by regression percentage (left, university; right, school)

Regression percentage significantly predicted WPM in both university and school participants. The results show that slow readers make more regressions, while faster readers make fewer regressions. This is not a surprising finding as slow readers might not need to regress because they read so slowly that they can decode every word they read. More regressions suggest that the participants read slowly, but they still struggle to get the gist of what they read, hence the more regressions. The findings suggest that both the university and school participants take time to decode, hence the fewer regressions they made in their overall reading.

Figure 4.10 below presents the effect of WPM as predicted by fixation duration

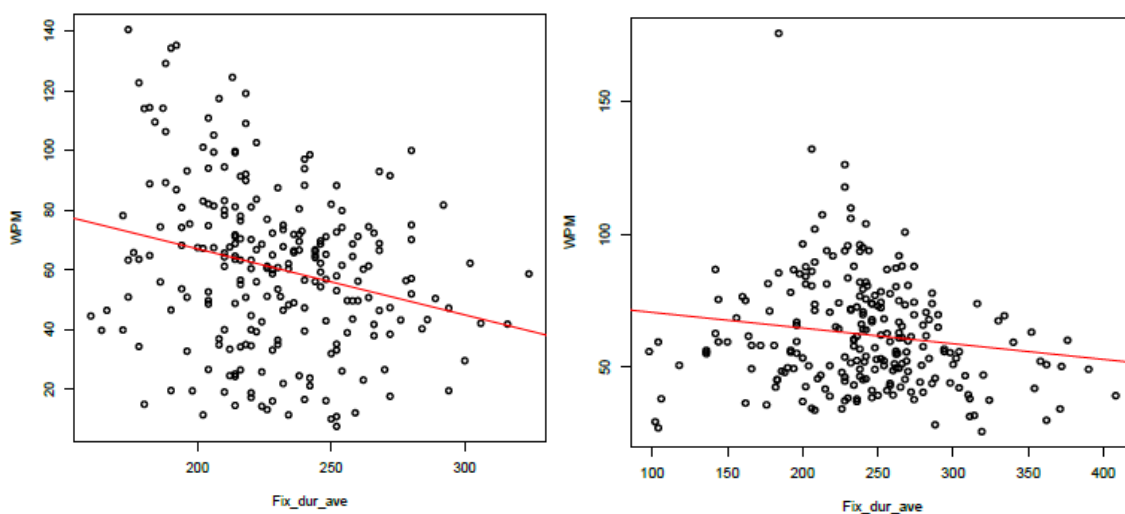


Figure 4. 10 WPM as predicted by fixation duration (left, university; right, school)

WPM was predicted by fixation duration in both university and school participants. The results show that slow readers make longer fixations, while fast readers make fewer fixations. This is an unsurprising finding because slower and struggling readers tend to fixate longer on words as compared to effective readers. This means that the stronger readers among the participants were quick to decode and comprehend the texts, hence the shorter fixations as indicated above in their case.

4.4.2.2 The effect of Text-type on WPM

Figure 4.11 below shows the effect of text type on WPM

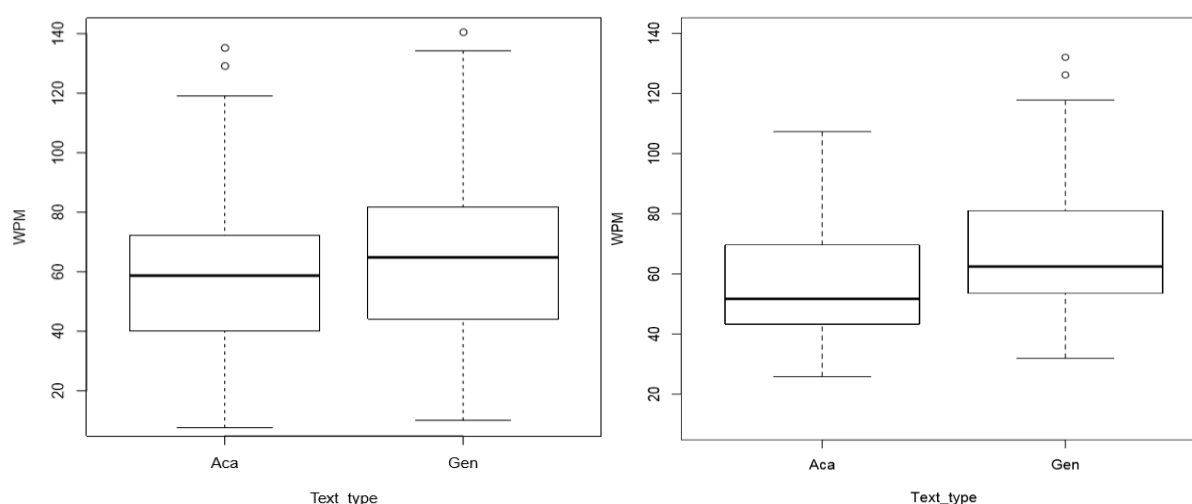


Figure 4. 11 WPM as predicted by Text-type (left, university; right, school)

Text-type predicted WPM in both university and school participants. The results show that both university and school participants had a lower reading speed in the academic texts than they did in the generic texts. The results were expected because generally academic texts are more complex than generic texts which are easier to read.

4.4.2.3 The effect of language on WPM

Figure 4.12 below presents the effect of language on WPM.

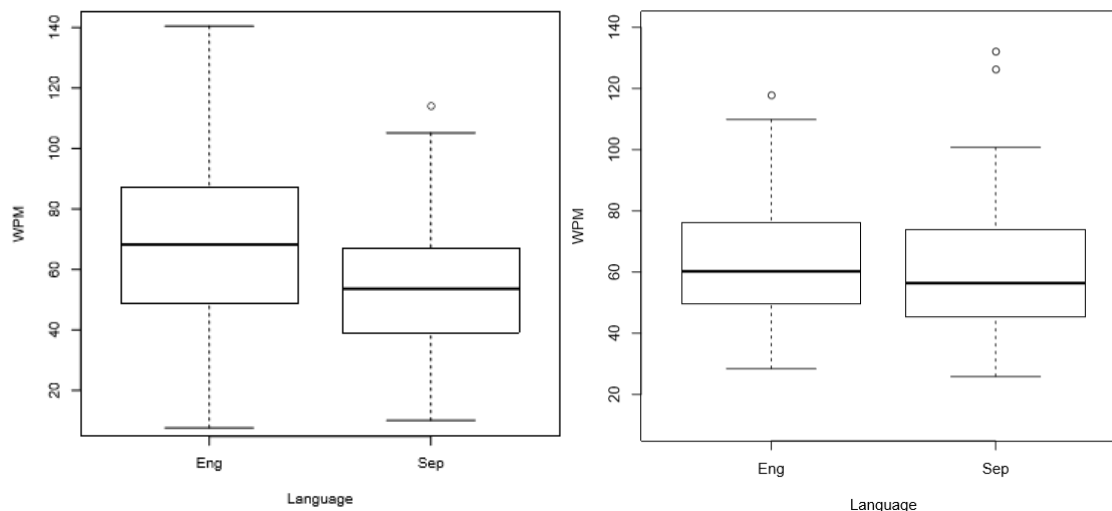


Figure 4. 12 WPM as predicted by Language (left, university; right, school)

Language predicted WPM in university participants, but not for school participants. Although the data for university participants show that the participants read faster in English as compared to Sepedi, the data for the school participants showed no difference between English and Sepedi reading. The reasons for this can be ascribed to the fact that the university participants read more English texts and that they rarely read in Sepedi in formal contexts; while the school participants are still required to read Sepedi in the formal context of the school regularly. Another reason could be because university participants have less exposure to Sepedi reading because they do all their university modules in English only. In addition, the school participants still take Sepedi as a school subject (in contrast to the university students who do not use Sepedi in formal contexts at all), and their other school subjects are offered in English as the language of teaching and learning. In other words, the school children are exposed to both languages (Sepedi and English), and therefore their reading speed is more similar for Sepedi and English as compared to university participants.

4.4.2.4 Summary of the results

The WPM data in the study showed that reading speed is a predictor of oral reading fluency because fluent readers read faster than less fluent readers. The speed and accuracy are linked to reading comprehension. In this study, the participants who read faster paid a fine by making more regressions and obtaining poor comprehension scores. Therefore, their reading speed is not helping them comprehend; hence, they should slow down. According to Berkoff (1979) being a fast reader does not mean being efficient, while being a slow reader does not mean being inefficient. According to Rayner *et al.* (2006), reading speed is dependent on the task specification. In this study, the participants were expected to complete comprehension questions; therefore, they should have slowed down in order to comprehend what they were reading, but they read faster and missed out on a lot of important information for later comprehension. For example, if the reader wants to get the gist from the text, speed reading can be beneficial, but if the reader wants to understand the text as a whole, then there are limitations to reading speed because the comprehension level will decrease as the speed increases (Balota, 2016).

4.4.3 Mixed-effects model regression LMER results

In this section, the results of the mixed-effects model regression are presented to investigate the relationships between first fixation duration, gaze duration, words skipped first and regressions out of word. The results of the mixed-effects model calculations provide information about decoding because they are early measures of reading comprehension. This means that when the participant encounters the word for the first time, we are able to determine whether they struggle with decoding or not. Therefore, early measures refer to the first time the reader identifies and recognise the words in a text.

The findings of the study for this section are presented in the following way:

The first set of data presents word frequency for both university and school participants for both academic and generic text types for both measures 1 and 2. The presentation of the data is classified into English and Sepedi sets for both word frequency and word length data. Only two measures were taken because these were the only measures that could fit into the scope and time frame of a thesis. Ideally, one should take more measures to ensure that one's understanding of the characteristics of the reading behaviour of participants is as comprehensive as possible. Despite acknowledging this limitation, the study at least includes 2 measures which do make it a bit more comprehensive than other studies conducted.

The findings are presented using the mixed-effects model of LMER. The presentation of the plots for first fixation duration and gaze duration are binned (refer to Chapter 3, Section 3.7.2), but the LMER runs on the unbinned frequency data. The findings presented in this section include: first fixation duration, gaze duration, words skipped first and regressions out of word.

4.4.3.1 First fixation duration (FFD): effects of word frequency and word length

First fixation duration (FFD) is defined as the early-local measure of reading (Whitford & Joannis, 2018), and it measures lexical activation and recognition (Rayner & Pollatsek, 1989). The first fixation duration can also be explained as the "time the reader spent initially fixating" the word (Liversedge *et al.*, 1998:58). According to Liversedge *et al.* (1998), 270ms is common for first fixation duration. The relationships between FFD and word frequency and length provide information about the decoding of the participants because it is regarded as an early measure of word identification or word recognition that determines how long the word gets fixated the first time and for how long the fixation lasts. According to Inhoff and Rayner (1986), Rayner and Duff (1986) and Rayne and Rayner (1995) it is common that readers make longer fixation durations when encountering low-frequency words and in most cases, the word length is controlled.

Similarly, longer words are fixated longer as compared to shorter words, and in most cases, word frequency is controlled. Notably, skilled readers are sensitive to word frequency and previous research showed that word frequency showed an effect on first fixation duration (Schuster *et al.*, 2016). In another study conducted by Ashby (2006), the findings revealed that low-frequency words had more fixations than high-frequency words for first fixation duration. A study conducted by Whitford and Joannis (2018) reported differential results that indicated that the participants were found to be slower at processing low-frequency words and they showed larger effects in first fixation duration for L1 (French) word frequency compared to English which is the second language of the participants.

The section below presents results for the LMER analysis of the effect of word frequency and word length box plots on first fixation duration for the English academic text for measures 1 and 2 and the English generic text for measures 1 and 2 for both university and school participants.

This is followed by the results for both the university and school participants reading the Sepedi academic text for measures 1 and 2 and the Sepedi generic text for measures 1 and 2.

Figures 13 and 14 below shows the results for the LMER analysis of the effect of word frequency on the first fixation duration for university and school participants on English reading.

Word frequency for university and school participants: English

Top: English academic texts, measure 1=left; measure 2=right

Bottom: English generic texts, measure 1=left; measure 2=right

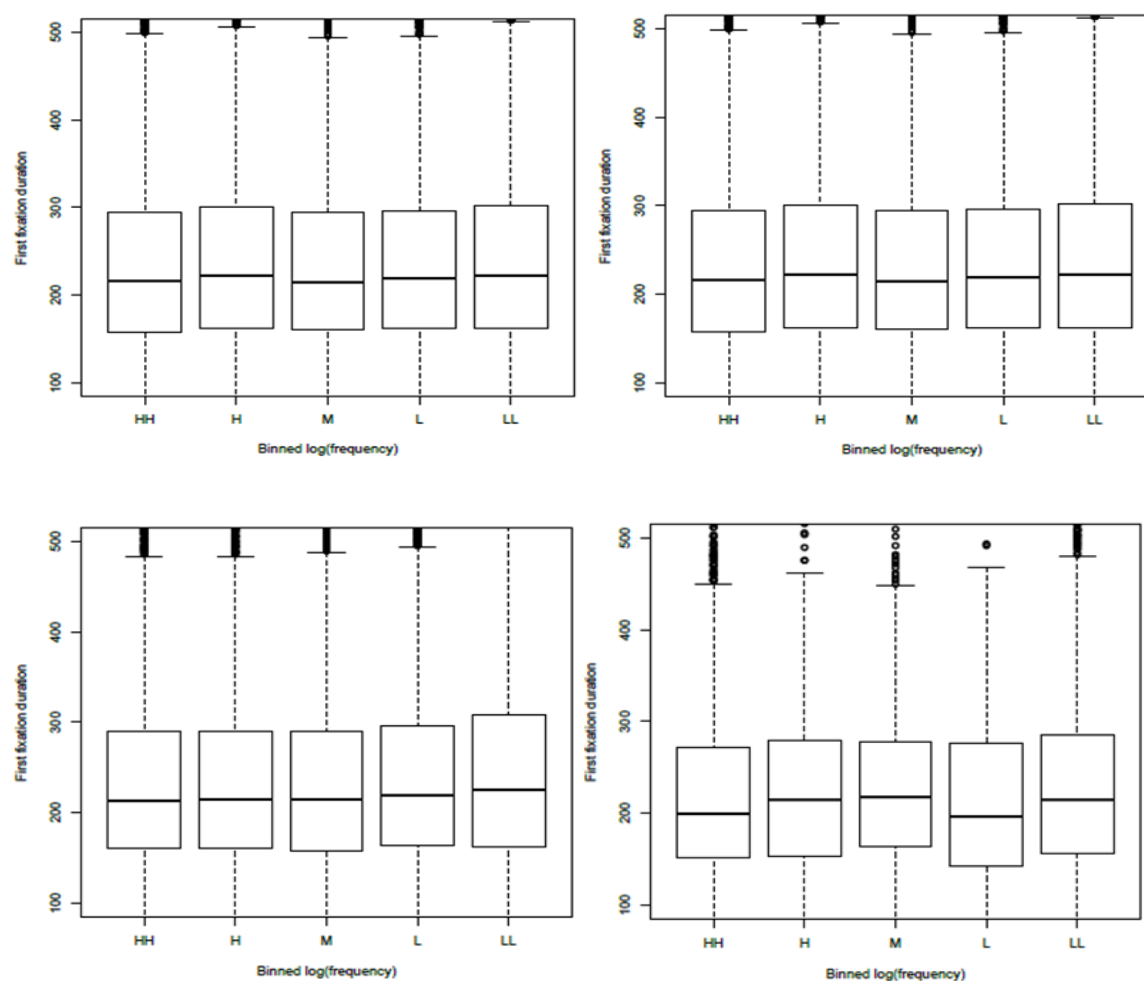


Figure 4. 13 shows the results for the LMER analysis of the effect of word frequency on first fixation duration for university participants: English

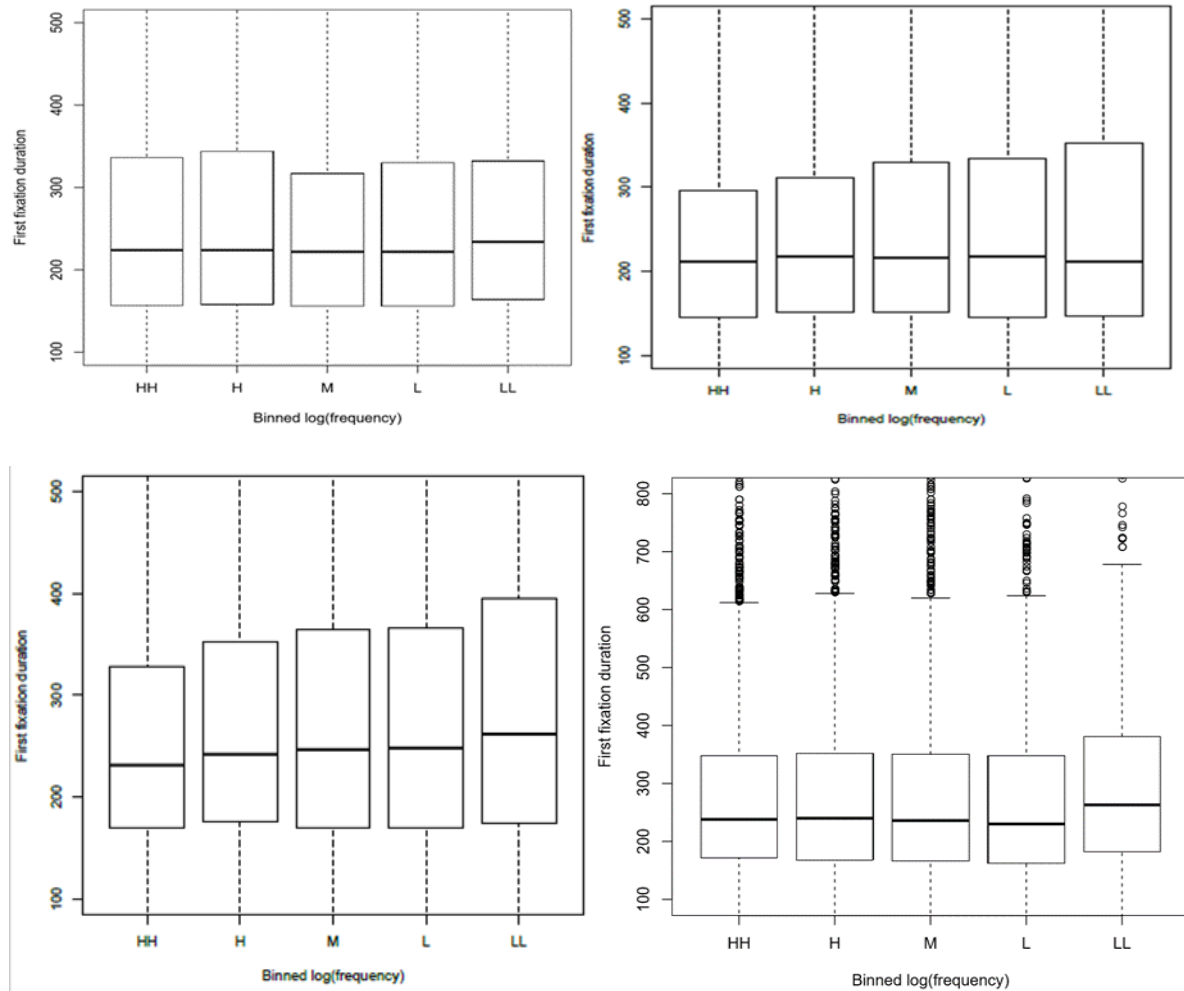


Figure 4. 14 shows the results for the LMER analysis of the effect of word frequency on first fixation duration for school participants: English

Figures 15 and 16 below shows the results for the LMER analysis of the effect of word frequency on the first fixation duration for university and school participants on Sepedi reading.

Word frequency for university and school participants: Sepedi

Top: Sepedi academic texts, measure 1=left; measure 2=right

Bottom: Sepedi generic texts, measure 1=left; measure 2=right

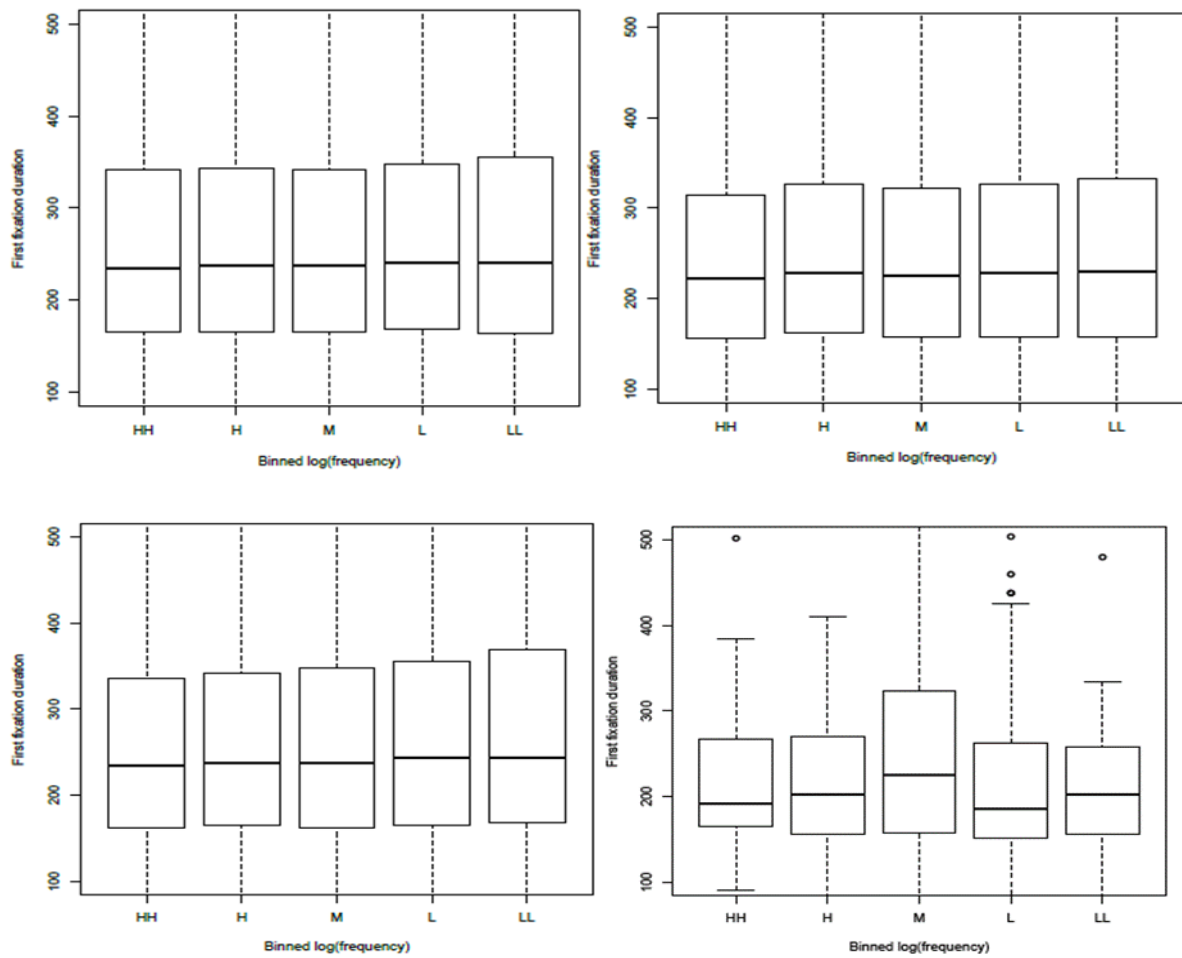
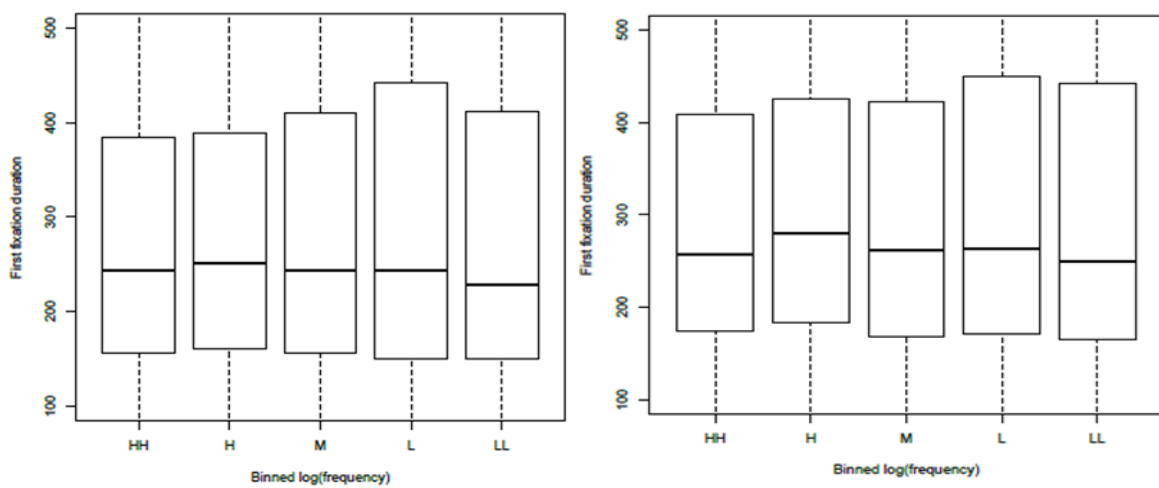


Figure 4. 15 shows the results for the LMER analysis of the effect of word frequency on first fixation duration for university participants.



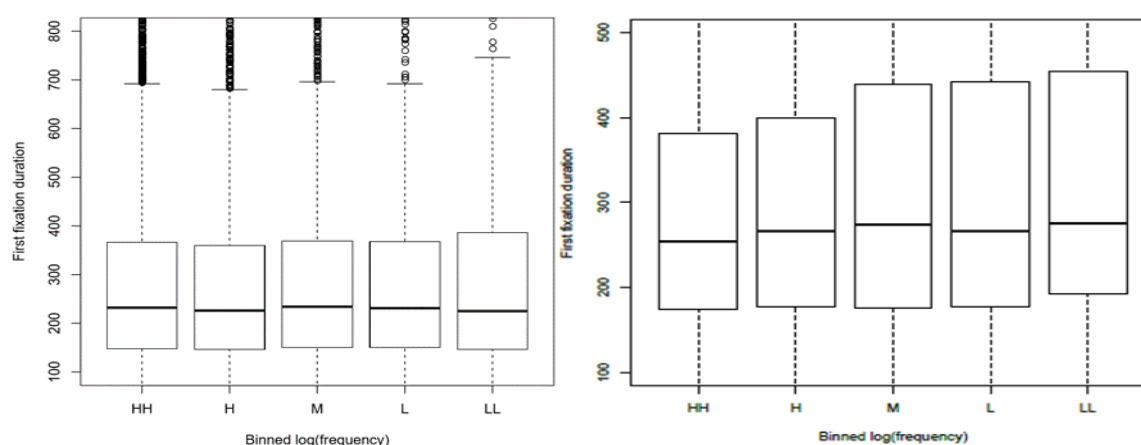


Figure 4. 16 shows the results for the LMER analysis of the effect of word frequency on first fixation duration for school participants

The table below (Table 4.41) presents the statistics for box plots above in figures 15 and 16 on word frequency for both university and school participants on measures 1 and 2 to indicate which measures were significant and which measures were not significant. The box plots presented in the above figures (figures 4.15-4.16) follow the same pattern as in the table below (Table 4.41).

Table 4. 41 Descriptive statistics on first fixation duration for word frequency

First Fixation Duration (FFD): Word frequency										
Language	Level	Text type	Measure 1				Measure 2			
			DF	F-Value	P-Value	Significant	DF	F-Value	P-Value	Significant
English	University	Academic	33322	5.785	0.01	*	34566	17.3096	3.183e-05	***
		Generic	31670	77.473	<2.2e-16	***	5130.4	9.8609	0.01	**
	School	Academic	13100	18.1830	2.021e-05	***	12745.0	41.354	1.315e-10	***
		Generic	7972.8	0.9900	0.31977		8195.5	3.2042	0.07348	
Sepedi	University	Academic	47785	0.4068	4.75e-05	***	39778	14.0355	0.000	***
		Generic	39454	44.982	2.015e-11	***	25749.5	2.89396	0.0882	
	School	Academic	11590.1	6.2062	0.01274	*	10885	15.6418	7.703e-05	***
		Generic	11734.0	0.09082	0.7631		10340.1	39.726	3.042e-10	***

Note to the table: *= p-value is less than 0.05 (significant); **= p-value is less than 0.01 (very significant); ***= p-value is less than 0.001 (extremely significant)

The data in the above figures (figures 4.15-4.16) and table (table 4.41) indicate a significant effect for English academic texts for both university and school participants for both measures 1 and 2; for English generic texts for university participants; for Sepedi academic texts for university participants during measures 1 and 2; Sepedi generic text measure 1 for university participants; Sepedi academic texts for measures 1 and 2 and Sepedi generic text measure 2. In all of the mentioned cases, the data confirmed that word frequency affects the first fixation duration. This means that the participants were sensitive during reading when they encountered frequent words as opposed to infrequent words.

Data for English generic texts for both measures 1 and 2, Sepedi generic text measure 2 for university participants, and Sepedi generic text indicated that there was no significant effect of word frequency for first fixation duration. This means that when the participants were reading the above texts, word frequency did not affect the duration of the first fixation. The participants

fixated frequent and infrequent words similarly. This finding is contrary to the expectation that skilled readers are sensitive to word frequency. Also, it suggests that readers struggle with decoding words accurately. It could also mean that the participants take note of the words, and they fixate on them in an attempt to decode and comprehend. Another possible explanation could be that the words may be shorter but less frequent because the length was not controlled for word frequency, and frequency was not controlled for word length.

Figures 4.17 and 4.18 below presents word length data on first fixation duration for English academic text for measures 1 and 2 and English generic text for measures 1 and 2 for both university and school participants, Sepedi academic text for measures 1 and 2 and Sepedi generic text for measures 1 and 2 for both university and school participants.

Figures 4.17 and 4.18 below shows the results for the LMER analysis of the effect of word frequency on the first fixation duration for university and school participants during English reading.

Word length for university and school participants: English

Top: English academic texts, measure 1=left; measure 2=right

Bottom: English generic texts, measure 1=left; measure 2=right

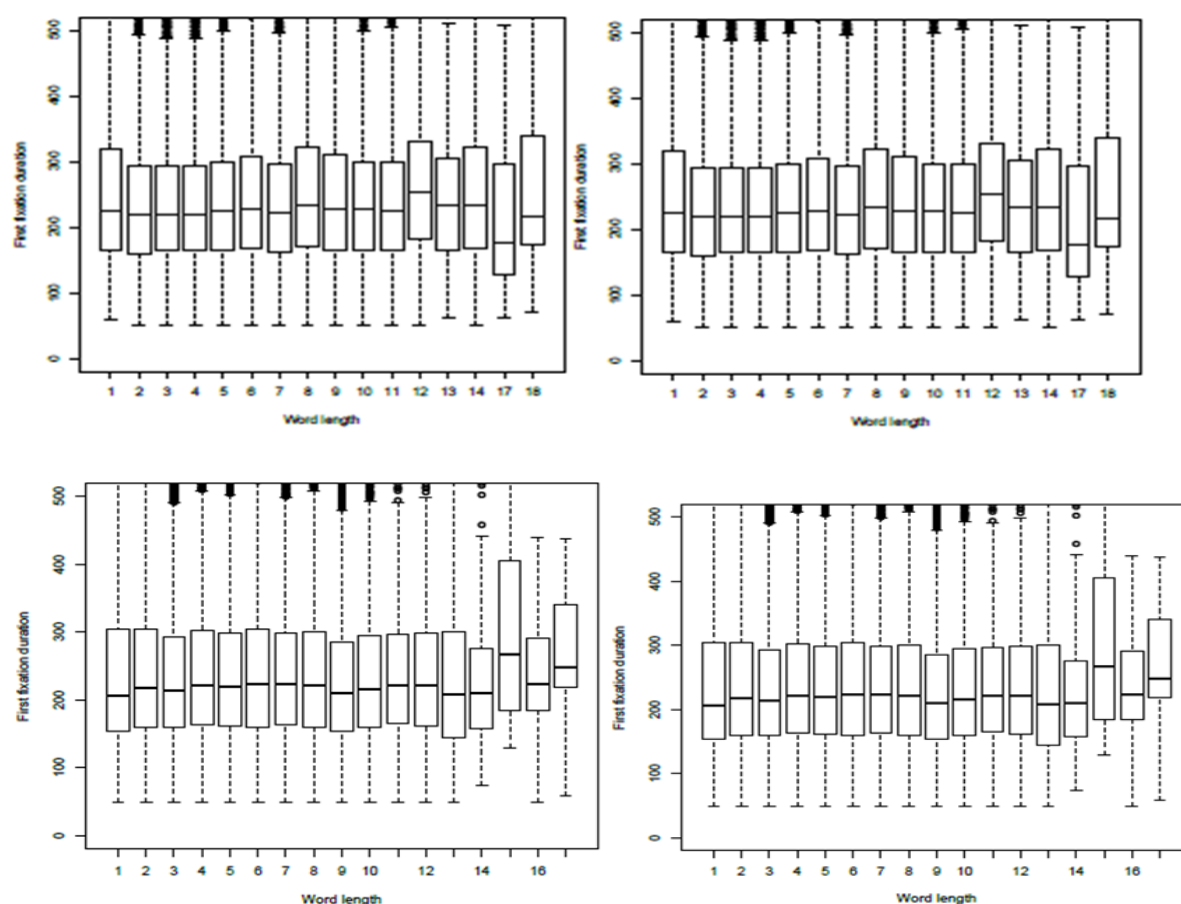


Figure 4. 17 shows the results for the LMER analysis of the effect of word length on first fixation duration for university participants

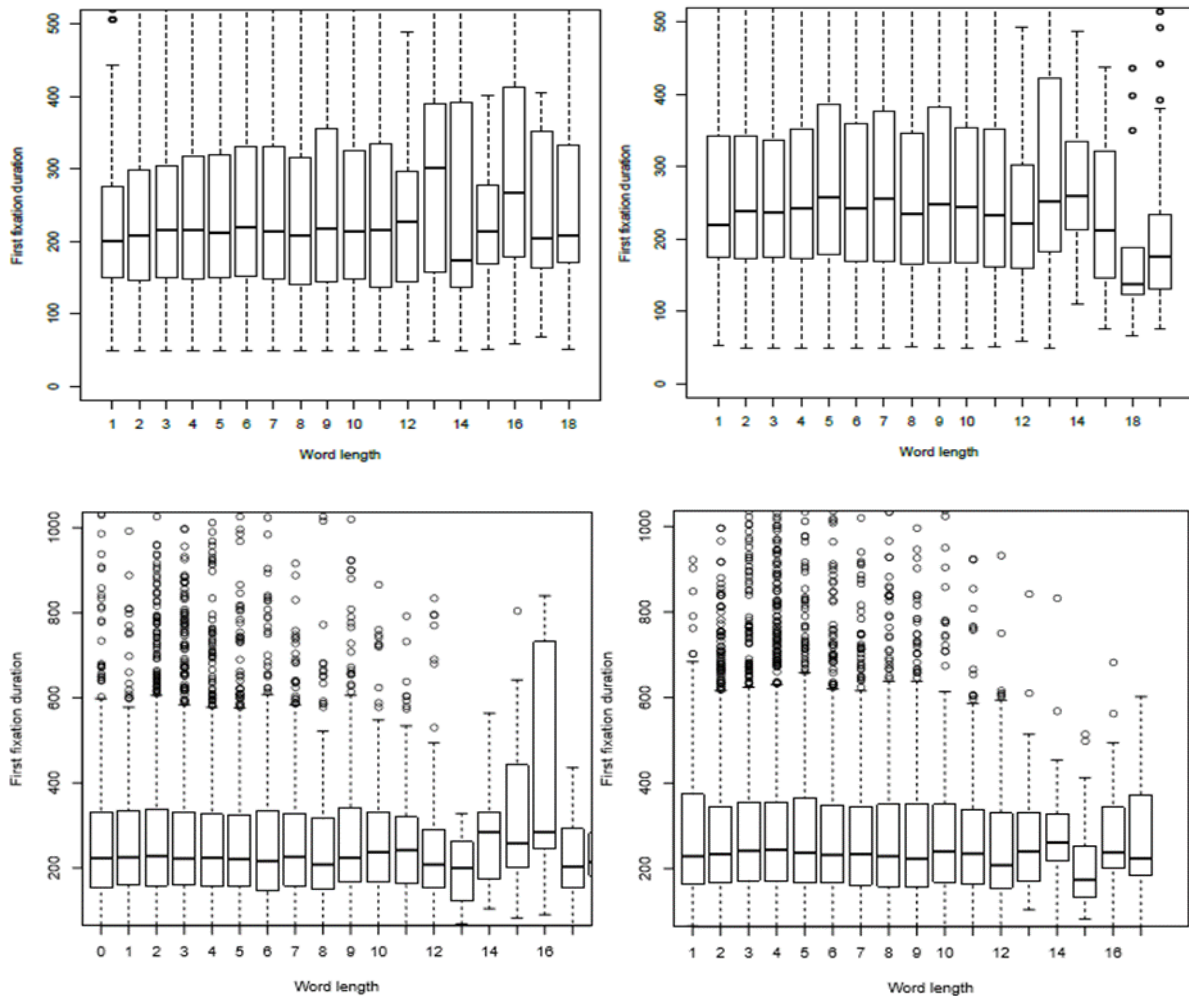


Figure 4. 18 shows the results for the LMER analysis of the effect of word length on first fixation duration for university and school participants

Figures 4.19 and 4.20 below shows the results for the LMER analysis of the effect of word length on the first fixation duration for university and school participants during Sepedi reading.

Word length for university and school participants: Sepedi

Top: Sepedi academic texts, measure 1=left; measure 2=right

Bottom: Sepedi generic texts, measure 1=left; measure 2=right

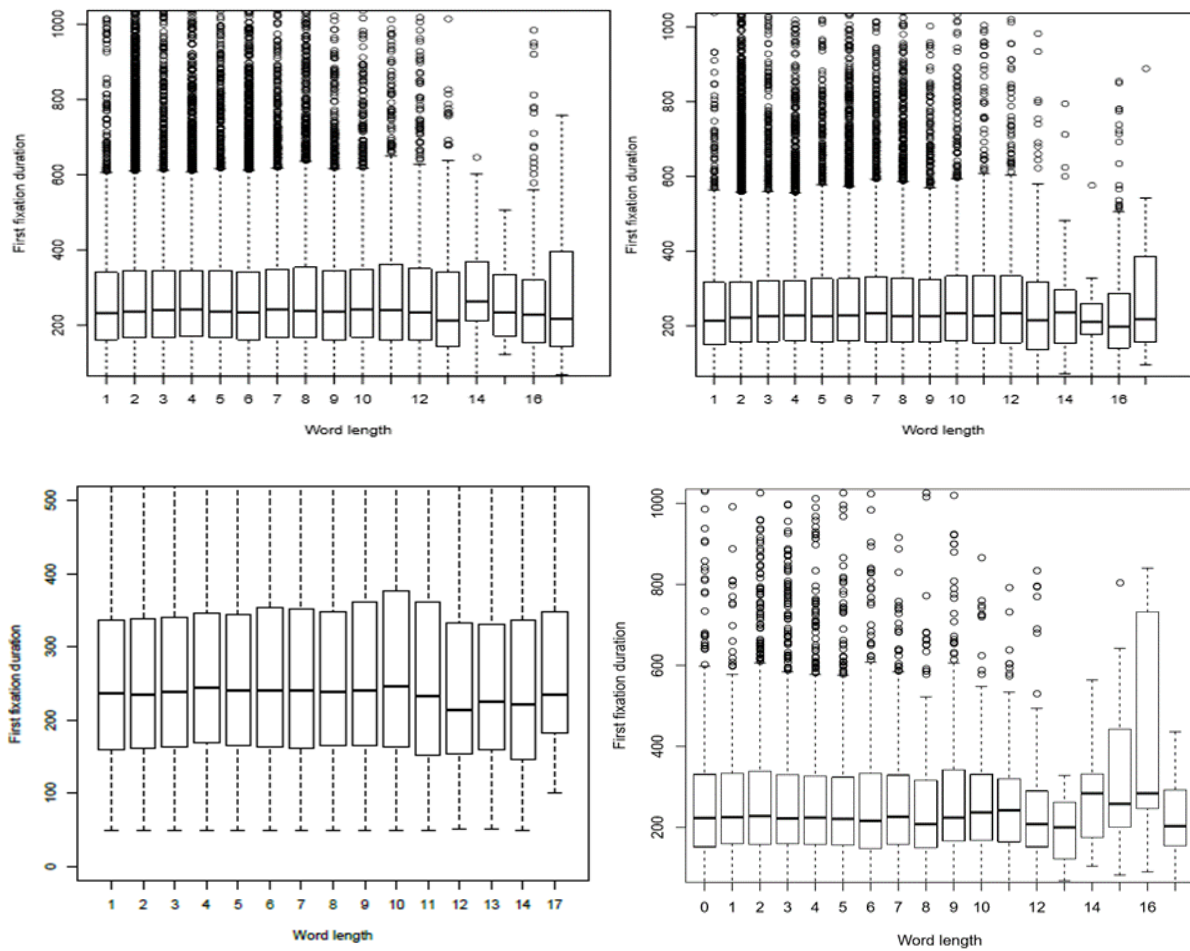
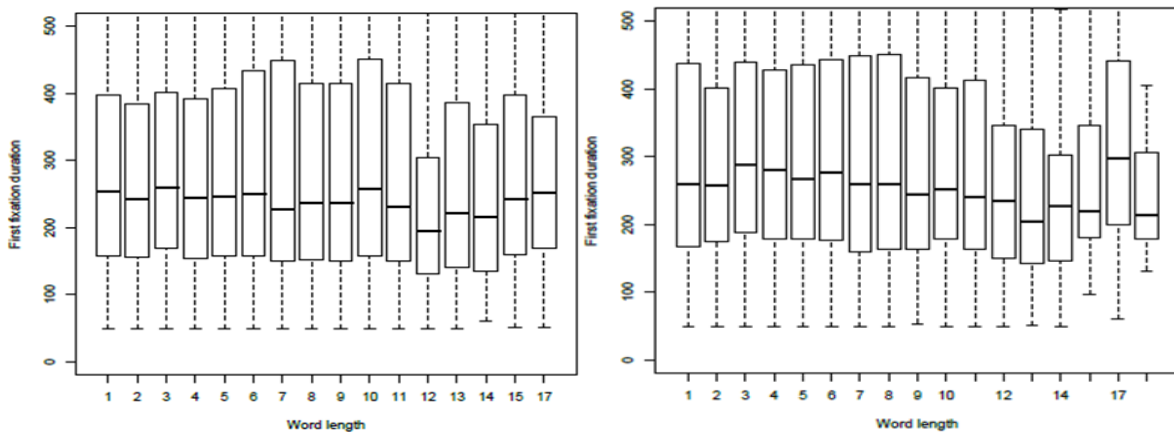


Figure 4. 19 shows the results for the LMER analysis of the effect of word length on first fixation duration for university participants



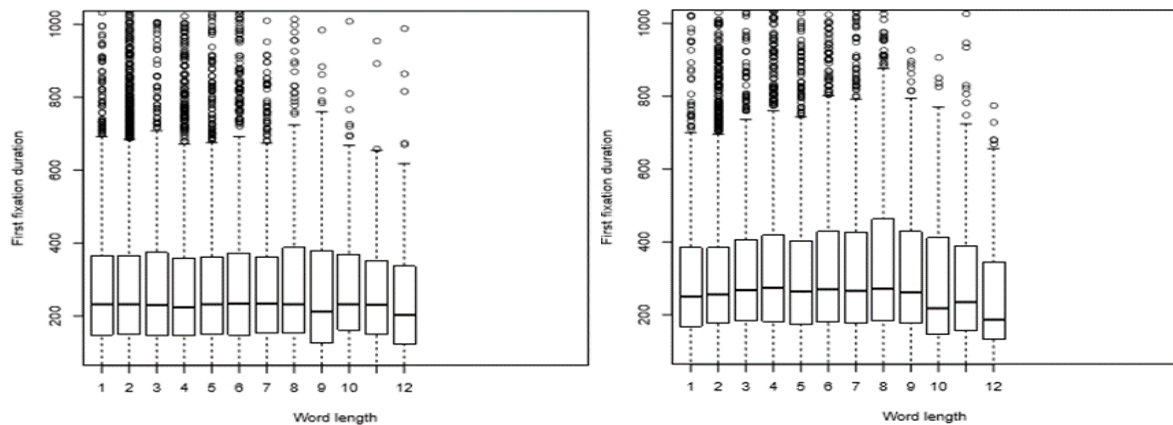


Figure 4. 20 shows the results for the LMER analysis of the effect of word length on first fixation duration for university and school participants

The table below (Table 4.42) presents the statistics for box plots above in figures 4.19 and 4.20 on word length for both university and school participants for measures 1 and 2 to indicate which measures were significant and which measures were not significant. The box plots presented in the above figures (Figures 4.19-4.20) follow the same pattern as in the table below (table 4.42).

Table 4. 42 Descriptive statistics on first fixation duration for word length among university and school participants

First Fixation Duration (FFD): Word length										
Language	Level	Text type	Measure 1				Measure 2			
			DF	F-Value	P-Value	Significant	DF	F-Value	P-Value	Significant
English	University	Academic	33322	41.171	1.414e-10	***	34566	0.6360	0.4252	
		Generic	31670	46.339	1.013e-11	***	5131.8	4.2672	0.038904	*
	School	Academic	13100	3.1791	0.07461		12745.5	0.695	0.4045	
		Generic	7973.2	1.2832	0.25735		8195.4	1.3519	0.24498	
Sepedi	University	Academic	47993	0.60859	0.4353		39779	0.0002	0.9891637	
		Generic	39454	7.231	0.007167	**	25749.6	0.01889	0.89069	
	School	Academic	11589.9	0.7057	0.40088		10885	2.9763	0.08452	
		Generic	11732.1	0.27485	0.6001		10340..2	1.646	0.19949	

Note to the table: *= p-value is less than 0.05 (significant); **= p-value is less than 0.01 (very significant); ***= p-value is less than 0.001 (extremely significant)

The data presented in the box plots and the table above (table 4.42) show that university students were sensitive to word length when reading English academic text for measure 1, English generic texts for measures 1 and 2, as well as reading Sepedi generic texts during measure 1. Indicating that they made longer fixation durations on longer words as compared to shorter words while reading the types mentioned above of texts in the relevant languages. These findings indicate that the decoding abilities of the university participants include a sensitivity for longer words. This finding confirms what was reported in earlier studies (Inhoff & Rayner, 1986; Rayner & Duff, 1986; Rayne & Rayner, 1995).

In contrast to the findings reported above, first fixation duration was not dependent on word length when reading English academic text during measure 2, Sepedi academic texts for measures 1 and 2 and Sepedi generic texts during measure 2. On the other hand, the school participants were not sensitive to the word length when reading in the eight conditions that formed part of this study. This means that school participants generally struggle to read texts irrespective of what language they are reading and the pattern of their reading is not dependent on word length, which is against expectations (Inhoff & Rayner, 1986; Rayner & Duff, 1986; Rayne & Rayner, 1995).

My findings also contradict the findings of studies by Inhoff and Rayner (1986), Rayner and Duffy (1986), Schilling, Rayner and Chumbley (1998), Sereno and Rayner (2003), and Tiffin-Richards and Schroeder (2015), who all found that low-frequency words are first-fixated for a longer duration than high-frequency words. Other studies, such as those by Blythe *et al.* (2009) and Liversedge *et al.* (2004), reported that first fixation duration was influenced by word length and word frequency. In the current study, there is no consistency of patterns from several conditions. These findings suggest that the participants cannot be regarded as skilled readers, given the irregular patterns from various conditions.

4.4.3.2 Gaze duration: effects of word frequency and word length

Gaze duration also is known as dwell time and is defined as the total number of all fixations in an area of interest (Holmqvist *et al.*, 2011:387). Other researchers (Rayner, 1998; Clifton *et al.*, 2007; Joseph *et al.*, 2009 & Foulsham *et al.*, 2013) define gaze duration as the total number of fixations on a word before moving to the next word. Similarly, Whitford and Joannis (2018) view gaze duration as the total number of durations of all fixations during the first reading. Similar to the first fixation duration, Gaze duration is also classified as an early measure of word identification and word recognition which reflects lexical access. According to Just and Carpenter (1980), word length affects gaze duration. In other studies, (Rayner *et al.*, 1996; Ashby, 2006; Joseph *et al.*, 2013; Foulsham *et al.*, 2013) readers made longer gaze durations on low-frequency words than on high-frequency words.

The section below presents results for the LMER analysis of the effect of word frequency and word length box plots on gaze duration for English academic texts for measures 1 and 2 and English generic texts for measures 1 and 2 for both university and school participants, and for reading Sepedi academic texts for measures 1 and 2 and Sepedi generic texts for measures 1 and 2 for both university and school participants.

Figures 4.21 and 4.22 below shows the results for the LMER analysis of the effect of word frequency on the first fixation duration for university and school participants on English reading.

Word frequency for university and school participants: English

Top: English academic texts, measure 1=left; measure 2=right

Bottom: English generic texts, measure 1=left; measure 2=right

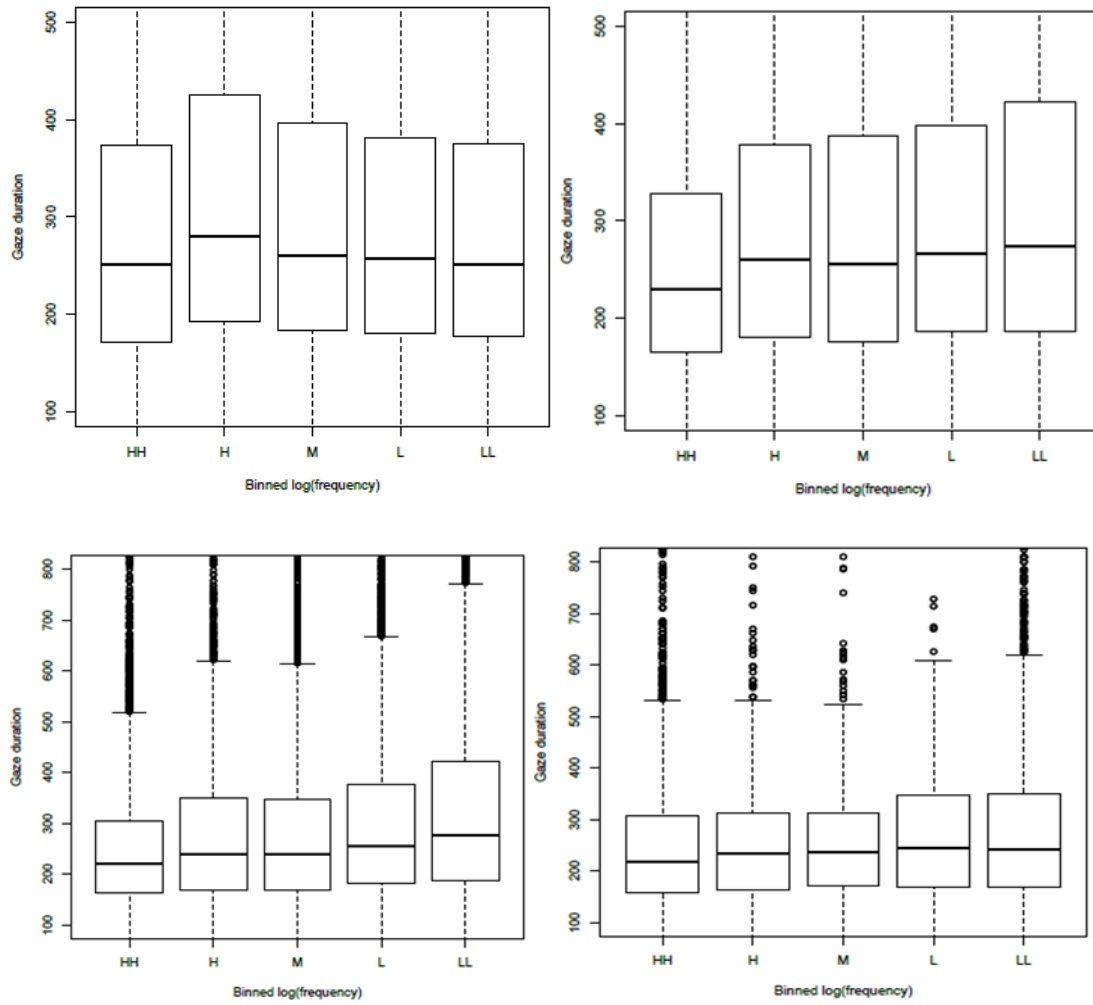
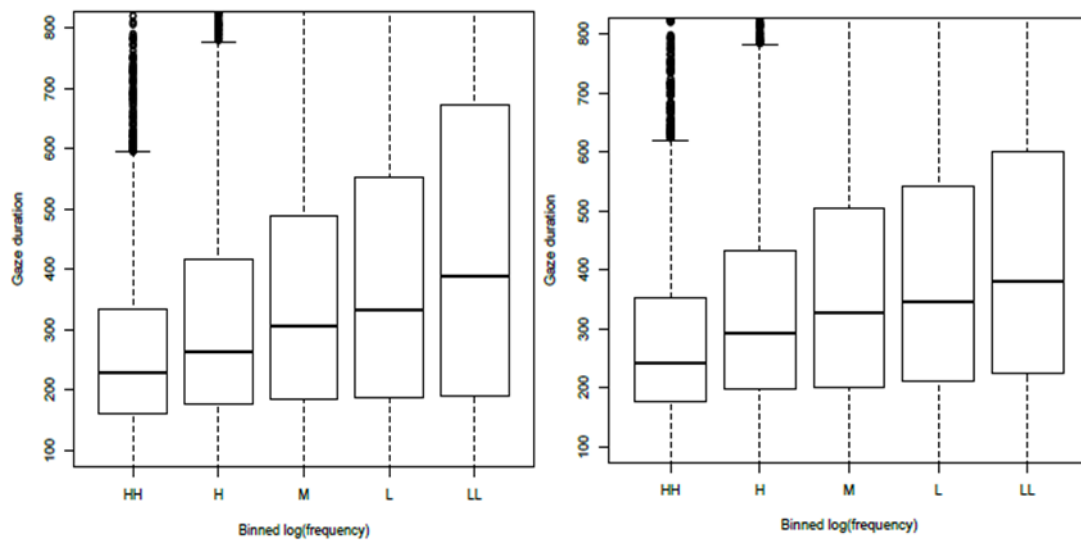


Figure 4. 21 shows the results for the LMER analysis of the effect of word frequency on gaze duration for university participants



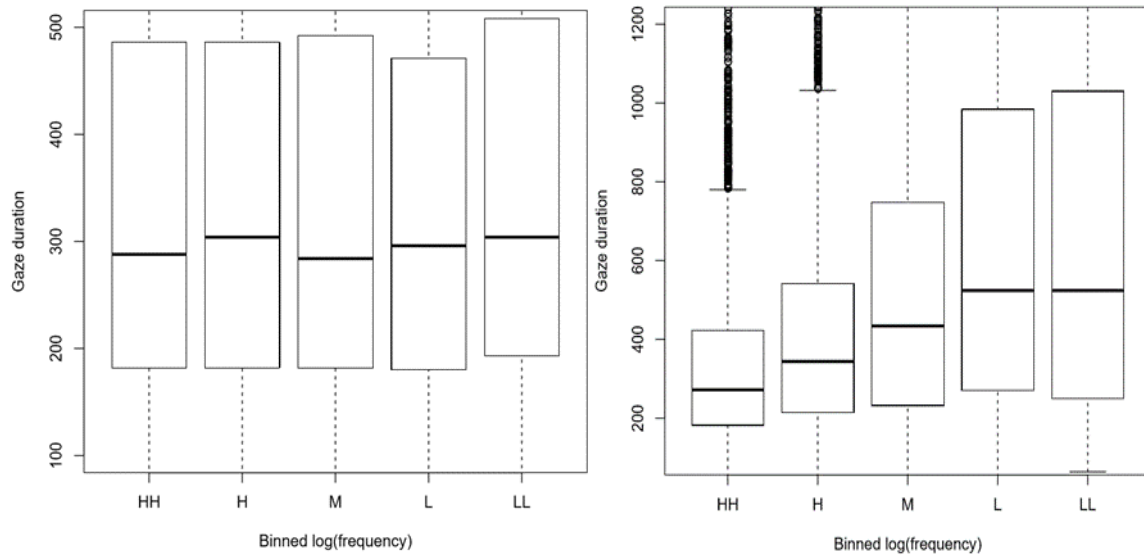


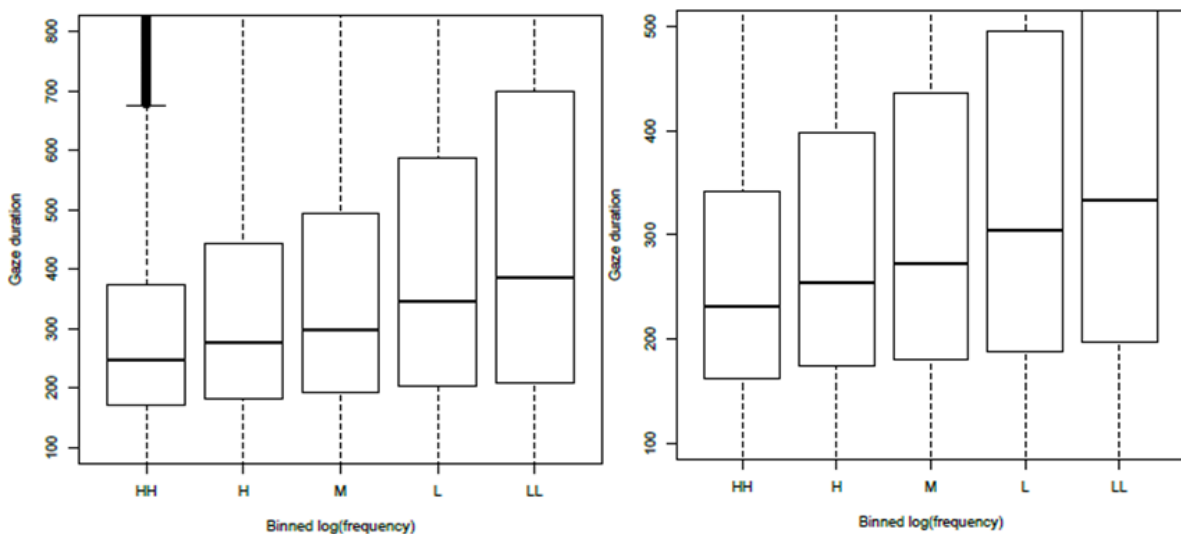
Figure 4. 22 shows the results for the LMER analysis of the effect of word frequency on gaze duration for school participants

Figures 4.23 and 4.24 below shows the results for the LMER analysis of the effect of word frequency on the first fixation duration for university and school participants on Sepedi reading.

Word frequency for university and school participants: Sepedi

Top: Sepedi academic texts, measure 1=left; measure 2=right

Bottom: Sepedi generic texts, measure 1=left; measure 2=right



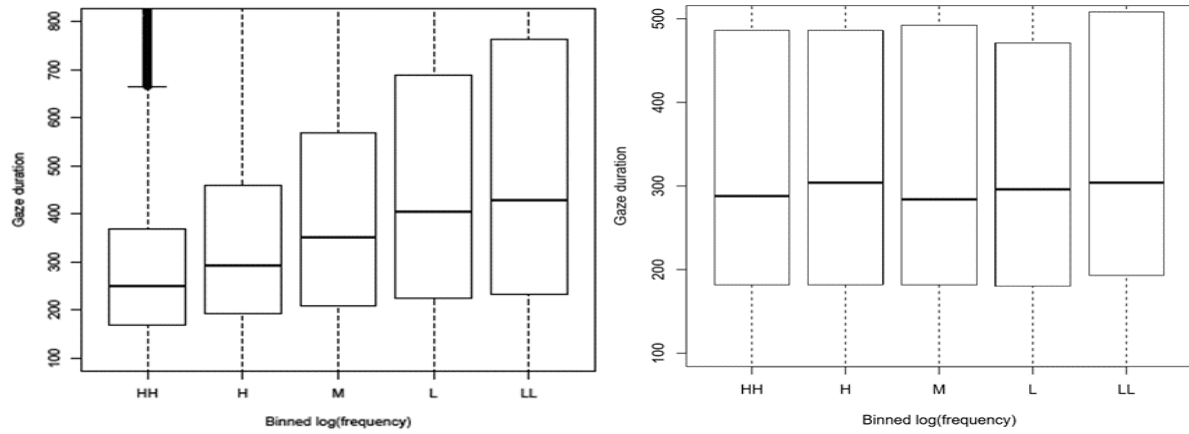


Figure 4. 23 shows the results for the LMER analysis of the effect of word frequency on gaze duration for university participants

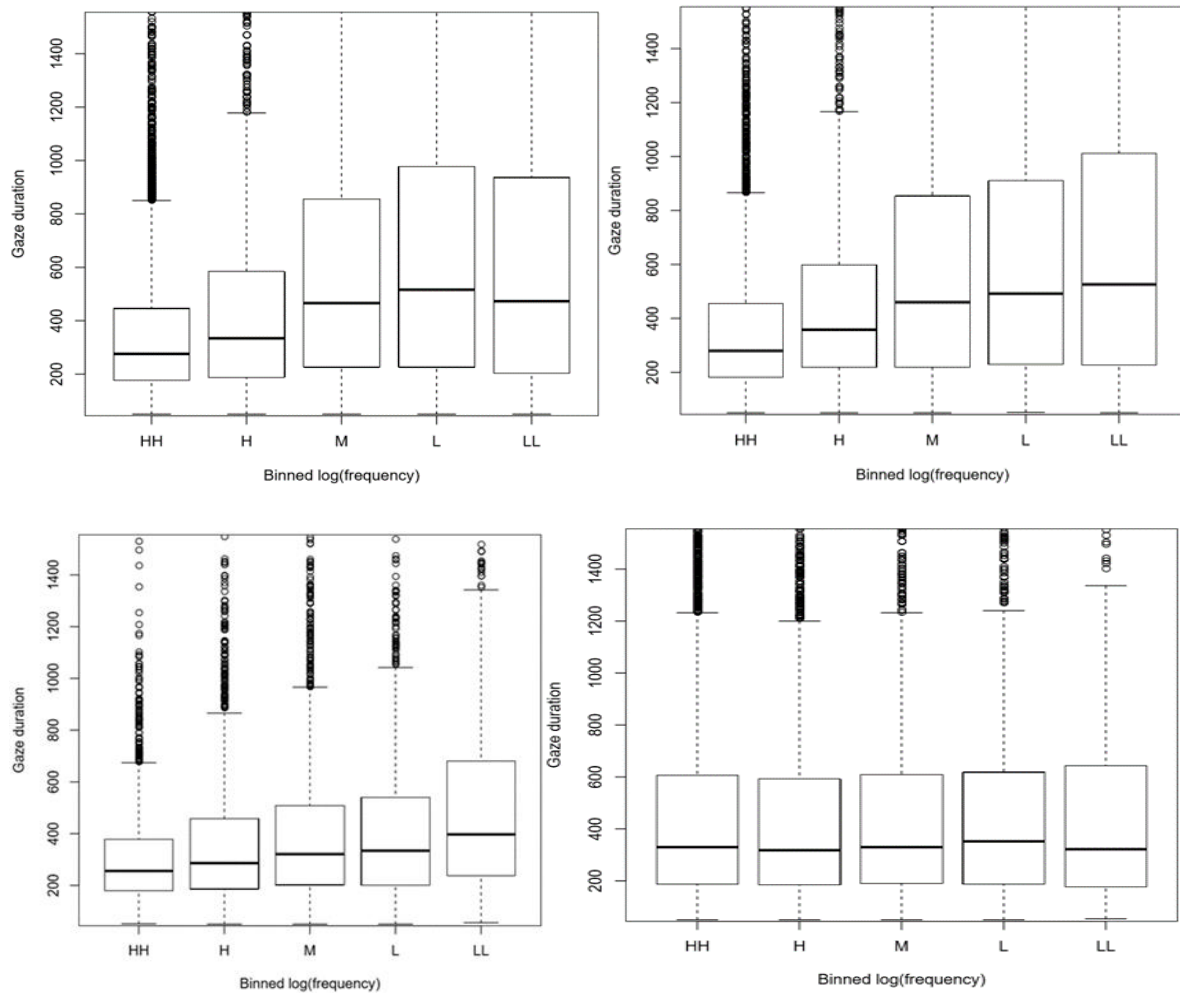


Figure 4. 24 shows the results for the LMER analysis of the effect of word frequency on gaze duration for school participants

The table below (Table 4.43) presents the statistics for box plots above in figures 4.23 and 4.24 on word frequency for both university and school participants for measures 1 and 2 to indicate which measures were significant and which measures were not significant. The box plots presented in the above figures (figures 4.23-4.24) follow the same pattern as in the table below (Table 4.43).

Table 4. 43 Descriptive statistics of gaze duration on word frequency among university and school participants

Gaze Duration (GD): Word frequency										
Language	Level	Text type	Measure 1				Measure 2			
			DF	F-Value	P-Value	Significant	DF	F-Value	P-Value	Significant
English	University	Academic	33407	0.46	0.49767		34481	40.79	1.717e-10	***
		Generic	31606.3	140.52	<2e-16	***	5118.8	16.200	5.781e-05	***
	School	Academic	13352.6	37.37	1.079e-09	***	12596.8	34.063	5.466e-09	***
		Generic	7879.6	0.9444	0.33118		8158.6	19.303	1.13e-05	***
	Sepedi	Academic	47022	0.4826	1.4e-16	***	39935	49.71	1.81e-12	***
		Generic	31606.3	140.52	<2e-16	***	25821.1	0.19	0.66062	
Sepedi	School	Academic	11914.2	21.63	3.336e-06	***	10786.2	20.89	4.906e-06	***
		Generic	11998.7	0.5350	0.46451		10387.9	55.636	9.415e-14	***

Note to the table: *= p-value is less than 0.05 (significant); **= p-value is less than 0.01 (very significant); ***= p-value is less than 0.001 (extremely significant)

The data in the above figures (figures 4.23-4.24) and table (table 4.43) indicates a significant effect for English academic texts for university participants for measure 2, English generic texts for university participants for both measures 1 and 2, English academic texts for both measures 1 and 2, English generic text for measure 2, Sepedi academic texts for university participants for both measures 1 and 2, Sepedi generic text for university participants for measure 1, Sepedi academic texts for school participants for measures 1 and 2 and Sepedi generic text for school participants for measure 2. These results confirmed that word frequency affects the gaze duration of the participants in these contexts. This means that the total fixations on low-frequency words were longer compared to higher frequency words before the participants moved to the next word.

On the other hand, data for English academic text for university participants for measure 1, English generic text for school participants for measure 1, Sepedi generic text for university participants for measure 2 and Sepedi generic text for school participants for measure 1 indicated that there was no significant effect of word frequency for gaze duration. This means that when the participants were reading the above texts word frequency did not affect the duration of the total gaze fixation. The participants had a similar amount of total gaze duration for both frequent and infrequent words. This finding is contrary to the expectation that skilled readers should and are sensitive to word frequency even when it comes to total gaze duration. In addition, it suggests that readers struggle with decoding words accurately. It could also mean that the participants take longer processing both low and high-frequency words in order to decode and comprehend the words or phrases. Another possible explanation that also applied with the first fixation duration could be that the words may be of low frequency but are longer because the length was not controlled for word frequency in this study.

This section presents results for the LMER analysis of the effect of word length box plots on gaze duration for English academic texts for measures 1 and 2 and English generic texts for

measures 1 and 2 for both university and school participants; Sepedi academic texts for measures 1 and 2 and Sepedi generic texts for measures 1 and 2 for both university and school participants.

Figures 4.25 and 4.26 below shows the results for the LMER analysis of the effect of word length on gaze duration for university and school participants on English reading.

Word length for university and school participants: English

Top: English academic texts, measure 1=left; measure 2=right

Bottom: English generic texts, measure 1=left; measure 2=right

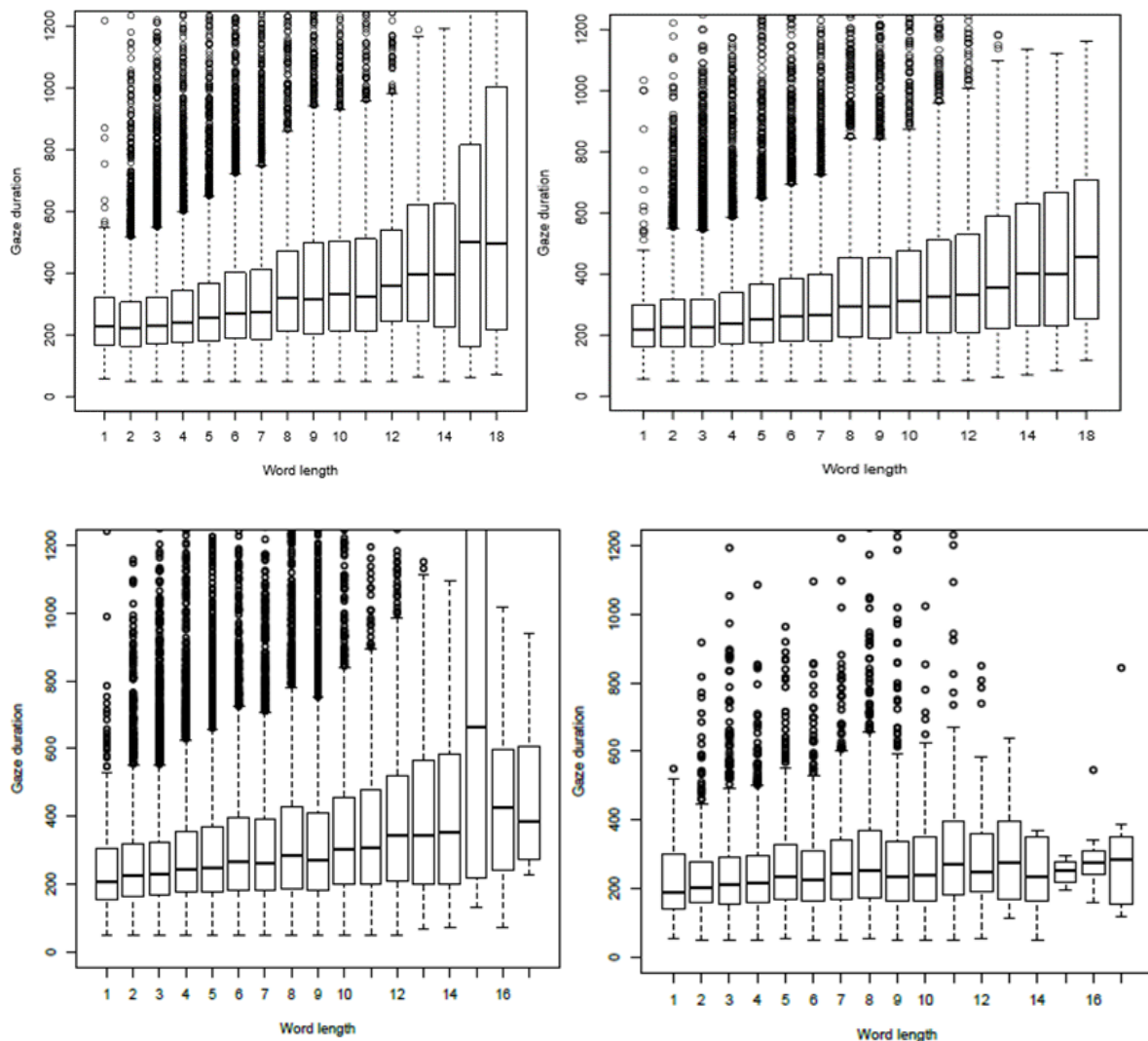


Figure 4. 25 shows the results for the LMER analysis of the effect of word length on gaze duration for university participants

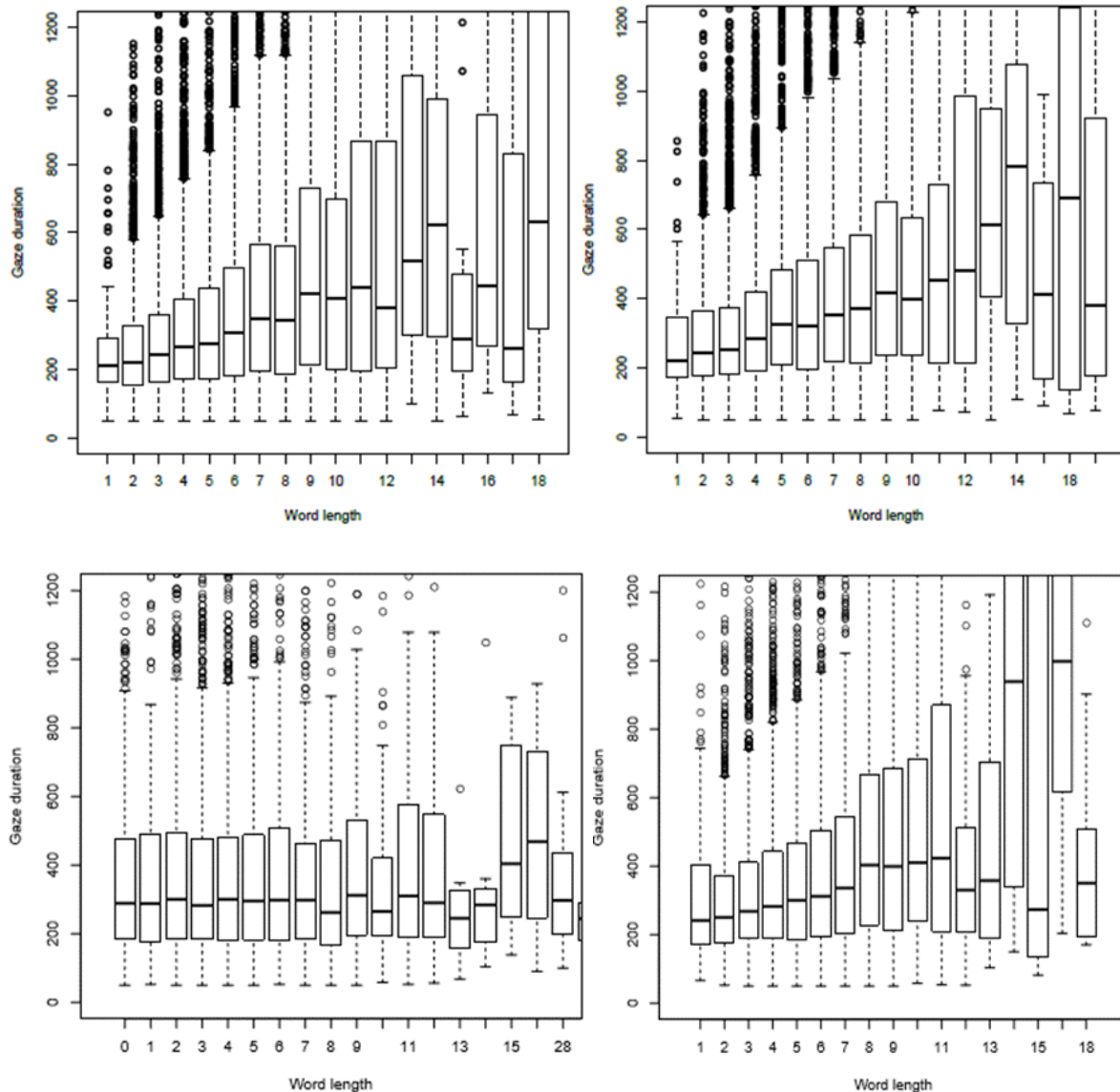


Figure 4. 26 shows the results for the LMER analysis of the effect of word length on gaze duration for school participants

Figures 4.27 and 4.28 below shows the results for the LMER analysis of the effect of word length on gaze duration for university and school participants on Sepedi reading.

Word length for university and school participants: Sepedi

Top: Sepedi academic texts, measure 1=left; measure 2=right

Bottom: Sepedi generic texts, measure 1=left; measure 2=right

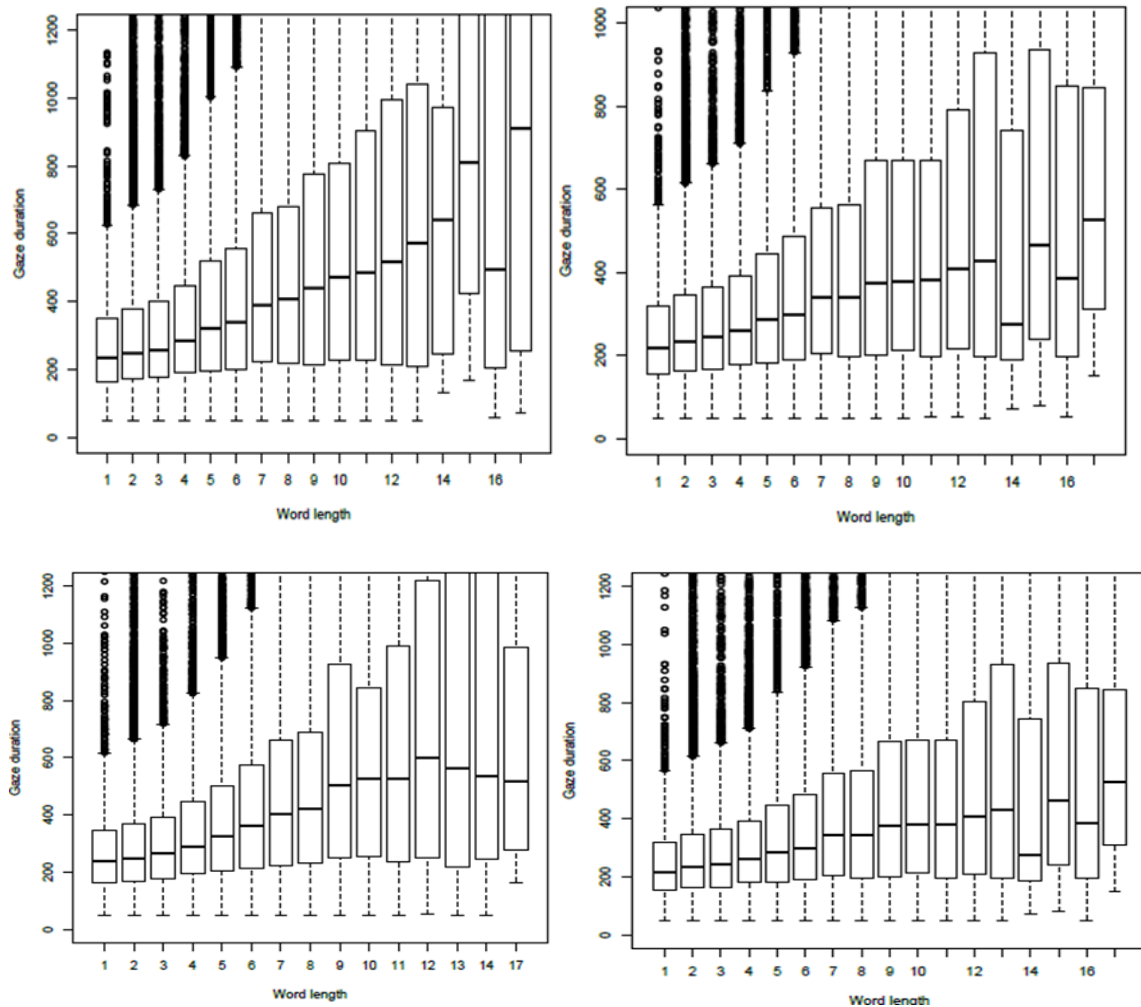
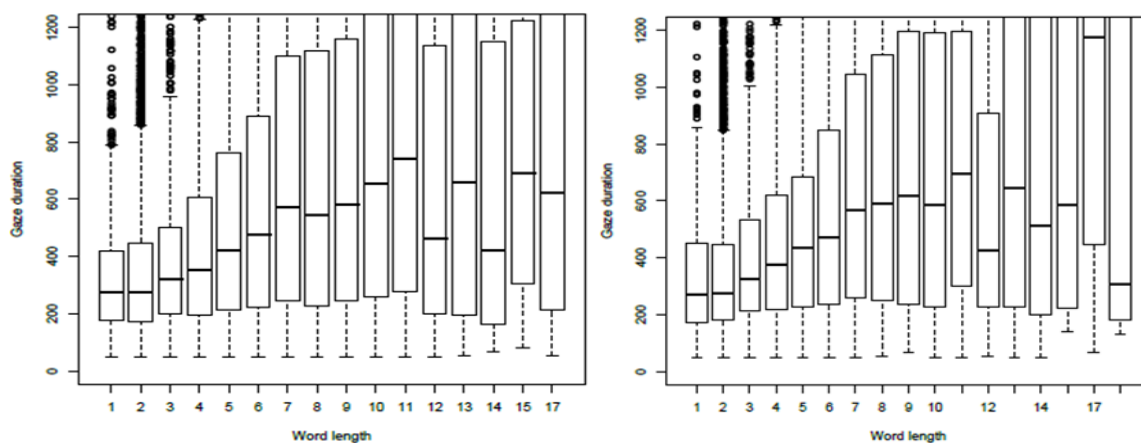


Figure 4. 27 shows the results for the LMER analysis of the effect of word length on gaze duration for university participants



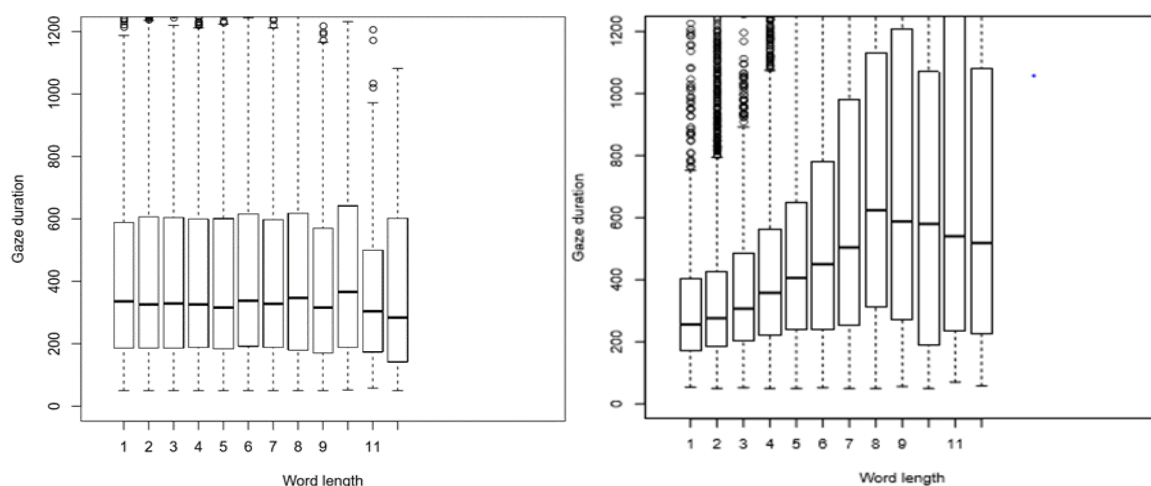


Figure 4. 28 shows the results for the LMER analysis of the effect of word length on gaze duration for school participants

The table below (Table 4.44) presents the statistics for box plots above in figures 4.27 and 4.28 on word length for both university and school on measures 1 and 2 to indicate which measures were significant and which measures were not significant. The box plots presented in the above figures (figures 4.27-4.28) follow the same pattern as in the table below (Table 4.44).

Table 4. 44 Descriptive statistics on gaze duration for word length on university and school participants

Gaze Duration (GD): Word length										
Language	Level	Text type	Measure 1				Measure 2			
			DF	F-Value	P-Value	Significant	DF	F-Value	P-Value	Significant
English	University	Academic	33409	2346.23	<2.2e-16	***	34481	952.34	<2.2e-16	***
		Generic	31606.3	471.60	<2e-16	***	5120.4	39.295	3.941e-10	***
	School	Academic	13353.1	420.49	<2.2e-16	***	12597.0	310.323	<2.2e-16	***
		Generic	7880.0	3.3530	0.06712		8158.4	232.555	<2.2e-16	***
Sepedi	University	Academic	48075	2487.32	<2.2e-16	***	39936	1493.61	<2.2e-16	***
		Generic	39266	59.51	1.243e-14	***	25821.3	326.44	<2.2e-16	***
	School	Academic	11913.9	541.25	<2.2e-16	***	10786.3	440.80	<2.2e-16	***
		Generic	11995.0	0.3420	0.55868		10388.0	224.499	<2.2e-16	***

Note to the table: *= p-value is less than 0.05 (significant); **= p-value is less than 0.01 (very significant); ***= p-value is less than 0.001 (extremely significant)

The data in the above figures 4.27 and 4.28 and table (table 4.44) indicate a significant effect for English academic texts for university and school participants for both measures 1 and 2, English generic texts for university participants for measures 1 and 2, English generic texts for school participants for measure 2, Sepedi academic texts for university and school participants for both measures 1 and 2, Sepedi generic text for university participants for measures 1 and 2, Sepedi generic text for school participants for measure 2. The data confirmed that word length affects total gaze duration. This means that the total fixations on longer words were longer compared to shorter words before the participants moved to the next word.

Surprisingly, data for English generic text for school participants for measure 1, and Sepedi English generic text for school participants for measure 1 indicated that there was no significant effect of word frequency for gaze duration. This is an unexpected finding, seeing that all the other conditions show a strong significant effect. This finding is contrary to the expectation that skilled readers should and are sensitive to word length even when it comes to the total gaze duration. Also, it could suggest that readers read either way more careful or were mindless when reading English generic text as well as the Sepedi generic text. Another possible explanation could be that the participants read carefully and slowly for easier decoding and comprehension for later comprehension tests.

Generally, the data in my study confirm the frequency and length effects observed in other studies. Frequency effects were also observed in a study conducted by Whitford and Titone (2014), where participants made longer gaze durations in the case of low-frequency words compared to high-frequency words. In addition, there were differences in L1 (French) and L2 (English) reading. The gaze durations for L1 were shorter compared to L2. In this study, there was no differential effect when it comes to language. This means that frequency effects were observed in both generic and academic text types and across languages. In Joseph *et al.* (2013) study of young skilled readers, the data show that longer gaze duration is related to low-frequency words when compared to high-frequency words. This means that the linguistic characteristics of the text drive children. This finding from Joseph *et al.* (2013) contradicts some of the findings for specific text types in the present study. Additionally, my study showed that school participants were either careful or mindless while reading generic texts for measure 1, and they modulated their reading in measure 2.

4.4.3.3 Word skipped first: effects of word frequency and word length

Words skipped first refer to words that are skipped during the first encounter while naturally reading a text. According to Starr and Rayner (2001), it is common for a skilled reader to fixate about 85% of words and to skip 35% of non-words. Previous research (Rayner & Fischer, 1996) reported that generally, word skipping occurs more often for shorter words, while long words are generally fixated. In addition, words with eight or more letters are skipped less compared to shorter words, and they also have a higher probability of being re-fixated while words with 2-3 letters are fixated 25% of the time (Starr & Rayner, 2001). The process of reading for skilled readers results in irregular eye movement patterns because they skip two-third of the words they fixate on (Rayner *et al.*, 2006).

This section below shows the results for the LMER analysis of the effect of word frequency and word length on words skipped first for university and school participants reading English academic texts for measures 1 and 2, English generic texts for measures 1 and 2, Sepedi academic texts for measures 1 and Sepedi generic texts for measures 1 and 2 of the study.

Figures 4.29 and 4.30 below shows the results for the LMER analysis of the effect of word frequency on words skipped first for university and school participants on English reading.

Word frequency for university and school participants: English

Top: English academic texts, measure 1=left; measure 2=right

Bottom: English generic texts, measure 1=left; measure 2=right

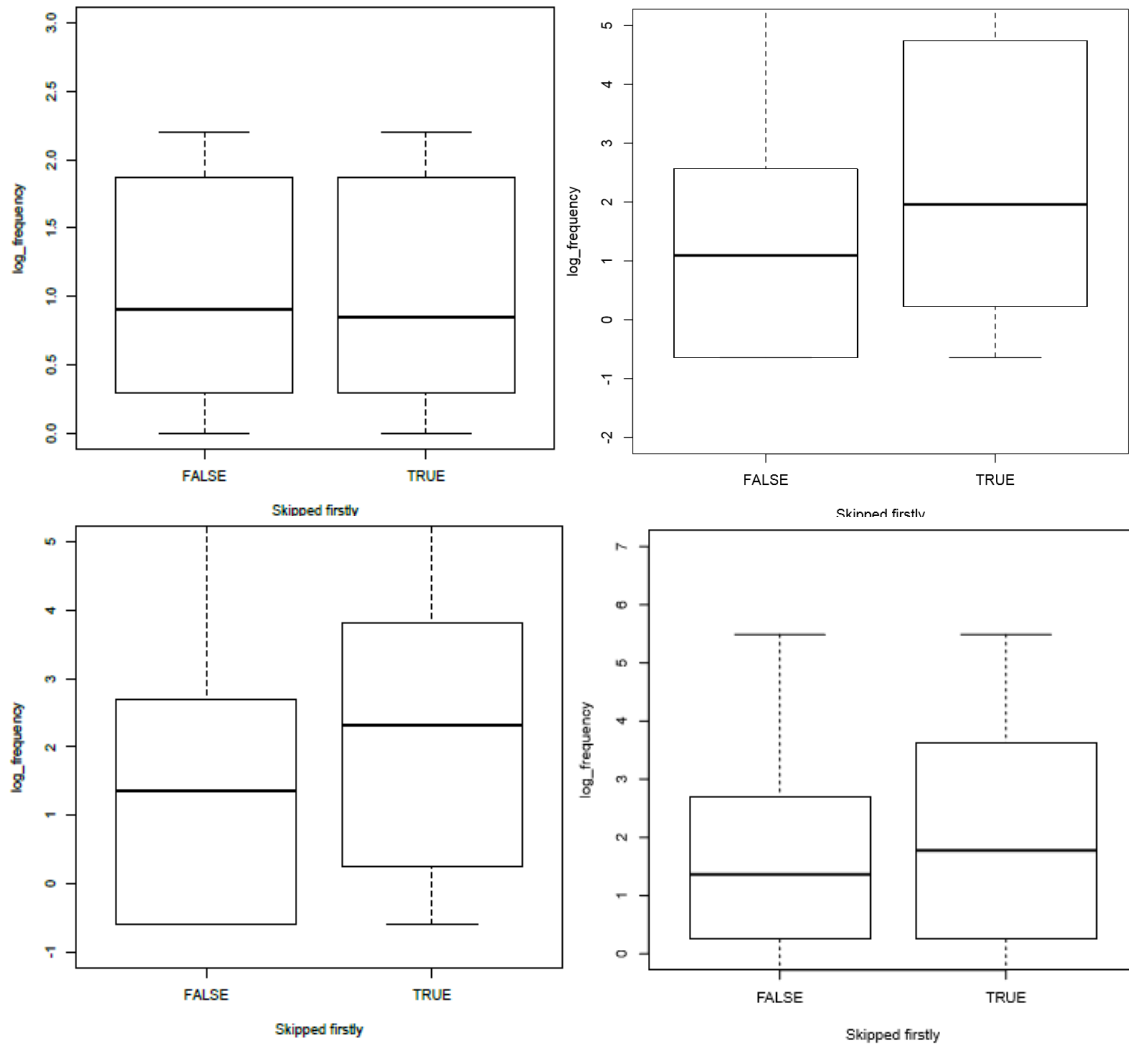


Figure 4. 29 shows the results for the LMER analysis of the effect of word frequency on words skipped first for university participants (FALSE=word was not skipped; TRUE=word was skipped)

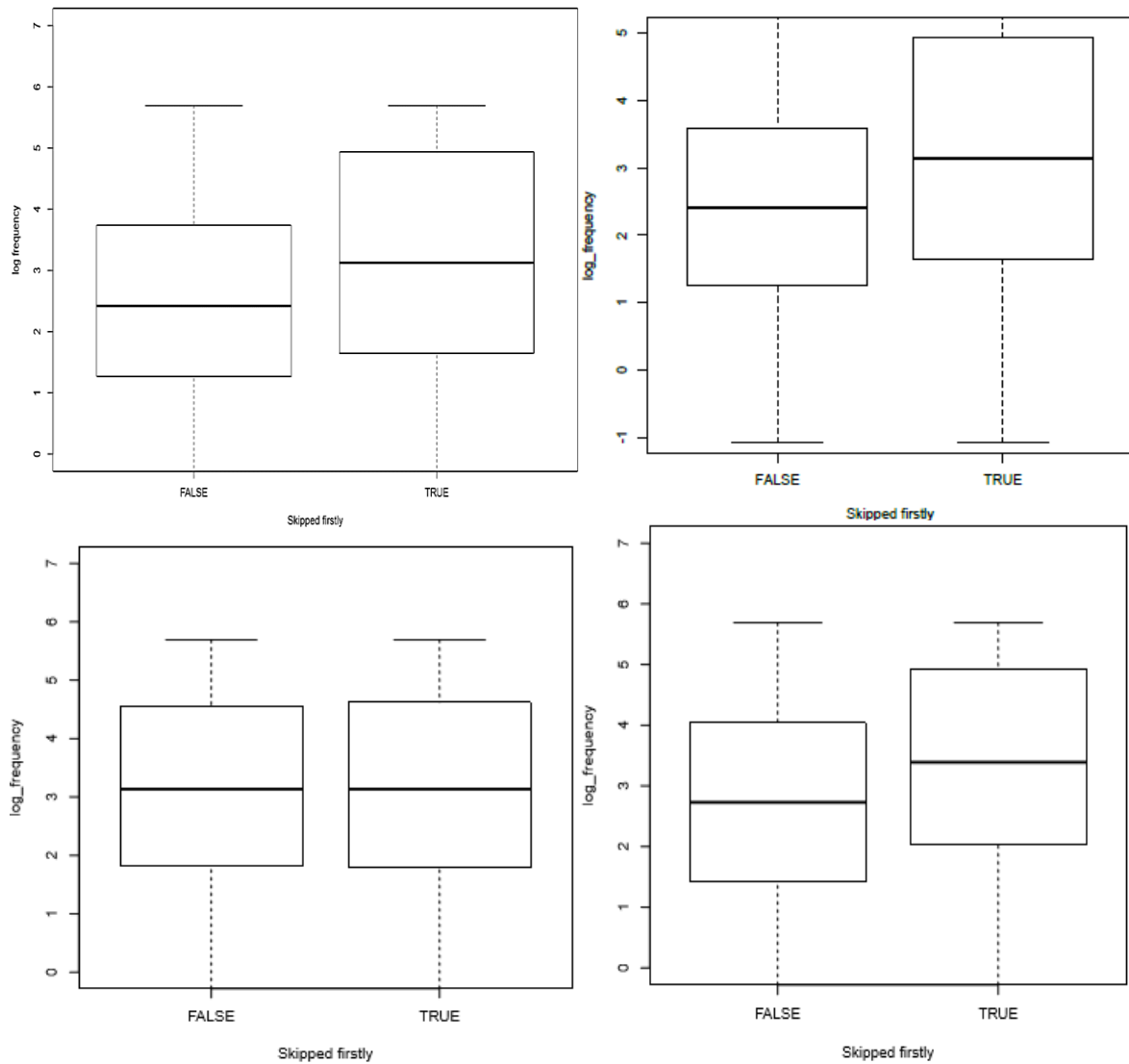


Figure 4. 30 shows the results for the LMER analysis of the effect of word frequency on words skipped first for school participants (FALSE=word was not skipped; TRUE=word was skipped)

Figures 4.31 and 4.32 below shows the results for the LMER analysis of the effect of word frequency on words skipped first for university and school participants when they were reading in Sepedi.

Word frequency for university and school participants: Sepedi

Top: Sepedi academic texts, measure 1=left; measure 2=right

Bottom: Sepedi generic texts, measure 1=left; measure 2=right

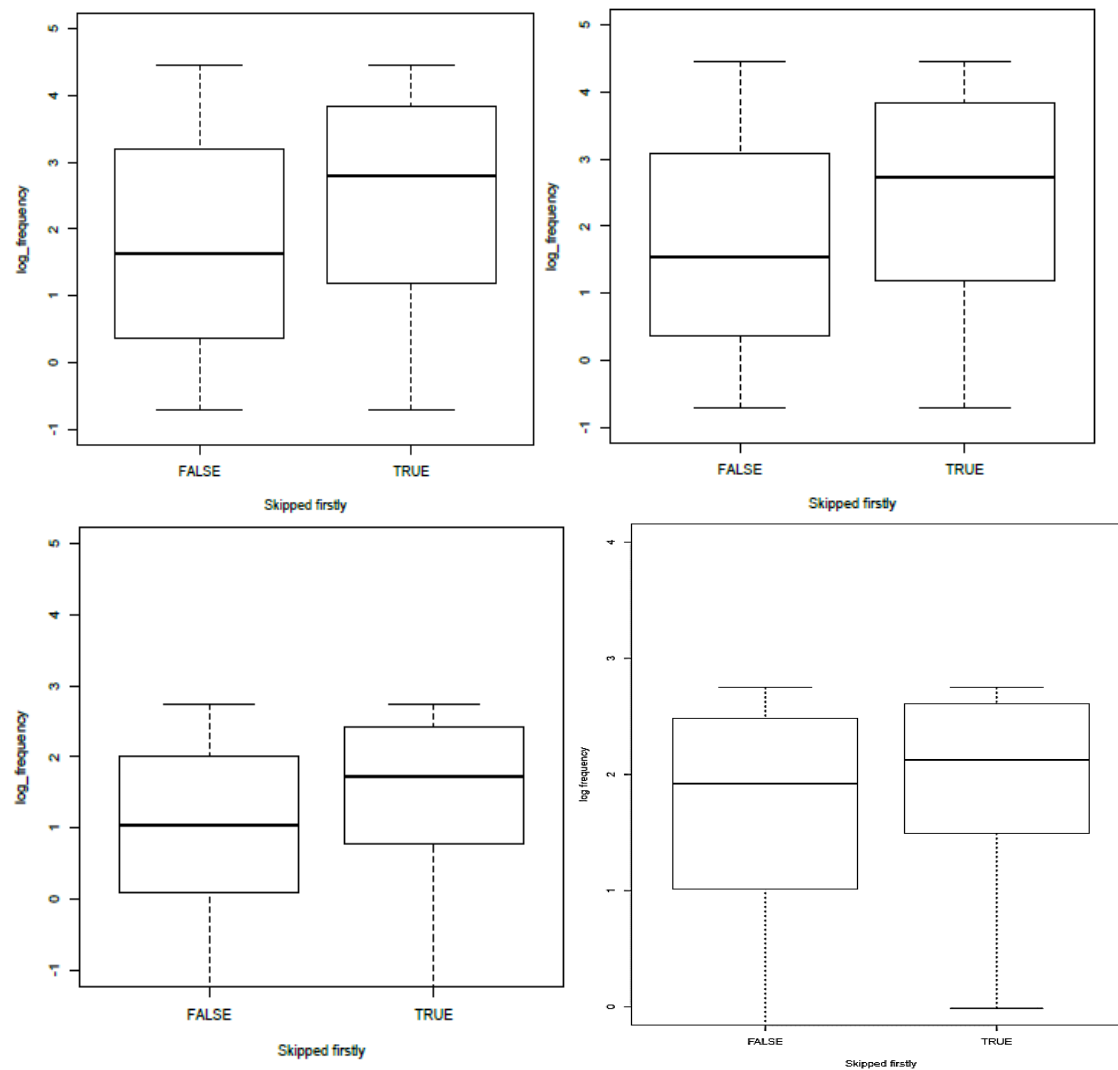


Figure 4. 31 shows the results for the LMER analysis of the effect of word frequency on words skipped first for university participants (FALSE=word was not skipped; TRUE=word was skipped)

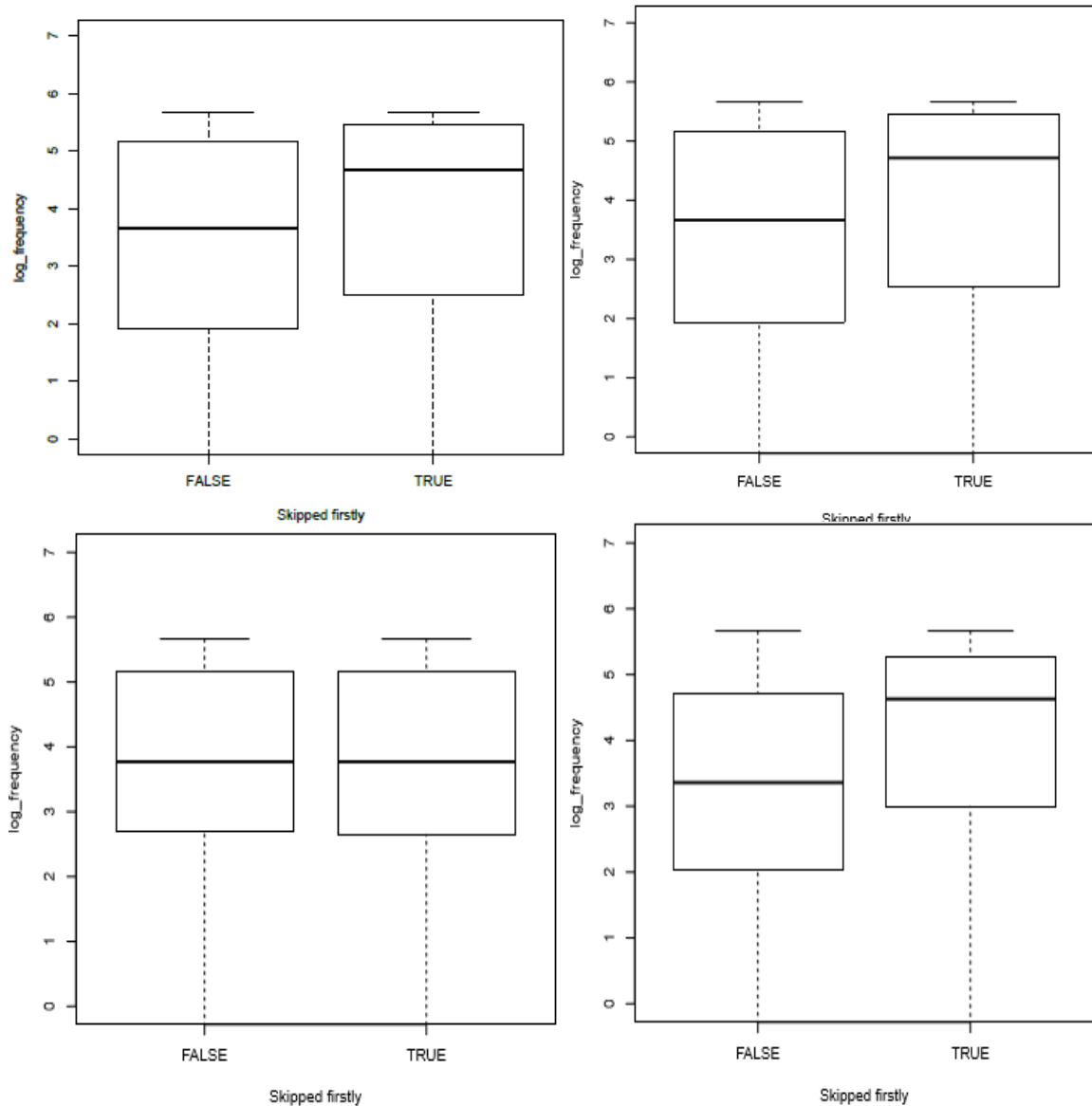


Figure 4. 32 shows the results for the LMER analysis of the effect of word frequency on words skipped first for school participants (FALSE=word was not skipped; TRUE=word was skipped)

The table below (table 4.45) presents the statistics for box plots above in figures 4.31 and 4.32 on word frequency for both university and school participants on measures 1 and 2 to indicate which measure was significant and which measures were not significant. The box plots presented in the above figures (figures 4.31 and 4.32) follow the same pattern as in the table below (table 4.45).

Table 4. 45 Descriptive statistics on words skipped first for word frequency among university and school participants

Words skipped first: Word frequency										
Language	Level	Text type	Measure 1				Measure 2			
			DF	F-Value	P-Value	Significant	DF	F-Value	P-Value	Significant
English	University	Academic	53475	1.841	0.0657		55046	133.79	<2e-16	***
		Generic	57374	200.86	<2e-16	***	48450	0.01547	0.9010	
	School	Academic	23285	32.91	9.776e-09	***	22706	46.879	7.741e-12	***
		Generic	7971.0	0.43960	0.5073		15304	50.322	1.363e-12	***
Sepedi	University	Academic	83922	12.270	<2e-16	***	78501	165.50	<2e-16	***
		Generic	62874	7113	1.15e-12	***	57099	43.94	3.411e-11	***
	School	Academic	17862	7.481	9.776e-09	***	17170	5.371	0.02049	*
		Generic	15518	1.14596	0.2844		14978	27.808	1.358-07	***

Note to the table: *= p-value is less than 0.05 (significant); **= p-value is less than 0.01 (very significant); ***= p-value is less than 0.001(extremely significant)

The data in the above figures 4.31 and 4.32 and table (table 4.45) indicate a significant effect for English academic text for university participants during measure 2, English generic text for university participants for measure 1, English academic texts for school participants for measures 1 and 2, English generic text for school participants for measure 2, Sepedi academic texts for university and school participants for measures 1 and 2, Sepedi generic texts for university participants for measures 1 and 2, Sepedi academic texts for school participants for measure 1 and a slightly significant effect for measure 2; and the data for Sepedi generic text reading for school participants for measure 2 confirmed that word frequency affects words skipped first when naturally reading a text. This means that the participants were sensitive to word frequency and skipped high-frequency words more compared to low-frequency words.

On the other hand, English academic text for university participants measure 1, English generic text for university participants for measure 2, English generic text for school participants for measure 1 and Sepedi generic text for school participants for measure 1 showed that there was no significant effect of word frequency for words skipped first. The findings from this study are not consistent, and they show irregular patterns of words skipped first in both measures 1 and 2 in English and Sepedi. It is an unexpected finding seeing that other conditions show a strong significant effect. This finding is contrary to the expectation that skilled readers should and are sensitive to word frequency and mostly skip high-frequency words as compared to low-frequency words.

Figures 4.33 and 4.34 below shows the results for the LMER analysis of the effect of word length on words skipped first for university and school participants for English reading.

Word length for university and school participants: English

Top: English academic texts, measure 1=left; measure 2=right

Bottom: English generic texts, measure 1=left; measure 2=right

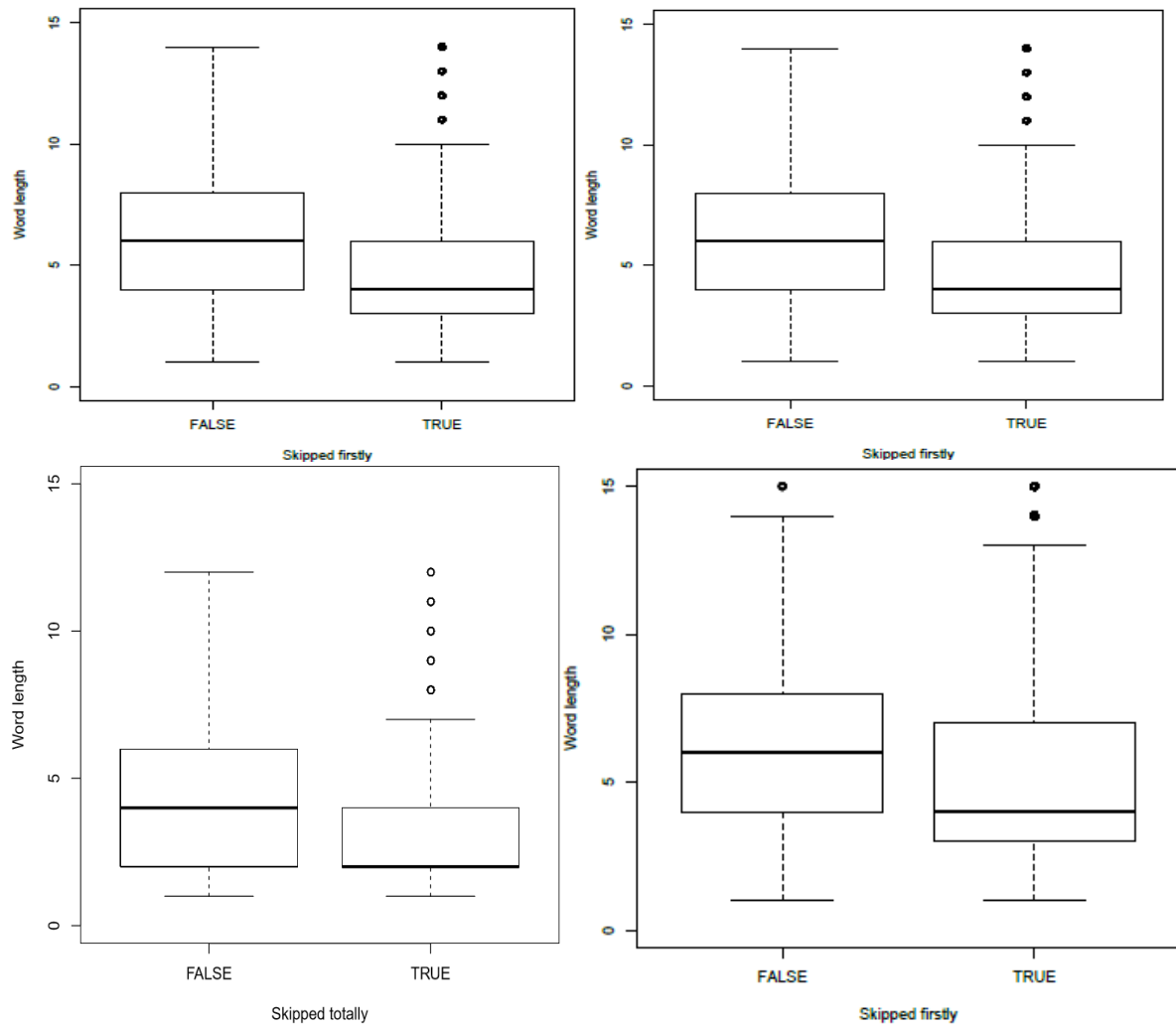
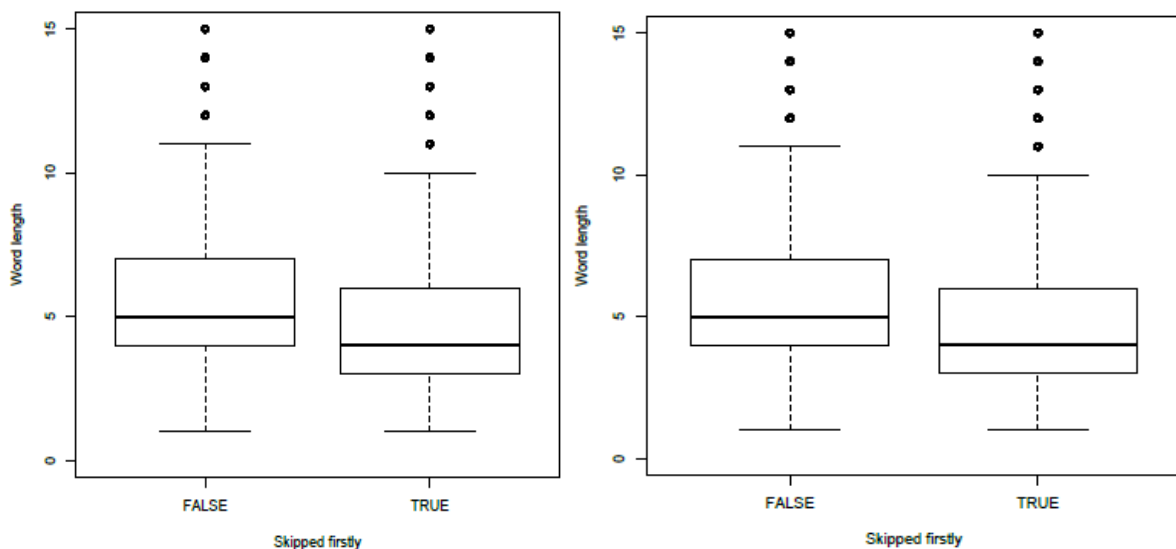


Figure 4. 33 shows the results for the LMER analysis of the effect of word length on words skipped first for university participants (FALSE=word was not skipped; TRUE=word was skipped)



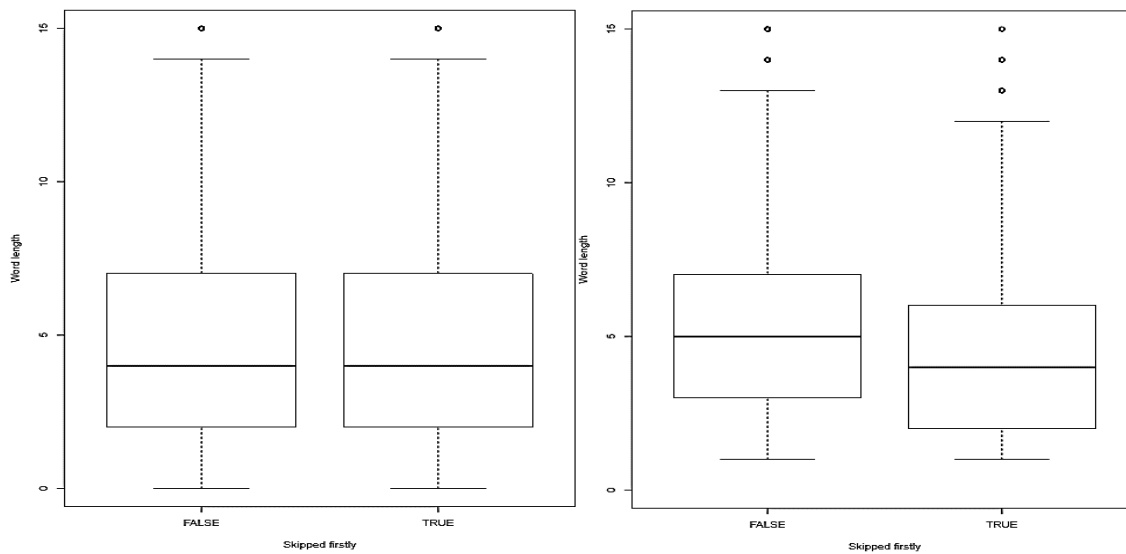


Figure 4. 34 shows the results for the LMER analysis of the effect of word length on words skipped first for school participants (FALSE=word was not skipped; TRUE=word was skipped)

Figures 4.35 and 4.36 below shows the results for the LMER analysis of the effect of word length on words skipped first for university and school participants for Sepedi reading.

Word length for university and school participants: Sepedi

Top: Sepedi academic texts, measure 1=left; measure 2=right

Bottom: Sepedi generic texts, measure 1=left; measure 2=right

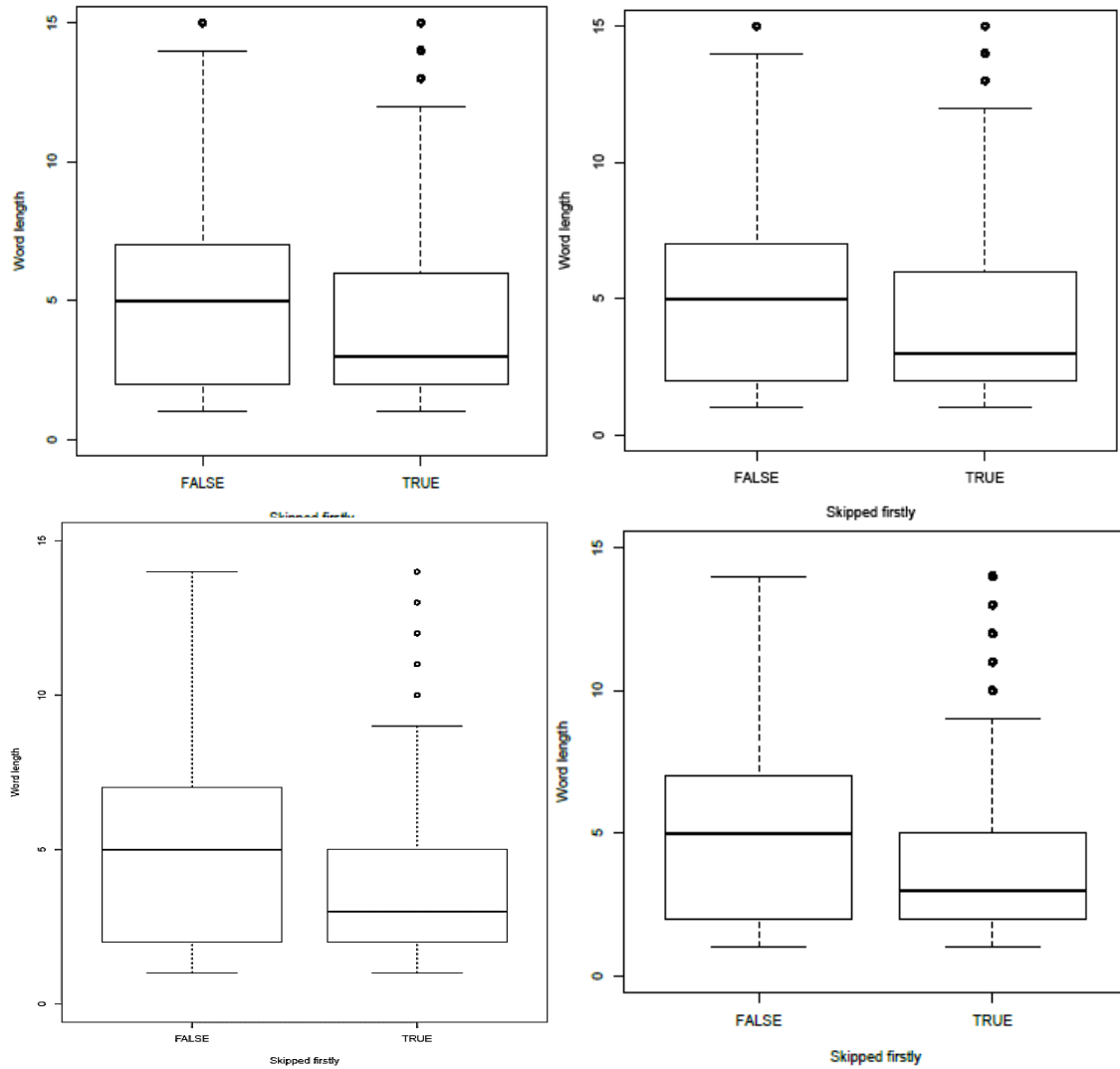


Figure 4. 35 shows the results for the LMER analysis of the effect of word length on words skipped first for university participants (FALSE=word was not skipped; TRUE=word was skipped)

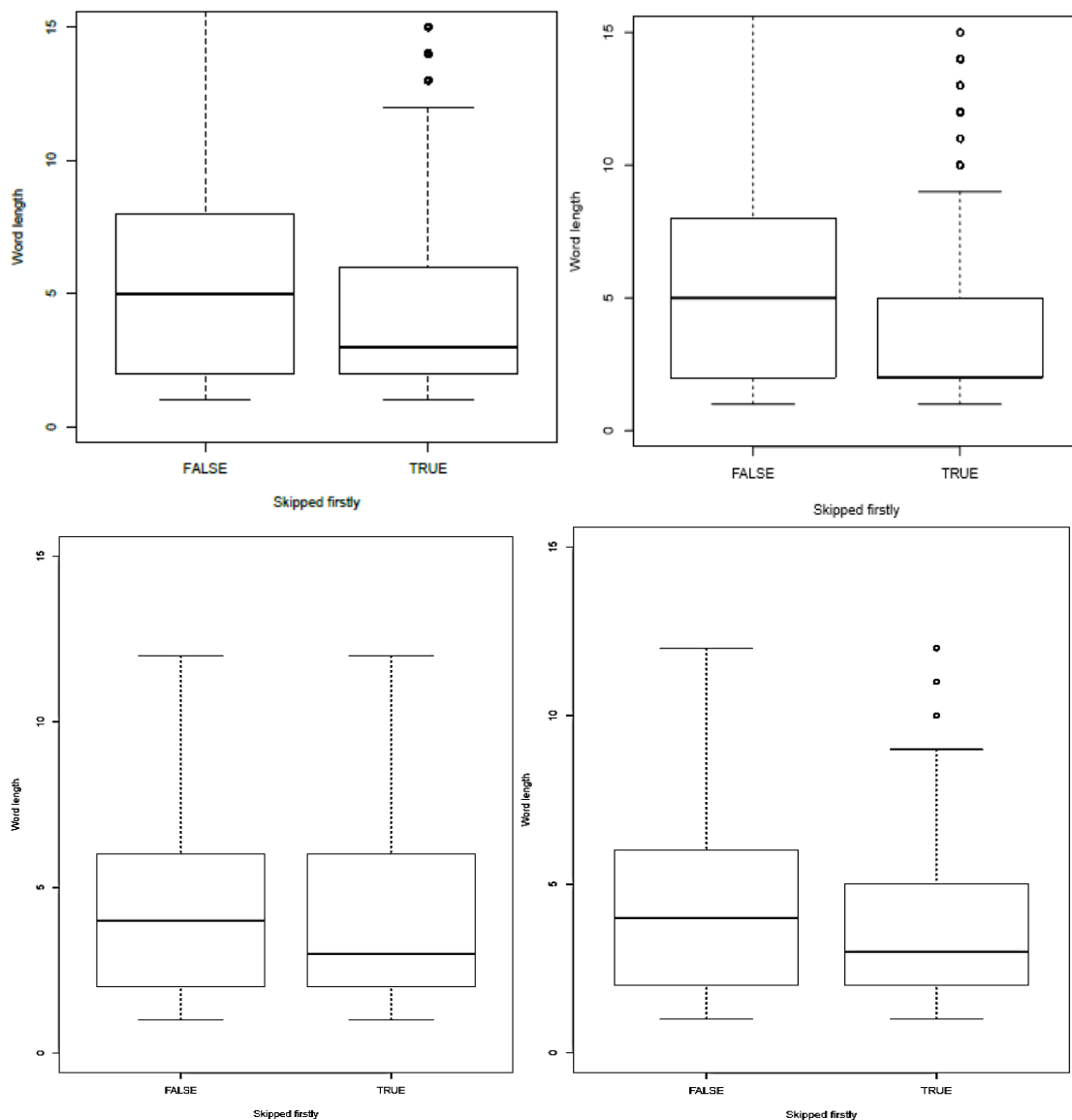


Figure 4. 36 shows the results for the LMER analysis of the effect of word length on words skipped first for school participants (FALSE=word was not skipped; TRUE=word was skipped)

The table below (Table 4.46) presents the statistics for the box plots above in figures 4.35 and 4.36 on word length for both university and school participants on measures 1 and 2 to indicate which measures were significant and which measures were not significant. The box plots presented in the above figures (figures 4.35-4.36) follow the same pattern as in the table below (Table 4.46).

Table 4. 46 Descriptive statistics on words skipped first for word length among university and school participants

Words skipped first: Word length										
Language	Level	Text type	Measure 1				Measure 2			
			DF	F-Value	P-Value	Significant	DF	F-Value	P-Value	Significant
English	University	Academic	53475	54.540	<2e-16	***	55046	1321.83	<2e-16	***
		Generic	57374	1522.86	<2e-16	***	48450	19.092	<2e-16	***
	School	Academic	23285	318.28	2.2e-16	***	22706	313.749	<2e-16	***
		Generic	7971.3	0.22066	0.6386		15304	164.339	<2.2e-16	***
Sepedi	University	Academic	83922	34.302	<2e-16	***	78501	1120.96	<2e-16	***
		Generic	62874	27.379	<2e-16	***	57099	324.96	<2.2e-16	***
	School	Academic	17862	158.716	2.2e-16	***	17170	186.730	<2e-16	***
		Generic	15516	1.27372	0.2591		14978	102.925	<2.2e-16	***

Note to the table: *= p-value is less than 0.05 (significant); **= p-value is less than 0.01 (very significant); ***= p-value is less than 0.001(extremely significant)

The data in the above figures 4.35 and 4.36 table (table 4.46) indicate a significant effect for English academic texts for university and school participants for both measures 1 and 2, English generic texts for university participants for measures 1 and 2, English generic text for school participants for measure 2, Sepedi academic texts for university and school participants for both measures 1 and 2, Sepedi generic text for university participants for measures 1 and 2; and findings for Sepedi generic text reading for school participants for measure 2 confirmed that word length affects words skipped first. This means that the participants skip shorter words more compared to longer words during the first encounter with the words before moving to the next word.

Surprisingly, data for English generic text for school participants for measure 1, and Sepedi English generic text for school participants for measure 1 indicated that there was no significant effect of word length for words skipped first. This is an unexpected finding seeing that all the other conditions/texts and measures show a strong significant effect. This finding is contrary to the expectation that skilled readers should and are sensitive to word length even when it comes to the words they skip on the first encounter while naturally reading the text. In addition, it could suggest that readers read way more careful or were mindless when reading English generic text as well as Sepedi generic text. Another possible explanation could be that the participants read carefully and slowly for easier decoding and comprehension for later comprehension tests, but when reading English and Sepedi generic texts they were already familiar with the text and did not need to fixate even on words that had 2-3 letters more often.

According to Starr and Rayner (2001), high-frequency words are skipped more compared to low-frequency words. In addition, shorter words are skipped more compared to longer words, e.g. prepositions, pronouns or even repetitive words are skipped more (Starr & Rayner, 2001). Reichle *et al.* (2003) and Ashby (2006) reported that shorter words were skipped more compared to longer words. Furthermore, skipping is much greater if the readers are not proficient in the language they are reading in (Cop *et al.*, 2017). In my study, the data show inconsistency, where some texts and measures indicated that the participants were sensitive to word frequency and word length and other texts showed no significant difference. In addition, the data do not show a pattern that can serve as an indicator of whether the participants

struggled to decode or if it was simply a comprehension problem. One surprising finding is the word length data for school participants which showed that the participants were not sensitive to word frequency and length in measure 1, but they seem to have modulated with the Sepedi and English generic texts indicating that they were sensitive to word frequency and word length which is expected from a skilled reader.

4.4.3.4 Regressions out of words: effects of word frequency and word length

Regressions out of word in this study are classified as an early measure of word identification or word recognition which refers to thinking about what the participants have encountered while reading. In other instances, it can be regarded as a late-measure because of its ability to reflect post-lexical integration of words combined in the text for comprehension. Regressions out of word refer to going back to the earlier encountered word to read it again. This is defined by Whitford and Joannis (2018:325) as regressing out of a word to a word that occurred earlier in the text. This takes place during natural reading, but the reader decides to go back to an earlier word to read again for a variety of reasons, one being to ensure comprehension. Skilled ordinary readers usually regress to previously encountered words, 10% to 15% of the time (Rayner *et al.*, 2006). According to Whitford and Joannis (2018), skilled ordinary readers should not regress out of a word more than once. If this happens, then it means that the reader is struggling with decoding and processing the word they regress into. The amount of regression out of a word can sometimes be as a result of skipping words during the first encounter. If the skipping rate of the readers during the first reading increases, the probability of making a regression back to the skipped word is guaranteed (White, 2008:216).

This section below shows the results for the LMER analysis of the effect of word frequency and word length on regressions out of words for university and school participants reading English academic texts during measures 1 and 2, English generic texts for measures 1 and 2, Sepedi academic texts for measures 1 and 2 and Sepedi generic texts for measures 1 and 2 of the study.

Figures 4.37 and 4.38 below shows the results for the LMER analysis of the effect of word frequency on regressions out of word for university and school participants for English reading.

Word frequency for university and school participants: English

Top: English academic texts, measure 1=left; measure 2=right

Bottom: English generic texts, measure 1=left; measure 2=right

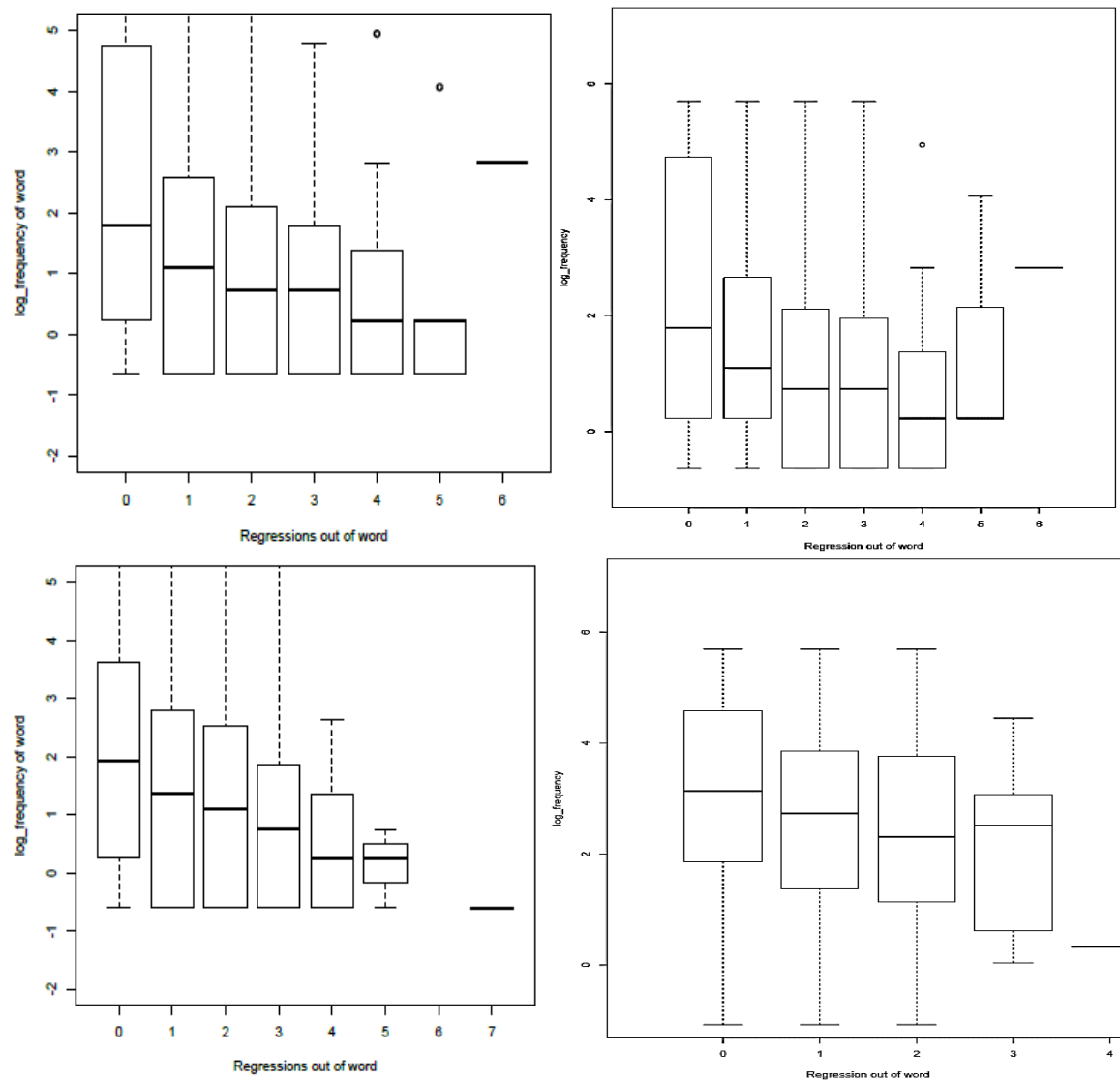


Figure 4. 37 shows the results for the LMER analysis of the effect of word frequency regressions out of word for university participants

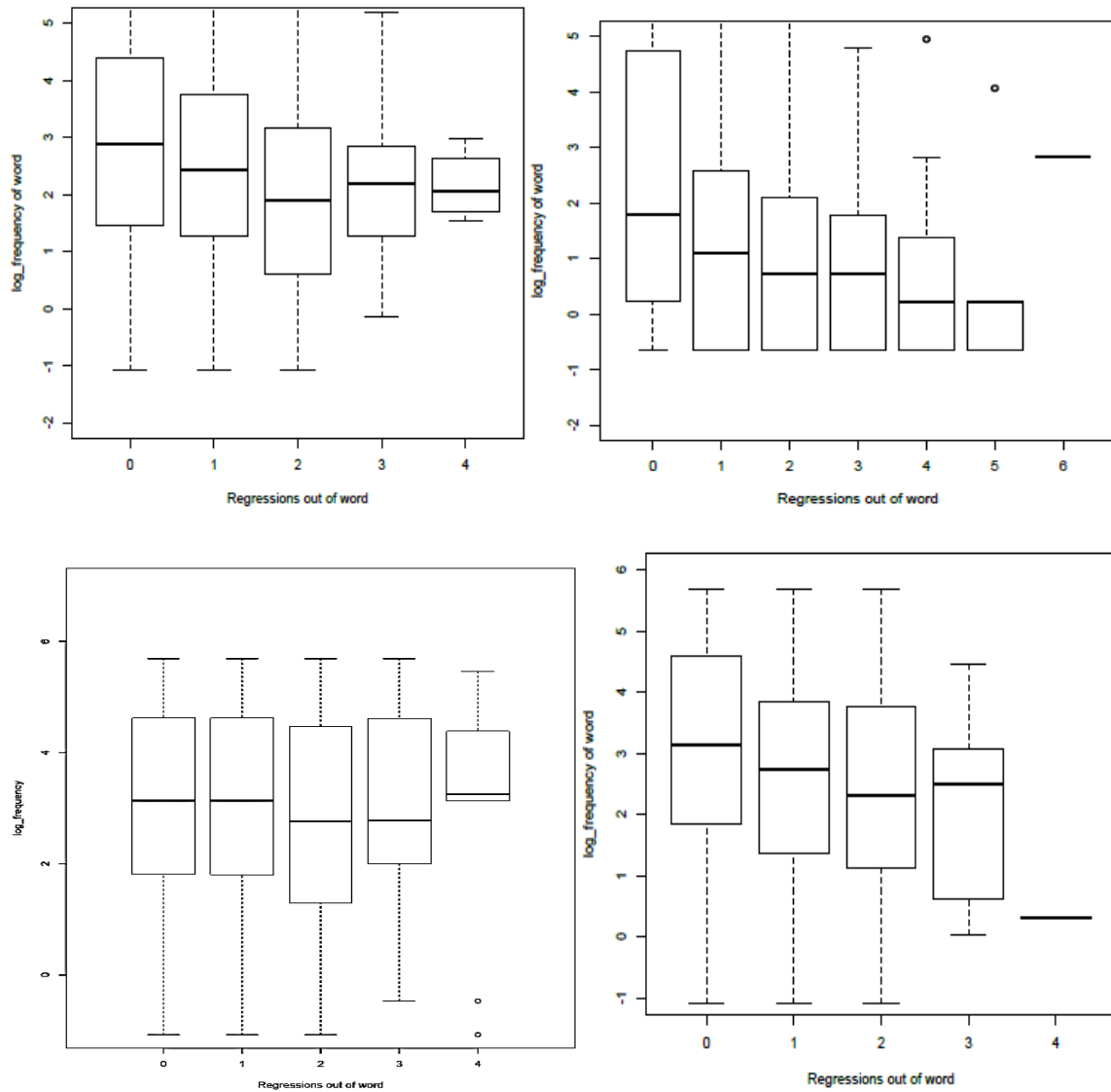


Figure 4. 38 shows the results for the LMER analysis of the effect of word frequency regressions out of word for university and school participants.

Figures 4.39 and 4.40 below shows the results for the LMER analysis of the effect of word frequency on regressions out of word for university and school participants for Sepedi reading.

Word frequency for university and school participants: Sepedi

Top: English academic texts, measure 1=left; measure 2=right

Bottom: English generic texts, measure 1=left; measure 2=right

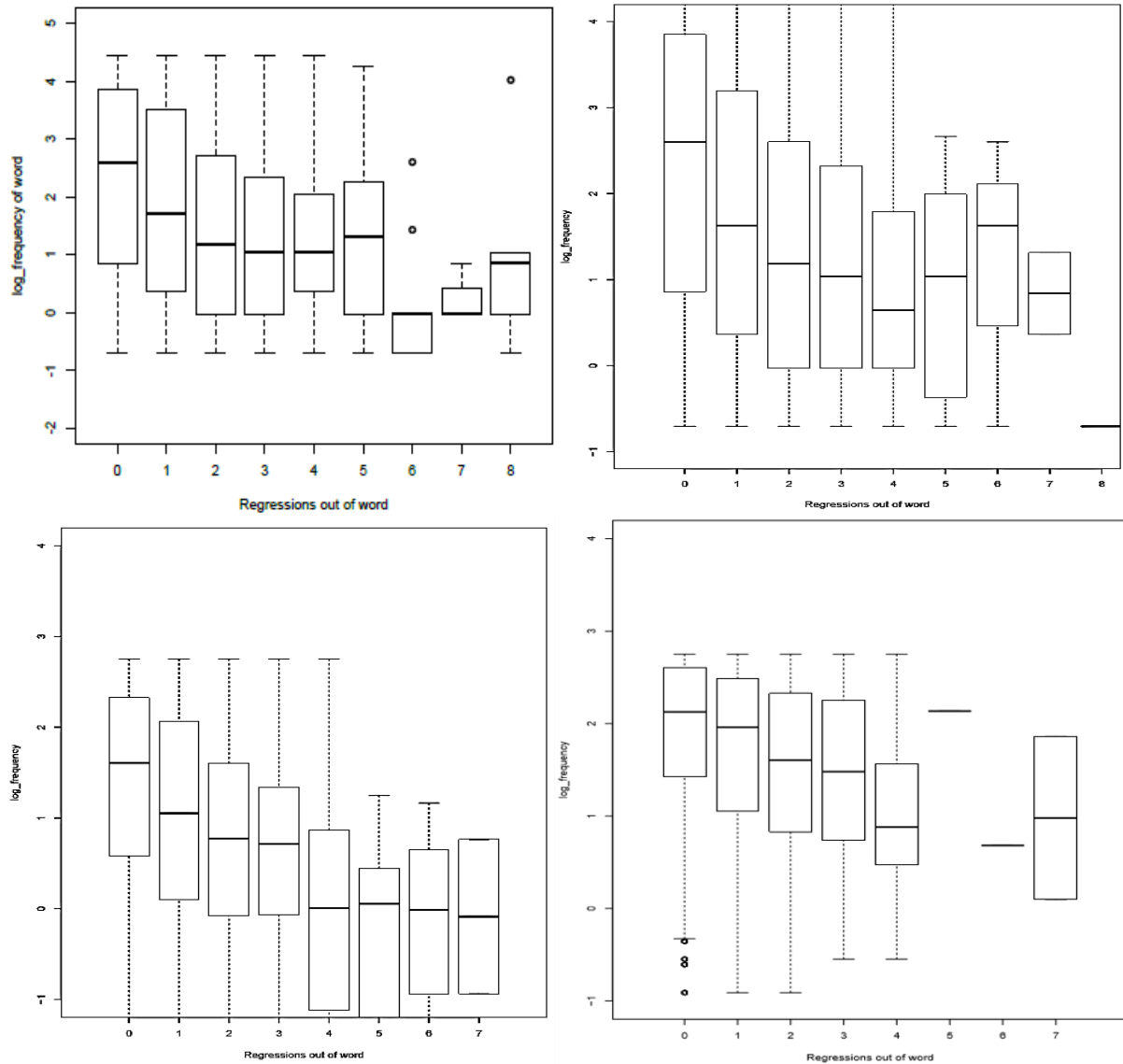


Figure 4. 39 shows the results for the LMER analysis of the effect of word frequency regressions out of word for university participants

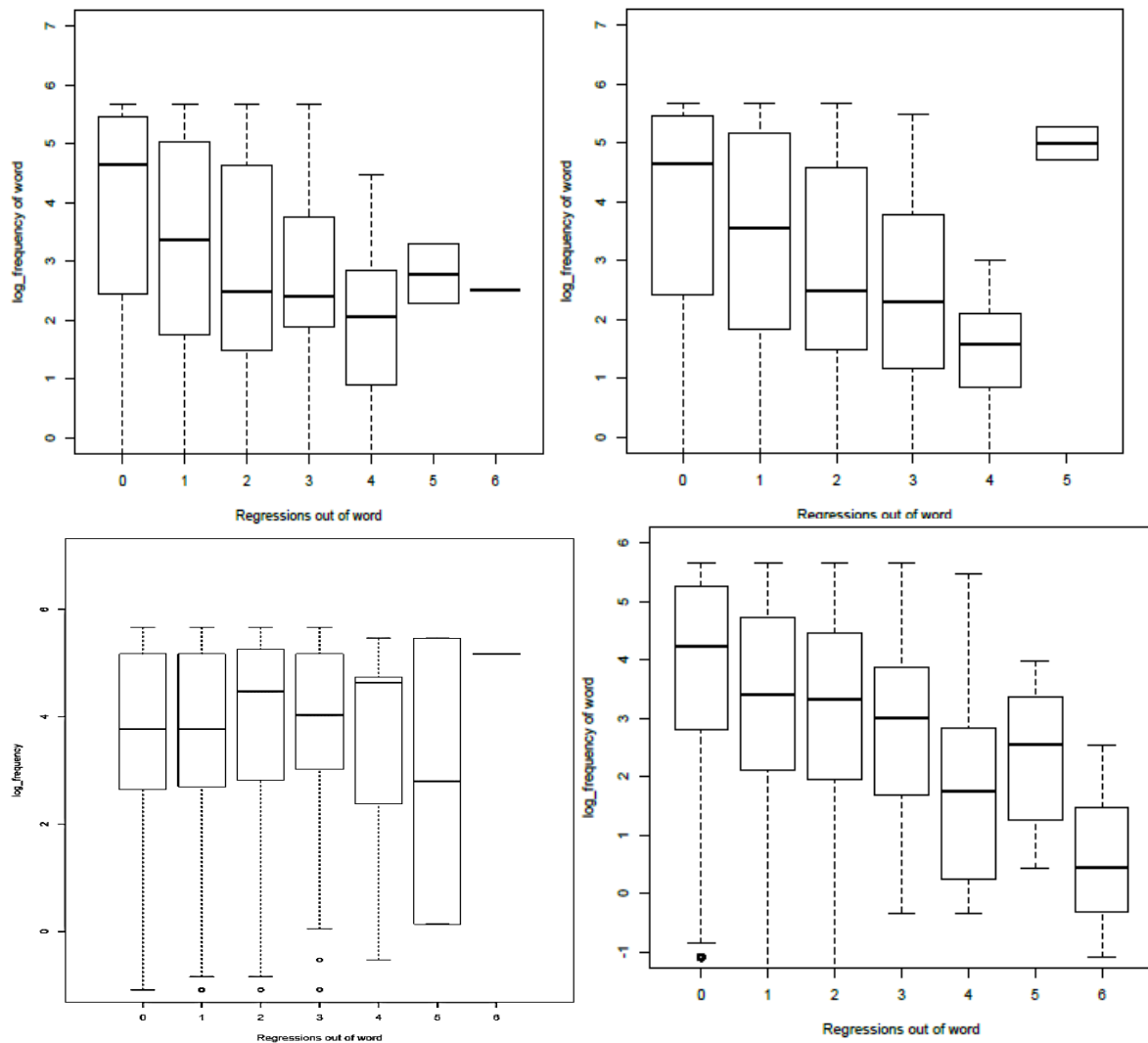


Figure 4. 40 shows the results for the LMER analysis of the effect of word frequency regressions out of word for school participants

The table below (Table 4.47) presents the statistics for box plots above in figures 4.39 and 4.40 on word frequency for both university and school participants on measures 1 and 2 to indicate which measure was significant and which measures were not significant. The box plots presented in the above figures (figures 4.39-4.40) follow the same pattern as in the table below (Table 4.47).

Table 4. 47 Descriptive statistics of regressions out of word for word frequency among university and school participants

Regressions out of word: Word frequency										
Language	Level	Text type	Measure 1				Measure 2			
			DF	F-Value	P-Value	Significant	DF	F-Value	P-Value	Significant
English	University	Academic	53475	0.838	0.4021		55046	63.88	1.332e-15	***
		Generic	57374	34.77	3.732e-09		48450	2.8627	0.09066	
	School	Academic	23285	8.545	0.003469	**	22706	13.423	0.000	***
		Generic	7973.2	0.0089	0.92492		15304.1	17.6955	2.607e-06	***
Sepedi	University	Academic	83922	8.060	8.88e-16	***	78501	71.25	<2.2e-16	***
		Generic	62874	6.705	2.04e-11	***	57099	7.195	0.007311	**
	School	Academic	17862	16.994	3.766e-05	***	17170	23.631	1.177e-06	***
		Generic	15526.1	0.3306	0.56534		14978	0.000	0.99401	

Note to the table: *= p-value is less than 0.05 (significant); **= p-value is less than 0.01 (very significant); ***= p-value is less than 0.001 (extremely significant)

The data in the above figures 4.39 and 4.40 and table (table 4.47) indicate a significant effect for English academic text for university participants for measure 2, English academic text for school participants for measures 1 and 2, English generic text for school participants for measure 2, Sepedi academic texts for university and school participants for measures 1 and 2, Sepedi generic texts for university participants for measures 1 and 2 and the data confirmed that word frequency effects regressions out of words when naturally reading a text. This means that the participants were sensitive to word frequency and regressed out of low-frequency words compared to high-frequency words. According to Rayner *et al.* (2006), readers regress to read material that they have previously encountered about 10% to 15% of the time. Also, the regression comes at different levels, and they are affected by word frequency in the text.

On the other hand, English academic text for university participants' measures 1, English generic text for university participants for measures 1 and 2, Sepedi generic text for school participants for measures 1 and 2 showed that there was no significant effect of word frequency for regressions out of words. The findings from this study are not consistent, and they show irregular patterns of regressions out of words in both measures 1 and 2 in English and Sepedi. It is unexpected finding seeing that other texts and measures, as reported above, show a strong significant effect. This finding is contrary to the expectation that skilled readers should and are sensitive to word frequency and mostly regress out of low-frequency words as compared to high-frequency words where regressions tend to be fewer.

Figures 4.41 and 4.42 below shows the results for the LMER analysis of the effect of word length on regressions out of word for university and school participants for English reading.

Word length for university and school participants: English

Top: English academic texts, measure 1=left; measure 2=right

Bottom: English generic texts, measure 1=left; measure 2=right

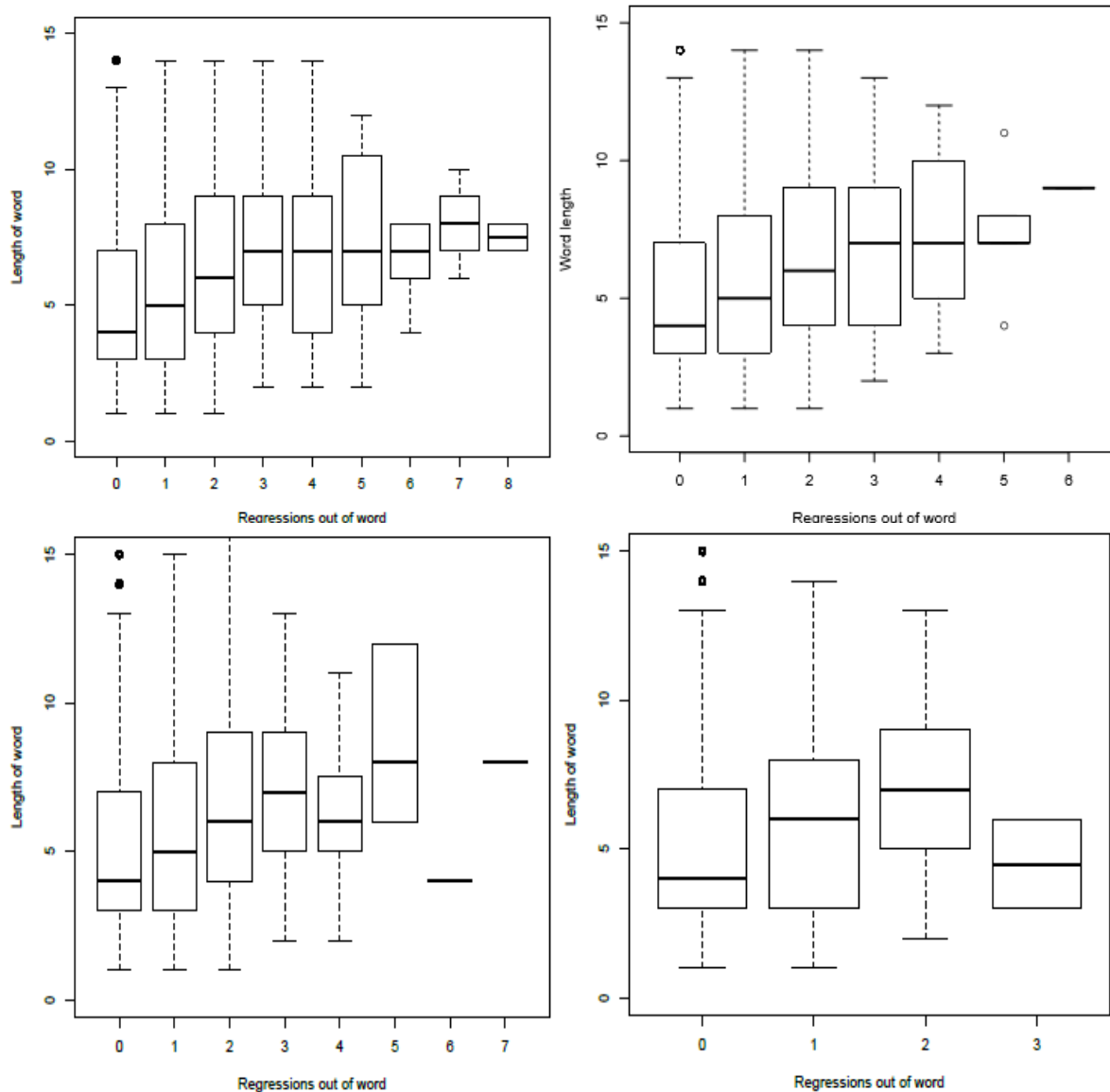


Figure 4. 41 shows the results for the LMER analysis of the effect of word length on regressions out of word for university participants

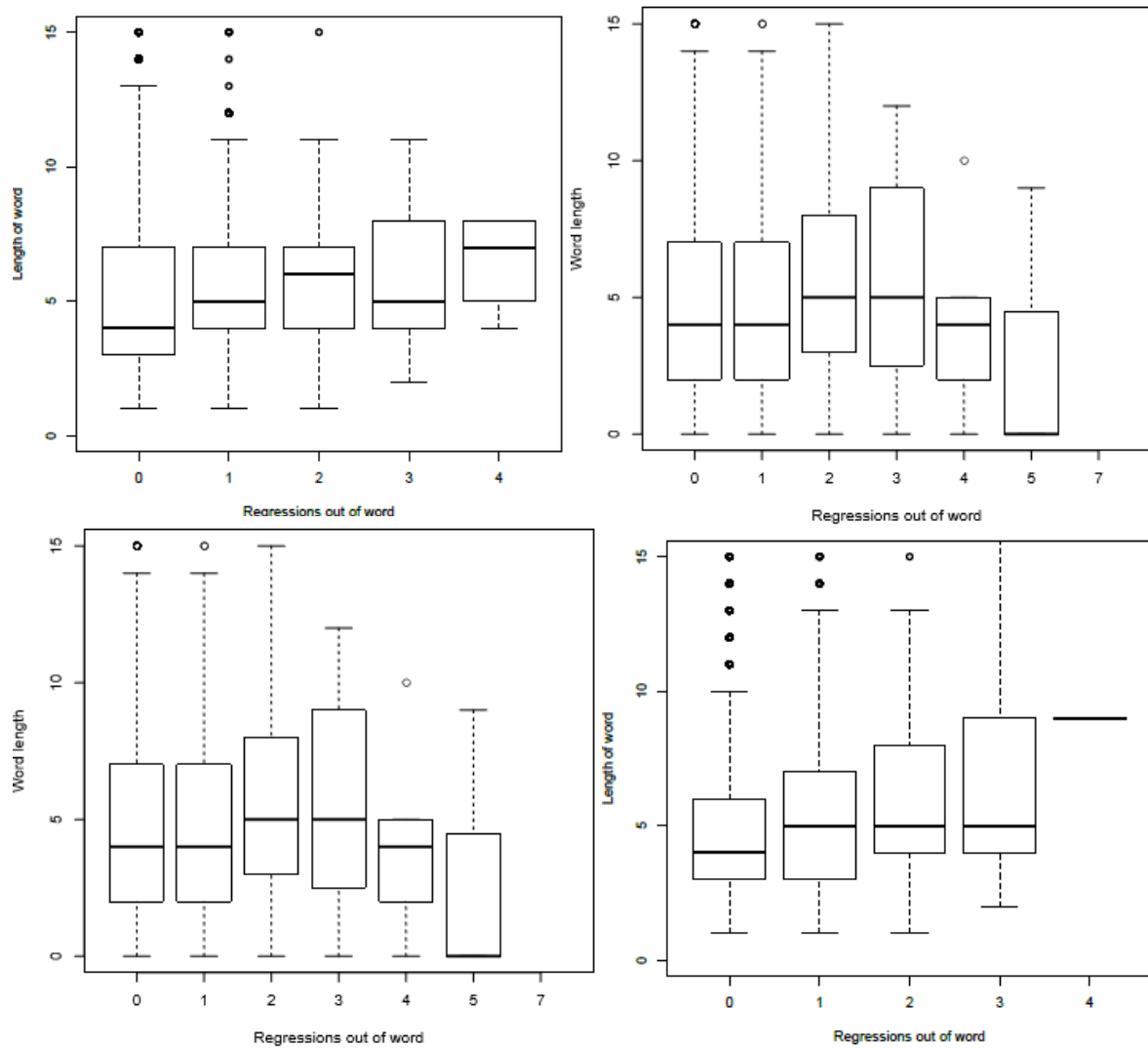


Figure 4. 42 shows the results for the LMER analysis of the effect of word length on regressions out of word for school participants

Figures 4.43 and 4.44 below shows the results for the LMER analysis of the effect of word length on regressions out of words for university and school participants on Sepedi reading.

Word length for university and school participants: Sepedi

Top: Sepedi academic texts, measure 1=left; measure 2=right

Bottom: Sepedi generic texts, measure 1=left; measure 2=right

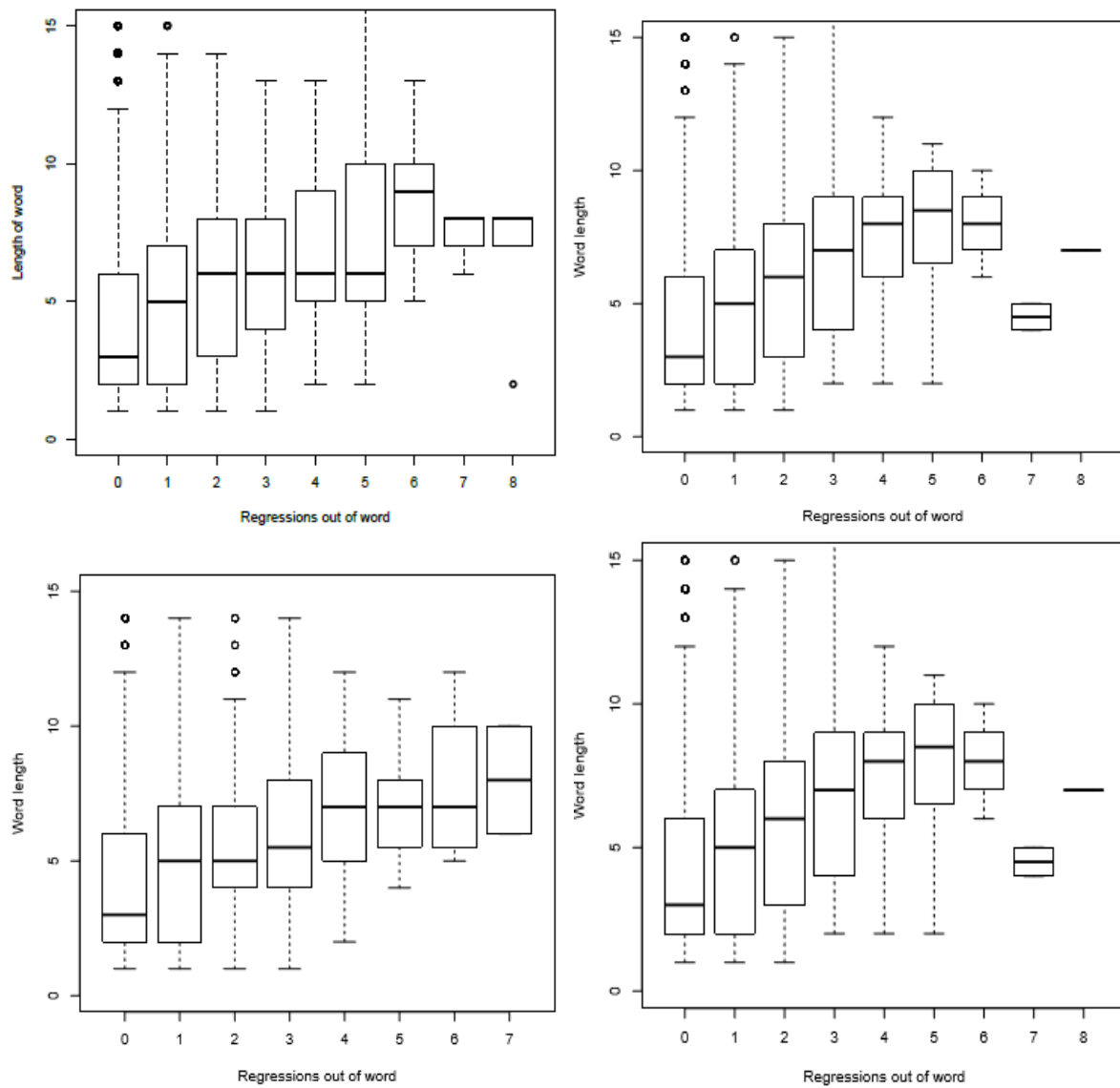


Figure 4. 43 Box-plots showing the effect of word length on regressions out of a word for university participants

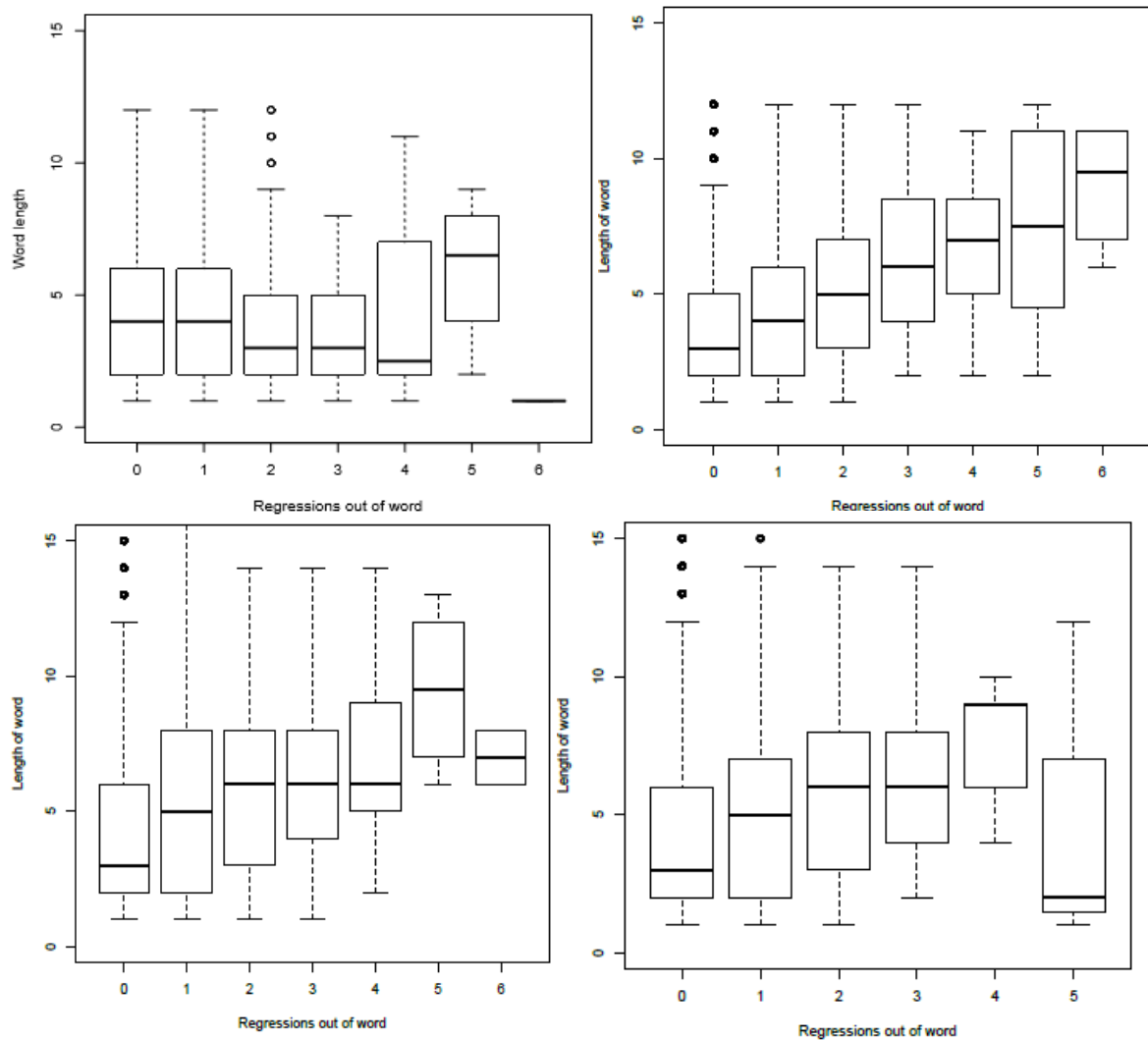


Figure 4. 44 Box-plots showing the effect of word length on regressions out of a word for university and school participants

The table below (Table 4.48) presents the descriptive statistics for box plots above in figures 4.43 and 4.44 on word length for both university and school on measures 1 and 2 to indicate which measures were significant and which measures were not significant. The box plots presented in the above figures (figures 4.43-4.44) follow the same pattern as in the table below (Table 4.48).

Table 4. 48 Descriptive statistics of regressions out of word for word length among university and school participants

Regressions out of word: Word length										
Language	Level	Text type	Measure 1				Measure 2			
			DF	F-Value	P-Value	Significant	DF	F-Value	P-Value	Significant
English	University	Academic	53475	29.371	<2e-16	***	55046	393.05	<2.2e-16	***
		Generic	57374	351.05	<2.2e-16	***	48450	2.8331	<2e-16	***
	School	Academic	23285	47.489	5.673e-12	***	22706	52775	3.86e-13	***
		Generic	7974.2	2.8556	0.09109		15304.0	23.2488	1.437e-06	***
Sepedi	University	Academic	83922	21.910	<2e-16	***	78501	408.80	<2.2e-16	***
		Generic	62874	15.149	<2e-16	***	57099	130.306	<2.2e-16	***
	School	Academic	17862	88.736	<2.2e-16	***	17170	52.459	4.581e-13	***
		Generic	15525.8	0.0536	0.81684		14978	112.911	<2e-16	***

Note to the table: *= p-value is less than 0.05 (significant); **= p-value is less than 0.01 (Very significant); ***= p-value is less than 0.001(extremely significant)

The data in the above figures (4.43-4.44) and table (table 4.48) indicate a significant effect for English academic text for university and school for measures 1 and 2, English generic text for university participants for measures 1 and 2, English generic text for measure 2, and Sepedi academic texts for university and school participants for measures 1 and 2, Sepedi generic texts for university participants for measures 1 and 2, Sepedi academic texts for school participants for measures 1 and 2, and Sepedi generic text for school participants for measure 2 confirmed that word length affects regressions out of words when naturally reading a text. This means that the participants made more regressions out of words on longer words as compared to shorter words. The findings in this study are expected, and they suggest that participants showed the ability to apply knowledge of letter-sound relationships and the participants were able to recognise shorter words quickly and regressed less as compared to longer words.

On the other hand, English generic text for school participants measure 1 and Sepedi generic text for school participants for measure 1 showed that there was no significant effect of word length for regressions out of word. The findings from this study are not consistent, and they show irregular patterns of regressions out of word in both English generic text measures 1 and Sepedi generic text measure 1 for school participants. These are unexpected findings seeing that the above-reported texts and measures show a strong significant effect for word length. This finding is contrary to the expectation that skilled readers should and are sensitive to word length and mostly regress out of longer words compared to shorter words. The findings could suggest that the participants might have missed what they deemed was important information, or they might have forgotten important information, and hence, they regressed many times on specific words. According to Rayner (1998), regressions are common when the reader has forgotten or missed important information. Another explanation could be that the participants were invested more in the text, and they needed to ensure that they comprehend the text for later comprehension tests.

4.4.3.5 Concluding section

In conclusion, the mixed effect model findings revealed some inconsistency about the participants' reading behaviour when examining the decoding measures of the first fixation

duration, gaze duration, words skipped first and regressions out of word. Generally, the findings indicated that in both the university and school participants, the data indicated inconsistent reading pattern irrespective of language and text type. Although the majority of the measures showed that the participants were sensitive to word frequency and length with different degrees of significance, few of the measures showed that the participants were not sensitive to word frequency and length for first fixation duration. The gaze duration findings indicated that the majority of the measures for both university and school participants showed that the participants were sensitive to word frequency and length, but few measures showed that the participants were not sensitive to word frequency and length. This just shows that the participants approach texts differently, and one can only make speculations about the inconsistency that is found in the reading pattern of both the university and school participants. The words skipped first data indicated that the majority of the measures for both university and school participants showed sensitivity to word frequency and length when reading texts for both academic and generic, although a few measures showed that the participants were not sensitive to word frequency and length for words skipped first. Lastly, the data for regressions out of word showed inconsistency as well between measures with the majority of the measures showing that the participants were sensitive to word frequency and length with a few measures indicating that word frequency and length did not affect their reading behaviour. In a nutshell, the reading patterns of the participants could have been influenced by textual factors, and also their reading goal as highlighted above.

4.5 Linguistics Comprehension

This section focuses on presenting results that work towards answering research question 2(b):

What conclusions can be made from describing fixation duration, saccadic amplitude, regressions, words skipped totally and comprehension scores with relation to linguistic comprehension?

To answer research question 2(b), this section provides findings for the linguistic comprehension measures that were included in the study.

4.5.1 Comprehension score analysis

The comprehension scores are classified under the aspect of linguistic comprehension that forms part of the SVR because it provides us with results that tell us whether the participants comprehended the text or not because comprehension scores are predictors of linguistic comprehension. The analysis of comprehension scores tells us more about the performance of the participants in all the comprehension tests that they completed after reading the various English and Sepedi texts for this study.

The table below presents descriptive statistics on the effect of text type and language on comprehension scores for university and school participants.

Table 4. 49 Descriptive statistics on comprehension scores for university and school participants

Comprehension scores						
	Text Type			Language		
	DF	F-Value	P-Value	DF	F-Value	P-Value
University	128.506	20.657	1,25E-02	195	4.5412	0.034340
School	195	7.1294	0.008223	89.570	0.480	0.49039

Figure 4.45 presents the effect of text type on comprehension scores for university and school participants.

4.5.1.1 The effect of text-type on comprehension scores

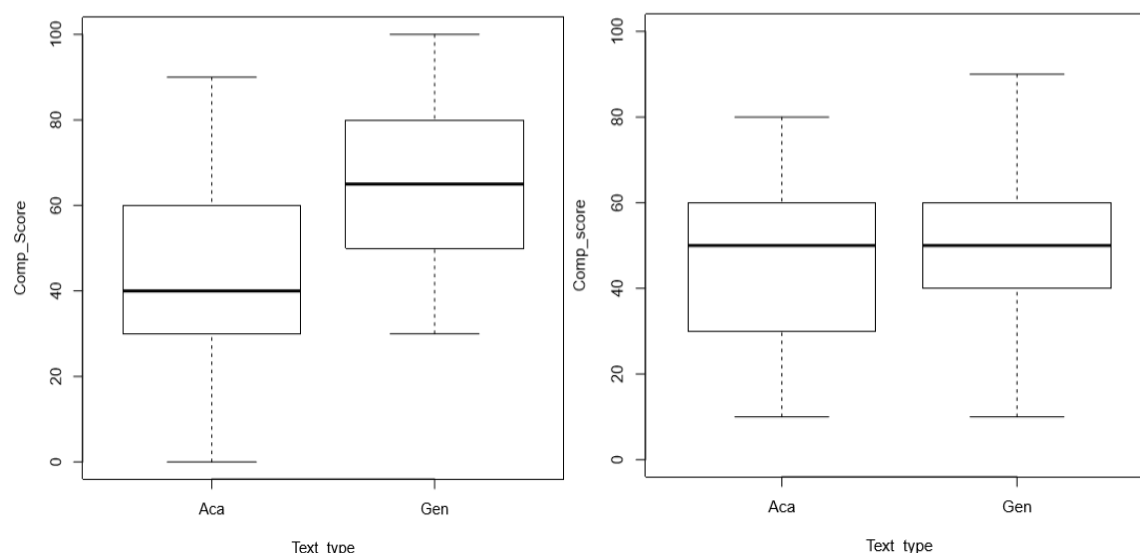


Figure 4. 45 Comprehension scores as predicted by text-type (left, university; right, school)

Text-type predicted comprehension scores for both university and school participants. From the plots above, the data show that the university participants performed better in the comprehension test for generic texts than for academic texts and the school participants had a small differential performance effect between comprehension scores for academic and generic texts which is statistically significant as presented in the above table (table 4.49). These results are expected in the university participants' data because academic texts are complex with a low readability score, while generic texts are typically easier to read and have a low readability score (see detailed description in Chapter 3). On the other hand, the school participants' data show that the averages are almost the same, but academic comprehension scores seem to be a little higher than the generic test scores.

4.5.1.2 The effect of language of text on comprehension scores

Figure 4.46 presents the effect of language of the text on comprehension scores for university and school participants.

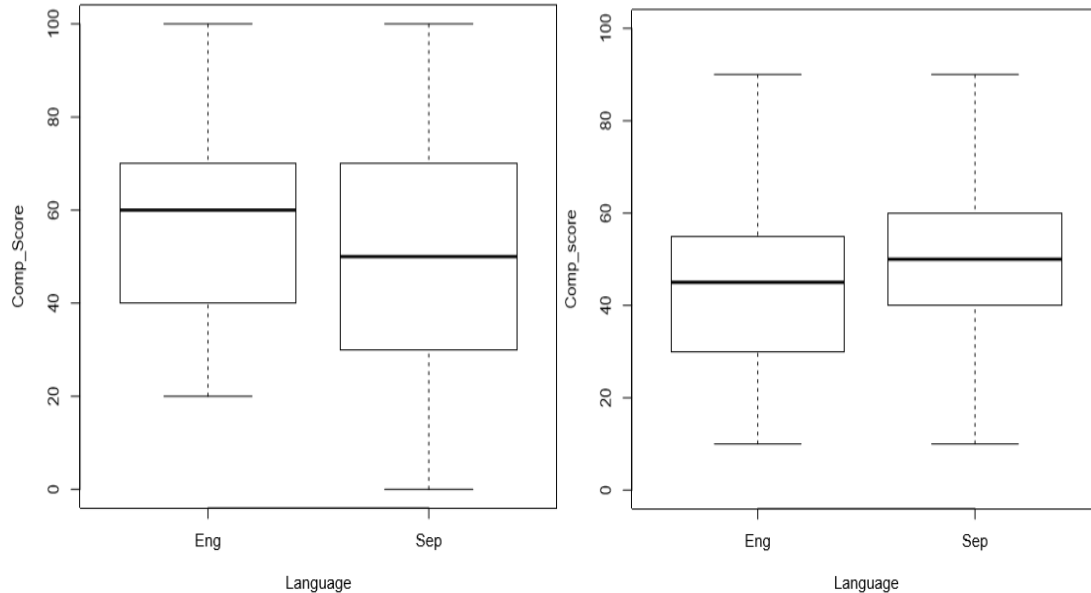


Figure 4. 46 Comprehension scores as predicted by the language of text (left, university; right, school)

The language of the texts did not predict the comprehension scores for university participants. According to the data, the participants performed better in the English comprehension test scores (56% average score from measures 1 and 2) as compared to the Sepedi comprehension test scores (49% average score from measures 1 and 2), showing a statistically significant effect. Meanwhile, for the school participants, the comprehension test scores indicate that they performed better in Sepedi (48% average score from measure 1 and 2) compared to English (44% average score from measure 1 and 2) which is not statistically significant. This means that school participants had higher comprehension scores in Sepedi compared to the English comprehension scores with a 4% difference which still places them at roughly the same level of reading comprehension in both languages.

The plots below present scatterplots that show comprehension scores for English and Sepedi for university participants based on measures 1 and 2.

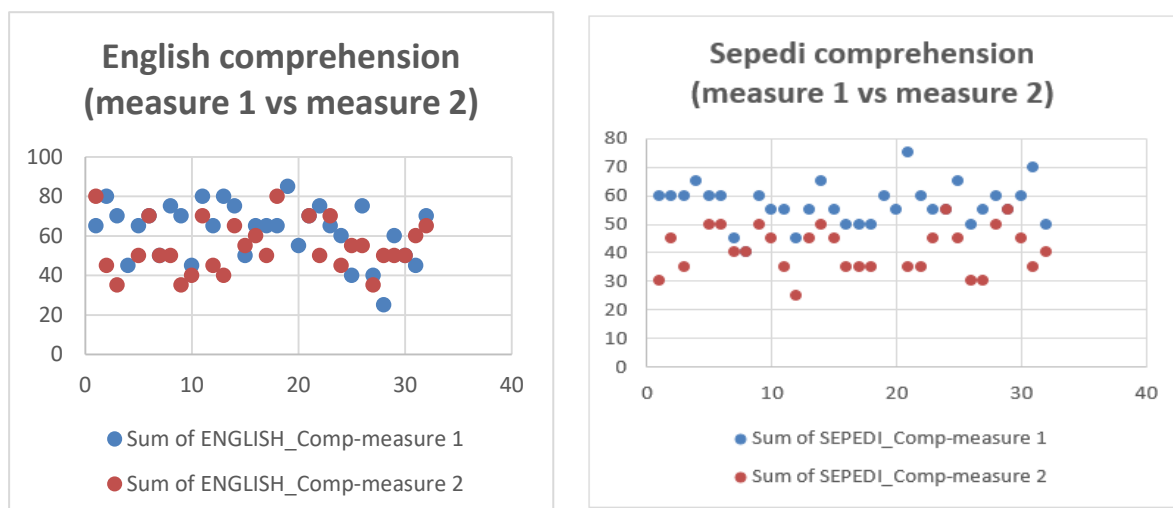


Figure 4.47 Scatterplots for English and Sepedi comprehension scores data for measure 1 and 2 among university participants

The above figure (figure 4.47) shows scatterplots for English and Sepedi comprehension scores for measures 1 and 2 for university participants. The data for English comprehension scores show the scores presented in the above figure. Therefore, this scatterplot becomes a visual representation of the comprehension scores for English and Sepedi reading on measures 1 and 2, which shows very small differences in the comprehension scores between the first and the second measure suggesting that the participants are comprehending their reading at the same level in both English and Sepedi. The data for measure 2 in both English and Sepedi comprehension scores show that the participants had higher scores in measure 1 than in measure 2. This could be because the comprehension test for measure 2 might have been pitched at a higher level compared to measure 1. After all, these tests were self-designed and not standardised, but the texts were the same.

The plots below present scatterplots that show the comprehension scores for English and Sepedi reading for the school participants based on measure 1 and 2.

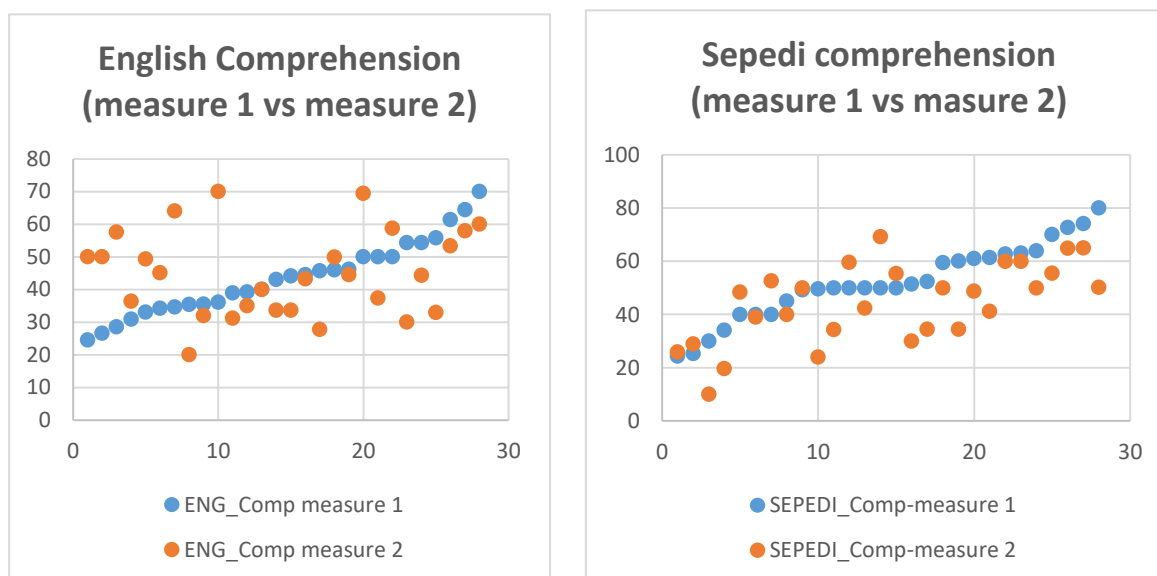


Figure 4.48 Scatterplots for English and Sepedi comprehension scores data for measure 1 and 2 among school participants

The above figure (figure 4.48) shows scatterplots for English and Sepedi comprehension scores for measures 1 and 2 for school participants. The data for English comprehension scores show the scores presented in the above figure. Therefore, this scatterplot becomes a visual representation of the comprehension scores for English and Sepedi on measures 1 and 2, which shows very small differences in comprehension scores between the first and the second measure suggesting that the participants are reading at the same level in both English and Sepedi. The data for measure 2 in both English and Sepedi comprehension scores show that the participants had on average higher scores in measures 1 than in measure 2. This could be because the comprehension test for measure 2 might have been pitched at a higher level compared to measure 1 because these tests were self-designed and not standardised tests, even though the texts were the same.

4.5.1.3 Summary of comprehension scores

Generally, the data show that irrespective of language the university and school participants are reading at the same level in their respective grade or education levels. The results show that the university and school participants perform similarly, although on average they scored different scores, they are reading at the same level in both English and Sepedi. Furthermore, regardless of text-type, university participants comprehend more when they read in English than in Sepedi, but school participants comprehend more when they read in Sepedi than in English. This could be due to less exposure to Sepedi materials at university for university participants, and also that school children are still learning Sepedi as a subject and therefore read often in Sepedi. This is evident in the comprehension scores above.

4.5.2 Fixation duration analysis

The fixation duration analysis examined which predictors significantly predicted the duration of fixations during reading. Fixation durations are interpreted as indicators of comprehension in this study because they are considered late measures. Late measures in eye movement research refer to indicators that can show and determine whether the reader is skilled or unskilled in comprehending what they are reading. When comprehension is delayed, measures like fixation duration (and others like saccades in section 4.5.3 and regressions in section 4.5.4) are registered later in the reading process and therefore are regarded as late measures. The fixation duration is defined as the moment when the reader is able to extract meaning from a word. Shorter fixation would mean that the reader processed the word quickly and extracted meaning, while longer fixations could mean the reader delayed in processing the word. This is defined by Radvansky and Ashcraft (2006:69) as interrupted pauses.

The table below presents descriptive statistics on the effect of language and regression percentage on fixation duration for university and school participants.

Table 4. 50 Descriptive statistics on the effect of language and regression percentage on fixation duration

Fixation duration						
	Language			Regression Percentage		
	DF	F-Value	P-Value	DF	F-Value	P-Value
University	123.120	12.3160	0.0006280	125.373	13.2969	0.00038
School	190.738	28.425	2.735e-07	192.167	33.029	3.514e-08

Figure 4.49 presents the effect of language on fixation duration for university and school participants.

4.5.2.1 The effect of language on fixation duration

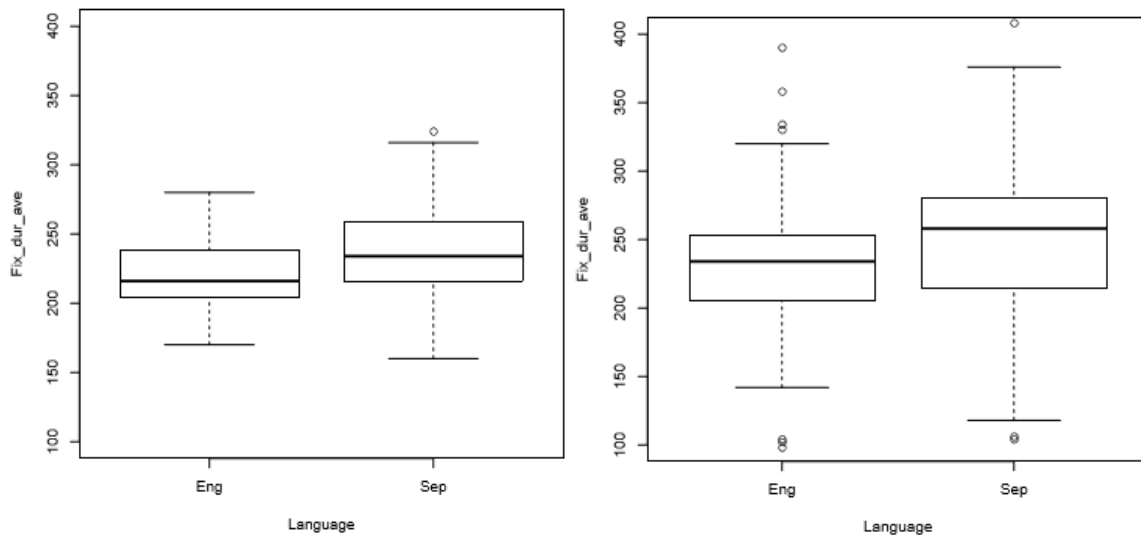


Figure 4. 49 Fixation duration as predicted by the language of text (left, university; right, school)

Language predicted fixation duration in both university participants and school participants. The data show that both the university and school participants made longer fixations when reading Sepedi texts as compared to English texts. This is an expected finding because of the length of the text and the structure of language and also because fixations of ordinary readers range between 150 to 300 ms. From looking at the data, the fixation duration is within the same range for both English and Sepedi. This means that the participants decode and comprehend both English and Sepedi at the same level with respect to fixation duration.

Figure 4.50 presents the effect of regression percentage on fixation duration for university and school participants.

4.5.2.2 The effect of regression percentage on fixation duration

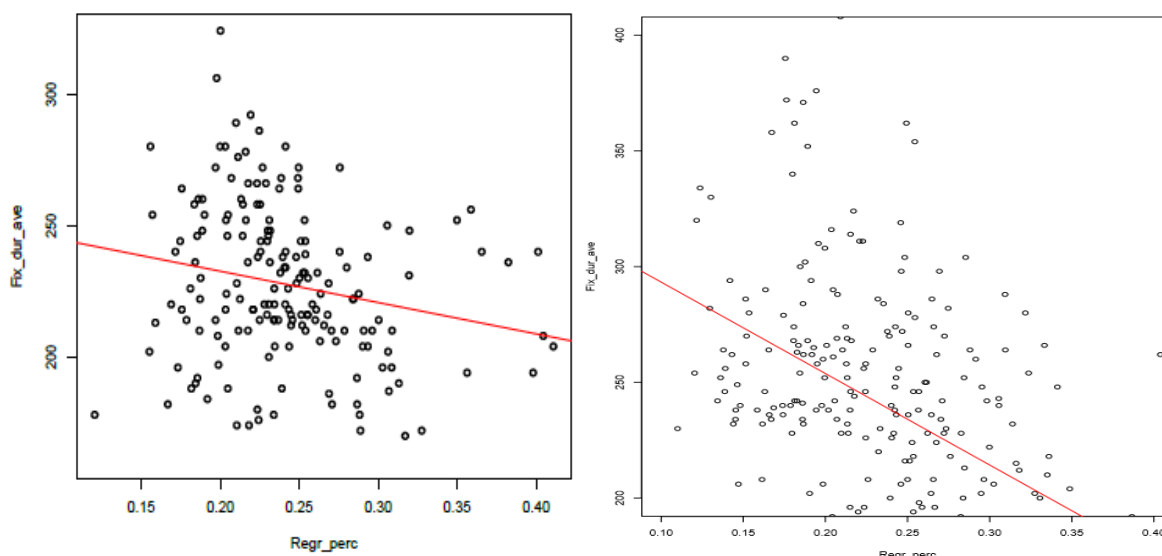


Figure 4. 50 Fixation duration as predicted by regression percentage (left, university; right, school)

Regression percentage predicted fixation duration in both university and school participants. In both university and school participants, more regression percentage predicted shorter fixation duration. This means that more regressions were made in instances where fixation durations were shorter. This suggests that these readers read quickly, but pay the penalty in the form of having to make more regressions.

4.5.2.3 Fixation duration summary

The results for the analysis of fixation duration showed that for both university and school participants, readers made longer fixations when reading the Sepedi texts than when reading the English texts. This is expected because Sepedi is an agglutinating language that contains the inclusion of different morphemes to words to determine meaning. Sepedi is unlike English, which is analytical. It could also be argued that school children and university students read much more English in general than they read Sepedi, which has something to do with their shorter fixations in English. This remains an unexpected finding that I can only speculate about. It could be that while overall reading improved for university participants, “learning” about the nature of participating in the study occurred in the case of school participants, which means that the learners realised that they needed to read more carefully so that they could answer the comprehension questions. This could explain the longer fixation durations for school participants during Sepedi reading for both measures on average. Furthermore, when considering the number of regressions made, this could imply that the readers fixated. This was expected because shorter fixation durations are observed, but the findings also indicate that the participants pay the price of making more regressions because they rush through the text when reading.

4.5.3 Saccadic amplitude analysis

The saccadic amplitude analysis examined which predictors significantly predicted saccadic amplitude during reading. Saccadic amplitudes are interpreted as indicators of comprehension in this study because the decision a reader makes by fixating one word and moving to another word can provide information about the decoding abilities and comprehension proficiency. In other words, if a reader fixates a word and then skips to the next word in a short period, it means that the next word was decoded faster than the previous word and possibly understood with more ease as well. This is defined by Rayner (2009) as movement in-between fixations. In

reading comprehension, the length of the saccades can tell us whether a reader is skilled or unskilled; where longer saccades describe skilled readers and shorter saccades describe unskilled or struggling readers.

The table below presents descriptive statistics on the effect of language and regression percentage saccadic amplitude for university and school participants.

Table 4. 51 Descriptive statistics on the effect of language and regression percentage for saccadic amplitude

Saccadic amplitude						
	Language			Regression Percentage		
	DF	F-Value	P-Value	DF	F-Value	P-Value
University	128.439	90.569	2.22e-16	126.601	0.050	0.82291
School	194.998	7.2690	0.007629	81.640	7.5519	0.007376

Figure 4.51 presents the effect of language on saccadic amplitude for university and school participants.

4.5.3.1 The effect of language on saccadic amplitude

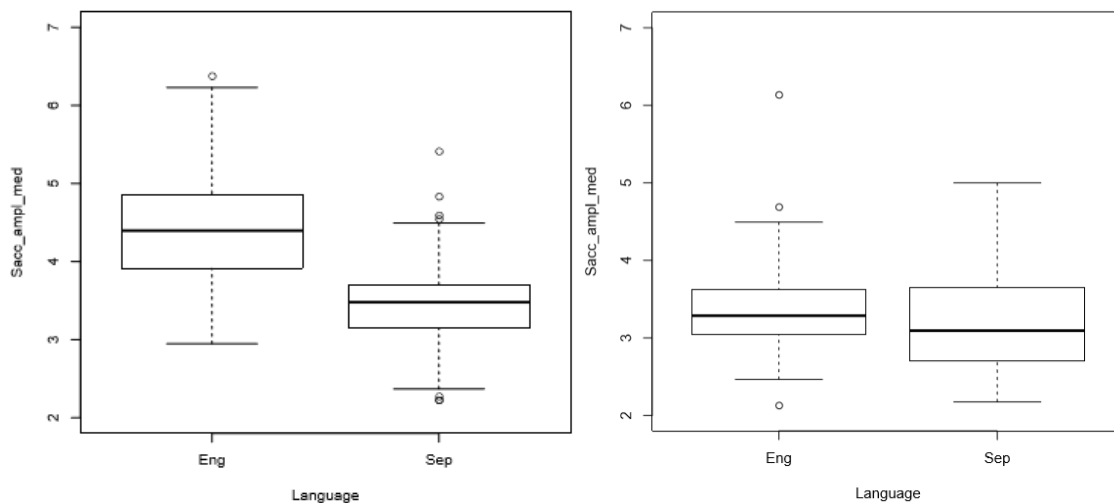


Figure 4. 51 Saccadic amplitude as predicted by the language of the text (left: university; right: school)

Language predicted saccadic amplitude in university and school participants. The data show that for both the university and school participants, readers exhibited longer saccades in English than in Sepedi, and from the plots presented above, the effect appears to be larger for the university than for school participants. This means that when the participants read an English text, they made longer saccades than they did when they were reading a Sepedi text. This is an expected finding because English and Sepedi have different orthographic structures. This means that the participants adjust their reading to the required structure of each language.

Figure 4.52 presents the effect of regression percentage on saccadic amplitude for university and school participants.

4.5.3.2 The effect of regression percentage on saccadic amplitude

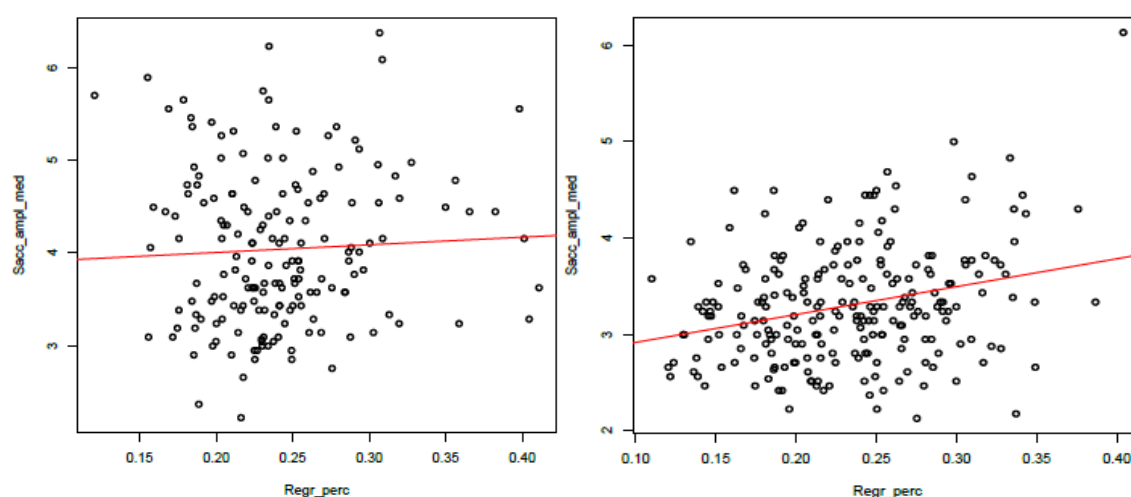


Figure 4. 52 Saccadic amplitude as predicted by regression percentage (left, university; right, school)

Regression percentage predicted saccadic amplitude only in school participants but not for university participants. The university participants showed no effect of regressions, and the school participants showed small effects of regressions on saccadic amplitude. This means that saccadic amplitude does not contribute to regressions in university participants, whereas for the school participants the data showed that the participants with longer saccadic amplitude made longer regressions, but the difference is very small. This is an unexpected finding because one would expect that shorter saccades would predict more regressions. I can only speculate about possible interpretations of this unexpected finding. It could mean that although the university participants made shorter saccades, they still saw the need to regress to increase their level of comprehension by making more regressions.

4.5.3.3 Summary of saccadic amplitude analysis

The results of the analysis for saccadic amplitude for university participants and school participants unsurprisingly revealed that when readers read English, they made longer saccades, whereas when readers read in Sepedi, they made shorter saccades. Also, the results for both university and school participants showed that readers who made longer saccades also made more regressions.

4.5.4 Regression percentage analysis

The regression percentage analysis examined which predictors significantly predicted the percentage of regressions made during reading. Regression percentage analysis is interpreted as an indicator of comprehension in this study because when readers read backwards for most

of the time, it can be considered a weakness in reading; therefore, more regressions would predict that the readers are struggling. Regression percentage is classified as a late measure which is associated with post-lexical integration (Whitford & Joannis, 2018). This means that the readers process what they read and make meaning, but it happens that they are unable to make out the meaning, they usually regress in the hope that by regression they will be able to make out the meaning clearly and accurately.

The table below presents descriptive statistics on the effect of text type and language on regression percentage for university and school participants.

Table 4. 52 Descriptive statistics on the effect of text type and language on regression percentage

Regression Percentage						
	Text Type			Language		
	DF	F-Value	P-Value	DF	F-Value	P-Value
University	123.180	5.2486	0.023	130.003	0.1648	0.685
School	189.757	11.732	0.000	189.770	29.025	2.101e-07

Figure 4.53 presents the effect of text type on regression percentage for university and school participants.

4.5.4.1 The effect of text-type on the percentage of regression

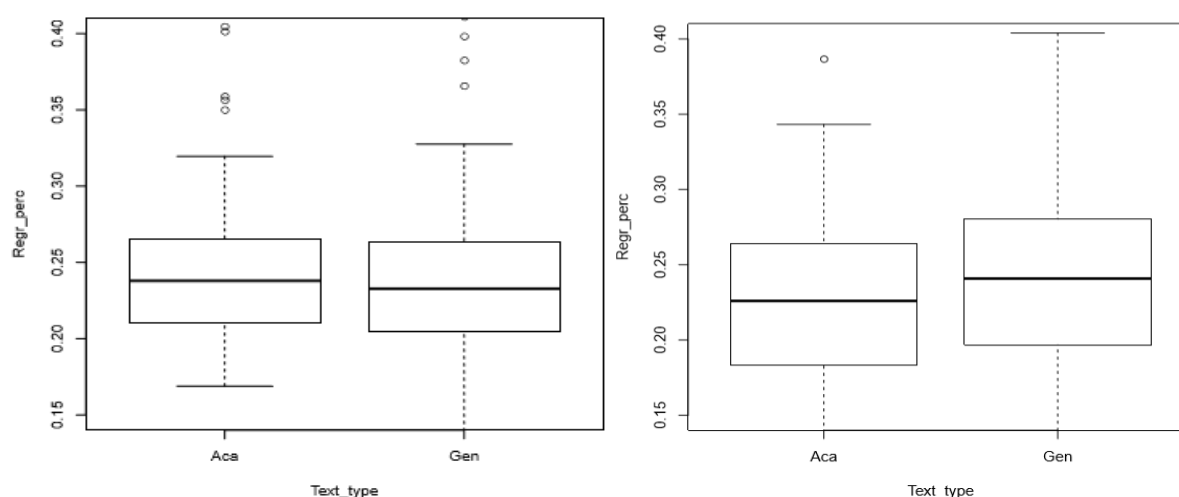


Figure 4. 53 Regression percentage as predicted by text-type (left, university; right, school children)

Text-type predicted regression percentage in both the university students and school participants. The data for the university participants showed that they made more regressions when reading the academic text than when they read the generic text, whereas the school

participants surprisingly made more regressions when reading the generic text than when they read the academic text. The latter was an unexpected result seeing that the academic text is more advanced than the generic text. The school participants could either be reading mindlessly, or they could simply be moving their eyes quickly. The content could also be a contributing factor, because the regression pattern could be an indication that the school participants were invested in reading the generic text more as compared to the academic text.

Figure 4.54 presents the effect of language on regression percentage for university and school participants.

4.5.4.2 The effect of language on regression percentage

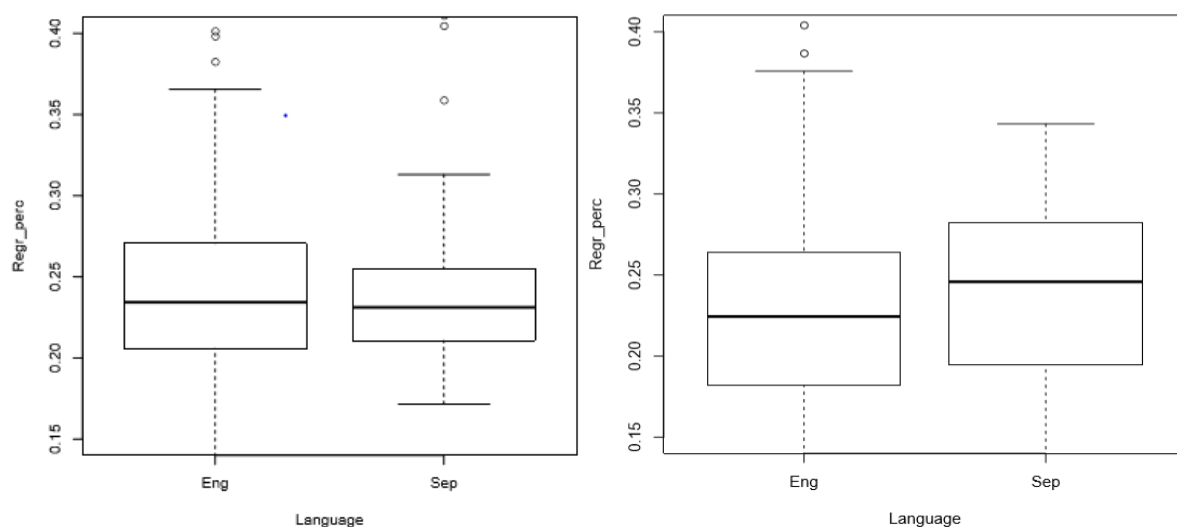


Figure 4. 54 Regression percentage as predicted by language (left, university; right, school)

Language predicted regression percentages in school participants but not in university participants. The school participants made more regressions in Sepedi than in English. When comparing the data across university and school, the data show more regressions in English for university participants and more regressions in Sepedi for school participants. This could be due to text length and structure of the texts which can affect regression percentage for the school participants, whereas for the university participants there was no difference in the number of regressions between the languages.

4.5.4.3 Summary for regression percentage analysis

The results for regression percentages indicated that the university participants made more regressions while reading academic texts as compared to generic texts; however, school participants made more regressions when reading generic texts compared to academic texts. These results for school participants are surprising because it was expected that it would be easier for both groups to read a generic text and that the ease of reading would be visible in fewer regressions made while reading the generic texts when compared to the academic text. One possible explanation for these unexpected findings is that the participants took their time and were not hurrying through the text and therefore, they did not need to make many

regressions. This answer is plausible if one considers the word per minute results reported in section 4.4.2.2 of this chapter. The word per minute results does indicate that the participants had a higher reading speed for generic text compared to academic text.

4.5.4.4 Summary for fixation duration, saccadic amplitude and regressions

Generally, skilled readers make shorter fixations and fewer regressions than unskilled readers, and there are more regressions in simple texts than in more difficult texts (Rayner & Pollatsek, 1989). When children first start learning to read, their fixations tend to be over 350 ms, and they make two to three fixations per word (depending on the length of the word). Furthermore, up to 30% of their fixations are regressions (backward movements to re-read earlier text) (Rayner & Pollatsek, 1989). Fixation duration decreases with age (Helo *et al.*, 2014), hence when most children have reached 12 years of age, fixation durations and saccadic amplitudes have stabilised (Buswell, 1922; Rayner, 1986; Rayner & Pollatsek, 1989). The percentage of regressions continues to decline with age and grade. Unless the text is difficult, typical average fixation durations for adult readers are around 250 ms, with a regression rate of 10% and a saccade amplitude of about eight characters (Rayner & Pollatsek, 1989). The regression findings reported for the school participants in this section is therefore similar to that reported for younger readers in the literature.

4.5.5 Word skipping – words skipped totally

Words skipped is defined as totally skipping words in a text while naturally reading the text. Words skipped is taken as an indicator of comprehension in this study because skipping words is a sign of comprehension deficiency because skilled readers are expected to be sensitive to word frequency and word length when naturally reading the text. According to Brysbaert and Vitu (2005), Rayner and McConkie (1976) and Rayner, Sereno and Raney (1996) word length affects skipping and the more the word length increases, chances of being skipped lessen compared to when the length of the word is shorter. In addition, 2-3 letter words have a probability of being skipped about 67% of the time, and the skipping rate decreases to about 20% when the word is between 7-8 letters long (Rayner & McConkie, 1976). On the other hand, high-frequency words have a high probability of being skipped most of the time compared to low-frequency words if word length is controlled (Rayner *et al.*, 1996).

This section presents the effect of word frequency, and length results on words skipped totally for both university and school participants.

4.5.5.1 The effect of word frequency and word length on words skipped totally for university and school participants

Figures 4.55 and 4.56 below show the results for the LMER analysis of the effect of word frequency and word length on words skipped totally for university participants reading an English academic text for measures 1 and 2, English generic texts for measures 1 and 2, Sepedi academic texts for measure 1 and Sepedi generic texts for measures 1 and 2 of the study.

Figures 4.55 and 4.56 below show the results for the LMER analysis of the effect of word frequency on words skipped first for university and school participants reading English texts.

Word frequency for university and school participants: English

Top: English academic texts, measure 1=left; measure 2=right

Bottom: English generic texts, measure 1=left; measure 2=right

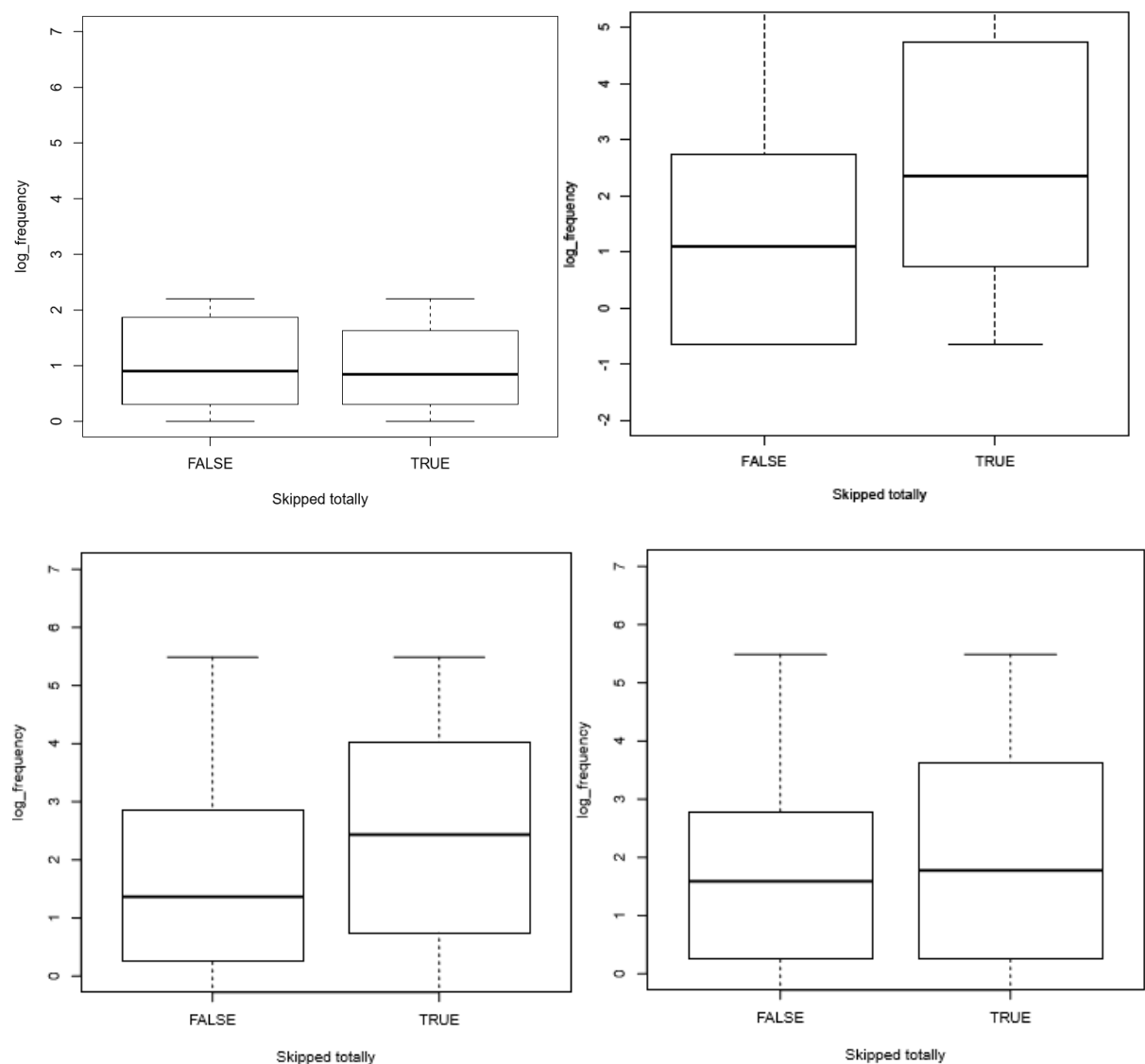


Figure 4. 55 show the results for the LMER analysis of the effect of word length on words skipped first for university participants reading Sepedi texts (FALSE=word was not skipped; TRUE=word was skipped)

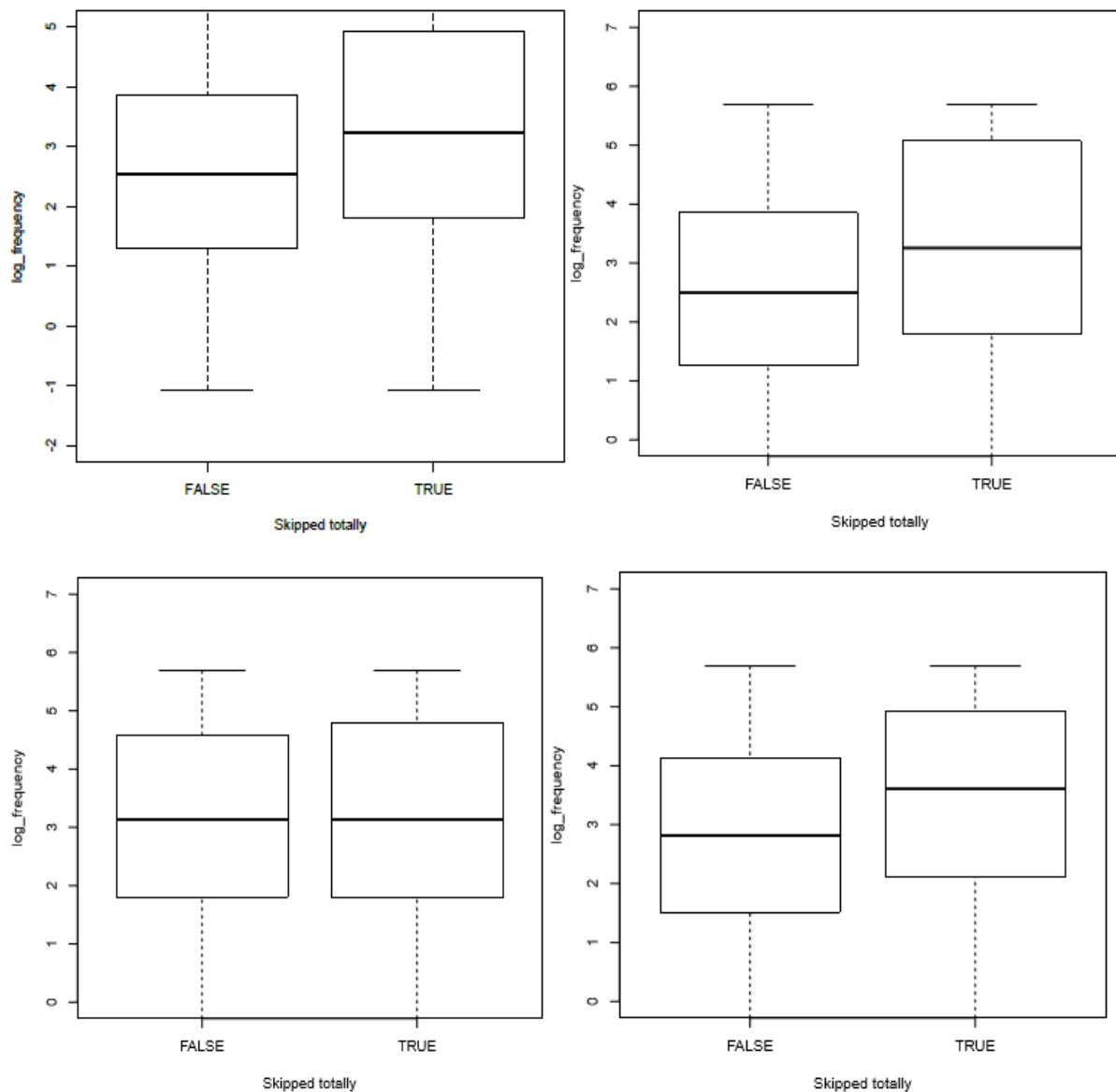


Figure 4. 56 show the results for the LMER analysis of the effect of word length on words skipped first for school participants reading Sepedi texts (FALSE=word was not skipped; TRUE=word was skipped)

Figures 4.57 and 4.58 below show the results for the LMER analysis of the effect of word length on words skipped first for university and school participants reading Sepedi texts.

Word frequency for university and school participants: Sepedi

Top: Sepedi academic texts, measure 1=left; measure 2=right

Bottom: Sepedi generic texts, measure 1=left; measure 2=right

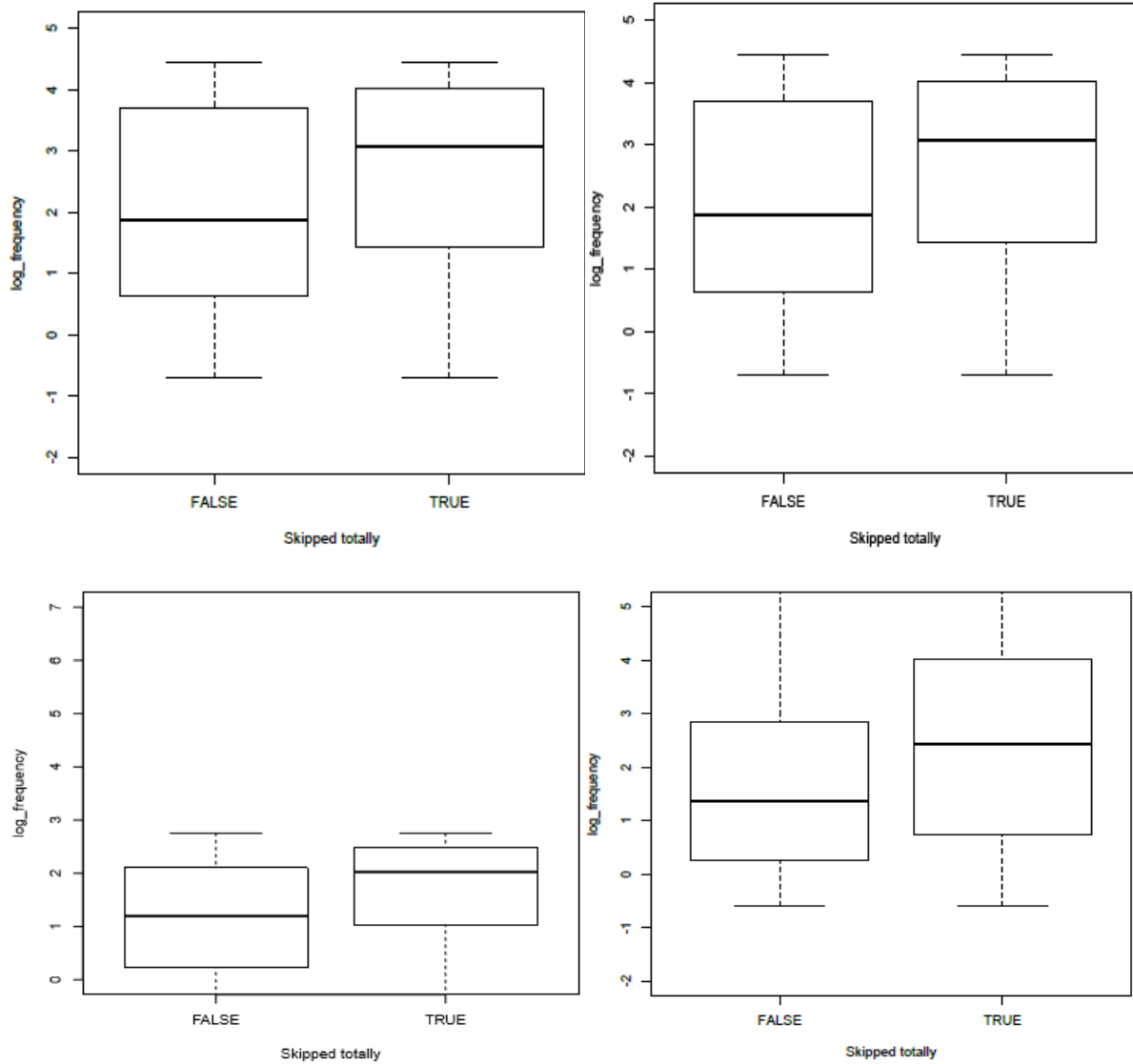


Figure 4. 57 presents descriptive statistics of words skipped totally on word frequency for the university participants (FALSE=word was not skipped; TRUE=word was skipped)

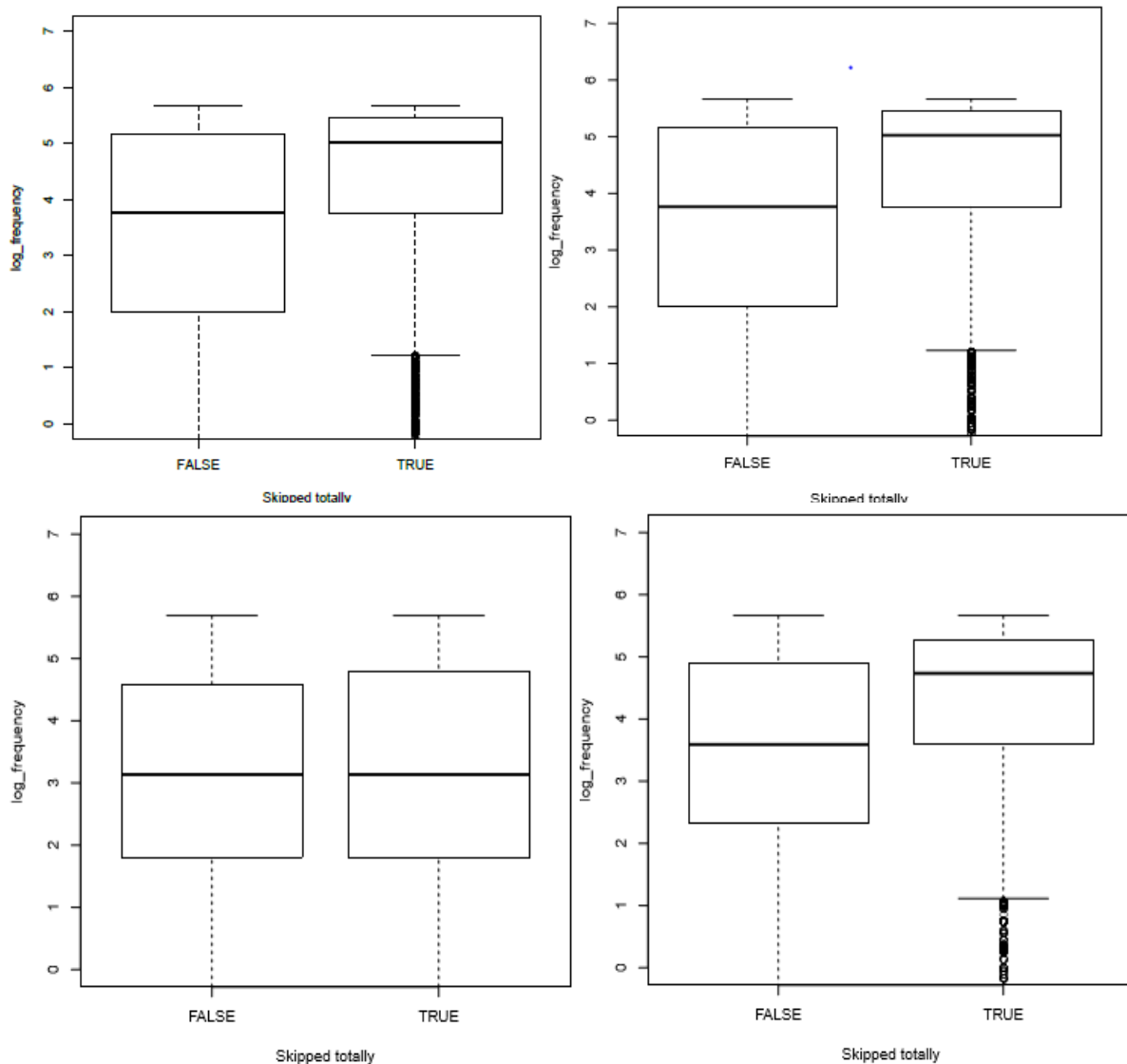


Figure 4. 58 presents descriptive statistics of words skipped totally on word frequency for the school participants (FALSE=word was not skipped; TRUE=word was skipped)

The table below (Table 4.53) presents the descriptive statistics for box plots above in figures 4.57 and 4.58 on word frequency for both university and school participants on measures 1 and 2 to indicate which measures were significant and which measures were not significant. The box plots presented in the above figures (figures 4.57 and 4.58) follow the same pattern as in the table below (Table 4.53).

Table 4. 53 Descriptive statistics of words skipped totally on word frequency for university and school participants

Words skipped totally: Word frequency										
Language	Level	Text type	Measure 1				Measure 2			
			DF	F-Value	P-Value	Significant	DF	F-Value	P-Value	Significant
English	University	Academic	53475	1.814	0.0697		55046	395.98	<2.2e-16	***
		Generic	57374	251.96	<2e-16	***	48450	0.00777	0.9297	
	School	Academic	23285	32.03	1.533e-08	***	22706	51.702	<2e-16	***
		Generic	7971.0	0.43960	0.5073		15304	52.862	3.753e13	***
Sepedi	University	Academic	83922	19.007	<2e-16	***	78501	327.12	<2e-16	***
		Generic	62874	13.193	<2e-16	***	57099	49.60	1.91e-12	***
	School	Academic	17862	126.142	<2e-16	***	17170	87.236	<2e-16	***
		Generic	15520	0.0257	0.87273		14978	26.851	<2.226e-07	***

Note to the table: *= p-value is less than 0.05 (significant); **= p-value is less than 0.01 (very significant); ***= p-value is less than 0.001 (extremely significant)

The data in the above figures (figures 4.57 and 4.58) and table (table 4.53) indicate a significant effect for English academic text for university participants for measure 2, English generic text for university participants for measure 1, English academic texts for school participants for both measures 1 and 2, English generic text for school participants for measure 2, Sepedi academic texts for university and school participants for both measures 1 and 2, Sepedi generic text for university participants for measures 1 and 2, Sepedi academic text for school participants for measures 1 and 2, and Sepedi generic text for school participants for measure 2 confirmed that word frequency affects words skipped totally. This means that the participants skip shorter words more compared to longer words during their natural reading of the text.

On the other hand, data for English academic text for university participants for measure 1, English generic text for university participants measure 2, English generic text for school participants for measure 1 and Sepedi generic text for school participants for measure 1 indicated that there was no significant effect of word frequency for words skipped totally. This is an unexpected finding seeing that all the other conditions/texts and measures show a strong significant effect. This finding is contrary to the expectation that skilled readers should be sensitive to word frequency even when it comes to the words they skip totally while naturally reading the text. In addition, it could suggest that readers were mindless and careless when reading the texts mentioned above. Another possible explanation could be that the participants read carefully and slowly for easier decoding and comprehension for later comprehension tests when reading measure 1 texts, but when they read the measure 2 texts, they were mindless because they felt too familiar with the text as they have already encountered the texts in measure 1.

Figures 4.59 and 4.60 below show the results for the LMER analysis of the effect of word length on words skipped first for university and school participants reading English texts.

Word length for university and school participants: English

Top: English academic texts, measure 1=left; measure 2=right

Bottom: English generic texts, measure 1=left; measure 2=right

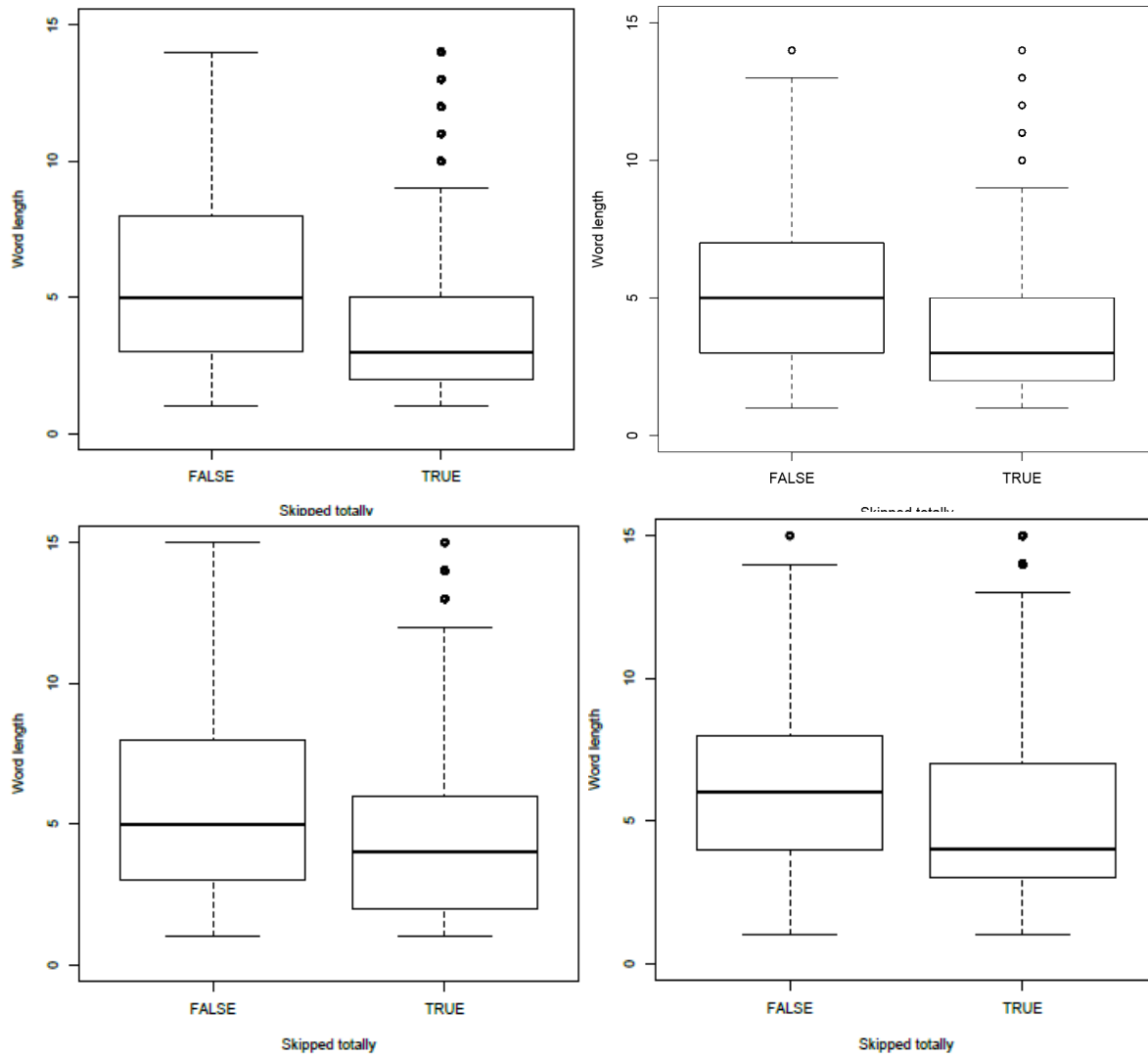


Figure 4. 59 show the results for the LMER analysis of the effect of word length on words skipped totally for university participants reading Sepedi texts (FALSE=word was not skipped; TRUE=word was skipped)

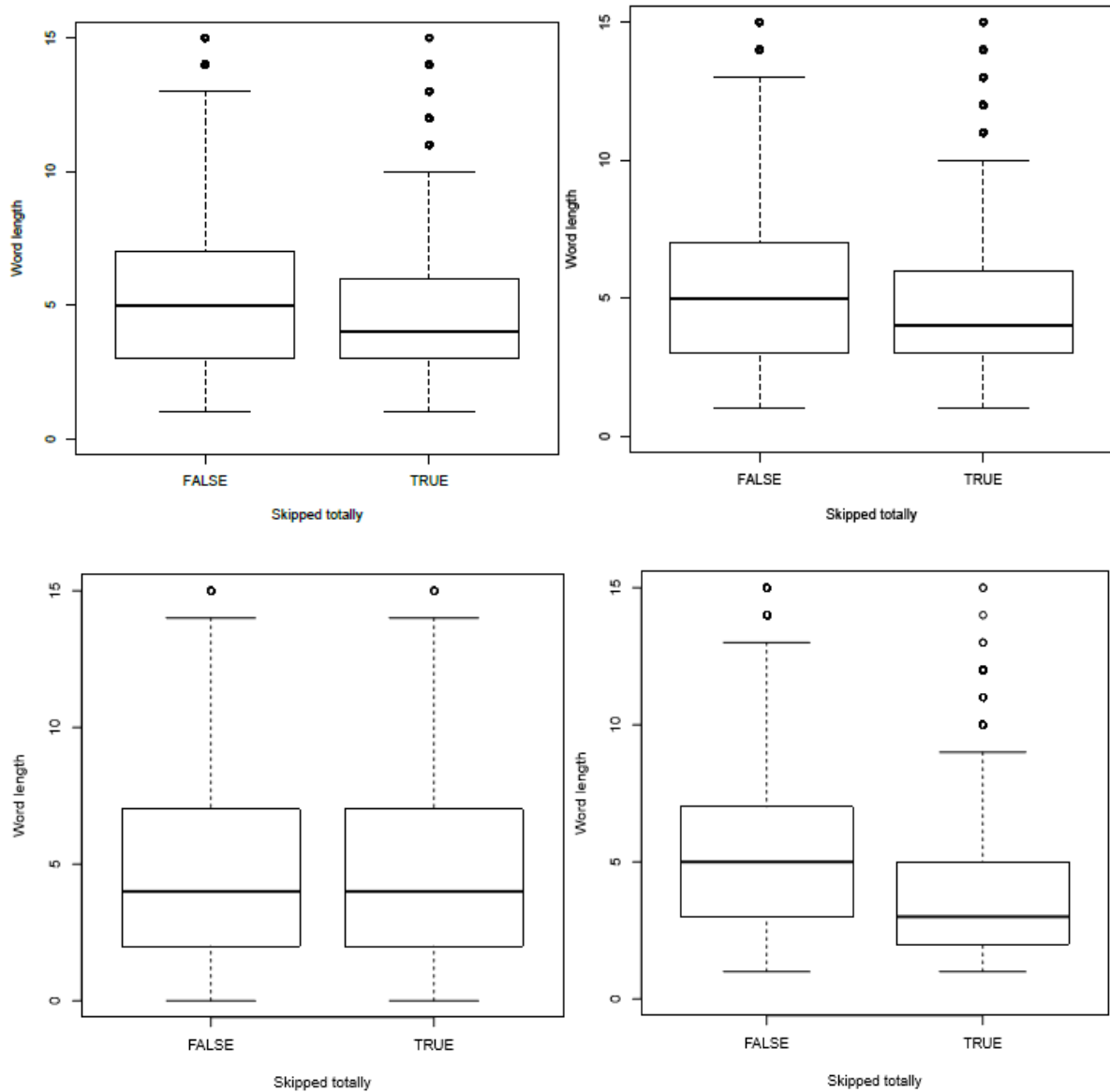


Figure 4. 60 show the results for the LMER analysis of the effect of word length on words skipped totally for university participants reading Sepedi texts (FALSE=word was not skipped; TRUE=word was skipped)

Figures 4.61 and 4.62 below show the results for the LMER analysis of the effect of word length on words skipped totally for university and school participants reading Sepedi texts.

Word length for university and school participants: Sepedi

Top: Sepedi academic texts, measure 1=left; measure 2=right

Bottom: Sepedi generic texts, measure 1=left; measure 2=right

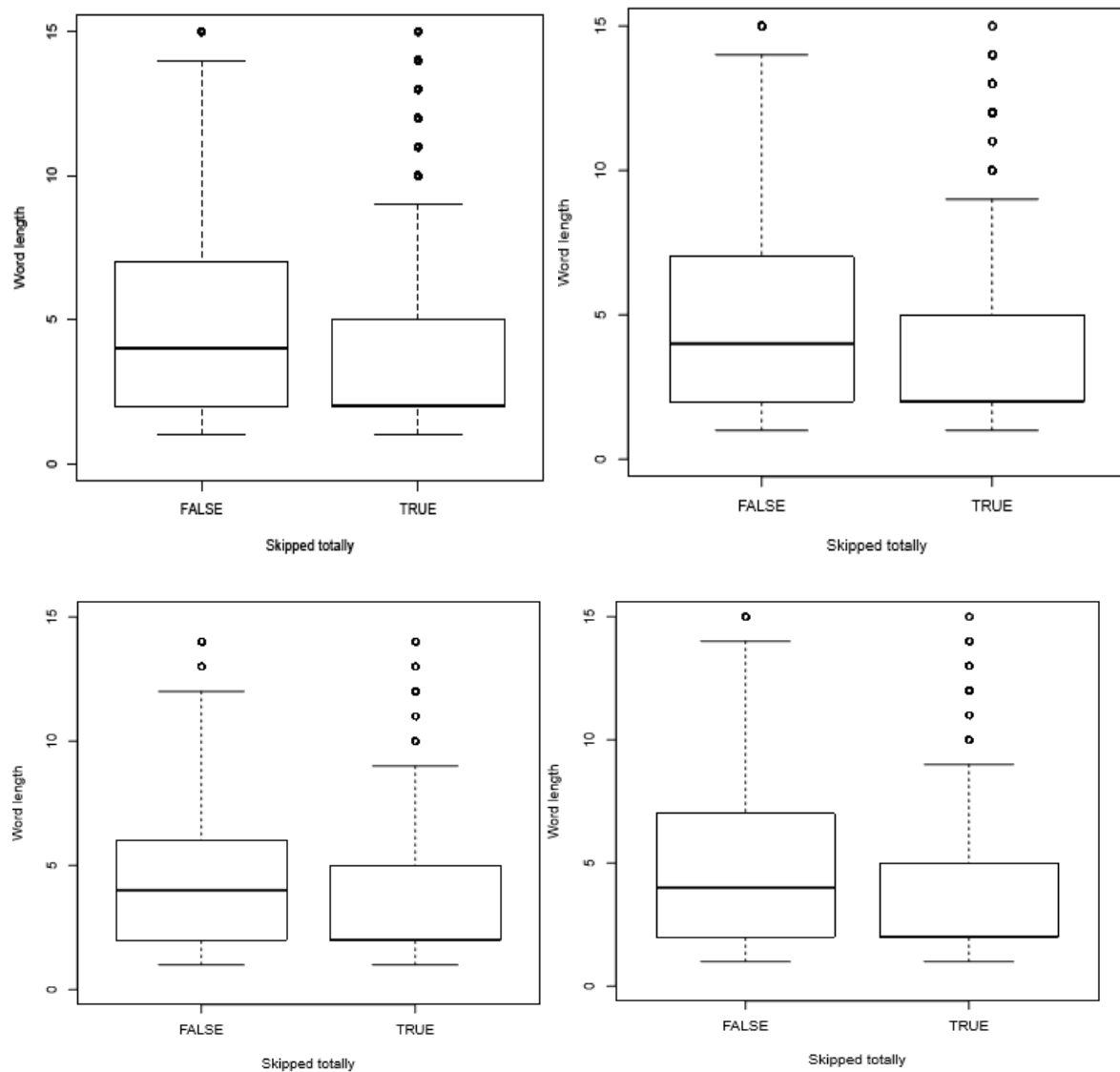


Figure 4. 61 show the results for the LMER analysis of the effect of word length on words skipped totally for university participants reading Sepedi texts (FALSE=word was not skipped; TRUE=word was skipped)

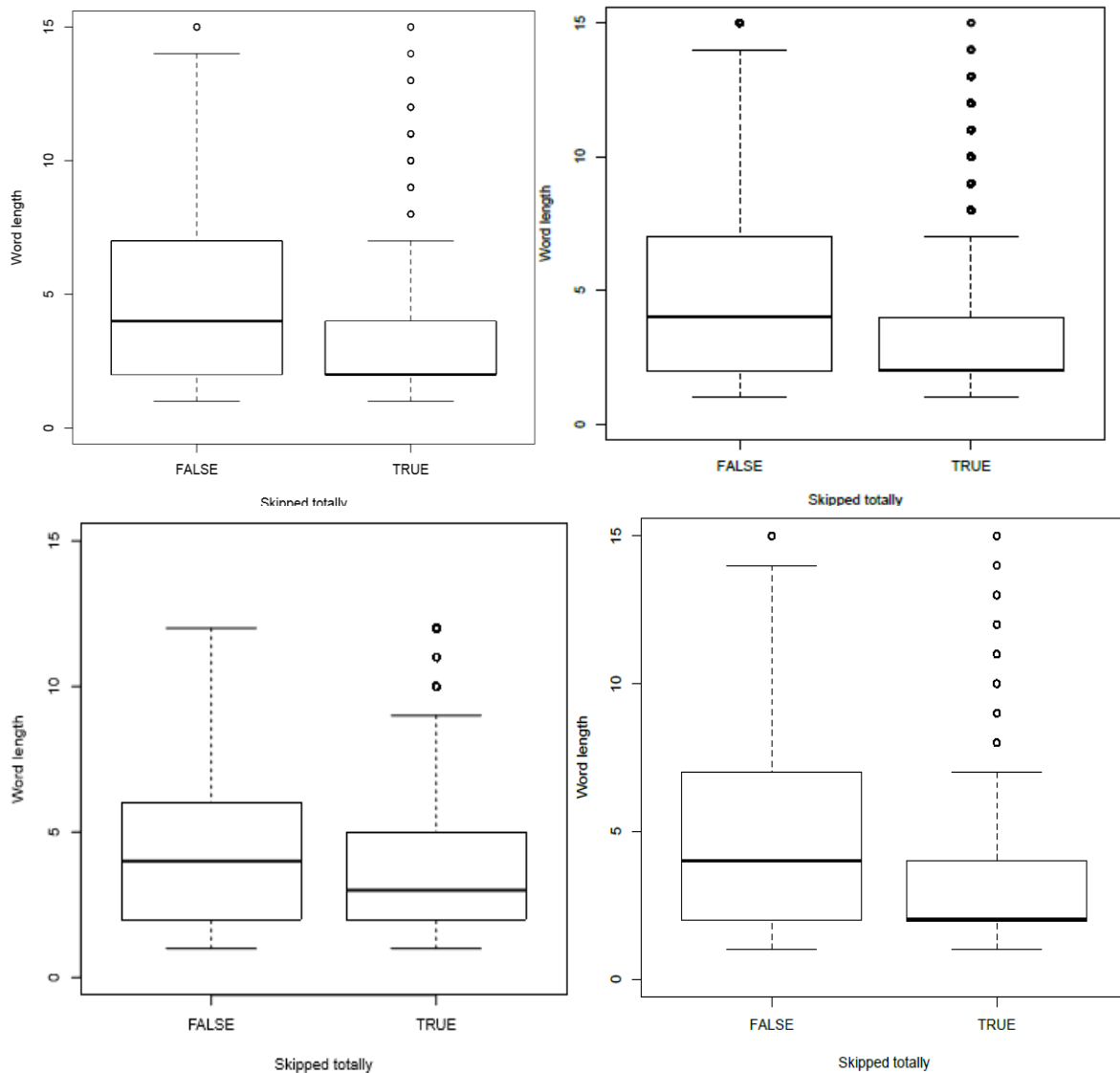


Figure 4. 62 show the results for the LMER analysis of the effect of word length on words skipped totally for university and school participants reading Sepedi texts (FALSE=word was not skipped; TRUE=word was skipped)

The table below (Table 4.54) presents the descriptive statistics for box plots above in figures 4.61 and 4.62 on word length for both university and school participants on measures 1 and 2 to indicate which measures were significant and which measures were not significant. The box plots presented in the above figures (figures 4.61-4.62) follow the same pattern as in the table below (Table 4.54).

Table 4. 54 Descriptive statistics of words skipped totally on word length for university and school participants

Words skipped totally: Word length										
Language	Level	Text type	Measure 1				Measure 2			
			DF	F-Value	P-Value	Significant	DF	F-Value	P-Value	Significant
English	University	Academic	53475	59.303	<2e-16	***	55046	1798.44	<2.2e-16	***
		Generic	57374	1720.48	<2e-16	***	48479	19.187	<2e-16	***
	School	Academic	23285	374.16	<2.2e-16	***	22706	306.284	<2.2e-16	***
		Generic	7971.3	0.22066	0.6386		15304	241.112	<2.2e-16	***
	University	Academic	83922	37.969	<2e-16	***	78501	1410.77	<2e-16	***
		Generic	62874	29.229	<2e-16	***	57099	437.01	<2.2e-16	***
Sepedi	School	Academic	17862	0.09766	0.7547		17170	150.082	<2.2e-16	***
		Generic	15520	0.0257	0.87273		14978	266.279	<2.2e-16	***

Note to the table: *= p-value is less than 0.05 (significant); **= p-value is less than 0.01 (very significant); ***= p-value is less than 0.001 (extremely significant)

The data in the above figures 4.61 and 4.62 and table (table 4.54) indicate a significant effect for English academic text for university participants for measure 2, English generic text for university participants for measure 1, English academic texts for school participants for both measures 1 and 2, English generic text for school participants for measure 2, Sepedi academic texts for university and school participants for both measures 1 and 2, Sepedi generic text for university participants for measures 1 and 2, Sepedi academic text for school participants for measures 1 and 2, and Sepedi generic text for school participants for measure 2 confirmed that word frequency affects words skipped totally. This means that the participants skip shorter words more compared to longer words during their natural reading of the text.

On the other hand, data for English generic text for school participants for measure 1, Sepedi academic text for school participants for measure 1 and Sepedi generic text for school participants for measure 1 indicated that there was no significant effect of word length for words skipped totally. This is unexpected findings because skilled readers usually skip shorter words more as compared to longer words, but the data in this study show that the participants were not sensitive to word length which is unusual for skilled readers but could be common for struggling readers. The issue here is not problems with decoding words, but skipping words regardless of their length. This simply means that the participants did not encounter those words, but they simply jumped through the text while reading which is questionable because they were seeing the texts for the first time during measure 1 and read measure 2 sometime later which (depending upon the memory of the participants) might or might not have made them more familiar with the text that they were reading for the second time. These findings could be interpreted as evidence of visual and linguistic factors, that are affecting words skipped totally in the text (Rayner *et al.*, 2011). In addition, it could simply reflect a comprehension deficit because the reader skips these longer words and never regresses to them for the integration of decoding and linguistic comprehension.

4.6 Summary of the main findings

The global measure results from the study revealed several findings that increase our understanding about the eye movement patterns of these Sepedi-English bilingual participants from university and high school. The findings for the global reading measures reported in this study are mainly compared with findings of studies conducted on other continents. Where there

are relevant South African studies to refer to, they are used in the comparative discussion of findings as well. As stated above, eye movement research conducted in South Africa is also used for comparison, although not all the measures used in this study have been taken into consideration in the South African studies to date.

Eye movement studies that were conducted in South Africa among African language speakers were conducted by Van Rooy and Pretorius (2013) and Land (2011). Van Rooy and Pretorius (2013) reported data of Grade 4 IsiZulu home language speakers who read in both IsiZulu and English. Their findings indicated an average fixation duration of 363.2 ms for English and 408.0 ms for IsiZulu. The reading rate scores for the readers were categorised according to the scores they received for a reading comprehension test designed for their study (weak comprehenders, borderline comprehenders and comprehenders). The scores for comprehenders and borderline comprehenders were 80-90 WPM and 50-60 WPM for weak comprehenders in English, while the scores for IsiZulu reading in the study was 30 WPM for all the groups, suggesting that the readers were struggling to read the texts. In other studies, Land (2011) reported regressions of 20% for English and 21% for IsiZulu among participants who were between the ages of 16 and 61 years.

In the above studies, the analyses did not take into account all the variables included in this study. The findings by Van Rooy and Pretorius (2013) and Land (2011), as found in the South African context, differ from the findings reported in previous research in other countries. For example, Rayner (1998) in his study reported data from 10 skilled adult readers of English, with an average fixation duration of 216 ms, a saccade amplitude of 8.1 characters (2.25°), 11% regressions and an average reading speed of 308 words per minute. A comparison can also be made for students reading difficult mathematical text in English, which resulted in fixation durations of 254 ms and 18% regressions (Rayner and Pollatsek, 1989). On the other hand, Buswell (1922) reported that 8-year-olds showed an average fixation duration of 364 ms, a saccadic amplitude of 4.8 characters and 23% regressions, but the study did not test for reading speed when the participants read an English text.

From the comparison in the above paragraph, one can infer that South African readers, compared to the readers reported by Rayner (1998), Rayner and Pollatsek (1989) and Buswell (1922) read slower as reported in other studies (Makalela, 2010;2012). The fixation duration (219 ms) of the university readers in this study as compared to the readers reported by Rayner (1998) with 216 ms have a small difference which is not significant, but the students reported by Rayner (1998) make fewer regressions (11%) as compared to the university participants in this study who made 24.2% of regressions. In other words, although all the readers in these studies made similar fixation durations, the readers in my study made more regressions than the readers in the study by Rayner (1998). The school participants made shorter fixations as compared to the learners reported by Buswell (1922), who made longer fixations (364 ms). Although the school participants made shorter fixations than the participants reported by Buswell (1922), all the participants made the same number of regressions.

4.7 Conclusion

It is important to highlight the following findings at this stage of the thesis:

The findings observed in oral reading fluency data that are summarised in this conclusion explain the reading patterns of the participants better than any other variables discussed to date. Oral reading fluency tests tell us a lot about the reading abilities of the readers, and this is confirmed in a previous study (Makalela & Fakude, 2014), which also confirms that oral reading fluency is a reliable predictor for reading comprehension in children. This suggests not only that oral reading fluency is a better measure of reading comprehension than eye movements, but that the Simple View of Reading (SVR) needs the fluency component to complete its formula as suggested by Silverman *et al.* (2013). The findings also suggest that a large number of children read silently without really understanding. Therefore, the oral reading fluency is necessary to fully conclude if participants can read or not by adding a fluency measure. The data reveal that the participants hurry through the text with too large saccades and too short fixations, and pay a speeding fine in the form of poor comprehension and an excessive number of regressions and re-readings.

Shorter fixations mean allowing less time for processing words and thereby decrease comprehension, especially for struggling readers (Balota, 2016). When the participants in this study read aloud, they need to produce sounds, and therefore, at least part of the phonological activation is activated. These children need to practice reading aloud more in order to improve articulation, pronunciation, vocabulary, intonation and utterance. Furthermore, reading aloud develops visual memory, and the children can learn how to spell words when they voice them aloud. Children benefit greatly from reading aloud if they have mastered reading aloud by Grade 4 (Vorstius, Radach & Lonigan, 2014), but if children have not mastered the art of reading aloud, they will experience prolonged challenges as is evidenced by the performance of the university participants in this study. It is not possible to speed read (skip content) if you read aloud; therefore, reading aloud allows readers to engage with every word in the text fully. Speed reading is seen in the eye movement data that showed a lack of frequency effect in silent reading (but we might not see it in reading aloud). Children learn to read better if they start to practise oral reading. The participants who took part in this study (both from the university and the school) need to *slow down*: make longer fixations and shorter saccades. The slowing down may assist them in understanding better what they are reading. It seems very likely that they need to practice to fixate a word until they understand it before moving to other words. They would then make shorter regressions and fewer re-readings, and in the long run, once their reading is automatic, their reading speed would increase with comprehension. Why did these participants never learn such the basic oculomotor behaviour that provides online and linguistic processing which is essential for reading? It is not unlikely that these participants were taught that it is important that they move their eyes quickly over the text, and that comprehension is a secondary or unimportant part of reading. It is also possible that these participants have not learned the automatic eye movement behaviour that is central to fluent reading. Automatisations of eye movements takes place during the process of reading more texts aloud until the read-aloud protocols are mastered (Samuels, 2006a). This study has shown that oral reading fluency is an individual trait that can be incorporated into the Simple View of Reading (SVR).

What I found in this study was that the school participants generally found reading very difficult. This could be because they had not been exposed to a lot of reading and therefore had not experienced a lot of new words six to seven years into the schooling system, and also because they had not been taught well enough to read in the early stages of learning to read. These school participants can be classified as “poor comprehenders” (Hulme & Snowling, 2011) because they move their eyes over the text, and they struggle to extract meaning from what they are reading. This could be due to the participants never really having mastered the skill of

reading for comprehension during their foundation-schooling phase when they first learnt to read in Sepedi and English. The results of this study suggest that the reading problems are much deeper, in the automatisisation of eye movements, and further suggest that both the school and the university participants are not equipped to cope with the content of their relevant grade or university level, as evidenced by the slow reading speed and poor comprehension scores that were reported in chapter 4.

If it is accepted that Sepedi is the L1 and English the L2 of these participants, then their L1 reading is less fluent than their L2 reading. Since the texts in Sepedi and English were comparable in word length and difficulty, could this possibly suggest that English may be their actual L1 at school? Or is L1/L2 a meaningless distinction for these children? The answer could be that English becomes a priority for these participants because it is the language of teaching and learning for all subjects at school. The case is similar for university participants: they learn through the medium of English, and they are no longer required to take a subject in Sepedi, which means that they experience limited exposure to written materials in Sepedi.

The next chapter, Chapter 5, will look at the implications of the findings of the descriptive study of university and school readers of Sepedi and English for the Simple View of Reading and for using these languages in education. This chapter will further provide conclusions and recommendations for future research and educational practices.

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In South Africa, learners who study through the medium of their home language from Grade 1 – 3 in primary school and who then switch to the use of English as the language of teaching and learning from Grade 4 onwards are experiencing tremendous disadvantages when it comes to reading in academic institutions. Most of the participants in this study (from both university and school) have a *reading* problem because if they struggle with reading Sepedi texts, they also struggle with reading English texts. I cannot qualify their deficiency as a *language* problem, because they experience the same problems when reading in both languages. The purpose of the study was to examine the role of decoding and linguistic comprehension within the Simple View of Reading framework among university and school participants. In Chapter 1 the following research questions were formulated:

1. Overall research question: What characterises the university and school readers of Sepedi and English in the study?
2. Within the theoretical framework of the Simple View of Reading, what characteristics of decoding and comprehension define the reading of the Sepedi and English university and school participants in the study?
 - c) What conclusions can be made from describing first fixation duration, gaze duration, words skipped first and oral reading fluency with relation to word recognition (decoding)?
 - d) What conclusions can be made from describing fixation duration, saccadic amplitude, regressions, words skipped totally and comprehension scores in relation to linguistic comprehension?
3. What are the implications of the findings of the descriptive study of university and school readers of Sepedi and English for the Simple View of Reading and for using these languages in education?

Recordings of eye movement data have helped us to understand where participants look and what they look at. Previous research on eye movement for L1 and L2 reading comprehension for multilingual African language speakers is very limited. In addition, limited research has been conducted on the reading of comprehension texts in South Africa with the help of eye movement data. The purpose of this study was to make use of eye-tracking technology to describe the reading behaviour and patterns for Sepedi-English readers at school and university in a multilingual environment. This study consisted of a review of literature that explored the use of eye-tracking technology as well as an empirical study to investigate reading in Sepedi and English.

In this chapter, an overview of the findings of the study is presented and the findings are discussed and interpreted. This is followed by a discussion of the results concerning the research questions posed in chapter 1. The chapter further presents the implications that are drawn from this study. Also, the contribution of the study and how it adds to the body of knowledge on reading research in South Africa is added. The limitations of the present study are also discussed, and recommendations for future research are presented.

5.2 An overview of the study

In Chapter 1 the issues of reading comprehension were discussed and the following topics were covered:

- Simple View Reading (SVR) (Gough & Tunmer, 1986)
- Reading literacy (Perkins, 1991; Pretorius, 2000, 2002; Sisulu, 2004; Pretorius & Mampuru, 2007; Mahala, 2010; Hoffmann, Sailors, Makalela & Mathee, 2010; Makalela, 2012; Makalela & Fakude, 2014).
- The South African Language policy context (Bamgbose, 1991; Heugh, 2002, Benson, 2005; Makalela, 2005, 2009; Paxton, 2009) and
- English as a medium of teaching and learning in South Africa (DBE, 2010b:8).

Reading research has established that speakers of indigenous African languages are experiencing reading problems. Are the reading problems associated with language or is it just a struggle with reading in general? To position the research project, the purpose of the study was to examine the role of decoding (word recognition) and linguistic comprehension within the Simple View of Reading framework in a sample of high school learners (Grade 8 and 9) and first-year university participants who read Sepedi and English. The study is broadly examined within the Simple View of Reading (SVR) which is made up by two components; decoding and linguistic comprehension.

To address the issues of reading comprehension, I decided to investigate the university and school participants because these two different groups are at different levels of education and in different environments. These two groups have learned through the medium of English from Grade 4 and carried on learning Sepedi as a subject at school through Grade 12, making English the language of teaching and learning in their education. Their home language remained important as a language of cultural identity, but in terms of use as a language of teaching and learning, Sepedi (the home language in this study) is rated second at least until Grade 12. The education language policy states that in Grade 4, learners should use two of the official languages, but the policy does not specify which language or languages should be used as the language of teaching and learning. Hence the school governing body is given the power to decide which language is used as the medium of instruction. Many schools opt for English as the language of teaching and learning over indigenous African languages for obvious reasons discussed earlier in the thesis.

The study incorporated the use of eye-tracking technology because it provides detailed information on the eye movement behaviour of study participants. Chapter 2 provided a detailed overview of numerous studies that conducted eye movement research on reading as well as literature on language policy and multilingualism. From the literature review, it was established that good readers could be identified by examining their eye movement behaviour. This is done by measuring the duration of fixations, length of saccades and the number of regressions displayed (Ashby, 2006; Reichle *et al.*, 2003; Rayner *et al.*, 2005; Rayner, 2009; Rayner *et al.*, 2006; Starr & Rayner, 2001; Slattery *et al.*, 2011). Research that focused on the measure of first fixation duration (Reichle *et al.*, 2003; Ashcraft & Radvansky, 2006; Starr & Rayner, 2001) and regression (White, 2008; Reichle *et al.*, 2003; Rayner, 2001; Rayner, 1998; Rayner *et al.*, 2006a) was also reviewed comprehensively in Chapter 2. Chapter 2 also established that word frequency and word length affect the reading of a text, where low-frequency words have longer fixations than high-frequency words (Inhoff & Rayner, 1986; Rayner & Duffy, 1986; Reichle *et al.*, 2003; Rayner, 1996; Ashby, 2006; Liversedge & Findlay, 2000; Rayner, 1998; Whitford & Titone, 2012). Chapter 2 also cited gaps in previous eye movement research and discussed the limitations noted in earlier research which focused on L1 and L2 reading comprehension. Some of these eye-tracking studies focused on the reading of sentences as the stimulus (Reichle,

2003; Ashby, 2006), or the reading of a novel half in English and the other half in Dutch, for example (Cop *et al.*, 2017), or the reading of a paragraph in English and French (Whitford & Titone, 2012).

The eye-tracking research presented in this study focused on the reading of Sepedi texts where Sepedi is perceived as the L1 and English is perceived as the L2. South African studies that focused on eye movement research were conducted by Van Rooy and Pretorius (2013), who investigated the reading of isiZulu speakers reading in isiZulu and English, and Land (2015), who investigated isiZulu speakers reading only in isiZulu. Other research that focused on the reading of L1 and an additional language include that of Ashby (2006) on the reading of English native speaking students; studies by Hyönä and Nurminen (2006) on Finnish students; studies by Whitford and Titone (2012; 2014) on French and English reading; studies by Cop *et al.*, (2017) on Dutch and English reading; and studies by Balling (2017) on Danish reading by students.

The present study sought to address the identified gap by using an eye tracker to investigate the reading behaviour of participants at university and high school levels reading in Sepedi (L1) and English (L2). To conduct the experiments for the study, data were collected using several instruments: reading comprehension texts, an oral reading fluency test, and an attitude questionnaire on the language history and the perceptions and attitudes of the participants towards Sepedi as a language of teaching and learning. The reading comprehension text was read using an eye tracker (SMI iViewX Hi Speed). The participants were tested individually, and after reading each comprehension text, the participants completed a pen-and-paper comprehension test to ensure that they had read the text for understanding. Once the participants had completed the comprehension texts on the computer (while the eye tracker traced their eye movements), they were asked to read aloud a different set of texts while they were recorded on an audio recorder; this is known as an oral fluency test, and the participants' eye movements were not recorded during this component. The language attitude questionnaire was issued to the participants once the eye-tracking experiment and oral reading fluency test had been completed.

5.3 Summary of Findings for each research question

Consistent with previous research, measures of decoding and linguistic comprehension are significant predictors of reading comprehension with the oral reading fluency measure added to Gough and Tunmer's (1986) SVR (Santoro, 2012; Catts, 2018; Johnston & Kirby, 2006; Tilstra *et al.*, 2009; Keenan *et al.*, 2008; Spear-Swerling, 2004; Adlof *et al.*, 2006; Catts *et al.*, 2006; Chen & Vellutino, 2007; Verhoeven & Leeuwe, 2008; Goff *et al.*, 2005; Cutting and Scarborough, 2006; Makalela, 2010,2012; Silverman *et al.*, 2013). The summary of findings in this chapter is discussed in terms of the research questions formulated in chapter 1. The aim of this section is to provide a brief concluding summary of the responses of the research questions formulated in the study.

Research Question One

Characteristics of the university and school readers of Sepedi and English

Results for the first research question indicated an even spread of participants by gender. The findings indicated that the parents of the participants vary in their level of education, suggesting that the participants come from different educational backgrounds. The majority for both university and school participants indicated that Sepedi was their strongest language and English was their second strongest language. The majority of the participants learnt Sepedi first;

however, a few participants learnt English first at nursery school. The university participants were generally positive and confident about their ability to speak, write, read and understand Sepedi and English, but reading was perceived as the least developed skill for Sepedi. The school participants were generally positive and confident about their ability to speak, write, read and understand Sepedi and English, but a few, although they were positive, were not satisfied with their ability to speak Sepedi. Reading was perceived as the least developed skill for Sepedi compared to speaking, writing and understanding but the English data was similar across speaking, writing and reading and higher for understanding but the school participants' level of satisfaction with their proficiency in English was very low. Generally, both university and school participants were positive about Sepedi as the language of teaching and learning at schools for scientific subjects even though the university participants felt differently about the idea. The participants pointed out that reading Sepedi and English made a large contribution to learning and using the languages. Generally, the majority of the participants read more in English compared to Sepedi and other additional languages they know.

Research Question Two

Characteristics of decoding and linguistic comprehension that define the reading of Sepedi and English university and school participants

The oral reading fluency data showed that the participants made 7 different types of miscues, but misspelling words occurred more for both university and school participants compared to other miscues. The data for miscue analysis revealed that the school participants made morphological spelling errors. Inflectional endings are meaningful because they give different meanings to words. Possible reasons why the participants make these kinds of errors is because of the lack of knowledge of Sepedi and English grammatical rules which are part of morphology. Also, the data revealed that the participants made mistakes by missing inflectional endings in progressive verbs. Whentaken together, orthographical knowledge is essential in learning spelling and acquiring spelling skills to improve correct word identification and accuracy with correct spelling. Generally, the data show variations with different conditions but reading patterns for both participants is similar across language and text types. Although the university and school participants performed better when reading English texts when compared to reading Sepedi texts, the differences between the results were not statistically significant.

Research Question (a)

Conclusions on describing decoding measures

The data revealed that more regressions are associated with higher fluency for both university and school participants, with more variations in school participants. Both university and school data showed that larger saccades are associated with higher fluency, with more variations in school participants. School participants' data showed that higher comprehension scores correlate with higher fluency, while this relationship was not reported for university participants. University participants showed that shorter fixation duration is associated with higher fluency, while there is no association among school participants.

The oral reading fluency data for English indicated that university participants inserted and misspelt words more than other miscues, while they substituted and misspelt words more compared to other miscues while reading Sepedi texts. On the other hand, the school participants' data indicated that the participants omitted and misspelt words more compared to other miscues while reading an English text. On the other hand, they omitted, substituted and misspelt more words when compared to other miscues while reading Sepedi texts.

The WPM (word per minute) data showed that higher speed is associated with fewer regressions and shorter fixations for both university and school participants. In addition,

participants read faster reading generic texts compared to academic texts. Furthermore, university participants read faster in English compared to Sepedi, while school participants showed no statistical difference related to reading speed in Sepedi and English.

Generally, the data showed that word frequency, and word length affected gaze duration, words skipped first, and regressions out of words, but there were no effects for first fixation duration. All conditions that formed part of the reading exercises in the study showed effects for first fixation duration, words skipped first and regressions out of words; except for English academic text measure 1 and English generic text measure 2 which showed no effect for first fixation duration, words skipped first and regressions out of words.

From the findings, the results for university participants showed that they exhibited longer first fixation durations on low-frequency words compared to high-frequency words, but no effect was found for word length. This means that the participants read the text the same way while they were reading measure 1 texts and measure 2 texts. When reading the Sepedi academic text, the results showed that university participants exhibited longer first fixation durations on low-frequency words reading measure 2 texts compared to measure 1 texts. When reading an English generic text, the university participants made longer first fixation durations reading measure 2 texts than reading measure 1 texts, although the measure 2 texts showed that low-frequency words received shorter first fixation durations. When reading a Sepedi generic text, the university participants made longer fixation durations reading measure 1 texts compared to reading measure 2 texts, which shows a small insignificant effect, and this showed that the university participants made shorter fixation durations on low-frequency words, but the difference is not statistically significant.

The results for school participants indicated that when reading an English academic text, participants made longer fixation durations reading measure 2 texts compared to reading measure 1 texts. When reading a Sepedi academic text, the results showed that the school participants made longer fixation durations on high-frequency words in measure 1 compared to reading the measure 2 text. When reading an English generic text, the school participants made longer first fixation durations on low-frequency words reading the measure 1 text compared to reading the measure 2 text, showing longer first fixation durations on low-frequency words, which was not significant. When reading a Sepedi generic text, the school participants made longer first fixation durations on low-frequency words reading the measure 1 text, while in the measure 2 text longer first fixation durations were made on low-frequency words, but the effect is not statistically significant.

The major finding in this study is that the reading behaviour we can see in the eye-movement data indicates a mis-automatisation that likely happened early for these children when they first started to learn to read, and that there is no easy way to help set it right later on in their lives. I believe that the one way to help these children is to structure the teaching of reading in the early grades differently: children should start to read aloud, not silently, and reading aloud should be continuously monitored during the early years; and children should be encouraged to read for comprehension, not for speed. Furthermore, children should read at home with their families. According to Pretorius and Mampuru (2007:56), for literacy development to take place, learners must practice reading if they aspire to become good readers. To practice reading, the learners need greater exposure to print materials from an earlier age, and the exposure should continue throughout their lives.

Research Question (b)

Conclusions on describing linguistic comprehension measures

Generally, the data showed that word frequency and word length affected words skipped totally. All conditions except for English academic text measure 1 and English generic text measure 2 showed no effect for words skipped totally.

The data showed that the participants made longer fixation durations which were associated with fewer regressions. In addition, longer fixation duration was evident in Sepedi than in English for both university and school participants. The saccadic amplitude data revealed longer saccades in English compared to Sepedi, and shorter saccades were associated with fewer regressions for both university and school participants. Regression percentage showed a variation across participants; with university participants making more regressions in academic texts, while school participants made more regressions in generic texts. In addition, university participants made more regressions in English, while school participants made more regressions in Sepedi. The comprehension scores for measure 1 and measure 2 were similar for university participants reading English texts, while comprehension scores declined in measure 2 for Sepedi. The school participants indicated similar patterns for comprehension scores in both measure 1 and measure 2 for both English and Sepedi. Generally, the university participants scored higher for generic texts than academic text as well as higher scores in English. However, the school participants did not have a differential performance with regard to their comprehension scores across text types but scores were higher for Sepedi compared to English.

Concerning comprehension, the main finding of the study indicates the reading behaviour that was carried on from early reading or struggles with decoding, suggesting that the participants transferred whatever type of reading issues from earlier reading which impedes comprehension among the participants in this study.

Research Question Three

Implications of the findings for the SVR and using Sepedi and English in education

In general, previous research has supported the fact that decoding and linguistic comprehension measures have the power to predict variability in reading ability in lower grades (grade 3-5) through university. According to the SVR, it is important to teach comprehension because it is evident that comprehension skills are assessed but are rarely taught (Pressley, 2006).

One way to improve the reading development of readers such as those at university and school in this study would be to explore different ways to use both languages, Sepedi and English, as compared to how they are being used now. In other words, instead of trying to develop literacy in the L1 (Sepedi in this case) and only use it as a language of teaching and learning until Grade 3, and developing literacy in the L2 (English in this case) in the short time between Grade 1 and 3 and then to switch to English as the main language of teaching and learning, one could consider approaching the literacy development of participants such as those in the study as a bilingual affair from the start. Scholars such as Banda (2010) have advocated for a “multilingual repertoire-based pedagogy”, and recently Coetzee-Van Rooy (2018) proposed that there is a clear bilingual grouping for literacy which she has observed in her studies of the multilingual repertoires of students in the Vaal Triangle region. Conceptualising of these readers as bilingual Sepedi-English readers with communicative competence in additional languages

when one designs appropriate language in education policies and plans would change how we develop reading for these readers in South African schools.

Previous studies (Manyike, 2012; DBE, 2014) have reported that in the lower grades (Grade 7 and below) the learners perform poorly because they struggle to understand the texts they read. One of the many ways to counter this problem is to allow learners in the classroom to use languages they are familiar with as resources. That is, to allow learners to provide their output in the language of their choice, even if they received the input in a different language. This provides learners and teachers with an opportunity to maximise their skills and may increase learners' participation in the classroom. Developing Sepedi-English bilingual readers within a framework of multilingual pedagogies like those referred to above would activate the strengths of the learners in more of the languages that they know and would hopefully advance their reading proficiency as well.

The language policy posits that schools should use an official language as the language of teaching and learning. In Grade 1 and 2, the policy posits that all learners must receive an education using at least one approved language, but the responsibility lies with the governing body of the school to select the appropriate language. Some schools use the home language in Grade 1 and 2, and some schools opt for English right from Grade 1. The policy further states that in Grade 3 a first additional language must be introduced in addition to the language of instruction. What is currently happening in government schools is that if a school chooses to use the learner's home language as the language of teaching and learning in Grade 1 and 2, they introduce English as a first additional language in Grade 3. English is supposed to be used as an additional language, but in Grade 4 the language of teaching and learning is switched from home language to English in government schools. This approach is supposed to be in line with the linguistic interdependency and threshold hypothesis, which posits that the L1 to L2 transfer predicts the successful development of a second language at school (Cummins, 2005). This means that learners must acquire skill in one language and then transfer the skill to another language later (Mgijima & Makalela, 2016:89). But if the skill has not yet been acquired and developed in one language, then it creates "The Fourth Grade Slump" when the children have to switch from their home language to English as the language of teaching and learning in Grade 4. This approach treats languages as separate and does not fully provide support for multilingual classrooms that seek to promote simultaneous development in two or more languages.

From the findings, oral reading fluency was predicted by several variables (regressions, saccadic amplitude, comprehension scores and fixation duration). Educators need to make use of oral reading fluency tests for diagnostic purposes. This is because oral reading fluency is a reliable predictor of comprehension and academic performance. From the findings of the study, the participants who performed well in reading comprehension tests were fluent. Furthermore, the findings revealed that the participants who were less fluent performed poorly in both Sepedi and English comprehension tests. Educators need to use oral reading fluency tests because they can offer insights into the difficulties that learners are experiencing. The oral reading fluency test would also provide more information that can help educators to design focused instructions for the learners. Oral reading fluency tests can be given at the beginning of the year in class because it can assist the teacher with placement. The Annual National Assessment (ANA) (DBE, 2010) was administered towards the end of the year, which does not provide an opportunity for intervention because it is very late in the year for learner placement according to their needs. Educators need to use oral reading fluency tests because they can establish whether learners are struggling with reading texts fluently, whether they are reading the text with accuracy, and whether they are understanding the word meanings.

Educators can implement different instructional strategies where they teach learners definitions of words and use the words in a context such as a sentence. These instructional strategies include vocabulary teaching, activating the background knowledge of the learners and repeating the responses said by the learners. By introducing these instructional strategies, this will allow the learners to spend more mental effort to learn the meaning of the word. Lastly, to learn the meaning of the word repeatedly and through different contexts (Tan, *et al.*, 2007:26). Educators can provide instructional teaching of vocabulary knowledge by teaching learners word meanings. According to Carnine *et al.* (2004), when students are involved in independent reading, they can learn word meanings. Educators can also activate learners' background knowledge by asking students questions to prompt what they know about the topic. Educators can also repeat the responses to the students in order to help them remember what they said. Carr and Thompson (1996) found that all the participants in their study benefitted greatly from the background knowledge activation strategy when passages were unfamiliar. The participants in this study require various kinds of vocabulary interventions that can be used to teach word meaning. According to Le (2014), educators can also put more effort into phrase reading if they want learners to improve their reading speed. It is noteworthy that learners need to increase their reading speed, coupled with comprehension. Learners who struggle with phrase reading but excel in word-by-word reading cannot compete with learners who excel in phrase reading because they are able to make quick decisions based on the ability to digest more information within a short space of time. Educators need to help learners to identify phrases if they are going to use the phrase reading strategy. In addition, they should also introduce it before students are involved in fixing their eyes on the texts. Educators should ensure that learners are acquainted with the combined effort related to physical and mental activity when fixing their eyes on phrases. This suggests that in order to create eye strain for learners, they should be trained first with identifying short phrases before intensive training is given with longer phrases (Le, 2014:33). Once the ability to combine physical ability (i.e. eye fixation) with mental ability (i.e. phrase identification at the level of form and meaning) fluency will result. This will enhance the process of comprehension (Le, 2014:33).

For other variables, if educators, make use of miscue analysis, they would know the kind of errors that their learners are struggling with and offer relevant reading development and support. For example, the miscue analysis data in this study revealed that learners struggle mostly with the spelling of words. Research showed that if learners have a good foundation and were taught the writing system, spelling system and spelling strategies in their home language, then learning a second language will happen quickly. Berkel (2005:97) revealed in a study conducted among Dutch participants that they found it easier to learn English because their writing system, spelling system and spelling strategies were well-developed in Dutch.

In addition, learners and students need to be aware of inconsistencies related to the writing and spelling system of English. Educators can have students listen to pronunciation or have them listen to a good reader. The miscue analysis revealed that the participants experienced problems with homophones, and they substituted a lot of words when reading English. Educators can also provide the participants with examples of vowels that can be spelt differently. If the participants are granted an opportunity to learn Sepedi and English orthographical regularities, they would be aware of spelling, and that would prevent them from overgeneralising spelling rules (Bancha, 2013). Therefore, pronunciation should be emphasised because participants can then avoid mistakes resulting from mispronunciation. Teachers can emphasise this by introducing dictionaries which can help learners with accurate spelling as this will also allow them to check pronunciation or phonetic symbols. Letter and sound correspondence teaching and knowledge of phonemics is important and can assist learners in coping with most of the words. It is worthy to note that the differences in Sepedi and English did not cause spelling mistakes as languages, but the participants should be aware of orthography, phonology and morphology.

Previous research revealed that learners' knowledge of prefixes and suffixes of words increased by grade 3 and 5 (Anglin, 1993). However, the oral reading fluency data in this study revealed that participants struggled with suffixes and often made substitutions while reading. The study revealed that decoding was somewhat accurate for university participants but due to shorter fixation durations and more regressions, the reading rate may not be adequate to support comprehension. The data in this study revealed that participants read faster in English as compared to Sepedi; with a lot of variations in English and Sepedi comprehension scores in both university and school participants. Therefore, it is vital to rethink L1 and L2 reading instruction to understand how to develop the participants as bilingual readers. On this note, it is important to take students' interest into account and select materials and reading tasks that are related to pleasure, information and general understanding (Brevik & Hellekjaer, 2018:89). It is worthy to note that by grade 8 and 9 the learners must have been already exposed or aware of morphology to support the development and rate of decoding skills (Nagy, *et al.*, 2006). Previous research (Beaman & Wheldall, 2000) argued that decoding is a pre-requisite for comprehension because without it, it is impossible to make meaning in texts. The findings also suggest that there is a mis-automatisation issue that hinders decoding skills which later impedes linguistic comprehension skills. The participants lack the word and letter identification skills. Once teachers know and understand the kind of errors the learners make, then they can design programmes that would address each and individual learner. If a learner is a struggling reader, like most of the learners in the present study, then the oral reading fluency test can be used for placement in the schooling system, and this will assist teachers greatly to place learners in additional reading support programmes at a much earlier stage of their educational level in a planned way.

The SVR posits decoding and linguistic comprehension as the two basic components of reading comprehension. To develop decoding abilities, educators need to design programs to develop the learners' basic components of alphabetic principles of phonemic awareness in Sepedi and English. It has been documented that learners need to know and master the alphabetic principle and the knowledge of letter-sound correspondence (Tan, *et al.*, 2007). The key is for educators to teach letter-sound correspondence and how to use this knowledge to decode words (Ehri, *et al.*, cited by Tan, *et al.*, 2007:22). Educators need to emphasise blending and segmentation skills which are directly linked to decoding. For example, if students hear certain alphabets, they would be able to say the words s/u/n=sun. Educators can ask learners to "pronounce the continuous sounds as a single unit by stretching out the sounds without pausing (e.g., /mmaad/) (Blachman, *et al.*, cited by Tan, *et al.*, 2007:22). Given that the data revealed that the majority of the school participants presented deficits in decoding, it is vital to determine how decoding ability contribute to reading comprehension. Contribution of decoding ability towards reading recognises words accurately and instantly. This process requires repetition and familiarity with these words through reading which will lead to sight words if they are read regularly during reading (Tan, *et al.*, 2007:21).

It is of importance for educators to acknowledge that learners may be able to decode words in isolation or in lists accurately and automatically, but they should, however, note that it is essential to ensure that they introduce decoding at a text-based level (Tan, *et al.*, 2007). In addition, educators should also take note of the learners' reading rate because there may be students who can decode words but at a slow rate which has the potential to impede comprehension. According to Tan *et al.* (2007) when a reader reads slowly, it affects their cognitive processing skills leading to no space for comprehending and also that readers might forget the words at the beginning of the sentence by the time they reach the end of the sentence. Educators can introduce repetitive reading as one of the fluency instruction strategies. According to Samuels (2002) when learners read a text repeatedly, they do so until they reach a certain level of fluency. This is achieved when learners are able to read unassisted by reading simultaneously with the teacher or an audio recording device. Another important element the educators need to take into consideration is the use of texts that are at the appropriate level of the students. Educators can apply reciprocal teaching and peer-assisted

learning techniques where learners can analyse the texts together. The literature on comprehension skills suggests that “comprehension monitoring, mental imagery, identification of title and key ideas, previewing, predicting and summarising text raise comprehension skills of learners” (National Reading Panel, 2000; Pressley, 2006; Kirby & Savage, 2008:79). Other additional skills, including reflection on sound structure and phonology, can be incorporated into enjoyable and fun games in the classrooms to keep learners interested in learning. According to the SVR children with good decoding and poor comprehension skills do not need their phonics to be developed; instead, the comprehension skills should be developed. Educators have a duty to design approaches that help learners to decode words in connected texts in addition to isolated words.

5.4 Discussion of the Findings

The findings of the study show that there were very strong correlations of eye movement measures between Sepedi and English when correlating fixation duration, saccadic amplitude, regressions and WPM. This means that if a child/student is a good reader in Sepedi or English, he or she is a good reader of both languages. The correlation for oral reading fluency showed a positive relationship between Sepedi and English; it is the traits of the individual participant that make him or her a good reader in both languages. From this, I can say that individual traits account for reading ability concerning reading aloud. It is difficult to say what the traits are that make a reader good in a low socio-economic environment that fosters poor readers. South African learners generally perform poorly in literacy and numeracy (Van Standen & Bosker, 2014). Many factors contribute to this poor state of affairs.

In South Africa, among black people, there is no reading culture (Pretorius, 2002; Mahala, 2010). Children lack access to reading materials, and they do not have anyone at home to read with them because the parents are likely to be illiterate. Poor readers have challenges directing enough of their attention to comprehending the meaning of the text because they are still at the decoding level (Eldredge, 1988). Furthermore, they perceive reading as a word-by-word decoding process rather than processing meaningful sentences and phrases, which has the effect that oral reading sounds like “barking the text” (Makalela & Fakude, 2014). In schools where indigenous South African home languages are used as the medium of instruction, the opportunity for learners to use their mother tongue as the language of teaching and learning only exists until Grade 3. More and more schools go straight for English language instruction due to better access to reading materials, better resources and appropriate teaching methodology (Boakye, 2015). By the time learners switch their medium of teaching and learning from their home language to English in Grade 4, they do not have a solid school literacy foundation in either English or the home language.

Children who come from low socio-economic backgrounds are likely to experience reading difficulties, and this can lead to failure throughout their school years. Buckingham *et al.* (2014:429) describe socio-economic status as comprising three components, namely household income, parents’ occupation and parents’ education. Studies on the relationship between socio-economic status and literacy have shown a positive correlation (McMillan & Western, 2000). To address this problem, there is a need for teachers to close the gap between poor and good readers by having “well-informed and realistic” plans to address the reading problem at school (Pretorius & Machet, 2003:129). Numerous factors contribute to the poor reading performance of many South African schools. The environment that many South African learners come from is rife with poverty and disadvantages which are manifested by the inadequacy of physical resources, overcrowding of classrooms, and inadequate supplies of learning materials and books. The strongest predictor of literacy development and success at school is when learners are fully involved with book-based activities. Newman (1999) reported that there is a significant

increase in the children's receptivity to languages when there are books and verbal engagement with storybooks between caregivers and children. For many South African children, the circumstances in which school and literacy development are started are not ideal. Many scholars refer to the crisis in primary education (Fleisch, 2008; Spreen & Vally, 2010; Spaull, 2013). The results from the present study indicate the degree of the crisis in the South African context to some extent: in 2017, neither the university participants nor the school participants in this study could be regarded as being good readers in Sepedi or English.

The major findings for first fixation duration, gaze duration, words skipping and regressions out of words are the following:

(1) The findings of this study showed that the first fixation duration showed no real effect on word length and word frequency, while gaze duration showed an effect on word length and word frequency. The lack of word frequency effect on FFD (First Fixation Duration) is proof that the participants regressed within or out of words before they had activated the lexical meaning of the word. This also means that the participants skipped the words but regressed back to the words in the process of reading. This findings from the study are consistent with the idea of mis-automatisation of reading. This propensity to regress too quickly could be a major explanation of why the reading ends up at a slow rate of 50 WPM.

The first fixation duration has often been reported to be dependent on word length and word frequency. For instance, in a recent study conducted by Whitford and Joanisse (2018), their bilingual participants were found to be slower at processing low-frequency words, and they showed larger effects in first fixation duration for L1 (French) word frequency. These results are the very opposite of what I found in my study. My findings also contradict the findings of studies by Inhoff and Rayner (1986), Rayner and Duffy (1986), Schilling, Rayner and Chumley (1998), Sereno and Rayner (2003), and Tiffin-Richards and Schroeder (2015), who all found that low-frequency words are first-fixated for a longer duration than high-frequency words. Other studies, such as those by Blythe *et al.* (2009) and Liversedge *et al.* (2004), reported that eye movements were influenced by word length and word frequency. The data in this study indicate the value of decoding because if the participants simply skip words and later regress, it means that they have problems registering the importance of those skipped words the first time they read the sentence.

(2) One of the most surprising findings of this study is that participants reading English academic measure 1 and English generic measure 2 showed a lack of effect for word frequency on FFD, gaze duration, words skipped first, words skipped totally and regressions out of words in university participants, while English generic measure 1 and Sepedi generic measure 1 data showed a lack of effects for word frequency and word length on FFD, gaze duration, words skipped first, words skipped totally and regressions out of words in school participants. This is an unexpected finding, and it is not clear what exactly could have caused this reading pattern, which only exists under these two specific conditions. These findings indicate that the participants were reading simply by moving their eyes over the text without paying attention to the content of the texts.

Skilled readers who read texts for comprehension are supposed to be sensitive to word length and word frequency which they show by exhibiting longer first fixation duration and gaze duration on low-frequency words and longer words compared to high-frequency words and shorter words. They are also careful readers but do not fixate every word when reading texts. Therefore, they skip shorter words and high-frequency words more compared to longer words and low-frequency words. Furthermore, they make more regressions on longer words and low-frequency words compared to shorter words and high-frequency words. In this study, and according to the findings highlighted in this paragraph, the participants completely disregarded word frequency and word length in certain conditions when they were reading, or more correctly, when they were moving their eyes over the text.

The reading behaviour exhibited in these findings tells us that the participants were reading these particular texts (for university participants, referring to the English academic measure 1 and English generic measure 2; and for school participants, English generic measure 1 and Sepedi generic measure 1) *mindlessly* while for the other texts, the eye-movement data indicate that the participants read in a reasonably normal way aligned with findings of other studies. This discrepancy is very difficult to explain. Perhaps the readers were exhausted from the reading efforts they had put into other texts and had given up on understanding? Or could it be that these participants were not concentrating during the reading of certain texts? According to Smallwood and Schooler (2006), failure in semantic processing can occur if readers shift their attention away from external stimuli (such as awareness of their environment and the task at hand), and the changes in the reading patterns are reflected by semantic or lexical processing (Foulsham, *et al.*, 2013). The pattern for all five measures reported in this study suggests that the school participants struggle to read because their reading behaviour reflects that of an unskilled reader. These results were expected and are not surprising. The expected results related to the lack of effect on word frequency and word length in this study could be because the readers shifted their focus from the task of reading at hand, which is associated with poorer reading comprehension as reported by many scholars (Smallwood & Schooler, 2006; Schooler, Reichle & Halpern, 2005; Smallwood, Fishman & Schooler, 2007). Up to this point, the findings in this study does support the SVR in that the reading patterns as explained in this chapter reveal that the participants' failure to comprehend the reading of texts is related to decoding variables. First fixation duration, gaze duration, words skipped first, and regressions out of words highlight the reading difficulties experienced by some of the participants in this study. Failure to decode results in the incompleteness of the SVR, which suggests that reading comprehension is only accomplished if both decoding and linguistic comprehension components are known.

Another reason that could explain the results related to the lack of effect on word frequency and word length in this study could be that the readers had not yet mastered the reading skills that they were supposed to have learnt during the establishment of letters to phonemes correspondence in Sepedi or English (Doignon-Camus & Zagar, 2014:1147) which is part of the decoding component in the SVR (Gough & Tunmer, 1986). The reading pattern of the participants showed that they did not stop to process the words before they either regressed or moved on to the next word, but continued reading. They probably did this in the hope that they would find clues further back or down in the text that would help them to understand the meaning of the word that they were finding difficult. But then, they made more regressions, which simply mean that they paid the penalty for rushing through the text and reading without successful lexical activation. Several words had 4 to 5 out-going regressions per participant for both university and school participants, which contributed to the very high global regression rate reported in earlier in chapter 4. This finding also shows that regression rate can help us to understand the reading pattern of the participants better. If readers regress out of words up to eight times, they make many saccades forward to the word, regress from it again, and then forward again, going back and forth. This reading pattern illustrates the characteristics of unskilled Sepedi-English reading in the case of this study.

(3) The regressions out of words show that in university participants word length affected the number of regressions out in all the conditions. When reading English academic measure 1, English academic measure 2, Sepedi academic measure 1, Sepedi academic measure 2, English generic measure 1, English generic measure 2, Sepedi generic measure 1 and Sepedi generic measure 2, the participants exhibited more regressions on longer words compared to shorter words. The effects of word length found in university participants reading in all the conditions is consistent with the findings of previous research by Rayner and McConkie (1976), Rayner *et al.* (1996), Joseph *et al.* (2009), and Foulsham *et al.* (2013), who reported that adult readers exhibit differences in their eye movement when reading longer words compared to short words.

(4) In this study, participants who read Sepedi academic text measure 1, Sepedi academic text measure 2, English generic text measure 1 and Sepedi generic text measure 1 exhibited longer gaze duration on low-frequency words compared to high-frequency words. This finding is consistent with Rayner and Duff (1986), Sereno and Rayner (2003), and Foulsham *et al.* (2013), who found that gaze duration was longer on low-frequency words than high-frequency words. This is also consistent with what Whitford and Joanisse (2018) found in their study, where they reported that bilinguals were slower at the processing of low-frequency words and that their results also indicated large effects in gaze duration for L1 (French) word frequency. On the other hand, the lack of word length effects on gaze duration for English academic text measure 1, English academic text measure 2, English generic text measure 2 and Sepedi generic text measure 2 is consistent with the lack of a significant effect of word length on gaze duration for adult readers (Joseph *et al.*, 2009).

(5) The difficulty level of the text determines word skipping. Rayner and Fischer (1996) found that the skipping of words was determined by how easy the meaning of a word was to access. The data for word skipping in my study show that the participants who exhibited word frequency and word length effect skipped high-frequency words more compared to low-frequency words, and they also skipped shorter words more compared to longer words. In university data, the participants skipped shorter words more often compared to longer words, and this is evidenced in all the conditions. Previous studies have established that skilled readers skip high-frequency words more than they skip low-frequency words, while at the same time they skip shorter words more than they skip longer words, which is consistent with what I found in the university participants' reading in all conditions, but it is only applicable to word length. One surprising factor is that word frequency showed no effect for two conditions, namely: English academic text measure 1 and Sepedi generic text measure 2 for university participants.

The results for school participants indicated that when reading English academic text measure 1, English academic text measure 2, Sepedi academic text measure 1 and Sepedi academic text measure 2, the participants skipped shorter words and high-frequency words more than longer words and low-frequency words. Surprisingly, when the school participants read the English generic text measure 1 and Sepedi generic text measure 1, they showed no effect (see results section in chapter 4) for all the eye movement measures. The results of this study contradict those of Brysbaert and Vitu (1998), Reichle *et al.* (1998) and Kliegl *et al.* (2004), who found that word length influences word skipping for both adults and children, but it may be that children and adults use different strategies when reading texts. These word length effects on skipping can be explained by parafoveal linguistic processing of words. The results could mean that the participants read mindlessly; that is, they were moving their eyes on the page without understanding or even paying attention to what they were reading.

(6) This study also reports findings on words skipped totally. The data show that the participants in this study skipped shorter words more often than longer words, and they also skipped high-frequency words more than they skipped low-frequency words. This is shown in university participants reading English academic text measure 2, Sepedi academic text measure 1, Sepedi academic text measure 2, English generic text measure 1, Sepedi generic text measure 1 and Sepedi generic text measure 2. In the school data, the participants showed word frequency effects and word length effects when reading in all the other conditions, except when reading English generic text measure 1 and Sepedi generic text measure 1. These results concur with what Joseph *et al.* (2009) reported on children's reading, which showed that they skipped shorter words more compared to long words.

The data also show the effect of word frequency and word length on regressions out of a word. Generally, more regressions could suggest that the readers are struggling with decoding and processing the word, phrase or sentence. For university participants, the results of regressions out of a word for word frequency effects showed that the participants exhibited more regressions out of a word for low-frequency words compared to high-frequency words when

reading English academic text measure 2, Sepedi academic text measure 1, Sepedi academic text measure 2, English generic text measure 1 and English generic text measure 2. This finding is consistent with Sereno and Rayner's (2003) study, which reported that the frequency effects for low-frequency words relate to increasing more chances of regressions than high-frequency words. In other studies, De Luca *et al.* (cited by Dürrwächter *et al.*, 2010:88) reported poor reading skills of participants and found effects for word length, but no effects for word frequency that affected eye movements in dyslexic Italian children, while Dürrwächter *et al.* (2010:96) reported that word length and word frequency led to an increase in eye movements of German children (L1), which showed that they had a higher percentage of regressions for low-frequency words than high-frequency words.

The results in this study may be reflecting the socio-economic factors that generally affect South African schools, especially in the townships (see Chapter 3 Section 3.2.3). Pretorius and Klapwijk (2016:5), report limited access to print materials and to the Internet in most South African schools. In the current study, school participants encountered print materials in restricted areas where print materials for L1 is not easily accessible, unlike English L2 material, which is easily accessible at schools. These children experience a lack of semantic diversity (words appearing in a wide range of contexts) due to lack of access to reading materials in indigenous language at home (Sepedi in this case). Scholars report that black South Africans, in general, do not have a reading culture (Sisulu, 2014). In a study conducted by "The Progress in International Reading Literacy Study" (PIRLS), about 78% of Grade 4 children in South Africa who participated in the 2011 and 2016 study were rated as illiterate (Kubheka, 2017). Despite these reports about the lack of availability of resources and print or online materials in African indigenous languages, it still does not answer the question of why the participants in this study read the way they read. The descriptive data presented in chapter 4 indicated that most of the reading that the participants engage in is in English as compared to other languages such as Sepedi which is perceived as the home language and strongest languages for the majority of the participants in this study.

The data for university and school participants indicate that the participants fixated longer when they read Sepedi texts compared to when they read English texts, which is expected, bearing in mind that the participants in this study use English as the medium of instruction at school and at university even though they learnt Sepedi first as observed in chapter 4. The university participants made longer fixation durations in measure 1 texts than in measure 2 texts, while school participants made longer fixation durations in measure 2 texts than measure 1 texts. The data show that the university participants changed their reading pattern by reading faster and making shorter fixations reading the text in measure 2. This means that the participants rushed through the text in measure 2 compared to when they read the text in measure 1. This is evident in the comprehension scores, which indicated that their performance also lapsed and it could be caused by the reading speed observed in measure 2 texts. In school participants, instead of rushing through the text, the participants slowed down a bit in measure 2, and this resulted in longer fixation durations in measure 2 text reading. Despite slowing down, the comprehension scores dropped, indicating that the slowing down did not benefit their reading comprehension as was expected. This means that these participants are struggling with decoding, and they cannot fully comprehend what they are reading.

Skilled reading is associated with good comprehension, which is accomplished with successful decoding and linguistic comprehension, and faster reading indicates fluency. These elements correlate positively with comprehension (Wallot, 2014). In the present study, I expected that school participants who struggle more with comprehending the text would have to slow down their reading so that they can understand better, but that did not happen. It seems as though if you struggle with decoding and linguistic comprehension, it does not matter whether you read faster or slows down. Slow readers are more likely to struggle to understand a passage of a text. This could be due to the fact that their memory is overloaded and they are unable to retain a large set of information to understand a text as a whole. This interpretation concurs with the

view of scholars such as Sackstein *et al.* (2015), who also found that readers who struggle to process a text suffer due to the inability to retain a large proportion of information. In a study conducted by Kriebler *et al.* (2016), it was reported that there is a positive correlation between reading speed and reading comprehension because individuals who scored higher in the reading speed assessment also performed better in the reading comprehension assessment. In this case, the reading speed is automatic, and it is not a pre-requisite for comprehension. According to Gates (1921), reading speed and comprehension may be two distinct concepts, but they are related factors. Bell (2001) is also of the opinion that reading speed and comprehension are closely related factors. Interestingly, the findings of the study showed that oral reading fluency showed a positive relationship with comprehension scores.

The data for university participants report no effect of fixation duration on WPM, but in school participants, the data show that the participants who read slowly made longer fixations. In both university and school participants, the data show that if the participants read faster and make shorter fixations, they make more regressions. Faster readers make longer saccades and the saccades are longer in English than in Sepedi for both university and school participants. This is not a surprising finding given the different structure for the two languages with English being analytical and Sepedi agglutinating. Generally, the fixation duration data showed that university and school participants showed a similar pattern in terms of fixation duration in the reading of the measure 1 text, but in the measure 2 texts the school participants made longer fixations than university participants. The data also show that the school participants made longer fixation durations in both Sepedi and English than the university participants. According to Helo *et al.* (2014) and Buswell (1922), fixation duration decreases with age: the research conducted indicated that two-year-olds fixate longer compared to 10-year-olds during picture viewing (Helo *et al.*, 2014).

The school participants in this study made longer fixations and more regressions as compared to the university participants. This is also consistent with Rayner and Pollatsek (1989), who found that older readers make fewer regressions than children. The school participants made longer fixations than university participants, with the majority of the school participants reading slowly as compared to the university participants. The school participants made shorter saccades as compared to the university participants with the majority of the school participants reading slowly compared to the university participants. The findings in this study are in line with the view of Helo *et al.* (2014), Buswell (1922) and Rayner and Pollatsek (1989), who found that younger readers fixate longer than older readers. Factors that can contribute to fixation durations and saccadic amplitude is word difficulty, familiarity, word length and word frequency. Helo *et al.* (2014) reported that children take longer to move to the next saccade than older readers, and it also depends on the task requirements that affect the movement of the eyes. The university participants in this study did not show any difference to the school participants because their eye movement patterns were similar. The school participants made shorter saccades reading measure 1 and measure 2 texts as compared to the university participants. The school participants also made shorter saccades in both Sepedi and English compared to the university participants, but both the university and school participants had a similar percentage of regressions. This is consistent with a study conducted by Helo *et al.* (2014), who reported that saccadic amplitude increases with age. The school participants are slower readers, and they make more regressions, shorter saccades and longer fixations than the university participants. This is consistent with what Helo *et al.* (2014) found in their study where younger reader made shorter saccades compared to the older readers. The school participants read slower in both generic and academic texts, and they made fewer regressions than the university participants. The school participants read at the same speed in both measure 1 and measure 2, while the university participants slowed down their reading in measure 2. The school participants did not show any difference in reading speed for Sepedi and English, whereas the university participants read slower in Sepedi than in English. For text-type, the school participants showed more regressions when they read generic texts than an academic text, while the university participants made more regressions in academic texts than in generic texts.

These findings were expected because academic texts are more complex compared to generic texts.

As was expected, faster readers made shorter fixations and fewer regressions. This is in line with Kriebler *et al.* (2016), who found that when readers are fluent, they read faster and make shorter fixation durations and shorter regressions. Although reading speed is not a predictor of text comprehension (Wallot *et al.*, 2014), it is an indication of a good and skilled reader. When analysing the WPM data for university participants, there seems to be no relationship with other variables because WPM did not show any effect of regressions and fixations, whereas the school participants who had a high reading speed made fewer regressions and had longer fixation durations. On the other hand, the participants who had a low reading speed made more regressions and longer fixations. The university participants slowed down their reading speed reading measure 2 text, but the reading speed of the school participants did not change when reading measure 2 text. This data support the study conducted by English *et al.* (2010). According to English *et al.* (2010), younger and less fluent readers do not modulate their reading, irrespective of their reading goals. This means that these younger and less fluent readers do not change their approaches to reading even when the reading goals differ (Baker, 1984). These participants are supposed to monitor and adjust their reading in order to avoid failure to prioritise the understanding of the text over word decoding.

The university participants' data showed more regressions for the academic text, while the school participants' data showed more regressions in the generic text. Furthermore, the data show that university participants who read faster made more regressions, but the school participants showed no effect of WPM on regressions. When readers increase their speed, they sacrifice the amount of information they understand from a text. Just and Carpenter (1987) reported that fluent readers who are reading a book for the first time would naturally expect some decrement in comprehension performance with increased speed. Faster speed implies lessened comprehension, while slower speed implies increased comprehension (Just & Carpenter, 1987). In other studies, Foulsham, Farley and Kingstone (2013) reported that word frequency and word length are dependent on whether readers shift their focus from the main task of reading, because their reading speed decreases and in instances where they reported that they were focused on the task, their reading speed was consistent.

Although faster readers make more regressions, slower readers in both university and school participants make more regressions and shorter saccades, while university participants made longer fixation durations and school participants made shorter fixation durations. The data revealed that university and school participants read slower in Sepedi than in English which is expected. The slow reading in Sepedi suggests that children experience orthographic challenges which could be due to lack of opportunities for Sepedi reading and the agglutinating nature of Sepedi orthography. In addition, this could be due to the difference in the text length. Continuous reading opportunities help children to develop automaticity and accuracy and the lack of reading, therefore, limits the development of reading (Van Rooy & Pretorius, 2013:295). In the South African context, Sepedi is the language of teaching and learning from Grade 1–3 only, and in Grade 4 learners transition to learning through the medium of English, which means that the learners transition to learning through the medium of English before they are fully equipped in their home language when they start Grade 4. The situation of transition then gets difficult because they are expected to have the reading skill in English, which is not always the case. When the participants start with Grade 4 they become more exposed to reading materials in English than in Sepedi because English is a functional language and also regarded as a language of literacy (Coetzee-Van Rooy, 2012). Another reason is because Sepedi is perceived as the language of daily interaction and teachers therefore, afford learners more opportunities to learn in English than in Sepedi (Pretorius & Currin, 2010).

The results for comprehension showed that the participants scored better with generic texts than academic texts, which was expected. Furthermore, regardless of text-type, the university

participants showed better performance in English than Sepedi, which was expected because university participants use English as the medium of instruction for all their modules, while school participants showed a higher score in Sepedi than in English, which was not surprising because the school participants still take a Sepedi subject at school and are therefore exposed to Sepedi in a formal context at school. The data for both university and school participants also revealed that their eye movements during silent reading seemed to be decoupled from comprehension, as evidenced by the lack of any correlation between eye movements and comprehension, and by a similar lack of any predictive power between them. It is very clear that university participants also display reading patterns of struggling comprehenders because they can decode in both languages, but their comprehension scores are very low, which could be explained by poor linguistic comprehension. This further suggests that both university school participants had developed an erroneous eye-movement behaviour during the foundation phase of their schooling when they learned to read, and did not later unlearn the behaviour. This has resulted in the struggle with reading a variety of texts (academic and generic) at both university and school.

Generally, school participants found it difficult to process the words in the text, which automatically affects the eye movement. This may be because these participants had problems with visual analysis of the character clusters in their early years during word identification, which leads to challenges in the interpretation of meaning, which persists throughout their lives as readers. Dürrwächter *et al.* (2010) found that the participants in their study experienced difficulties in processing the text, which slowed down their reading and affected their eye movements. Furthermore, issues of poor comprehension and difficulties in reading the material could also be a contributing factor that could explain the eye movement pattern of the school participants. Also, the university participants also exhibited similar reading patterns to the school participants. The issue is not necessarily the oculomotor routine, but could be related to difficulties with processing words. Both university and school participants made ridiculously many regressions out of words as reported in this study. This is aligned with the strange frequency and word length results when compared to existing results from other contexts. When the participants landed on a high-frequency word, they very often regressed instead of keeping their eyes on the word until lexical activation was ready, which may be the core effect of the mis-automatisation of their reading behaviour.

The findings in this study replicate those of Van Rooy and Pretorius (2013), who found a similar result for isiZulu (see *chapter 2: Literature Review*). The important question is: which factors make some children/students fluent readers of all languages, while others remain less fluent in all their languages? The participants who have learned to read in both languages may come from families of literate people who were very supportive of their children at the stage of learning to read. In these families, parents would sit and read with or to their children, and they would bring books home. It is a well-known factor that in South Africa, many children who come from impoverished communities do not have access to libraries, and hence they have limited access to reading materials. The same applies to access to the Internet: the families would not necessarily be literate or have access to books or the Internet, meaning that they would have neither the means nor the skills and motivation to encourage their children to read.

5.5 Contribution of the study

The study contributed new knowledge in several ways.

The major contribution of the study is detailed eye-tracking measures for reading in an African language – the scope of my data is unique in the South African context concerning reading

studies in general (regardless of language), but the detailed data on reading in an African language is highly unique.

The study is providing current data on the reading comprehension proficiency of first-year students and Grade 8 and 9 learners who use Sepedi as an L1 and English as an L2. This study has expanded the existing knowledge of the reading proficiency of students in both Sepedi and English and has provided a better understanding of the students' reading performance proficiency level. This was measured through the use of an eye tracker to determine eye movement and fixation patterns during the process of reading comprehension. By evaluating the reading proficiency of learners and students for different types of texts, this study contributed towards the establishment of the relationship between L1 and L2 but did not provide any evidence that indicates the direction of the transfer. The co-development of both Sepedi and English reading skills will provide the most effective way to develop educated, confident Sepedi and English bilinguals because Sepedi is their mother-tongue and forms part of their identity, an image of the present and future self, while English contributes greatly to their career success.

There is currently no reported data for Sepedi reading comprehension proficiency for students in a multilingual institution and community high school. Hence the purpose of this study was to fill the gap by providing new, valid and reliable data about the Sepedi and English reading proficiency levels of the participants in these contexts. The available research studies on reading in African languages are the ones by Land (2015), Van Rooy and Pretorius (2013), Phokungwana (2012) and Pretorius and Matjila (2004). The existing body of research was presented as an overview in Chapter 2.

The study also started to reflect on the implications of the findings for reading development in the South African context. More work should be done to consider how the findings of the study could be used as input for developing the ability of teachers to develop reading in the home language and English at all levels of education in South Africa.

5.6 Limitations of the study

It should be noted that the study has several limitations.

Based on the samples selected, the results can be a source of reference concerning the characteristics described such as age, language proficiency and learning experiences. The experimentation was fairly small in size, which unavoidably placed the study at a perceivable detriment. Given such an important red flag, careful consideration should be made to avoid over-optimism in the generalization procedure. In addition, the lack of benchmarks in African languages for WPM (word per minute) means that there are no norms against which the results can be evaluated.

I think that there are well-known difficulties with doing studies that collect two measures of data: firstly, sample sizes might start bigger and shrink as people drop out of the study – which is completely the usual way for education work done in this way (Mahlasela, 2012:83). Most of the studies in reading development present a one-time design because of the difficulties mentioned above. The implementation of two measures in this study is a first for Sepedi and the explanatory power of collecting data using two measures or two tests of reading the same text with a gap of 5 weeks in-between is more meaningful than a single-measure design. If possible, even more measures should be included in future research of this nature.

The limitations noted in the study include the following:

The **first** and most important limitation was the sample size. From the beginning of the study, the sample size was small after some of the participants had withdrawn from the study and never completed the experiments. The sample size of the study consisted of 58 participants in total. When considering previous eye movement research on reading, this is an acceptable sample. In the following studies Hyönä and Nurminen (2006) used 44 Finnish students, Cop *et al.*, (2017) used 19 students, Ashby (2006) used 44 students, Balling (2017) used 27 Danish high school pupils, and Joseph *et al.* (2013) used 22 eight-year-old children and 28 university participants. The sample size used in the present study is not considered small in comparison with previous studies, although a much larger sample size would provide a more extensive set of data.

A **second** limitation relates to the language attitude questionnaire. I believe that more specific and reliable results could have been obtained from the participants, especially regarding questions related to attitude towards Sepedi as a language of teaching and learning. The questions did not provide the participants with an option of dual-medium teaching and learning and only asked them if they preferred learning through the medium of Sepedi, instead of providing an option for them to decide whether they wanted to be taught in both Sepedi and English.

A **third** limitation pertains to the comprehension texts. As was reported in Chapter 3, the texts for university and school participants were much longer compared to those which previous studies have used. The participants had to read four long texts, which could have contributed to their fatigue. It could be that half-way through the texts the participants had become tired of sitting in an uncomfortable position. Most of the participants could not finish the first test in one period of time, and that prolonged the duration of the entire experiment.

A **fourth** limitation was lack of inferential questions. The comprehension tests comprised multiple questions, which resulted in limitations because the participants had no opportunity to answer inferential questions. Inferential questions are very important, and they provide insight into whether the readers understand the text that they are reading. This would have provided more insight into the participants' reading proficiency because it prompts questions that require the participants to draw conclusions based on the text they have read. A further (and very important) limitation of the comprehension tests is that they actually assessed recall and not necessarily comprehension. Usually, with comprehension tests, participants can search for the answers in the text they read, but here they read and had to recall/remember what they had read to answer the questions. Their ability to correctly recall the information is, of course also affected by the length of the texts they had to read.

A **fifth** limitation pertains to the oral reading fluency test collected through a voice recorder. The participants were requested to read aloud, but they were not required to answer comprehension questions. I believe it would have added more value if the participants had completed a comprehension test based on the read-aloud task and also possibly to record their eye movements while reading aloud.

A **sixth** and final limitation of this study was that the attempt to provide the participants with additional reading material in Sepedi could have been structured and planned more carefully. One could have added measures such as making sure that the reading is monitored to ensure that all the participants actually read all the texts and completed all the questions. One could also consider checking the readability of the text to ensure that the texts are aimed at the correct level for the participants and that they are sufficiently easy/difficult – if the texts are too easy or difficult, would the students bother to read them if the decision was up to them and they were not monitored during their reading? The effect of providing additional reading material in Sepedi was not optimized in the study.

5.7 Recommendations for future research

. In most higher education institutions in South Africa, English is used as the medium of instruction across disciplines. Most black students are not exposed to their first language at higher education institutions in South Africa. At this level, the L1 is mainly used for communication among family and friends. Students' use of the L1 is therefore limited in a tertiary education environment, but if the participants master the L1 then there is the potential of a positive transfer. The study suggests that multilingual pedagogies and translanguaging techniques which allow learners an opportunity to learn two or more languages simultaneously should be explored. This study contributed to efforts to use African languages more prominently in education because it provides empirical information about the attitudes of students and learners towards the idea of using African languages in education and it provides detailed information about the current state of the abilities of the participants to read in Sepedi and English. The findings of the study embolden the notions that literacy development in South Africa should be considered as a multilingual (including bilingual) matter. More work should be done to investigate the direction of language transfer in this context.

I think that a major finding of this thesis is that the issues with reading in South African schools are not primarily a matter of which languages are being used. Instead, the issues are caused by a mis-automatisation of reading behaviour in general, which is evident in the data as a propensity to reflexively regress multiple times from around one-third of the words in the texts, rather than making time for lexical and phonological activation, as evidenced by the lack of a frequency effect on the first fixation durations. This could also be due to the languages, schools and how reading is taught and developed as a result of these issues. Supporting bilingualism or multilingualism in all grades can be good for other things, but will not address the issues of reading. Instead, reading must become a priority in the early grades where educators teach the children what to do during reading, and encourage them to practise reading aloud for at least the first three years in school.

The data in this study support Lyytinen's *et al.* (2015) study, which states that readers should learn to be fully fluent in reading aloud before attempting to read silently. Likely, the participants in this study never started reading aloud, or that reading aloud was not fully developed by the time they were required to do silent reading, and that they learned early on that, they should silently move their eyes, and thus mis-automatised fundamental eye-movement behaviour during reading when they were not required to verbalise the content. The participants in the present study reflected the difficulties experienced when reading a text for understanding. This finding that the participants can decode the text by making fewer miscues but they struggle to comprehend what they are reading points to a limitation in the SVR formula which emphasises that reading comprehension is the product of decoding and linguistic comprehension. It is, therefore, important that when learners start to read, they should read aloud, and only after they can do so fluently, should they read silently without voicing the text, as this will prepare them to process the words in silence. The university participants are generally fluent readers, but they also need to slow down to increase their level of comprehension because they might have learned earlier in their schooling that reading faster means that one is perceived as fluent. According to English *et al.* (2010), slow reading of the text is frequently linked to poorer comprehension, while faster reading results in good comprehension. This statement by English *et al.* (2010) contradicts what the participants in this study need to do for better reading comprehension. If readers are fluent and accurate in their reading, speed happens automatically and with practice comes improvement for both accuracy and speed.

In future, the study could be conducted in an area where Sepedi is the dominant language. Although the participants in this study stated that Sepedi was their strongest language, it would be interesting if the study could be replicated with a different sample under different conditions.

It is assumed that the participants in an environment where their home language is dominant will have a higher literacy level. Lower school grades could also be included in this kind of study. The findings of the study generally reveal that the participants in the study struggled to read. I believe that investigating Grades 4 – 6 would be beneficial because, at an early age, an intervention programme could be introduced to improve the reading ability of the participants. The intervention programme could be aimed at assisting struggling learners. From the findings of the current study, it can be deduced that learners in the lower grades experience major difficulties because, at Grade 8 and 9 levels, the participants are still struggling to read. The idea would be to find two comparable primary schools and include the youngest children as participants. In one school, the teachers could teach reading as they always have done, and in the other school, a teacher could be placed whom we have trained to teach reading according to scientific principles. Reading competence could be measured every six months with the paradigms that could be developed based on the findings of my study. At this stage, my hypothesis would be to expect that the eye movements, reading fluency and comprehension will soon differ significantly between the participants in these two schools. If that happens, we can prove that it is the teaching of reading in the early grades that improve reading development. Multilingual pedagogies and translanguaging techniques used in multilingual classrooms can benefit the learners. It is important to make use of every available language as a resource if we are to improve the level of education in multilingual South Africa.

Future studies can include a longitudinal design which follows up on the progress of the participants over a long period, although there are limitations in running this design: participants drop out, sample sizes shrink, etc. Yet, the design has the potential to provide great benefits. Although the participants in this study were positive about their home language Sepedi and were confident that they would use the language at school for scientific subjects, they did not complete reading the additional Sepedi texts; however, it has opened my mind for future research. Future studies can now proceed with a view to addressing as many of these limitations as possible. In conclusion, I recommend that more intervention reading programmes be conducted and studied because more of these studies would enable researchers to answer more of the questions about reading development in indigenous languages more conclusively.

5.8 Conclusion

Within the original SVR model/framework proposed by Gough and Tunmer (1986), this study sought to examine the role of decoding (word recognition) and linguistic comprehension within the Simple View of Reading framework in a sample of high school learners (Grade 8 and 9) and first-year university participants. Examining the influence of both decoding and linguistic comprehension on reading comprehension in university and school participants provided information on reading since eye movement research on reading and reading comprehension is in its infancy in South Africa, especially with regard to reading in African languages. Only a handful of studies have been conducted (e.g. Van Rooy & Pretorius, 2013; Land, 2015) in which the reading of isiZulu was investigated. The current study is unique in that no studies have thus far been conducted on reading in Sepedi as a home language and English as L2 among university and Grade 8 and 9 school participants.

The use of this framework was supported, given that both the decoding and linguistic comprehension measures predicted reading comprehension at both university and school participants. Furthermore, it is clear that competency in the early measures (of encountering words by decoding) of eye movement, namely, first fixation duration, gaze duration, regressions out of word, words skipped first, word per minute and oral reading fluency, are important and predict reading comprehension. In addition, late measures (of processing words through linguistic comprehension) of eye movements and other measures such as fixation duration,

saccadic amplitude, regressions, words skipped totally, and comprehension scores are necessary to determine reading comprehension. Generally, the data revealed that the participants are struggling and not consistent readers with comprehension and therefore, future research is justified to clarify the decoding and linguistic comprehension skills that are significant to reading comprehension and also to determine if the relationship between decoding and linguistic comprehension could be established for students who struggle with reading comprehension in a longitudinal study. The importance of including an oral fluency measure to complement the components included in the SVR framework also emerged in this study.

In summary, this research described bilingual readers within the SVR model which contributed to characterising the reading of university and school participants by measuring their decoding and linguistic comprehension skills through a range of measures such as comprehension passages. Also, the study made use of a questionnaire in order to characterise the university and school participants in terms of the reading behaviour as well as their use of languages around them. Thus far, The SVR model has helped in describing the reading of university and school participants, however, more research is of vital importance in order to define and design programmes that are relevant and necessary for struggling readers in a South African context. Other factors of consideration for further research include (i) describing reading instruction executed by educators in the classroom during the process of reading development and (ii) describe the role of teachers in their quest to improving the reading ability of the school participants. Apart from reflecting on the educational level of the parents, the study did not investigate fully how the participants' background at home affected their reading development. In addition, the study did not describe the extent to which the parents played on the role of reading development of the participants (e.g. reading with their children in their early age and the availability of reading materials at home). In light of this, this study does not suggest drastic changes, but to provide support to teachers in schools to improve reading development instruction of school readers because young readers with positive reading experiences and successes in early reading end up being successful readers.

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Africa's agenda in the coming decade

Today, Africa is the world's least urbanized continent, with only one third of the population living in cities and the rest in rural areas and heavily dependent on agriculture. But, in the past two decades the rural-urban migration has accelerated, and the continent now has the world's highest rates of rural-urban migration. Since, in most countries, even the largest urban centers cannot offer much employment, most of the migrants (mainly young men) remain unemployed and forced to live in very dreary conditions.

The rural-urban migration presents a difficult dilemma for the African countries and will require significant shifts in policies in the coming decade. On the other hand, the exploding urban population and their high unemployment require large investments in the urban centers. On the other hand, the eroding of agricultural resources due to the climatic changes and the aging rural population as the young people migrate to urban centers will lead to a decline in food production. Furthermore, a rise in rural poverty, will require large investments in the rural periphery, particularly in the more remote and isolated areas. How should African countries allocate their limited resources to cope with these two challenges and reduce poverty? How will they be able to provide enough food to their growing populations, especially if droughts will be more frequent or if another food crisis occurs? How can the global community help the African countries cope with this dual dilemma and secure their food requirements? The following is a more detailed description of these two crucial issues and their implications for the future agenda of the continent, for donor countries, and for the international development organizations.

The rural dilemma

Around three-quarters of Africa's poor live in rural areas and depend on agriculture for their livelihoods. In the coming several years most development efforts will, therefore, be concentrated on the rural sector and large investments will be needed to increase agricultural production. This will further build rural roads (after years of gross neglect). Rural development is the most rapid and most effective way of reducing poverty and malnutrition in Africa. Although the urban population is expected to double between 2000 and 2030, and the majority of the African population will live in urban areas by 2030. Rural poverty will remain high and the effects of climate changes may increase both the number of the rural poor and their proportion of the population. Furthermore, if climate changes will be as drastic as has been predicted, many people in semiarid rural areas will be forced in the next decade to move to other regions and other countries in Africa or elsewhere. The reason for this is that they will not be able to live on agriculture in their current place of residence. The migration across regions and countries in search of land and water resources will contribute to heightened ethnic tensions. African countries must design collaborative strategies to cope with their problems, increase food production, and prevent an escalation of tribal conflicts. The main strategies to reducing rural poverty will have to include the following measures:

- Increasing agricultural productivity, possibly by introducing Genetically Modified crops.
- Preventing a reduction in yields in semiarid areas by developing drought-resistant crops and supporting local extension services to introduce these crops in all rural areas.
- Building the rural road infrastructure so farmers can trade with urban centers and fertilizers, seeds, and other needed agricultural inputs.
- Securing the supply of food to farmers in the event of drought, this may occur more frequently, and in the event of a sharp rise in food prices.
- Diversify income sources in the rural areas both by diversifying agricultural production and by introducing other forms of employment, like processing or even light manufacturing.
- Design a government supported insurance program that will secure the supply of food and seeds to farmers in the event of a drought to increase their incentive to remain in their villages despite adverse climatic changes.

The urban dilemma

By 2030, Africa will be an urban continent. However, since the urban areas are practically stagnant, local industries cannot be developed. The lack of resources will prevent local investors from developing competitive industries able to export to global markets, and unemployment will remain high. Moreover, the pressures of unemployment and foreign migration are likely to force many countries to restrict trade in order to secure their local employment. African countries do not have the resources or the expertise to

develop competitive industries. Most of the current 70% unemployment in Africa's urban population will remain so. Health problems may worsen, crime spread, the family structure will be likely fragmented, and the growing number of single mothers will have greater difficulties raising their children.

This is not just an African problem. An estimated one billion people in Latin America, Asia, Africa, and the Middle East live in slums or shanty towns that are not even legally recognized and do not receive any public services. In Africa, the main problem of the urban population is unemployment, and this problem will worsen with the rise in the number of migrants. As described above, the lack of employment will live in the cities increasingly intolerable.

In the coming years, the rate of urbanization in Africa will accelerate, according to United Nations estimates. 40 percent of the population in West Africa will move to the coastal cities; by 2022, the entire coastline between Accra and the Niger Delta will become a continuous urban megalopolis. More than 50 million people and five other cities will have more than ten million inhabitants.

The large and growing flow of migrants to the urban centers will continue despite the lack of any chances to find employment. The dismal living conditions in the slums will lead to the urbanization of poverty. Although poverty will still concentrate in rural areas for at least another generation, the growing number of poor in urban centers will force government to change their development policies. The urban poor are more likely to resort to crime, join armed militias, and seek whatever assets they can loot in order to survive. The growing pressure on the urban centers will force most African governments to change their priorities in very fundamental way through the following measures:

- More resources will have to be invested in the urban centers; and
- Government programs will have to include the provision of basic services to the urban poor, including water supply, health, and more adequate shelter.

Can the food crisis happen again?

Besides the threat of trade restrictions on food supply and price, the most "expected unexpected" threat is another energy crisis and another massive rise in oil prices. Despite large investments to save energy, and find economically efficient substitutes, as well as to search for new sources of fossil fuel, it will take at least another decade before reliable, safe and cost effective alternative energy sources are available. In the meantime, the demand for fossil fuel and natural gases will remain high and continue to rise. According to the latest statistical report; in the first quarter of 2009 oil prices increased by more than 50 percent above their level in the last quarter of 2008.

Oil prices crashed to less than one-fourth of their peak level from over \$140 per bbl. in mid-2008 to around \$40 a few months later. It was clear that these new process were too low and below the production and transportation costs of many oil-producing countries. It did not take long for venture capitalists and investments companies to spread announcements inviting savers and investors to buy oil futures, claiming oil prices are bound to rise. By mid-2009 oil prices rose to nearly \$80 per bbl. according to the IMF's World Economic Outlook of 2009, they may continue to rise and remain highly unstable. As a result, the costs of fertilizers and transport will remain high and also will keep food prices at high levels.

Preparing for the worse, consumers and producers are making efforts to find effective and affordable substitutes, from hybrid cars to the use of sun and wind energy. The recent solution might not be an effective one for later in the future, but it's a work in progress. Researchers work intensively on the development of Genetically Modified crops that require less fertilizers and pesticides and are more drought-resistant. The development of second-generation crops, like Jatropha and palm oil are for more efficient and less expensive production of bio-fuel. Countries build large projects to use the energy of waterfalls and the sun for the production of electricity. Innovators and start-up companies are working hardest in search of the magic formula and ultimate solution to the production of affordable energy. Perhaps, one of them dared predict, by building in space huge mirrors the size of Arizona and Texas that will concentrate the sun's energy. In the long run, a solution will undoubtedly be found, mainly because the world will run out of existing resources, but the road to that happy end, while it may not be that long is bound to be difficult and expensive.

A rise in oil price is in itself not likely to create a global food crisis, however. The commodity boom of 2007-08 and the subsequent dramatic economic bust in the second half of 2008 were the results of a

combination of events in different global markets that, at the outset, did seem to threaten the global food market. Indeed, all studies on the food crisis until mid-2008 focused on the impact of the fundamentals. They blamed primarily the collaborative program of the United States and the European Union to buy corn in order to produce bio-fuel. Only when the financial markets crashed and many investment companies went bust did the risks they took in their reckless investments in commodity crisis and the financial crisis become clearer. The financial markets today remain fragile, but all the precautions, monitoring, and supervision have been put in place to prevent risky investments. The growing risk aversion of individual savers and investors are likely to make traders and investors in these markets show more resistant.

There are other dangers and other markets that are likely to have indirect effects of food prices. The doubts recently expressed about the actual impact on global warming of the extensive release into the atmosphere of carbon-dioxide from the use of coal and fossil fuel may slow down the research for alternative energy sources and keep oil prices high. But the greatest risk is the possible impact of political events in the Middle East on the supply of oil from the Gulf countries, Iraq and Iran. The war in this region is far from ending, and the confrontation between the West and Iran seems to escalate. The greater involvements of China in the world oil market and its direct contracts with several key oil-exporting countries, from Angola to Iran, to Venezuela, further increases uncertainty about future oil prices. If the threat of these development on the supply of oil increases, a rise in oil prices will become more likely and even some investments companies may bypass their caution and increase investment in oil futures, further pushing up the spot prices of oil. All these developments may bring oil and gas process back to their peak level in 2008 and, among other effects. This is likely to raise the cost of food production and food prices. Even if these developments do not escalate to the extent that they create another global commodity crisis, they are bound to be extremely damaging to their poor consumers. The fragility of the global financial system seems even more threatening in the coming one or two years, and some analysts (for lack of better word) volunteered all sorts of doomsday predictions. Now, not only financial institutions face difficulties paying their debts, but even solid countries have difficulties. If the public loses confidence in the ability of countries to pay their debts, it may indeed become a major crisis.

Fictional Name: _____

English academic measure 1 (university participants)

Answer the following questions based on the text that you just read by placing (X) next to the answer you choose.

1. Africa is the world's least urbanized continent, because
 - A. 70% of the population is living in cities
 - B. The economy of the country is struggling
 - C. Only one third of the population lives in cities
 - D. Two third of rural areas are heavily dependent on agriculture
2. What are the implications of exploding urban population and their high unemployment on rural areas?
 - A. Rural areas depend on agriculture
 - B. High unemployment in rural areas
 - C. Unemployment in rural areas are forced to live in very dreary conditions
 - D. There will be a decline in food production
3. Why is rural development important?
 - A. Good strategy to elevate poverty
 - B. Rapid and effective way to reduce poverty and malnutrition
 - C. Relevant method to combat malnutrition
 - D. To increase agricultural production
4. The following factors will affect Africa in 2030 except one from the following:
 - A. Crime spread
 - B. Unemployment will change
 - C. Mothers will experience great difficulties in raising children
 - D. Health problems may worsen
5. In your view, what causes acceleration with regard to the rate of urbanization in Africa?
 - A. Rural-urban migration due to poverty
 - B. Urban-rural migration due to poverty
 - C. Rural-urban migration due to an increase in food production
 - D. Urban-rural migration due to a decline in food production.
6. The reason why the continent has the world's highest rates of rural-urban migration. Choose the best option.
 - A. Rural-urban migration has decreased
 - B. Rural-urban migration has accelerated
 - C. Urban-rural migration has increased
 - D. Urban-rural migration has accelerated
7. Provide the reason why people in the semiarid rural areas will be forced to move to other regions.
 - A. Due to climate, depending on agriculture for survival will be a challenge
 - B. Due to poverty and malnutrition
 - C. Rural poverty will remain high
 - D. Rural areas will not be able to live on agriculture in their current place of residence
8. What kind of an urban continent will Africa be in 2030?
 - A. Unemployment will remain high since urban areas are practically stagnant
 - B. Exports to global markets
 - C. Local developments will be developed
 - D. Increase in trade
9. What evidence can you draw from the statement that states that Africa is not the only continent that experiences social problems
 - A. One billion people in Latin America, Asia, Africa and Middle East receive public services
 - B. People do not receive any public service
 - C. One million people do not receive services

- D. Migrants increases the level of economy
10. What are the implications of having a growing number of poor people in urban centres?
- A. Urban poor might resort to crime
 - B. More resources will be invested
 - C. Government will include the provision of basic services
 - D. Most Africans will change their priorities

Fictional Name: _____

English academic measure 2 (university participants)

Answer the following questions based on the text that you just read by placing (X) next to the answer you choose.

1. Africa is the world's least urbanized continent, because
 - E. 70% of the population is living in cities
 - F. The economy of the country is struggling
 - G. Only one third of the population lives in cities
 - H. Two third of rural areas are heavily dependent on agriculture
2. What are the implications of exploding urban population and their high unemployment on rural areas?
 - E. Rural areas depend on agriculture
 - F. High unemployment in rural areas
 - G. Unemployment in rural areas are forced to live in very dreary conditions
 - H. There will be a decline in food production
3. Why is rural development important?
 - E. Good strategy to elevate poverty
 - F. Rapid and effective way to reduce poverty and malnutrition
 - G. Relevant method to combat malnutrition
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4. The following factors will affect Africa in 2030 except one from the following:
 - E. Crime spread
 - F. Unemployment will change
 - G. Mothers will experience great difficulties in raising children
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 - E. Rural-urban migration due to poverty
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 - G. Rural-urban migration due to an increase in food production
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 - G. Urban-rural migration has increased
 - H. Urban-rural migration has accelerated
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 - E. Due to climate, depending on agriculture for survival will be a challenge
 - F. Due to poverty and malnutrition
 - G. Rural poverty will remain high
 - H. Rural areas will not be able to live on agriculture in their current place of residence
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 - E. One billion people in Latin America, Asia, Africa and Middle East receive public services
 - F. People do not receive any public service
 - G. One million people do not receive services

- H. Migrants increases the level of economy
10. What are the implications of having a growing number of poor people in urban centres?
- E. Urban poor might resort to crime
 - F. More resources will be invested
 - G. Government will include the provision of basic services
 - H. Most Africans will change their priorities

APPENDIX B

Comprehension text (academic) and test for Sepedi reading measure 1 and measure 2 (university participants)

Naa dinaga tša Afrika di ka kgona go phela bjang ka tlhalelo ya dijo?

Nyakego ya dijo e tlo tšwela pele go angwa ke sephetho sa United States le sa European Union go tšwela pele ka tšweletšo ya dibešwa tša tlhago. Godimo ga fao, hlwahlwa ya godimo le nyakego ye ntši ya dijo tša phepo le tše di loketšego mmele ka dinageng tše di tšwelelago le tšeo di hlabologago e tla ba seemo se sekaone. Kabo ya dijo e tla tšwela pele go tia. Go ya ka dikakanyetšo tša Mokgatlo wa Dijo le Temo wa Mokgatlo wa Dinagakopano, go tla ba fela le go phuhlama go gonnyane ka tšweletšong ya dijo lefaseng ka bophara ka 2009 le ka 2010 go tšwa ka dipegong tša ngwaga wa 2008. Kabo ya dijo ka dinageng tša Afrika e kotsing, le ge go le bjale, ka lebaka la diphetogo tša maemo a boso, methopo ya meetse ye e phuhlamago, le go theoga ga dikelo tša kgolo ya ditšweletšo tša dithoro tša mabele. Kgolo ya tšweletšo ya dijo ya ka moso e ka mpshafatšwa, le ge go le bjale, ka boithamelolo bja theknolotši bjo bo bonagalago kudu, tšhomišo ye kgolo kudu ya dibjalo tše di Bjetšwego ka Mokgwa wa Phetošo ya Ditšini, le go tšweletšwa ga dibjalo tšeo di kgotlelelago komelelo. Diphetogo tša maemo a boso ka lebaka la go ruthufala ga lefase di tla ba le diabe tše mpe kudu go tšweletšo ya dijo ka mafelong ao a hlokago dipula. Se ke kudu ka Afrika le ka Dinageng tša Bogareng bja Bohlabela, eupša tšweletšo ya dijo go emetšwe gore e tla hlatloga ya Bohlabela bja Yuropa le ka Bogareng bja Ešia, kudukudu ka Ukraine le Russia.

Diphetogo ka go kabo ya tšweletšo ya dijo go ralala le dikhontinente le go palelwa ke go fihlelela tumelalano ya tša kgwebišano ka tša temo magareng ya dinaga tše ntši go ile gwa dira gore dinaga tše ntši tše di hlokago tšeo di tsenyago dijo go tšwa dinageng di šele di be kotsing. Go ba kotsing fa ke ka lebaka la magato ao a tšerwego ke dinaga tšeo di romelago dijo dinageng di šele di nnoši. Godimo ga fao, ditiragalo tše di bego di se tša emelwa ka mafapheng a mangwe di tla ba le diabe tše di sego tšwa thwii go tšweletšo ya dijo le kgwebišano lefaseng ka bophara. Go phuhlama ga ekonomi ka 2009 go bile le tshenyo ye nnyane go feta ka fao batho ba bantši bo bego bo tšhoga ka gona ka lebaka la magato ao a tseneletšego le ao a ilego a tšewa ka tirišano a mabapi le ditšhelete le mašeleng. Magato a a tšerwe ke dinaga tše di hlabologilego gomme tlhokego ya mešomo e tšwetše pele go ba godimo gomme lefapha la ditšhelete le ile la tšwela pele go ba kotsing. Go boima go akanya ka ga seabe sa maemo a a kabo ya dijo ka dinageng tše di hlabologago. Eupša go na le dipelaelo tša gore go tiiša seemo sa ditšhelete go tla gapeletša United States le European Union go fokotša dithekgo tša mašeleng. Se ke ka lebaka la batšweletši ba bona ba tša temo gomme se se hlatloša theko ya dijo ka mebarakeng ya lefase ka bophara. Tlhatlogo ya ditheko tša oli ye e mpshafaditšwego yeo e lego setšweletšwa sa ka moragonyana sa go tsoga ga ekonomi e ka feletša ka tlhatlogo ye nngwe ya ditheko tša dijo.

Le ge e le gore maemo a a ka kgonagalago a ka hlatlošago theko ya dijo; ga go na kgonagalo ya gore a ka hlola ditlhaelelo ka kakaretšo tšeo di ka feletšago ka mathata a mangwe a dijo a lefaseng ka bophara. Diphetogo tša boso tšeo di akanywago le tšona go na le kgonagalo ya gore di ka senya dinaga tšeo di sego tša hlabologago ka mafelong ao a hlokago dipula. Eupša se se ka se fokotše kabo ya dijo lefaseng ka bophara. Ka ntle le dipelaelo tšeo di begilwego ka ga dikakanyo tša Phanele ya mebušo ye mentši ka ga phetogo ya klaemete, diabe di šetše di ile tša bonagala ka mafelong ao a hlokago dipula fao go nago le maemo ao a sa kgahlišego a boso le maemo a kgafetšakgafetša a komelelo le a mafula. Le ge e le gore go na le ditlhaelelo tša ka nageng tša tšweletšo ya dijo, tlhalogo ya ditheko tša oli goba ga maemo a mangwe ao a lebeletšwego ga go na kgonagalo ya gore a ka mpefala go fihla go seemo sa mathata a dijo lefaseng ka bophara a go swana le a tlhaelelo ya godimo ya mengwageng ya bo 2007– 2008. Se se tla ba le seabe seo se sa kgahlišego go dinaga tše di hlokago le go setšhaba seo se hlokago, kudukudu ka dinagamagaeng tšeo di lego kotsing ya komelelo goba ya mafula. Mo ke fao balemi ba gona ba kgonago gannyane tlhatlogo ya theko ya manyoro. Dinaga tša Afrika tše di tšweletšago oli di tla tloga di holega go tlhatlogo ya ditheko tša oli. Eupša maitemogelo a ngwagasome wo o fetilego a laetša gore ke fela palophatlo ye nnyane ya matseno ao yeo e tlogo šomišwa go thuša balemi ba bona goba go kaonafatša seabe sa ditheko tša godimo tša dijo go bahloki.

Mehutahuta ya magato a swanetše go tšewa ka ntle le tikatiko ka nepo ya go kgontšha ditšhaba tšeo di lego ka dinageng tše di lego kotsing gore di kgone go phela ka magato a a kimollo. Magato a a swanetše go tšewa bobedi ke dinaga tša ka mo dileteng tše le ke mokgatlo wa tlhabollo wa boditšhabatšhaba. Magato a a swanetše go tšewa ka mathokong a mmalwa. Sa mathomo, go hlabolla mehutahuta ya dibjalo le mekgwa ya tšweletšo ye e gatetšego pele yeo e tlogo kgontšha balemipotlana ka dinageng tše

di hlabolopgago gore di kgone go phela ka maemo a komelelo a kgafetšakgafetša le methopo ya meetse ye e fokolago yeo go emetšwego gore e tla ba gona mo ngwagasomeng wo o latelago. Sa bobedi, go tšea magato a go šomiša methopo ya meetse ye e lego gona ka go a seketša kudu, le sa boraro, hloma magato a maleba a polokego ao a tlogo šireletša kabo ya dijo go bahloki seabakeng sa ge go ka ba le tlhaelelo ya dijo goba ge go ka ba le ditheko tša dijo tša godimo. Magato a go kgona go phela ka diabe tša komelelo le methopo ya meetse ye e fokolago a nyaka gore go be le diprotšeke tše kgolo ka go mehutahuta ya mafelo ao a akaretšago:

- Go hloma mehutahuta ya dibjalo tše di kgotlelelago komelelo le go di abela balemi le gape ka go mafelo a kgole kudu;
- Go aga mekero ya go tliša meets go tšwa go methopo ya dinoka go ya mafelong a kgole;
- Go aga matamo a go kgoboketša meetse go tšwa go meetse a pula;
- Go hlabolla le go hlahla balemi go šomiša ditheknolotši tša go nošetša tše di seketšago tshenyegelo;
- Go aga mananeokgoparara ao a lego maleba a gore ba kgone go šomiša meetse a go nošetša le a go nwa, go akaretšwa mohlagase wo o šomišwago ke dipompi tša go goga meetse, tlhwekišo ya meetse, le ditsela tša magaeng, bjalobjalo.

Go hlabolla ga mehutahuta ye meswa ye e nago le tšweletšo kudu ya dibjalo tše di kgotlelelago komelelo go ka se kgone go dirwa ke dinaga tše di hlabollogago ka botšona. Sa mathomo, go šetše go dirilwe dinyakišišo tše di tseneletšego ka go lefapha le ka dinageng tše ntši. Dinyakišišo tše di swanetše go ba motheo wa dinyakišišo tše dingwe go tšwela pele tšeo di ka hlokegago go beakanya leswa dibjalo gore di sepelelane le maemo ka dileteng tše dingwe. Bontši bja Dinaga tše di sego tša Hlabologa ga di na phihlelelo go dinyakišišo tša mahlale tše di dirilwego goba go bašomi ba tša mahlale le go mafelo a dinyakišišo go ka itirela dinyakišišo tša tšona. Sa bobedi, dinyakišišo tše di na le seabe go dinaga tše ntši tša ka ntle, ka ge di hola dinaga ka moka ka seleteng sona seo gomme ka moka ga tšona di swanetše go kgona go hola bobedi le go abelana ditshenyegelo tša dinyakišišo tše. Gabotse, kgokaganyo ya tirišano ye ke mošomo wo mogolo. Eupša maithomelo a Lenaneotlhabollo la Temo ya Afrika ka fase ga taolo ya Mokgatlo wa Seboka sa Afrika ke bohlatse bja gore maithomelo a a kgonagala ebile a ka šoma gabotse kudu. Maithomelo ao a tsebagago kudu lefaseng ka bophara ke Sehlopha sa Ditherišano ka ga Seboka sa Boditšhabatšhaba sa Dinyakišišo tša Temo sa mafelo a boditšhabatšhaba a dinyakišišo a 15 ka dinageng tše di hlabologago. Dinaga tše di a dirišana go maatlafatša seabe sa dinyakišišo tša tšona ka ditiro tša mohlakanelwa tšeo di oketšago go šoma gabotse le go phatlalatša ditsenogare tša tšona go ya dinageng tše di hlabologago.

Masolo a dinaga a go hlabolla mananeokgoparara a dipolaseng le go beakanya maemo a polokego ya setšhaba a thekgilwe ka bophara le ka kabelo ke Panka ya Lefase ya Dipanka tša Tlhabollo tša Dilete, ya dinaga tše di fago kabelo. Eupša, ka dinageng ka moka tše ntši kudu go kgatha tema ga dinaga tša tšona go bile go gonyane kudu go feta dinyakwa le bokgoni bja tšona. Bontši bja thekgo ya tšona bo tšwa dinageng tše mmalwa tša mehutahuta. Bontši bja thušo ya dinaga tša ka ntle e sentšwe, gomme seabe sa yona sa go kaonafatša maemo a bophelo bja ditšhaba tša tšona se bile se sennyane kudu. Ka ntle le tlhokomelo ye e tseneletšego kudu ya dinaga tše di fanago ka kabelo, le mekgatlo ya tlhabollo ya boditšhabatšhaba mabapi le phethagatšo ya mananeo a thušo a mehutahuta le tshekatsheko ye e filwego šedi kudu ya diabe tša makgonthe tša diprotšeke le mananeo a tlhabollo, ka go kgatha tema ka go mananeo a a dinaga ka botšona. Kudukudu dinaga tša Afrika tše di humilego ka methopo di ile tša hlaelela kudu ka bokgoni bja tšona. Go tsenya letsogo ga bontši bja dinaga go hloma maemo a polokego ya setšhaba le go hwetša kabo ya dijo ya tšhoganetšo go sa le ka fase kudu go dinyakwa tša makgonthe, gomme seabakeng sa tlhaelelo ya dijo ditšhaba di swanetše go tshepha thušo ya tšhoganetšo go tšwa dinageng tša ka ntle.

Maemo a boso ke fela karolo ya lebaka la tlhaelelo ya dijo yeo ka dinako tše dingwe e fihlelelago maemo ao a šiišago ka seeming seo e lego gore go na le maemo a boso ao a sa kgahlišego. Ka go dinaga tše ntši tša Afrika, go tloga ka seleteng sa *Horn of Africa* go fihla ka *Great Lakes*, dithulano le dintwa tša bana ba thari di na le tsenyo ye kgolo kudu go tšweletšo ya dijo ya ka dinageng tšeo le go kabo ya dijo ya tšhoganetšo. Ka dileteng tše dingwe tše ntši leuba la HIV/AIDS, malaria, le malwetši a mangwe a kotsi ka ge a bolaya setšhaba ebile a senya kudu bokgoni bja tšona bja go tšweletša dijo tša tšona.

Seabe go kgwebišano ya lefaseng

Bothata bja dijo le melawana ya mebušo ye mentši e tsentšwe tirišong go šireletša badiriši le batšweletši ba yona. Tumelelano ka ga kgwebišano ya tša temo magareng ga dinaga tše ntši le diphetšo tša go beela mellwane kgwebišano ya tšona, e padile le ge e le gore seo se be se tshela molao. Go tshela

melao ya ditumelelano tša kgwebišano tša ka dileteng tše di kgathilego tema ka go tšona, di tla ba le diabe tše kgolo go kgwebišano ya lefase ka go ditšweletšwa tša temo mo mengwageng ye e tlogo.

Seemo se se hlatlogago sa kgwebišano ka tshepedišong ya tirišano ya dinaga tša lefase e bile mohola go dinaga tše ntši. Ge fela kgwebišano e be e sa lefelwe gomme dihlohleletši tša mebaraka la laotše boyo bja kgwebišano. Go ya ka menyetla ya dinaga ye e bapetšwago, dinaga tše di ipuletšego mebaraka ya tšona fao e gwebago go yona, balemi bao ba tšweletšago dibjalo bao naga ya bo bona e bilego le seemo seo se sa kgahlišego ge e bapetšwa ba ile ba swanelwa ke go fetoša tšweletšo ya bona. Godimo ga fao, ba fetoša dibjalo ka nepo ya gore ba kgone go rekiša dibjalo tše ka ditheko tše kaone ka mebarakeng ya gabobona goba go di romela dinageng tše dingwe. Se ke seo se diragaletšego bontši bja balemipotlana ba Afrika bao ba bego ba tšweletša korong, mabele, le dithoro tše dingwe, eupša ba be ba sa kgone go phadišana le dithoro tša go se ture tše di bego di tlišwa ka dinageng tša bo bona go tšwa ka United States goba ka Australia.

Ka go dinaga tše tše mmalwa balemi ba bantši ba ile ba fetogela go tšweletšo ya dibjalo ka hlwahlwa ya godimo gomme ba ile ba holega go kgwebišano. Bontši bja balemi, bao ba tšwago ka dinageng tše di nago le naga ye ntši gob aka dileteng tša kgole, ba ile ba palelwa ke go fetogela fa.

Tšhošetšo ye kgolo go kgwebišano ya mahala ya lefaseng ka bophara ke dithulano tše di golago ka dinageng tše ntši mabapi le ditumelelano tšwa kgwebišano le mabapi le kgwebišano ya mahala ka kakaretšo. Bobedi mokgatlo wo o bušago le mekgatlo ya dipolotiki ye e lego kgahlanong le yo o bušago ka dinageng tše ntši, tše di hlabologilego le tše di hlabologago di nyaka pušetšomorago ya kgwebišano le dinaga tša ka ntle. Se ke ka lebaka la gore se se di tlogela di le kotsing kudu go phadišana ye e sego ya loka le dinaga tše dingwe, kudukudu le China, e lego seo se kwešago bohloko diintasteri tša tšona le go tšea mešomo ya tšona. Ka lebaka la mathata a dijo a mengwageng ya 2007–2008, ba bolela gape gore seemo sa godimo sa go se be sekeng ka mmarakeng wa lefase se di tlogela di le kotsing kudu. Go ba kotsing fa ke ka lebaka la phetogo ye e sego ya emelwa ya melawana ya kgwebišano ya dinaga tše dingwe yeo e nyakago go šireletša dikgahlego tša tšona. Bontši bja mekgatlo ya dipolotiki, le gape dirutegi tše dingwe, ba nyaka gore go be le tshekatsheko leswa ya bokgoni go gwebišana le dinaga tša lefase le ga meholo ye e tšwago go ditumelelano tša kgwebišano tša dinaga tše ntši. Ka kakaretšo go a dumelwa gore go gwebišana le dinaga tša lefase go phatlalatša meholo ka lebaka la kgwebišano le kgolo ya ekonomi ka dinako tše kaone. Gape go bolelwa gore ge dinako tše mpe di fihla ka dinageng tše dingwe, kgwebišano le dinaga tša lefase le kgwebišano ya mahala di phatlalatša seemo sa mathata go bohle.

Bontši bja dirutegi di gatelela meholo ya tirišano ka ditumelelanong tša kgwebišano le dinaga tše ntši. Eupša, gape ba lemoga gore ditumelelano tše di na le mohola ge dinaga ka moka di fihlelela ditlamego tša tšona tša tumelelano yeo. Godimo ga fao, ge dinaga di sa tsenye tirišong melawana ya kgwebišano yeo e tlogago tumelelano le ge e le gore di bona go le maleba go tsenya tirišong go tšea magato a go šireletša bareki ba tšona. Magato a a tšewago ke dinaga di nnoši go na le kgonagalo ya gore a tla baka phetolo ye e swanago ka dinageng tše dingwe gomme se sa feletša ka go phuhlama ga tumelelano ka moka. Ka lebaka la se, mebaraka ya lefase e ka se be seemong se sekaone gomme tšweletšo ya se be kaone, gomme sa ba kotsi go bohle.

Ga go na kganetšo ya gore ka ntle le ditumelelano tša kgwebišano ya mahala, dinaga di ka se kgone go tšweletša fela ditšweletšwa goba tša ba le tšweletšo ka mafapheng ao di nago le menyetla ye mekaone gomme tšweletšo ya tšona ka go realo e ka se be ye kaone. Le ge e le gore melawana ye ya kgwebišano ya boditšhabatšhaba e tsebja ke bohle, ke dinaga tše mmalwa kudu tše di hwetšago go le boima kudu go dumela tirišano ya kgwebišano. Se ke ka lebaka la pelaelo ya gore dinaga tše dingwe di šomiša kgwebišano ya mahala ka go tšea magato di nnoši ao a sa obamelego tumelelano ye di e tsenetšego. Mošomo wa Mokgatlo wa Kgwebišano wa Lefase ke go thibela go se obamele ditumelelano tše, gomme o otlala dinaga tše di tšea magato ao di nnoši. Eupša go na le mafapha ao go ona go se obamele fa go hlalago ka go ona. Tlhokego ya tumelelano ya kgwebišano ka go ditšweletšwa tša temo e ile ya dira gore dinaga di itšeele magato ao di bonego a le maleba go dikgahlego tša tšona gomme tša laletša dinaga tše dingwe go tšea magato ao a swanago. Dithulano tše tša kgwebišano, le ge e le gore ke fela tša ditšweletšwa tše mmalwa, di fokotša go tshephana ga kakaretšo gomme tša hlohleletša dinaga tše ntši go tšea magato ao a fapafapanego kudu. Se ke ka lebaka la ge di nyaka go itšhireletša kgahlanong le maemo a ka go iletša kgwebišano ya tšona le go oketša tšweletšo ya tšona ya ka mebarakeng ya tšona le ge e le gore ga e šome gabotse e bile go bitša mašeleng a godimo: Mathata a dijo a file dinaga tše ntši diputseletši tše tiilego gore di fetogele go melawana ya go itšweleletša dijo. Ka mabakeng a mangwe, go

renta naga ka dinageng tše dingwe fao di ka kgonago go tšweletša dijo tšeo di tlogo ja ke batho ba tšona fela.

Fictional name: _____

Sepedi academic measure 1 (university participants)

Araba dipotšišo tše di latelago mabapi le temana ye o e badilego. Kgetha karabo ya gago ka go swaya (X) go karabo yeo o e kgethilego.

1. Kgetha setsopolwa go tšwa kalenaneong la kamofase seo se fago bohlatse bjo bo thekgago taba ya gore selekane goba tirišano magareng ga US le EU e bile ye kaone.
 - A. "Kabo ya dijo e tla tšwela pele go tia"
 - B. Kabo ya dijo e tla tšwela pele go se tiye
 - C. "Hlwahlwa ya godimo le nyakego ye ntši ya dijo tša phepo le tše di loketšego mmele ka dinageng tše di tšwelelago le tše di hlabologago e tla seemo se se kaone"
 - D. Diyo tša hlwahlwa ya godimo le tša phepo le tše di loketšego mmele
2. Efa mabaka ao a nago le seabe ka go mpshafatšo ye kgolo ya ka mosoka go tšweletšo ya dijo. Kgetha yeo e sa amegego.
 - A. Boitlhamelo bja theknolotši
 - B. tšhomišo ye kgolo kudu ya dibjalo tše di Bjetšwego ka Mokgwa wa Phetošo ya Ditšini
 - C. Methopo ya meetse ye e phuhlamago
 - D. Go tšweletšwa ga dibjalo tše di kgotlelelago komelelo
3. Naa ke dinaga dife tše di emetšego go hlatloga ka go tšweletšo ya dijo?
 - A. Ukraine le Dinaga tša Bogareng bja Bohlabela
 - B. Ešia le Russia
 - C. Ukraine le Russia
 - D. Russia le Dinaga tša Bogareng bja Bohlabela
4. Naa dinaga tše di hlabologilego gannyane go tšwa ka seleteng seo go nago le dinaga tše di hlabologilego tše di hlabologago di ka fokotša ditshenyegelo bjang ge di dira dinyakišišo tša mahlale ka nepo ya go beakanya gore dibjalo di be maemong a itšego ka dileteng tše itšego?
 - A. Dinyakišišo tša mahlale di hola dinaga ka moka ka dileteng tše di swanago, gomme ka go realo di ka kgona go abelana tshenyegelo ya dinyakišišo.
 - B. Dinaga tše di hlabologilego di ka abelana dikutollo tša dinyakišišo le dinaga tše di sego tša hlabologa mahala
 - C. Go kgona fao go oketšegago le go phatlalatša ditseno gare tša tšona go dinaga tše di hlabologago
 - D. Dinaga tše di sego tša hlabologa di ka kgona go šoma ka mokgwa wa tefo go lefa dinaga tše di hlabologago tše di tlogo fana ka dinyakišišo tša tšona tša mahlale
5. Naa ke mokgatlo ofe wo o thekgago maithomelo a naga a go hlabolla mananeo kgoparara a dinagamagaeng le leano la polelokego ya setšhaba?
 - A. Dinaga tše di Sego tša Hlabologa
 - B. Lenaneotlhabollo la Temo ya Afrika
 - C. Sehlopha sa Ditherišano kaga Seboka sa Boditšhabatšhaba sa Dinyakišišo tša Temo
 - D. Panka ya Lefase ya Dipanka tša Tlhabollo tša Dilete
6. Khutsofatšoya MDT e emetše
 - A. Mokgatlo wa Tokologo le wa Afrika
 - B. Mokgatlo wa Diyo le Temo
 - C. Mokgatlo wa Diyo le wa Afrika
 - D. Dipulego tša Diyo le Temo
7. Phetogo ya boso ye e bakwago ke go ruthufala ga lefase e tla le seabe seo se sego sa loka go _____ ka mafelong ao a hlokago dipula.
 - A. Tšweletšo ya dijo
 - B. Go phuhlama ka go tšweletšo ya dijo
 - C. Koketše go ka go tšweletšo ya dijo
 - D. Phokotšego ka go tšweletšo ya dijo

8. Dilo tše di latelago ke mehutahuta ya magato ao a swanetšego go tšewa ka nepo ya go kgontšha dinaga tše di lego kotsing go kgona go phela. Kgetha ye e sa amegego.
 - A. Go hlabolla mehutahuta ya dibjalo le mekgwa ya tšweletšo ye e gatetšego pele
 - B. Go aga matamo a go kgoboketša meetse go tšwa go meetse a pula
 - C. Go šomiša methopo ya meetse ye e lego gona ka go a seketša
 - D. Hloma magato a maleba a polokego ao a tlogo šireletša kabo ya dijo go bahloki
9. Ke ditlamorago tše dife tšeo di ka tlogo mabapi le dintwa go kgwebišano?
 - A. Go hloka tshepo
 - B. Khampani e lahlegetšwe ke dipoelo
 - C. Puno e be e sakgone go phenkgisana le mebaraka ya lefase
 - D. Go fetola dibjalo
10. Naa ke magato le maano afe ao go ya ka menyetla ye e bapetšwago yeo balemi bao ba tšweletšago dibjalo ba swanetšego go a dira ge phadišano e le godimo?
 - A. Rekiša dibjalo ka theko ye kaone ka mebarakeng ya ka nageng go ba ka go di romela ntle
 - B. Fetoša tšweletšo ya bona
 - C. Fokotša theko ya bona ya dibjalo
 - D. Oketša theko ye barekišago ka yona ka nepo ya go dira letseno

Fictional Name: _____

Sepedi academic measure 2 (university participants)

Araba dipotšišo tše di latelago mabapi le temana ye o e badilego. Kgetha karabo ya gago ka go swaya (X) go karabo yeo o e kgethilego.

1. Sebakeng sa ge go na le tlhalelo ya dijo, naa ke dipeakanyo dife tšeo dinaga tša Afrika tše di humilego ka methopo di ilego tša di tsenya tirišong?
 - A. Naga e tla hwetša dikabo tša dijo go tšwa go dinaga tša mabapi
 - B. Setšhaba sa ka nageng se tla tshepha thušo ya tšhoganetšo go tšwa dinageng tša ka ntle
 - C. Setšhaba se tla tshepha kabo ya dijo go tšwa lefelo la sona la polokelo ya dijo
 - D. Naga e tla fokotša setšhaba sa yona ka go romela batho ba bangwe ka dinageng tša mabapi
2. Kgopolo ya kgwebišano ya mahala ka kakaretšo e baka gore dinaga tše ntši di be kotsing go phadišano ye e sego ya loka. Naa ke dinaga dife tše di kwešago bohloko dikgwebo tša tšona?
 - A. Australia
 - B. United States
 - C. Ešia
 - D. China
3. Efa lebaka leo le dirago gore dinaga tše dingwe di itemogele mathata a go dumelelana le kgwebišano ya tirišano.
 - A. Ga di na methopo ya maleba
 - B. Di hloka tshepho go dinaga tše dingwe
 - C. Di tšhoga gore dinaga tše dingwe di itšeela sephetho sa go tšea magato di nnoši
 - D. Ga di na kgahlego ka gobane di dumela gore di ka se ba šomele gabotse
4. Kgetha tlhalošo ye e bolelago gore kgwebišano ya mahala e na le boleng bjo bohlokwa
 - A. Kgolo ka go kgwebišano e feletša ka katlego ya mebaraka ya balemi
 - B. Kgolo ka go tšweletšo e feletša ka kgwebišano ye e tšwelago pele ya dinaga tša mabapi
 - C. Go palelwa ga dinaga go tšweletša ditšweletšwa tše itšego fela goba ka ditšweletšwa tša mafapha a mangwe
 - D. Go palelwa ke go tšweletša ditšweletšwa tše di šomego gabotse
5. Naa mošomo wa Mokgatlo wa Kgwebišano wa Lefase ke eng?
 - A. Go thekga dinaga tše di nago le mathata a kgwebišano
 - B. Go thibela go se obamele melao le go tla dinaga tše di tšeago magato di nnoši
 - C. Go fa melawana ya mekgatlo ya kgwebišano
 - D. Go šireletša ditokelo tša semolao tša balemi bao ba gwebišanago
6. Go fetogela go tšweletšo ya hlwahlwa ya godimo go tlišitše mathata go balemi ba bantši bao ba lego ka dinageng tše di nago le naga ye ntši. Naa ke eng seo se bakilego se?
 - A. Balemi ba be ba hloka methopo
 - B. Mananeokgoparara a ka nageng a amile tšweletšo ya dibjalo
 - C. Balemi ba paletšwe ke go romela dibjalo tša bona dinageng tša ka ntle ka pela ka fao go bego go nyakega ka gona ka lebaka la maemo a ditsela tše di bego di sa kgahliše
 - D. Balemi ba be ba se na tsebo ye e lekanego go fetogela go tšweletšo ya hlwahlwa ya godimo
7. Naa dinaga tše di sego tša itemogela komelelo di ile tša dira selo se sekaone sa go tswalela mellwane ka nepo ya go thibela gore go se be le dijo tše di romelwago dinageng tša ka ntle?
 - A. E be e le selo se sekaone ka gobane ba hlokometše dipeeletšo tša tšona
 - B. E be e le phošo ka gobane se se šitiša kgwebišano le dinaga tše dingwe gomme se ka moso se tla baka mathata a kgwebišano
 - C. E be e le phošo ka gobane ge di ka felelwa ke dijo tše e ka di phatlalatšago ka nageng gona di tla be di hlamilile mapheko le dinaga tše dingwe
 - D. E be e le selo se sekaone ka gobane go bohlokwa go thekga ditšweletšwa tša ka nageng
8. Ge dinaga ka moka di angwa ke komelelo, tšweletšo e nanya kudu. Naa seemo se se na le diabe dife go naga? Kgetha lefokwana leo le lego maleba kudu.
 - A. Poelo ya go rekiša ditšweletšwa e ba fase

- B. Batho bao ba hlokago ba ka se kgone go reka ka gobane dijo di a tura
 - C. Naga ga e tšweletše dijo tše di lekanego
 - D. Batho bao ba hlokago ba itemogela tlhokego ya dijo ye kgolo
9. Kgwebišano le dinaga tša lefase le kgwebišano ya mahala di bonwa bjalo ka dilo tše di bakago go phuhlama ga naga. Se ke ka lebaka la
- A. Go gwebišana mahala fao go sa holego naga yeo e romelago ditšweletšwa dinageng tša ka ntle
 - B. Go na le tlhokego ya poelo ka kgwebišanong
 - C. Kgwebišano ya dinaga tša lefase le kgwebišano ya mahala di senya katlego ya naga
 - D. Kgwebišano ya mahala e baka thulano gareng ga dinaga
10. Dilo tše di latelago ke diabe tša go iletša kgwebišano le tšweletšo ya ka nageng ye e oketšegago ya mebaraka ya ka nageng.
- A. Di šoma bokaone ebile ga di ture
 - B. Di na le bokgoni bjo bontši kudu le kelo ya fase ya ditheko
 - C. Ga di šome bokaone ebile di a tura
 - D. Di tura kudu ebile di šoma bokaone

APPENDIX C

Comprehension text (generic) and test for English reading_pre and -post (university participants)

Why Textbooks Are a Crucial Part of Every Child's Learning Journey

South Africa's education system is widely accepted to be in crisis. An alarming number of its children are functionally illiterate and innumerate. Many schools lack equipment, infrastructure and even basic necessities like furniture. In this context, could improving access to textbooks make any real difference? The answer is yes. Textbooks matter. That's why their absence from one South African province's classrooms made headlines in 2012. The country's Department of Basic Education failed to deliver textbooks to learners in the Limpopo province that year. This led to a court battle between the organisation I work for, Section27 - a public interest law centre focusing on health and education rights - and the government.

The court found in Section27's favour, with the judge ordering that the department urgently deliver textbooks to Limpopo's schools. That wasn't the end of the matter. In 2014 Section27 launched a new application on behalf our clients - an organisation called Basic Education for All and a number of Limpopo schools - because not all the province's schools had received the textbooks they needed that year. In May 2014, Judge Neil Tuchten of the North Gauteng High Court ruled that the department had violated children's rights to a basic education. Tuchten ordered the department to provide a textbook to every learner for every subject by the start of every academic year. The department appealed this ruling, a matter now due before the Supreme Court of Appeal.

Tuchten in his judgment said: Textbooks have been part of the stock in trade of the educator for centuries. There is something special about a book. It has a very long life, far longer than that of the individual reader. It is a low technology device. It is accessible to anyone who can read the language in which it has been written. During the hours of daylight, it can be read (accessed) without any other supporting technology at all. It needs no maintenance except the occasional strip of adhesive tape. Some of South Africa's foremost education researchers agree. They have found a positive correlation between access to textbooks and learners' results. Here's why, in a country as unequal as South Africa, textbooks matter so much.

South Africa's poor educational outcomes

Education researchers are reluctant to pinpoint a single cause for a child's poor performance at school. But many agree that having access to textbooks is an important contributor to improved performance. A transnational study involving 15 countries in Africa - among them South Africa, Kenya, Lesotho, Swaziland, Namibia, Malawi and Uganda - assigned maths and reading tests to Grade 6 learners (who are on average 12-years-old) and to their teachers.

In an analysis of the results, Stellenbosch University economist Nic Spaull found that 27% of South Africa's Grade 6 learners were functionally illiterate and 40% functionally innumerate. Figures differed substantially across South Africa's nine provinces. Limpopo, centre of the textbook crisis and court cases, recorded the lowest reading test results: 49% of the province's Grade 6 learners were deemed to be functionally illiterate. Spaull's research also measured the impact of access to textbooks on educational performance. He found that learners with their own reading textbooks, or who share with not more than one student, "perform significantly better" than those who have to share textbooks with more than one other classmate.

Teacher content knowledge

In the Limpopo textbook case, the Department of Basic Education argued that teachers can fulfil the function of textbooks. But current research suggests otherwise. In many cases, teachers lack content knowledge in the subjects they are teaching. Data from the pan-African study shows that only 32% of South African teachers had the required levels of content knowledge. The function of a textbook is

essentially to guide the teaching and learning of the curriculum in a particular subject. Against the backdrop of poor teacher context knowledge, textbooks play a fundamental role in supplementing teachers' knowledge deficits.

Cultural practices

Education researchers have also explored the importance of what's called "cultural capital". This relates to family literacy and practices in homes and communities that can help children prepare for school. It also includes exposure and access to books and other printed materials. But South Africa is not a reading society: the country's deputy president Cyril Ramaphosa has said that only 14% of South Africans are active book readers and a mere 5% of parents read to their children. Where learners do not have access to books in their own homes textbooks can potentially remedy this "cultural" deficit. There is no single "magic bullet" that will solve South Africa's educational problems. But there is clear evidence that access to textbooks is an important part of the solution. Textbooks do matter. They play a crucial part in overcoming some of the broader structural deficits to teaching and learning.

Supreme Court of Appeal: Textbooks are a constitutional right

On Wednesday, the Supreme Court of Appeal was emphatic: by not delivering textbooks to all Limpopo learners, the Department of Basic Education and provincial department had violated learners' rights to basic education. It's the strongest judgment yet that all learners, especially the disadvantaged, have a constitutional right to textbooks. "I've been looking into the Limpopo textbook issue," Section 27 attorney, Nikki Stein, emailed her colleagues in January 2012. The Limpopo Department of Education had not, yet, ordered books for the year, blaming it on the fact that they were under national administration.

After almost four years and four high court appearances later, the Supreme Court of Appeal (SCA) on Wednesday confirmed the state's responsibility to do everything possible to fulfil the immediate right to basic education. Each and every Limpopo student at public schools has a right to receive textbooks before the commencement of the year, said the judgment, which could have an impact on how the right to education is assessed. In dismissing the Department of Basic Education's (DBE) appeal, SCA Justice, Mohamed Navsa, began with a quote from former slave, Frederick Douglass, on the importance of reading. A Kofi Annan quote on the link between literacy and hope followed. The judgment then unpacked arguments from the DBE, which was appealing a high court judgment, and respondents Basic Education for All (BEFA), who along with 22 Limpopo school governing bodies and the SA Human Rights Commission have continued to push the case.

The key question is whether Section 29(1) (a) of the Constitution, which states that everyone has a right to a basic education, means every learner in every school should have a textbook and how the government should be assessed on its obligations. The SCA found it difficult to understand why the DBE had appealed. "Before us counsel on behalf of the DBE was hard-pressed to present a coherent basis for resisting the relief sought by BEFA. Counsel submitted that the relief sought demanded a standard of perfection that could not be met. Primarily, though, the DBE's case appeared to be that Section 29(1)(a) of the Constitution did not require of it that each learner in every school be provided with a textbook," it read.

The court said the difficulties in the DBE meeting its own plan to deliver textbooks in 2014 were largely its own fault, having a poor plan and poor logistics. "The truth is that the DBE's management plan was inadequate and its logistical ability woeful," said the judgment. "The plan was flawed. The law is clear."

On figures from 2014, the DBE said 97% of Limpopo learners had received textbooks (a figure which is disputed). The court asked about the three percent who didn't: "clearly, learners who do not have textbooks are adversely affected. Why should they have to suffer the indignity from having to borrow from neighbouring schools or copy from a blackboard which cannot, in any event, be used to write the totality of the relevant part of the textbook? Why should poverty stricken schools and learners have to be put to the expense of having to photocopy from the books of other schools?

Why should some learners be able to work from textbooks at home and others not? There can be no doubt that those without textbooks are being unlawfully discriminated against."

Noting those adversely affected are poor, black learners in rural areas, the SCA said we must guard against failing the vulnerable. The judgment declared that the DBE and Limpopo Department of Education violated learner's rights in 2014. It also declared the Constitution does entitle every learner to a textbook, which must be delivered before the commencement of the teaching course.

Writing before the case was heard, Faranaaz Veriava, a public interest lawyer working with Section27, which has been active in the case since 2012, called the appeal "arguably the most important education rights case" heard in the courts. She explained that "the core issue that will be determined by this appeal is the appropriate standard of review for assessing whether or not government has complied with its obligation to provide a basic education in terms of Section 29(1)(a) of the Constitution".

It was about whether goals in basic education are or should be immediately or progressively realisable. Section27 attorney Kate Paterson said the judgment negates the possibility for the DBE to argue that the right to education only involves implementing a plan over a period of time. According to the department's own policies, every learner should have a full complement of textbooks before the school year, and they cannot go back on their own goals. Improving delivery over a period of time isn't good enough. Paterson said the judgment speaks clearly to the immediately realisable standards of basic education and said it could also influence other identified DBE deliverables.

The DBE was criticised for its decision to appeal the past high court judgment and Paterson said she sincerely hopes the DBE does not appeal the case in the Constitutional Court. No matter Ndebele, a journalist at Section27 who has worked closely with the BEFA community group, said initially the students she worked with felt nobody cared about them. "But now look what they've done. There isn't another child in SA who will have to go without a textbook. And they did that. This is only the beginning," said Ndebele. Department of Basic Education spokesperson, Elijah Mahlangu, on Wednesday said the department's lawyers are still studying the judgment before they brief the minister and she discusses it with provincial education MECs. He said the DBE will respond in greater detail in the coming days and could not comment on whether it plans to appeal.

Schools claim no textbooks received all year

The Limpopo education department faces increased pressure after a report revealed 50% of next year's books are yet to be acquired. In the past two weeks, five schools have said they have not received a single Caps textbook this year, let alone the textbooks for next year, according to the rights organisation, Basic Education for All (Befa). "It will be a disaster for those schools for next year. Those five are not even part of the schools that were represented in our court case [this year]. They are different schools," Befa member Tebogo Sephakgamela told the Mail & Guardian on Monday.

He was commenting on statements made in a report by the auditor general, which had said that the Limpopo education department had failed to acquire half the textbooks needed for 2015. The figure was in a South African Press Association (Sapa) story that quoted the Synopsis on the AG's Limpopo Department of Education Management Report. "From what I see on the ground, I can tell you that story is true. That story does not come from nowhere. It's an auditor general's report. There is no way he was not telling the truth, given the fact that some of the schools have not even received textbooks for this year," Sephakgamela said. This is a worrying trend that the phasing in of the new Caps curriculum began in 2012 and was completed the year 2015.

Fictional Name: _____

English generic measure 1 (university participants)

Answer the following questions based on the text that you just read by placing (X) next to the answer you choose.

1. Was it necessary for the Department of Basic Education to make an appeal based on the textbook issue?
 - A. It was necessary because they were protecting their image
 - B. It was not necessary because they violated learners' rights for their right to education
 - C. It was not necessary because the department only wasted resources
 - D. It was necessary because it was not their fault
2. Select a best possible explanation that tells you that the Department of basic Education succeeded in implementing the textbook strategy in Limpopo by 97%?
 - A. They succeeded, because a high percentage of learners received textbooks
 - B. They succeeded, because more textbooks have been delivered
 - C. They did not succeed because they failed to reach 100% of their delivery
 - D. They succeeded because they raised a bar from 2012-2014.
3. BEFA stands for
 - A. Black Elevation For All
 - B. Basic Education Federation Alliance
 - C. Basic Education For All
 - D. Basic Education Federal Alley
4. Provide evidence to show that the community lost faith in the department for fulfil its duties.
 - A. Ndebele said students she worked with felt nobody cared about them
 - B. Learners are without textbooks and it is only beginning
 - C. Department of Basic Education was criticised
 - D. Department of Basic Education was taken to court
5. Is there evidence provided in the text to prove that the claims made by schools for not receiving textbooks are true?
 - A. 50% of the following year books are yet to be acquired
 - B. Learners did not receive textbooks
 - C. The districts are still waiting for the textbooks they ordered
 - D. The principals feel that the education system are failing
6. Two factors that played a role in the difficulties in the Department of Basic Education's meeting its own plan to deliver textbook are
 - A. Executive management
 - B. Political parties that influence decisions
 - C. Poor implementation
 - D. Poor planning and logistics
7. Did the Department of basic education go back on their word when they promised what is written in their policies that every learner should have a full complement of textbooks?
 - A. Yes. The policy was not implemented
 - B. No. The department delivered 97%, hence it is a work in progress
 - C. Yes. 3% of the learners' right were violated
 - D. No. 97% of the learners' rights were not violated
8. According to Mail & Guardian report, a teacher from a certain school stated that he submitted the requisition forms three times to request textbooks. What does this tell us about the Limpopo Department of Education?
 - A. The department is failing the province
 - B. The department is failing the system of delivering textbooks

- C. The principal is failing the teachers
- D. The teachers are failing the learners

9. What particular action or practices would be consistent in order to remedy the Limpopo Department of Education textbook crisis?

- A. Department needs to share their strategy across the country on how they manage to deliver services
- B. Equality in the country
- C. Consistency throughout the country
- D. Carrying on through investigation about the schools

10. What specific conclusion can be drawn from this article?

- A. 39 schools in Limpopo did not receive textbooks
- B. Principals are finding it difficult to run their schools with no textbooks
- C. The Limpopo Education Department is failing to deliver services, despite receiving three court interdicts
- D. Department of Basic Education are ignorant for not intervening in the Limpopo textbook crisis.

Fictional Name: _____

English generic measure 2 (university participants)

Answer the following questions based on the text that you just read by placing (X) next to the answer you choose.

1. South Africa's education system is widely accepted to be in crisis because a great number of children are illiterate and innumerate, what evidence can support the above mentioned statement?
 - A. South Africa does not have a reading culture
 - B. South Africans are very lazy to read
 - C. Rural areas cannot afford to buy books
 - D. There is a huge gap of reading book in African languages
2. Limpopo province made headlines in 2012 about the textbooks crisis. Why did this issue get a lot of attention?
 - A. Textbooks matters because lack of it hinders learning to progress
 - B. Teachers love using textbooks a lot, they depends on them
 - C. Learners rely on textbooks for learning
 - D. The province is likely to receive a lot of attention because of corruption
3. What are the disadvantages of having a textbook?
 - A. It has a very long life
 - B. It is a low technology device
 - C. It is accessible
 - D. It is expensive
4. What do the findings by Nick Spaull, an economist at Stellenbosch University imply about the state of literacy in South Africa?
 - A. It is important for textbooks to be delivered to school early in the year
 - B. Lack of textbooks will lead to poor performance
 - C. South Africans Grade 6 learners are functionally illiterate by 27% and 40% innumerate.
 - D. Access to textbooks increase chances of performance
5. What evidence can you provide to support the fact that South Africa is not a reading culture?
 - A. Learners are performing poorly and their reading levels are low
 - B. Most parents do not read for their children
 - C. 14% of South Africans are active book readers and a mere 5% of parents read to the children
 - D. Rural areas do not have access to a library
6. The following are a list of necessities for school participants, except one. Identify the least one out.
 - A. Textbooks
 - B. Furniture
 - C. Tablets or computers
 - D. Infrastructure
7. What were the after effects of failing to deliver textbooks?
 - A. Learners failed and the province's average % dropped
 - B. Learners and teachers began a protest
 - C. Learners had to share textbooks with learners from other schools that had textbooks
 - D. This led to a court battle between a public interest law centre focusing on health and educational rights and the government
8. The article states that textbooks are a very important source. Select the best possible reason to support the statement.
 - A. It makes it possible for teachers to present lessons in class
 - B. There is a correlation between access to textbooks and learner's results
 - C. It has massive information

- D. Learners can share information easily by using textbooks.
9. According to the content knowledge of the teacher, what is the function of a text?
- A. To guide the teaching and learning of the curriculum in a particular subject
 - B. To assist teachers so that they can have a guided assessment
 - C. To impart teachers with knowledge
 - D. To help teachers plan their lessons carefully
10. How long did it take for the Supreme Court of Appeal to receive judgement?
- A. 8 years
 - B. 4 years
 - C. 2 years
 - D. 14 years

APPENDIX D

Comprehension text (generic) and test for Sepedi reading_pre and-post (university participants)

Naa 'bohwa' bja rena ke eng?

Kgwedi yeo e sa tšwago go fela ya Lewedi (Setemere) e tsebega e le kgwedi ya 'bohwa' (heritage). Gape re botšwa gore ka setšo ye ke kgwedi ya mathomo ya ngwaga. Ye ke kgwedi yeo bjang le mehlare di hlogago leswa e le taetšo ya bophelo. Seo bangwe ba se botšišago, le ge go le bjalo, ke gore na ge re re keteka 'bohwa', re ra ge re keteka eng? Na 'bohwa' ke eng?

Wikipedia, yeo e lego ye nngwe ya dipukuntšu tša inthanete, e hlalosa 'bohwa/ bohwa bja setšo' go ba 'lefa la dilo tšeo di swaregago le tšeo di sa swaregego tšeo di tswalanywago le sehlopha goba setšhaba seo se rilego tšeo e lego lefa leo re le humanego go tšwa melokong yeo e fetilego, tšeo re di bolokago mehleng ya bjale gomme re rata go di fetišetša go meloko ya ka moso'. Dilo tša go swarega di akaretša meago, maswika a segopotšo, boalo bja naga, dipuku, diaparo, dilo tša go bopša (ka kota, letsopa, gauta, letlalo, bjang, mahlaka, bjalobjalo). Bohwa bja go se swarege bo akaretša dinonwane, dikoša, polelo, meetlo le ditlwaello, tsebo le diphedi (dimela le diphoofolo).

Ge e tšwela pele, Wikipedia e re 'bohwa' bja setšhaba se sengwe le se sengwe ke moswananoši e bile bo ka se tšeelwe legato ke selo. Bohwa bja setšhaba se sengwe le se sengwe ke karolo ye bohlokwa ya setšhaba seo yeo e se hlaolago go ditšhaba tše dingwe. Ditšhaba tša lefase di swana ka dilo tše dintši gomme se se dira gore batho ba go tšwa ditšhabeng tša go fapana ba kgone go phela mmogo ntle le mathata. Le ge go le bjalo, go na le dilo tše dingwe tšeo ditšhaba tšeo di rilego di tsebegago ka tšona – polelo, mmimo, dijo, dipapadi, mahlale, ditšweletšwa tša kgwebo, diaparo, bjalobjalo tšeo di tsebegago ka tšona.

Naa nna le wena ge re re re be re keteka bohwa, gabotse ke eng yeo re bego re e keteka? Kudu dinageng tša Yuropa, karolo ye nngwe ye bohlokwa ya bohwa bja dinaga tšeo ke meago ya kgale. Mo gagaborena ga go na meago e mekae ya setšo goba ya SeAforika yeo ke bonego e ketekwa. Mafelo a segopotšo bjalo ka Mapungubwe, Tšate, lewa la Makapane, Bela-Bela, dithaba tša Makgabeng, sefate sa GaChuene, bjalobjalo a fela a ketekwa. Gape re keteka dibjalo tša go swana le mehlare wa Mongwane (Baobab), morula le diphoofolo tše dikgolo tše hlano – tlou, tau, nkwe, nare le tšhukudu.

Karolo ye nngwe ya setšo yeo ke bonago e fela e ketekwa ke ya diaparo. Ga ke na nnete gore na ka kgonthe diaparo tša mašela tša mebalabala tšeo go thwego ke tša setšo, ka kgonthe ke tša setšo naa, goba ke karolo ya bohwa naa? Lešela setšo sa MaAforika? Le ge go le bjalo, diaparo tša letlalo tšeo ke felago ke bona batho ba di apara tšeo ke a kgolwa gore ke tša setšo.

Karolo yeo ke gopolago gore e bonala kudu ya bohwa bja rena ya dilo tšeo di sa swaregego ke mmimo. Le ge karolo ye e gwahlafetše gomme e fokola go ya pele le pele ka ge e sa hlabollwe, mmimo wa setšo o sa fela o bonala mo le mola. Ntle le dinatla tša go swana le Dingaka Phillip Tabane le Sello Galane tšeo di lekago go hlabolla mmimo wa malopo le wa kiba, mmimo wo ga o laetše o ketekwa go ya kgole.

Karolo yeo e gwahlafetšego kudu ya bohwa bja rena e akaretša polelo, dijo, dipapadi, mahlale le tsebo tšeo e lego bohwa bja borakgolokhukhu'a rena. Tsebo ya dihlare le kalafo ya malwetši, tsebo ya go boloka dijo (megwapa, bokoma, bjalobjalo), meetlo le ditlwaello (diila, mekgwa ya go nyala, ditlwaello tša poloko ya bahu le tše dingwe) di nyameletše goba di fetogile. Na bohwa bja rena bo a tielela goba bo a gwahlafala? Na ge re keteka bohwa, ke eng yeo nna le wena re e ketekago?

Letšatši la Bohwa, 24 Lewedi Ka Steve Mofokeng Kua KwaZulu-Natal, 24 Lewedi le be le tsebega ka Letšatši la Shaka gomme le be le ketekwa go gopola Kgoši ya go tuma Shaka, yo a ralokilego karolo ye bohlokwa ya go kopanya meloko yeo e fapanego ya Mazulu bjalo ka setšhaba seo se kopanego. Ka letšatši le ngwaga wo mongwe le wo mongwe batho ba kgobokana lebitleng la gagwe go mo hlomphe. Molaekakanywa wa boikhušogohle woo o abilwego Palamenteng ya Afrika Borwa ka morago ga 1994 ga se wa akaretša 24 Lewedi bjao ka boikhušogohle bjoo bo akantšwego.

Inkatha Freedom Party (IFP), mokgatlo wa dipolotiki woo o nago le maloko a mantši a Mazulu, ba ganana le tlogelo ye. Go ile gwa fihlelelwa tirišano gare ga IFP le Palamente gomme letšatši la fiwa leina la bjale, Letšatši la Bohwa. Bohwa bo hlalošitšwe bjalo ka 'seo re se amogetšego: palo ya palomoka ya bophelo bja lešoka le bobogego, mafelo a bohlokwa a saense le a histori, digopotšo tša setšhaba, meago ya histori, mešomo ya bokgabo, dingwalo, mmimo, ditšotšhaba le dikgobokanyo tša museamo, gammogo le ditokumente tša tšona.' Letšatši la Bohwa ga se fela ka go keteka ditšo tša dihlopha tšeo di fapanego, eupša gape ka dihlopha tšeo di fapanego tšeo di abelanago mahlakore a ditšo tša wona.

Dikokwane tša kopano ya setšhaba, poelano le boineelo di swanetše go gatelelwa. Maikemišetšo ke go hlohleletša gape MaArika Borwa a mannyane go šireletša le go hlomphe bohwa bja bona bja go abelwana. Mo polelong yeo e dirilwego ka tiragalong ya bobedi ya moketkong wa Letšatši la Bohwa ka 1996, Presidente ya maloba ya Afrika Borwa Nelson Mandela o rile: 'Ge mmušo woo o kgethilwego ka mokgwa wa temokrasi o tšea sephetho sa go dira Letšatši la Bohwa bjalo ka le lengwe la matšatši a setšhaba, re dirile seo ka gore re tseba gore bohwa bja ditšo tša rena tšeo di humilego gape di fapanego bo na le maatla ao a tseneletšego go thuša go aga setšhaba sa rena se sefsa.'

Bjalo ka ge o bona lehlabula le gaketše ka ditho tša lona ka moka, le mehlare ya merula le yona e thabile ka dienywa tša yona e lego marula. Marula ge a budule kudu a fetša ka go hlohlorega mohlareng, a wela fase. Re kgoboketša marula ao ra fihla ra a thula, ra mina todi ye ya wona me ra e tšhela ka sebjaneng. Re tlogela todi yela ka moo go fihla e bela gannyane. Bangwe ba tšhela dithuši gore metsana ale a morula a šale a le bose kudu. Ka morago o a tšewa o išwa thekišong. Seno se se bose kudu, ke ka moo o hwetšago bommasepala wa Mopani ba swara meletlo ya mokete wa marula. Le boramahlale ba ile ba lemoga tsebo ye ya ngwana'mmala wa sebilo gomme ba fetša ba hlabolotše seno se, ba se nokela ka mabotlelong ba fetša ba se bitša gore ke Amarula. Gothwe sona seno se se thuša kudu go hlwekiša teng gobane go ba bangwe se a tšholodiša.

Ge o tloga Lebowakgomo o roropa ka tsela o feta Moteti o tla no hwetša bommagobatho ba thekgile dintibelwana. Tsebo ya tlhago e thušitše masea a mantši ao a bego a swerwe ke hlogwana, ba lebelela godimo ba sa fetše, ba ntšha le lengwana. Ngwana yo o a babja. Le mantle a gagwe a talafetše o ka re a motho yo mogolo. Go na le ditsela tše ntši tša go thuša ngwana yo ntle le go reka selo kaekae. Bangwe ba tla no hwetša mae a mabedi a kgogo, ba hlakanya le diemadirile tša bona ba noša ngwana mme a bapala. Yo mongwe o lla ka tsela ye kganthe o swerwe ke morithi wa letswele. Ga a kokotlele, o bodutwana mme ga a ipshine ka papadi. Bakgekolo le bakgalabje ba tseba gabotse gore ba swanetše go tšeang eng ba kopanye le tšie ya mohuta mang gomme ba tope bolwetši ka mabinakošana ba lahlele kua.

Rutanag bana ditaola le se yeng natšo badimong. Ge o lebelela mosadi yo o hlotla bjala. Ka sehono nkabe a šomiša sefo ya go sekološa meroko go tšwa go bjala bjo. Tatagosetšhaba yena o šomiša senwelo sa go bjalwa, sa hlokomelwa go fihla se oma gabotse. Ba se tšea batsebi ka tsebo ya bona ba se ripa ka bogare mme gwa dirwa senwelo sona se sa meetse a go tonya. Bjala bjo bo nwewa ka sego goba senwelo seo le sona se bjetšwego gomme sa gola, sa ripše mohlareng wa sona, sa omelela, mafelelong se ripše ka bogare gore se tšwe tše pedi. Malwetši a mehutahuta wona a alafša gabotse ka bo monokomoropana le digwere tše dingwe. "Ga go sehlare sa go alafa go feta seo se tšwago mobung". Ao e bile mantšu a nkadingala yo mongwe ge a be a efa polelo lekgotleng la dingaka tša setšo. O re bjalo ka ge motho a bopilwe ka leraga leo le lona le tšwago mobung, gona motho o swanetše go fodišwa ke sehlare seo se tšwago gona mo mobung. Tsebo ya tsebo mohuta wo e bohlokwa go bafsa ba lehono ka ge go šetše go na le bohlatse bja gore ba itlhomološa segagabobona.

Mohlomongwe ba dirwa ke gore le bona batho ba bagolo ba jewa ke dihlong tša tsebo ye. Tsebo ya bodikela ke yona e tšeelwago hlogong go feta yeo e godišetšego ngwana mmala wona wo. Borakgolo le bomakgolo ba tseba gore ge ngwedi o sekametše ka thoko efe o bolela ka lehu la go se fele, mola ge o sekametše kaekae o laetša gore pula kgeding yeo e tlo ba ye ntši. Lebelela gape meropa yeo e dirilwego ka mekgopa ya diphoofolo. Go binwa dikiba le dimpepetlwana ba tidinya yona meropa ye ya go dirwa ka diatla ntle le go šomiša mahlale a theknolotši. Tsebo yona ye ya dira gore motho a tšee phatla ya kgomo a dire seta ka yona. Go na le bohlatse bja tlhago, bjo bo nyakago tlhahlo fela gore bo tle bo tšwele nyanyeng. Batho le bona ba tlogele go jewa ke dihlong tša tsebo ya bona ya tlhago.

O mongwe le o mongwe wa rena o hweditše pitšo ya go ba ngaka ya setšo a ba a rutwa ke dinaka tše dingwe le go ithuta mmogo le dingaka tše dingwe tša setšo. Re humana tsebo ya rena ka ditsela tše di latelago tše nne: Re hwetša tsebo go tšwa go ba barutiši le ba eletši ba rena, re ithomela tsebo go ya ka mo re filwego ka gona, re hwetša tsebo go tšwa go dingaka tše dingwe, re fiwa tsebo ke badimo ba rena mo ditorong. Le ge re ena le tsebo e tee o mongwe le o mongwe wa rena o na le lefapha leo o na le

tsebo kudu ka lona. Ka tsela yeo tsebo ya rena ya swana ka gore e tšwa badimong b arena ebile ka moka rena le maloka a go itshwarela yona. Ge re fetišetša tsebo ya rena pele ka ntle gago tsebiša badimo ba rena le dingakammogo ka rena re tla galefiša badimo ba rena gomme ra senya le go tšhilafatša tsebo yeo re na go le yona.

Re ka abelana ka tsebo ya rena ge feela re latela meloa ya setšo yeo e beilwego maelana le go dira go loka setšhabeng gape le hwetšwa kabelo go ditsenwa tšeo dihwetšagalago gotšwa tsebong ya rena ya setšo. Re hlobaetšwa ke tahlegelo ya tsebo ya setšo ye e šetšego e bile gona entle le go tsebagatša mothopo wa tsebo yeo le go abelana ditsenwa tše di hwetšagalago ka lebaka la tsebo yeo ya setšo. Re kopantsha setšhaba sa rena le pharologano ya hlago re šomiša setšo sa rena. Bontši bja dihlare tša kalafo di kgobaketšwa gotšwa ditulong tša rena, ka tsela yeo setšhaba se kgona go bona kgomagano ya pharologano ya hlago, tša maphelo setšhabeng le bophelo bja tšatši ka tšatši bja setšhaba.

Tsela yeo re rwalelago dihlare tša kalafo tikologong ya rena e eletšwa ke melao ya setšo yeo e hlohleletšago go šomiša di dirišwa tša rena tša hlago ka pabalelo re gopola setšhaba sa ka meso. Go fa mohlala ka se, pele re ka rwalela dihlare re thoma ka go botšiša badimo pele le go kgonthišiša gore dihlare tšeo re di rwalelago di tla kgona go tšwela pele di phela le go phediša balwetšwi bao re ba alafago ka tšona. Ka morago gage re kgobakeditše mahlare le mamalamati a sehlare re tšhela mobu godimo ga medu ya sehlare go se tšhireletša gore se tšwelepele se phela. Dihlare tša rena re di kgobaketša go ya ka sehla, ge go rwalelwa sehlare ka sehla se se fošagetšego go ka ba le ditla morago ga tše di šiišago setšhabeng bjalo ka komello. Ka lebaka la gore re rwalela dihlare ge feela di nyakega, re kgona go rwalela dihlare tša rena gabotse ntle le go senya goba go rwalela go fetiša ka mo go hlokagalago. Re tšhireletša pharologano ya hlago ka tsela tše di fapanego:re hlokomediša gore a go be le mmolo wa hlaga le gore bao ba rwalelago dihlare ka go senya ba a emišwa go dirwa bjalo. Re fetišetša pele tsebo e ya go rwalela le go diriša hlago ya rena ka pabalelo go setšhaba sa rena sa ka moso.

Fictional Name: _____

Sepedi generic measure 1 (university participants)

Araba dipotšišo tše di latelago mabapi le temana ye o e badilego. Kgetha karabo ya gago ka go swaya (X) go karabo yeo o e kgethilego.

1. Kgwedi ya "Lewedi" e tsebega e le kgwedi ya eng?
 - A. Ya dikgaruru
 - B. Ya tokollo
 - C. Ya bohwa
 - D. Ya phetogo
2. Na "bohwa" ke eng?
 - A. Dilo tše re tatago go do fetišetša go meloko ka moso, go swana le dijo, bj.bj
 - B. Ke medu ya maphelo a rena
 - C. Ke mekgwa yeo re phelago ka yona
 - D. Ke dilo tša kgale, tša bo makgolo le makgolokhukhu
3. Bohwa bja go swarega bo akaretša tše di latelago. Ye tee ya tšona e fošagetše.
 - A. Dipuku
 - B. Diaparo
 - C. Dilo tša go bopša
 - D. Tsebo le diphedi
4. Ke eng karolo ye nngwe ye bohlokwa ya bohwa bja Yorupa?
 - A. Mmino
 - B. Meago ya kgale
 - C. Diaparo
 - D. Dijo
5. Diaparo tša setšo tša Afrika-Borwa ke
 - A. Matlalo a diphoofofo
 - B. Ke diroko tša basadi le marokgo a banna
 - C. Ke diaparo tša go dirwa ka mahlaka a noka
 - D. Ke diaparo tša go dirwa ka mehlare
6. Letšatši la bohwa, 24 Lewedi ka Stere Mofokeng kua Kwa-Zulu-Natal le be le keteka eng?
 - A. Letšatši la setšo
 - B. Letšatši la Nelson Mandela
 - C. Letšatši la Inkata-Freedom-Party
 - D. Letšatši la Shaka
7. Dikenywa tša morula di šomišwa go dira eng?

- A. Dithotse
- B. Bjala/seno
- C. Go apea
- D. Go dira dilo tša go tlotša sefahlego

8. Bolwetši bja hlogwana bo alafega bjang?

- A. Ba kopanya molora le oli gomme ba tlotša ngwana hlogo
- B. Ba tšea legare ba sega ngwana mokokotlo/mohlane
- C. Ba kopanya diemadirile le mae a mabedi ba nweša ngwana
- D. Ba apeša ngwana motlamo nokeng le matsogong

9. “Ga go sehlare sa go alafa go feta seo se tšwago mobung”. Setsopolwa se se ra go reng?

- A. Mobu o a fodiša
- B. Dihlare ka moka di tšwa mobung
- C. Sehlare sa go feta tše dingwe ke sa go itirela
- D. Dihlare tša go hlakantšhwa le mobu dia fodiša

10. Na setšhaba se a holega go ditaba tša setšo?

- A. Setšo se thuša batho go dira ka go loka
- B. Melao ya setšo e bothata
- C. Mokgwa wa go dira dilo ke wa ditheko tša fase
- D. Mokgwa wa go dira dilo o bonolo

Fictional name: _____

Sepedi generic measure 2 (university participants)

Araba dipotšišo tše di latelago mabapi le temana ye o e badilego. Kgetha karabo ya gago ka go swaya (X) go karabo yeo o e kgethilego.

1. Ka setšo, Lewedi ke kgwedi ya bokae?
 - A. Ke kgwedi ya senyane
 - B. Ke kgwedi ya mathomo
 - C. Ke kgwedi ya lesomepedi
 - D. Ke kgwedi ya bobedi
2. Bohwa bjago se swarege bo akaretša tše di latelago. Ye tee ya tšona e fošagetše.
 - A. Dikoša
 - B. Polelo
 - C. Meago
 - D. Meetlo le ditlwaelo
3. Na e kaba bohwa bja setšhaba se sengwe le se sengwe boa swana?
 - A. Ee, ditšhaba tšohle tša naga di phela go swana
 - B. Aowa, ditšhaba tšohle ke moswananoši
 - C. Ee, ditšhaba tšohle ke moswananoši
 - D. Aowa, ditšhaba tšohle di a swana
4. Mo Afrika-Borwa go ketekwa mafelo a segopotšo a alatelago. Kgetha yeo e sa amanego le tše dingwe.
 - A. Bela-Bela
 - B. Diphoofolo tše hlano
 - C. Mapungubwe
 - D. Dithaba tša Leboa
5. Mmino wa setšo, o o ketekwago ke MaAfrika ke mmino wa
 - A. Mmino wa kwaito
 - B. Mmino wa malopo le kiba
 - C. Mmino wa dinaka
 - D. Mmino wa bodumedi
6. Ke ka lebaka la eng go ketekwa ditšo tša MaAfrika?
 - A. Gore re kgone go fetišetša go bana
 - B. Gore re tsebe ka bohwa bja ditšo
 - C. Gore re kgone go tsebana gore re bahlobo-mang
 - D. Go tseba kaga bohwa bjarena
7. Go ya ka setšo sa rena ke bolwetši bofe bjoo bo ka alafegago ntle le go reka dihlare?

- A. Dimpagile di rurugile
 - B. Bolwetši bja hlogwana
 - C. Masea ao a sakgonego go iša dijo maleing
 - D. Masea ao a thibanego mahlo
8. Rutang bana ditaola le se yeng natšo badimong? Setsopolwa se se ra go reng?
- A. Fetišang bongaka go bana
 - B. Fetišang mekgwa ya go iphediša
 - C. Fetišang mekgwa ya go fodiša
 - D. Tlogelang go ba dingame/go timana
9. Dingaka di hweditše tsebo ka mekgwa efe? Kgetha yeo e sa amanego le tše dingwe.
- A. Ba ithomela tsebo go ya ka moo bafilwego
 - B. Go tšwa go Modimo
 - C. Go tšwa go badimo ditorong
 - D. Go tšwa go dingaka tše dingwe
10. Ke eng se bohlokwa seo re ka ithuta go sona ka go kgoboketša dihlare tša setšo?
- A. Go rwalela dihlare ge di nyakega
 - B. Go kgoboketša dihlare ka bontši go bohlokwa
 - C. Dingaka di kgoboketša dihlare go di omiša
 - D. Go kgoboketša dihlare go thuša hlago gore mehlare ye meswa e hloge

APPENDIX E

Comprehension text (academic) and test for English reading (school participants)

High drama in flood rescue

Hundreds of people, including primary school participants, left destitute and stranded by days of heavy rain and flooding in Mpumalanga and Limpopo, have been plucked to safety by air force and police helicopters. The two-day high-risk aerial and ground rescue, which has developed into a humanitarian relief mission, was launched after rain deluged large sections of the eastern parts of the country and Mozambique earlier this week.

Rivers burst their banks, flooding large tracts of land in low-lying areas. Pilots and aircrew from the SA Air Force's 17 and 19 helicopter squadrons in Pretoria and Hoedspruit took off on Wednesday to lift scores of people to safety from parts of Limpopo, Mpumalanga and the Kruger National Park, where several tourists were washed away in their cars or trapped overnight.

The floods have left three people seriously injured and compelled authorities to shut the Kruger park's border posts. Although flood waters began to subside on Thursday, the airlifts and ground operations continued. Police in Casspirs crossed flooded rivers repeatedly to reach trapped villagers, often bringing them across on the roofs of the armoured vehicles because of the height of the water, while civilians rescued people trapped in two buses.

Civilians used private helicopters and specialised off-road vehicles to rescue guests stranded at game lodges in and around the Kruger park. In scenes reminiscent of the 2000 floods that struck Mozambique, this week's rescue saw mothers with young children being airlifted from trees and the tops of partially submerged houses. The rescue was not without risks, however.

A flight engineer from Hoedspruit's 19 Squadron fractured a leg while trying to rescue a mother and her child from a tree. The injury compelled the pilot of the Oryx helicopter to abandon the rescue, winch the injured sergeant-major on board and fly him to hospital. The woman and her child were later rescued by the crew of a police helicopter, air force spokesman Lieutenant-Colonel Piet Paxton said.

Paxton said the rescue mission had been intense. Pilots and aircrew went to the aid of 53 primary school participants trapped by rising flood waters at their schools in the Acornhoek area of Bushbuckridge. Six helicopters rescued people from trees, tops of buildings, stranded vehicles, partially submerged houses and land cut off by rising waters, he said.

"The airlift rescue, which had to be called off several times, has been extremely dangerous. Adverse weather conditions have made getting to some people very difficult. But, despite these trying conditions our aircrew have persisted in aiding as many people as possible, often putting their own lives in danger." Describing some of the rescues, Paxton said an Oryx helicopter crew had rescued a family, who included a young child, from a steep valley where they had been hiking near the Blyde River Dam wall. He said 130 villagers, 40 of them children, were airlifted to safety from Moloro Village near Bushbuckridge to Bolang Village. "This was done as a preventive measure after fears arose of the potential of more flooding," he said.

Paxton confirmed that an Oryx flight engineer had fractured a leg while trying to rescue a mother and her child. "He is in a serious but stable condition waiting to be flown to 1 Military Hospital in Pretoria. "Fortunately the aircrew from a police helicopter were able to rescue the mother and her child." Paxton said the search and rescue mission had evolved into a humanitarian relief mission. "We will now be lifting food and water supplies to villages in remote areas cut off because roads have been washed away. "We have not received any more calls (for rescues), although we airlifted 26 people from an area that was potentially unsafe."

Limpopo police spokeswoman Ronel Otto said that the province's search and rescue teams had been activated. They included divers and K9 unit members. "Police from stations in the affected areas have all been called up to help with the rescues and are assisting. "Limpopo's disaster management personnel in reaching communities cut off by flood waters." More than 200 people had been rescued by police, air force and disaster management personnel and by civilians, Otto said.

Limpopo Disaster Management spokeswoman Tseng Diale said the injured had been taken to the Hoedspruit Military Hospital. She said 13 major roads had been extensively damaged, along with several bridges, cutting off entire villages.

"As soon as the water levels decrease an assessment of the damage will be done. We are appealing to communities to assist us in the cleaning up operations," she said. South African National Parks chief executive David Mabunda said: "Of the 1 800 guests in the Kruger park 80, including 10 staff members, were evacuated. "Four tourists were trapped in their car overnight and were rescued, while six tourists were washed away in their car near the Hamilton's tented camp while crossing a low bridge. "They were not seriously injured and were taken to the Nelspruit Hospital. "Sixty tourists, including foreign guests, were trapped in camps and lodges around the park. They all are safe."

Mabunda said 80 percent of the park was functional, but the biggest problem was the availability of water as most pumps had been washed away, as had some sections of tarred road. "No animals have been killed or hurt. Our anti-poaching operations are continuing, and SANDF members are still protecting the borders." Weather forecaster Edwin Thema said rains would continue in the Lowveld, with a 30 percent chance of rain on Friday, but there was no chance of rain falling in Limpopo or Mpumalanga over the weekend. - Pretoria News

Fictional Name: _____

English academic measure 1 (school participants)

Answer the following questions based on the text that you just read by placing (X) next to the answer you choose.

1. Which province/s were affected by floods that left hundreds of people destitute and stranded?
 - A. Mozambique and Limpopo
 - B. Limpopo and Mpumalanga
 - C. Mpumalanga and Mozambique
 - D. Mpumalanga
2. What does the word “stranded” mean?
 - A. They were stuck and could not move
 - B. They had problems moving
 - C. They moved, but slowly
 - D. They moved, but they could not get far
3. What did the civilians use to rescue guests stranded at game lodge in and around the Kruger Park?
 - A. Boats
 - B. Helicopters and vehicles
 - C. Private helicopters and off-road vehicles
 - D. SA Air Force’s 17
4. What happened to the flight engineer who was trying to rescue a mother and her child from the tree?
 - A. He injured his arm
 - B. He had a fractured leg
 - C. He broke his neck He fell on his back and injured his spine
 - D. He was hit by a tree
5. Six helicopters rescued people from the following situations except ONE.
 - A. Trees
 - B. From the river
 - C. Rooftops of buildings
 - D. Stranded vehicles
6. What was the reason for moving 130 villagers from Moloro to Bolang village?
 - A. The people wanted to relocate.
 - B. The area was flooded.
 - C. It was no safe to stay at Moloro village.
 - D. Potential of more flooding
7. Oryx flight engineer who had a fractured leg was taken to hospital. Who finally rescued the mother and child?
 - A. Air-crew from a police helicopter
 - B. Oryx helicopter
 - C. SA Air Force
 - D. Military helicopter
8. The following rescue teams rescued 200 people, except for ONE team.
 - A. Police
 - B. Military service
 - C. Air force
 - D. Civilians
9. How many major roads were damaged due to the floods?
 - A. 13
 - B. 11

C. 6

D. 3

10. Mabunda said 80% of the park was functional, but there were problems; what kind of problems were they?

A. All animals were still in care.

B. The staff from the park were in care.

C. Most pipes were washed away, there is no water.

D. Some of the guest houses were washed away.

Fictional Name_____

English academic measure 2 (school participants)

Answer the following questions based on the text that you just read by placing (X) next to the answer you choose.

1. Which province could be next in line if the Mpumalanga and Limpopo floods continued?
 - A. Northern Cape
 - B. Eastern Cape
 - C. North-West
 - D. Kwa-Zulu Natal
2. What was the reason for the two-day high-risk aerial and ground rescue?
 - A. Because of the rain that delayed large section of the eastern part of the country.
 - B. The floods spread all over.
 - C. There was a lot of cases about people trapped in their own villages.
 - D. Teachers and children were trapped in some schools.
3. How many provinces and park were affected?
 - A. Two parks and one province
 - B. One park and two provinces
 - C. Three provinces and one park
 - D. Three provinces
4. Why did the authorities shut the Kruger Park's boarding post?
 - A. Roads were damaged.
 - B. Because the floods left three people seriously injured.
 - C. There was no car movements during the floods.
 - D. The authorities thought it would not be safe to allow incoming traffic, fearing more deaths.
5. What type of risks did the police get into when trying to save people who were trapped by floods?
 - A. Crossing flooded rivers repeatedly to reach trapped villagers.
 - B. Pneumonia
 - C. Cold and flue
 - D. Swimming to the trapped people without proper attire.
6. What is the name of the Chief Executive of South African National Parks?
 - A. Daniel Mabunda
 - B. David Mabunda
 - C. David Mabula
 - D. David Mabu.
7. What happened to the four tourists who were trapped in their car overnight?
 - A. They were rescued

- B. They were washed away by the floods.
 - C. They managed to find their way to the guest house.
 - D. The car got trapped by a tree.
8. What happened to the six tourists who were washed away in their car near the Hamilton's tented camp while crossing a low bridge?
- A. They were taken to police station for safety.
 - B. They were taken to hospital at Nelspruit.
 - C. they were taken to the guest house.
 - D. They all died.
9. Were the animals affected in any way?
- A. They were kidnapped.
 - B. Some animals were stolen.
 - D. Some animals could not survive the floods, so they died.
 - D. They were not hurt.
10. What is the name of the person who reports on weather?
- A. Meteorologist.
 - B. Weather forecast.
 - C. Weather forecaster
 - D. Whether forecaster.

APPENDIX F

Comprehension text (academic) and test for Sepedi reading (school participants)

Ditšhupetšo mešomong

Nkga e be e ja nkgawane moepong wa polatinamo wa Reboile. Bašomi ba moepo ba lle bogale bja tau gomme ba le šupa le le mo gore, tše bjalo ba ka se di kgotlelele. Sebakwa ke eng ge e se megolo ya fase yeo ba e fiwago, kgethollo, kgatelelo gammogo le go se hlatlošwe ga bašomi.

Mpilobilong wo bašomi ba moepo ba be ba swere diemadirile. E be e le leemaema mabinakoša a fošwa leboelela, diemadirile tšeo le tšona di eya godimo le fase go šupašupša ka tšona koša e rutlolla tlhaka. Go be go opelwa dikoša tša boipelaetšo le tša kgwabo, tša mohlang wola wa kgethollo go ya ka merafe ka mo Afrika-Borwa. Ke re koša e be e gobelwa o a nkwa! Go be go opelwa dikoša tša tokologo.

Mekgatlo ya go emela bašomi le baetapele ba dikereke ba lekile go tsenya letsogo ka go kgalema bašomi gore ba se dire ditšhupetšo tša go ba le dikgaruru. Baetapelebagolwane mmušong le bona ba lekile go tsena seemo ka bogare eupša go latša tšie ya fo ba go tšhela leswika ka meetse ka kgopolo ya gore le tla gola. Baetapele ba mekgatlo ya go emela bašomi ba tsenetše ditherišano tšeo di teilego kota makga a mmalwa go fihlela go tsoga sesasedi seo se gapeleditšego ba Ditirelo tša Sephodisa go romela lebotho la bona go latša tšie. Le ge go le bjalo ga se gwa thuša selo. Bašomi ba ile ba hlokomologa le go se ele hloko ditaello le dikgalemo.

Tiragalo ya moepo wa Reboile e tšeelana mollo thwii le yela ya go direga ngwagola (2012) ka la 16 Lewedi moepong wa Lonmin, Marikana. Afrika-Borwa e ile ya itemogela tiragalo ya go setla pelo fao malapa ao e ka bago a masome a mane a ilego a ikgona senko ka go loba meloko le metswalle. Afrika-Borwa e ile ya aparelwa ke boso. Profense ya Leboa-Bodikela e ile ya aparelwa ke moya wa nyamo fao bašomi bao e ka bago masome a mane ba ilego ba lewa ke sethunya. Se se ile sa tšea megopolo ya MaAfrika-Borwa sa e boetša moragorago mengwageng yela ya kgethologanyo ya bo-1960 le bo-1976.

Naga ya Afrika-Borwa e ile ya tsena tebetebeng ya go anegwa le mafaseng a ntle ka tiragalo ye ya go garoša matswalo. Ya hlola le go ba le ditlamorago tša go se leše di wela. Boraditaba ba di bea ka lehlakore la bona la boikgopolelo. Basekaseki le bona ba ile ba di sekaseka ka tsela ya bona le bona. Maemo a ranta ya Afrika-Borwa le ona a ile a amega ge a bapetšwa le a ditšhelete tša dinaga tše dingwe.

Tiragalo ye e bile ye nngwe ya ditšhupetšo tša go goga lebaka le letelele ka mo Afrika-Borwa ngwagasomeng wo. Go kile gwa ba le ditšhupetšo tša bašomedi ba mmušo tša go gagaba lebaka la dibeke tše tharo, tša fela ka šebešebe. Gwa ba le ditšhupetšo tša bašomedi ba mmasepala naga ka moka le gona ra itemogela šebešebe yeo e ilego ya rena mafelelong.

Gantši ge go eba le ditšhupetšo, badiraditšhupetšo le bengmešomo ba gapa leswiswi gomme gwa feleletša go eba le tshenyo yeo e ka bakago dikotsi, go amega ga ekonomi le mahu. Go bohlokwa gore badiraditšhupetšo ba kwešiše le go tseba seo ba se lwelago. Maikutlo a pefelo le ona a ka ba le ditlamorago tša go se kgahliše. Go na le bana bao ba hlwago ba šikašika le mebila ka ditoropong le mafelong a dikgwebo ba sa tsene sekolo. Ke bona ba felago ba iphihla ka badiraditšhupetšo go tšweletša mešomo ya bona ye mebe. Ke gona fao o tlogo lemoga mohola wa go ba ga bana ka phapošing ya borutelo. Go dira bjalo e tla ba gona go efoga le go iphapantšha le matlabotša.

Ge bašomi ba tšweletša maikutlo a bona go mongmošomo, go bohlokwa go kgonthišiša polokego le tšhireletšo ya bašomi bao ba dirago ditšhupetšo. Kgonthišišo yeo e ka tšwa mahlakoreng a go fapana e lego bengmošomo, bašomi le mekgatlo ya bona gape le mmušo. Ditherišano tša go ama dilo goba dinyakwa tša bašomi di thome ka potlako gore ge bašomi ba thoma go tlelwa ke go se sa kgotlelela ya ba go a rungwa. Ke gona fao re ka itemogelago bašomi ba go re: Mphowa! Ka moleteng wa tšhošane. E ile ya ba moletesekuba, ba fega magato a go dira ditšhupetšo ba šušumetšwa ke diphihlelelo tša barerišane ba bona le bengmošomo. Bothata ke gore ge go e ba le ditšhupetšo, ga di ame bašomi le bengmošomo fela, eupša di ama naga ka moka re lebeletše bophelo le maemo a ekonomi. Tema yeo mmušo o kago e kgatha ke go kgonthišiša polokego le tšhireletšo ka go romela maphodisa a bomahlwaadibona ao a tsebago ka tša taolo ya lešaba ka gore bomagogorwane ba ka feleletša ba galefišitše seemo ka go tšea sephetho sa ka pela go tšeo di tla bego di dirwa ke badiraditšhupetšo.

Se bohlokwa ke gore ditšhupetšo e be tša khutšo gomme mafelelong mahlakore a fihlelele kwano gomme seboko se tsene nyobeng. [Mothopo: Boitlhamelo]

Functional Name: _____

Sepedi academic measure 1 (school participants)

Araba dipotšišo tše di latelago mabapi le temana ye o e badilego. Kgetha karabo ya gago ka go swaya (X) go karabo yeo o e kgethilego.

1. "Nkga e be e ja Nkgawane". Setsopolwa se se ra go reng?
 - A. Batho ba bannyane ba be ba sa hlomphe batho ba bagolo.
 - B. Go be go le dikgraruri
 - C. Batho ba be ba sa theeletši.
 - D. Go be go le dintwa.
2. Sebakwa ke eng? Kgetha yeo e sa amanego le tše di latelago.
 - A. Megolo ya fase
 - B. Kgethollo
 - C. Kgatelelo
 - D. Go hlatlošwa ga bašomi
3. "Go latša tšie ya fo ba go tšhela leswika ka meetse ka kgopolo ya gore le tla gola". Setsopolwa se se ra go reng?
 - A. Ga baka ba tšia maele
 - B. Ba fetotše megopolo
 - C. Ba be ba tshepiša go theeletša.
 - D. Ba be jele bogale
4. Ke eng seo se dirilego gore go tsoge sesasedi?
 - A. Ditherišano di sepetše gabotse.
 - B. Ditherišano ga se tša fela.
 - C. Ditherišano ga se di sepele gabotse.
 - D. Ditherišano ga se gwa bolelwa ka tšona.
5. Ke ditlamorago tše dife tšeo di diregilego ka lebaka la ditšhupetšo?
 - A. Malapa a mašome a mane a lobile meloko le metswalle.
 - B. Ditsela di tswaletšwe
 - C. Meago e fišitšwe.
 - D. Dikolo di tswaletšwe.
6. Maemo a ranta ya Afrika-Borwa a amegile bjang?
 - A. E be e le godimo.
 - B. E be e sa amega.
 - C. E be e le fase, ge e bapetšwa le dinaga tše dingwe.
 - D. E be e sa fetoga.
7. Ke ka lebaka la eng badiraditšhupetšo ba swanetše go kwešiša le go tseba seo ba se lwelago?

- A. Gobane maikutlo a pefelo a ka ba le ditlamorago tša go se kgahliše.
- B. Gobane seo se tla dira gore ba se ke ba tšeatšeeega.
- C. Gobane ba tla letela ditlamorago.
- D. Gobane ba tla kgona go dira dipeakanyo ka tshwanelo.
8. . Ke eng seo se dirago gore badiraditšhupetšo ba be bogale?
- A. Ga se ba kwane ka ditherišano.
- B. Ditherišano ga di tshepiši.
- C. Ditherišano tšeo di tšeago lebaka le letelele.
- D. Ditherišano tšeo di sa ba lebanago.
9. Ke tema efe yeo mmušo o e tšeago?
- A. Go kgonthišiša polokego le tšhireletšo
- B. Go kgonthišiša gore batho ka moka ba latela melao.
- C. Go kgonthišiša gore ba tseba seo batho ba se nyakago.
- D. Go kgonthišiša gore gona le kgotso.
10. Ke eng se bohlokwa ge go diragala ditšhupetšo?
- A. Go hlokega ga dintwa.
- B. Go hlokega ga maroga.
- C. Ke khutšo.
- D. Gore morero o sepele gabotse.

Fictional Name: _____

Sepedi academic measure 2 (school participants)

Araba dipotšišo tše di latelago ka go kgetha karabo ya gago ka go swaya (X) go karabo yeo o e kgethilego.

1. "Bašomi ba moepo babe ba jele bogale bja tau". Setsopolwa se se ra go reng?
 - A. Bašomi ba moepo ba be ba jele nama ya tau
 - B. Bašomi ba moepo ba be ba nyamile
 - C. Bašomi ba moepo ba be ba befetšwe
 - D. Bašomi ba moepo ba be ba eja marapo a hlogo.
2. Ke dikoša tša mohuta mang tše di bego di opelwa?
 - A. Dikoša tša go kweša bohloko
 - B. Dikoša tša dikgopelo
 - C. Dikoša tša maroga.
 - D. Dikoša tsa tikologo
3. "Go latša tšie". Setsopolwa se se ra go reng?
 - A. Go tšhela phori mahlong.
 - B. Go bea maemo ka tlase ga taelo
 - C. Go homotša batho.
 - D. Go theeletša maikutlo.
4. Ke tiragalo efe yeo e bapetšwago le tše di diregilego moepong wa Reboile?
 - A. Tiragalo tša Komatipoort
 - B. Tiragalo tša Marikana ka la 26 Lewedi.
 - C. Tiragalo tša Marikana ka la 06 Lewedi
 - D. Tiragalo ya Marikana ka la 16 Lewedi
5. Go bolawa ga basomi ba moepo wa Reboile go bapetšwa le tiragalo tše dife?
 - A. Ditiragalo tša JUNE 16 1976.
 - B. Ditiragalo tša 1960 le bo 1976.
 - C. Ditiragalo tša 1956.
 - D. Ditiragalo tša 1960.
6. Gantši ge go e ba le ditšhupetšo, ke mafapha a mafe ao a amegago?
 - A. Mafapha a tšhireletšo
 - B. Mafapha a thuto.
 - C. Mafapha a politiki.
 - D. Ekonomi le mahu.
7. Ke dipeakanyo dife tšeo di lego bohlokwa go ditšhupetšo?
 - A. Go kgonthišiša gore badiraditšhupetšo ba tseba seo ba se nyakago.

- B. Go kgonthiśiśa polokego.
 - C. Go kgonthiśiśa gore ga gobe le dintwa.
 - D. Go kgonthiśiśa gore baemedi ba tseba seo bašomi ba se nyakago.
8. Ditšhupetšo ga di ame bašomi le bengmešomo fela. Ke lefapha le lefe leo le amegago?
- A. Ba mokgahlo wa unioni.
 - B. Ba mokgahlo wa tšhireletšo.
 - C. Ba mokgahlo wa beng ba dikhamphani.
 - D. Di ama naga ka bophara
9. Ke lefapha le lefe leo mmušo a le šomišago go kgonthiśiśa polokego le tšhireletšo?
- A. Masole a naga.
 - B. Maphodisa ao a tsebago ka taolo ya lešaba.
 - C. Batšhireletši ba khamphani.
 - D. Bahlokomedi ba meago.
10. “Seboko se tsene nyobeng”. Setsopolwa se se ra go reng?
- A. Ditaba di senyegile.
 - B. Ditaba ga di kgahliši.
 - C. Ditaba ga se di fele.
 - D. Ditaba di rarollotšwe

APPENDIX G

Comprehension text (generic) and test for English reading (school participants)

Workers warned before bloodbath text

Johannesburg - An emotional and a heartfelt plea was made to striking workers near a Lonmin mine in Marikana in North West province moments before many were gunned down by police.

"I told them to leave... I pleaded, I pleaded," said Joseph Mathunjwa, president of the Association of Mineworkers and Construction Union (Amcu) on Friday. He was overcome by tears at a news briefing in Johannesburg as he recounted events on Thursday that led up to the shooting which saw 34 people killed near the mine. "I pleaded with them: 'The writing is on the wall, they are going to kill you'," he had told protesters.

Mathunjwa had visited the protesters accompanied by other Amcu leaders at the time. Workers had refused to leave, vowing to stay on the hill even if they were killed because their mission was to feed their families. "We got in our cars and left... After a few minutes the phone rang (about the shooting). I wanted to turn back and go and die with my comrades," said Mathunjwa, wiping away tears with a handkerchief. But those in the car with him decided to drive to safety.

Police fired on the protesters, many of whom were armed, while trying to disperse them after a week of violent protests that led to the deaths of ten people. Mathunjwa and those in the car with him noticed a car following them and had to use different routes to return to Johannesburg. They arrived back at 3:00 on Friday. Police put the death toll at 34, while the National Union of Mineworkers (NUM) said it was 36. Mathunjwa said Amcu protesters were without police or a security escort, or any supervision on Thursday while NUM had security. "This security is for the individually connected." He said there was no union rivalry, but that the NUM had "internal issues" which had nothing to do with Amcu. "It's not a rival issue with NUM and Amcu. It's a domestic issue with (in) NUM," he said.

Mathunjwa dismissed reports that Amcu was funded by expelled ANC Youth League president **Julius Malema**. "The allegations are baseless and unfounded. We have no political relationship with any political movement inside this country or outside." "We are committed to any process that will stabilise the area and bring peace and calm to the area," said Mathunjwa. Amcu was a recognised trade union at Lonmin with 7 000 members, most of them at Lonmin's Karee mine. It had about 30 000 members nationally.

Mathunjwa called on President **Jacob Zuma** to investigate the bloodbath. "It is with great regret and shock that the situation... had resulted in the loss of lives of so many mine workers." "It is our strong belief that this unfortunate killing could have been avoided... [if the matter] was treated with the sensitivity it deserved." He also called on the nation to observe an hour of mourning for those who were killed. A minute of silence was observed at the start of the media briefing. Amcu planned to visit the families of the deceased and assist with funeral costs.

Workers claimed to be earning R4 000 a month, while those living outside the hostel were earning an extra R1 000. They were demanding a salary of R12 500 a month. The bloodbath made international headlines, and led to a drop in Lonmin's share price. South Africa accounts for about three-quarters of the world's platinum, which is used to make catalytic converters in cars. London-based Lonmin [**JSE: LON**] told the Guardian that 96% of its production comes from Marikana.

Fictional Name _____

English generic measure 1 (school participants)

Answer the following questions based on the text that you just read by placing (X) next to the answer you choose.

- 1 Amcu is regarded as
 - A. Organisation
 - B. a trade union
 - C. Company
 - D. the opposition of NUM
- 2 . What was the reaction of protesters when Mathunjwa had visited them?
 - A. They were filled with rage
 - B. They were happy to have a representative with them
 - C. They refused to leave, vowing to stay on the hill even if they could be killed
 - D. They got more upset because Mathunjwa was not supporting their mission
- 3 . An emotional and heartfelt plea was made to the striking workers by a representative from which organisation?
 - A. National Mining Union
 - B. International association of mines
 - C. Association of mine workers and construction union
 - D. Association of miners and construction union
- 4 . What was the request made by Mathunjwa to the president Jacob Zuma?
 - A. To investigate the bloodbath
 - B. Funding.
 - C. To motivate the mine workers.
 - D. To release a statement that the needs of the mine workers will be met.
5. What evidence is provided in the text to indicate that the president of Amcu, Joseph Mathunjwa felt remorse about the killings?
 - A. A moment of silence was observed.
 - B. Amcu planned to visit the families of the deceased and assist with funeral costs.
 - C. An hour of mourning.
 - D. Affected families received food parcels and signed contract for monthly salaries on behalf of their loved ones.
- 6 . Workers staying outside the hostel earned an extra R1000 on top of the R4000. What do you think is the reason for this? Choose an appropriate answer.
 - A. Grocery
 - B. School fees for children.
 - C. Transportation purposes.
 - D. For lunch while at work.

7. How much did the workers want as a salary?
- A. R12 500.on top of R4000.
 - B. An addition of R1000.
 - C. No increment, only medical cover, house allowance and car allowance.
 - D. R12 500.
8. What was the reason for the drop of Lonmin's share price?
- A. The bloodbath made international headlines
 - B. Workers stopped working because of the protests and production dropped
 - C. Foreign investors needed more profit
 - D. Local investors pulled out
9. How much percentage of the London-based share comes from Marikana?
- A. 69%
 - B. 34%
 - C. 96%
 - D. 89%
10. The three-quarter of the platinum in South Africa is used to make
- A. Motorcycles
 - B. Cars
 - C. Ships
 - D. Converters in cars

Fictional Name: _____

English generic measure 2 (school participants)

Answer the following questions based on the text that you just read by placing (X) next to the answer you choose.

1. In which province is the Marikana mine situated?
 - A. North-West province
 - Gauteng
 - Free State
 - Limpopo
2. "Gunned down" means
 - A. A gun was held on their heads
 - B. They were killed
 - C. They were kidnapped
 - D. They were held hostage
3. What caused the shooting at the Marikana mine?
 - A. protestors were throwing stones.
 - B. Protestors were insulting police.
 - C. Protestors provoked the police.
 - D. protestors were threatening the police.
4. Why did the police not open fire at the protestors from the beginning?
 - A. protestors were not doing any harm but singing.
 - B. protestors were in a good and working relationship with the police.
 - C. The police thought the protestors were having a peaceful protest because they indicated so.
 - D. They were there to keep the peace.
5. According to the police, how many people were killed?
 - A. More than 30
 - B. Less than 20
 - C. More than 100
 - D. More than 39
6. According to National Union of Mineworkers (NUM) how many people were killed?
 - A. 39
 - B. 36
 - C. 31
 - D. 34
7. The Amcu had no security during the protest, while NUM had security. What does this suggest?

- A. NUM has a lot of money.
 - B. NUM fears for their lives.
 - C. It means the NUM is well connected.
 - D. NUM was just taking a precaution.
8. According to the allegations report dismissed by Mathunjwa, who funded Amcu?
- A. NUM
 - B. Jacob Zuma
 - C. Amcu
 - D. Julius Malema
9. The word below means that someone is no longer working temporarily.
- A. Expelled
 - B. Exposed
 - C. Suspended
 - D. Retrenched
10. Why did Mathunjwa dismiss the allegations about about Amcu been funded by ANC Youth league president?
- A. The allegations are baseless
 - B. He did not believe the allegations were true.
 - C. he was working closely with the ANC Youth president.
 - D. He was afraid to tell the truth.

APPENDIX H

Comprehension text (generic) and test for Sepedi reading_measure 1 and measure 2 (school participants)

Mafula ke eng?

Mafelelong a ngwaga wa 1999 le mathomong a ngwaga wa 2000 naga ya Borwa bja Afrika e eile ya welwa ke mafula a mašoro ao a ilego a feta le maphelo a batho ka bontši. Ka mahlakoreng a mangwe a naga go ile gwa direga dipšhešamare tšeo go sego yoo aka di lebalago bophelong ka moka. Dithoto tša batho di ile tša gogelwa ke merwalela ya meetse a dinoka tšeo di bego di fufula maphoto ao a bego a tsietša batho le diphidi ka moka. Dinoka tše di be di goma ka maribana bošego le mosegare gomme di fetše di hlatša mafula. Naga ka moka e be e phulegile didiba tšeo di bego di fetogile matsha ka gare ga malapa a batho. Mo gohle go lla segwagwa fela.

Masetlapelo ruri

Ditsela tša rena di gogotšwe ke mafula, maporogo a kgaoga ka bogare gomme batho ba thoma go hlobaetšwa ke go hloka dijo le dinamelwa tša go ba iša kua le kua.

Dinamelwa tše dintši di ile tša gogolwa gomme le lehono le mahlankgana a tšona a ile le naga. Leruo la batho le lona le ile la sobelela ka monga wa seloko gomme beng ba lona ga ba tsebe gore ba tlo reng. Ditsela tša dikontiri di be di fetogile tša mabu mola tša mabu e be e le sellong se segolo bakeng sa tshenyegelo yeo e bego e hlolegile. E be e le ditsikitlano tša meno gohle nageng. Tirelo ya kabo ya dijo e ile ya kgaolwa gomme metse ya thoma go hloka dijo etšwe dikanapa di ngangane ka mašelang.

Ka lebaka la mafula a, mmušo o ile wa fetša o eme ka maoto ka go hlama sekhwama sa go lliša batho bao ba amilwego ke mafula a. Gape o ile wa bega ditokologo tšeo di bego di amegile kudukudu go ba "ditikologo tša masetlapelo". Kua Mozambique gona go ile gwa napa go hlolega masetlapelo a magolo ao a ilego a ba a go goga šedi ya lefase ka moka. Seripa se segolo sa naga ka moka se ile sa ba ka fase ga mafula gomme batho ba thoma le go tšhabela le godimo ga mengwako. E rile ge mengwako e sobelela ka fase ga meetsefula, batho ba bona botšhabelo e tlo ba godimo ga mehlare. Ke fao mosadi a ilego a ba a feša a ile madibeng godimo ga mohlare. Gona fa re leboga madira a tlhakodišo a Afrika-Borwa gobane a ile a thuša mosadi yoo.

Ekonomi e amega bjang?

Mengwako le yona e ile ya kgerega mola e wela dithoto tšeo di bego di senyega le go gogolelwa ka dinokeng tšeo le tšona di bego di di rwalela fao go tsebjago ke tšona fela. Ye mengwe mengwako e wela batho ba robetše, e gogole diapapro ka moka, batho ba šale ba ikapere. Le gona fao mmušo wa rena le dikomiti tšeo di ilego tša hlangwa, di ile tša dira kgoeletšo go batho go thuša bao ba lego mathateng ka diaparo goba ka moo ba ka kgonago ka gona. Mafula a a tswetše ditšiololo ka go a mangwe malapa.

Taba ye ya mafula e ile ya ama ekonomi ya naga ya rena ka kudu gobane e le matete a tlhago, yona polelo ya Mmopi. Mmušo ga wa ka wa dira peakanyo ya mabaka a mohuta wo pele. Ka go realo gore batho ba phološwe, mmušo ka bowona o ile wa tšea magato a go thuša setšhaba. O ile wa swanelwa ke go tsenya letsogo ka gare ga sekhwama seo se sa lebanego mabaka a mohuta wo ka nepo ya go phološa fela. Batsebi ba ditaba ba re mafula ao a hlotšwe ke EL Nino yeo e bego e wetše naga ya rena. Bangwe ba re ke ka lebaka la go fela ga ngwagakgolo wa 1999 le go kokota ga ngwagakgolo wa 2000. Bjale, rena re no ba magareng- maaroganong a ditsela.

Fictional Name: _____

Sepedi generic measure 1 (school participants)

Araba dipotšišo tše di latelago mabapi le temana ye o e badilego. Kgetha karabo ya gago ka go swaya (X) go karabo yeo o e kgethilego.

1. Go feta le maphelo a batho. Setsopolwa se se ra go reng?
 - A. Go loba ga maphelo a batho
 - B. Go bolaya batho.
 - C. Go kgetholla batho.
 - D. Go mema batho.
2. Go sobelela ka monga wa seloko. Setsopolwa se se ra go reng?
 - A. Go itswenya.
 - B. Go ikgetha.
 - C. Go itshepelela.
 - D. Go timela
3. Ka morago ga mafula, go diregile eng ka ditsela tša mabu?
 - A. Ditsela di be dile gabotse.
 - B. Dibe dile sellong se se golo, e le masetlapelo.
 - C. Go be go sa sepelegi.
 - D. Ditsela di be di tswaletšwe.
4. Ke ka lebaka la eng batho ba be ba tšhabela godimo ga mengwako?
 - A. Seripa se segolo sa naga ka moka se ile saba ka fase ga mafula.
 - B. Meetse a be a le gohle.
 - C. Meetse a be a tsene ka gare ga mengwako.
 - D. Meetse a be tšere dithoto.
5. Ge mengwako e thoma go sobelela ka fase ga meetsefula, batho ba ile ba tšhabela kae?
 - A. Godimo ga meago ye megolo.
 - B. Batho ba ile ba tšea ke meetse.
 - C. Batho ba ile ba neela maphelo a bona.
 - D. Godimo ga mehlare.
6. Go diregile eng ka mengwako nakong ya mafula?
 - A. E ile ya kgerega.
 - B. E be e tletše ka meetse.
 - C. E be e tšere ke meetse, mmogo le dithoto.
 - D. E tšere ke dinoka.
7. Batho ba mmuso ba ile ba dira eng go thuša bao ba amegilego ke mafula?
 - A. Mmušo o ile wa aga mengwako.
 - B. Mmušo o ile wa tšea batho wa ba iša dihoteleng go dula gona.
 - C. Mmušo o dirile dikgoeletšo go setšhaba, go thuša bao ba lego mathateng.
 - D. Mmušo o ile wa ba neela mekgwako e meswa.
8. "Mafula a tswetše ditšhiololo ka go a mangwe malapa". Setsopolwa se se ra go reng?
 - A. Malapa a mangwe a lobile meloko le metswalle ya bona.
 - B. Bana ba lahlegetšwe ke batswadi
 - C. Mafula a bolaile batho.
 - D. Mafula a hlokišitše banna basadi ba bona.
9. Ke ka lebaka la eng ekonomi ya naga e amegile?
 - A. Ka gobane se se hlagilego e le matete a tlhago.
 - B. Ka gobane batho ba be ba sa ye mabenkeleng.
 - C. Ka gobane dikgwebo di be di tswaletšwe.
 - D. Ka gobane mmušo e be o swanetšwe ke go lokiša maemo.
10. Ke ka lebaka la eng mmušo o be o sa dira dipeakanyo mabapi le mabaka a mafula pele?
 - A. Mmušo o hloka tšhelete.
 - B. Gobane tšhelete e na le mošomo o mogolo.
 - C. Gobane mmušo o tletše ka bomenemene.
 - D. Gobane se ga sa nka sa direga peleng.

Fictional Name: _____

Sepedi generic measure 2 (school participants)

Araba dipotšišo tše di latelago ka go kgetha karabo ya gago ka go swaya (X) go karabo yeo o e kgethilego.

1. Na mafula a go bolelwago ka o na taodišong ke afe?
 - A. Mafula ao a ilego a feta ka maphelo a batho
 - B. Mafula a lefase
 - C. Dipula tše di sa felego
 - D. Dipula tša medupi
2. Ke ditlamorago tše dife tše di hlolwago ke mafula? Kgetha yeo e sa e sa amanego le tše dingwe.
 - A. Maporogo a ile a kgaoga.
 - B. Batho ba ile ba lahlegelwa ke maphelo a bona.
 - C. Go ile gwa ba le hlokego ya dijo.
 - D. Batho ba ile ba šomisa ditsela tša dikontiri fela.
3. Ke naga e fe yeo masetlapelo a yona a ilego a tanya šedi ya lefase ka moka?
 - A. Mozambique
 - B. Namibia
 - C. Zambia
 - D. Afrika-Borwa
4. Na o gopola gore ke ka lebaka la eng batho babe ba hloka dijo mola ba ngangane ka mašelang?
 - A. Go be go sena dinamelwa tša go ya mabenkeleng.
 - B. Tirelo tša kabo ya dijo di ile tša kgaolwa.
 - C. Mabenkele a be a tswaletšwe.
 - D. Mabenkele a gogotšwe ke mafula
5. Na mmuso wa naga ya rena o ile wa tsenya letsogo bjang go thuša bao ba wetšwego ke masetlapelo?
 - A. Ba ile ba fa batho dintlo tse mpsha
 - B. Mmuso o ile wa tsenya letsogo ka gare ga sekhwama seo se sa lebanago mabaka a ka mohuta wo ka nepo ya go phološa fela.
 - C. Ba ile ba iša batho dinageng tše dingwe.
 - D. Batho ba ile ba fiwa tšhelete.
6. Ditiragalo tša masetlapelo a go hlolewa ke mafula di diregile neng?
 - A. 1999
 - B. 2000
 - C. Mafelelong a 2000
 - D. Mafelelong a 1999 le mathomong a 2000
7. Mosadi yo a ilego madibeng mohlareng o hlakodišitše ke mang?
 - A. Ke ba lelapa.
 - B. Ke bahlapetše ba Mozambique.
 - C. Ke bahlapetše ba Afrika-Borwa.
 - D. Ke bahlakodiši ba Afrika-Borwa.
8. Go diregile eng ka ditsela ka morago ga go hlolega ga mafula? Kgetha yeo e sa amanego le meetse.
 - A. Maporogo a hlamile dinoka.
 - B. Ditsela di be di tletši meetse.
 - C. Ditsela tša dikontiri di be di fetogile tša mabu.
 - D. Ditsela tša mabu di fetogile maope a go boifiša.
9. Ke ka lebaka la eng batho ba be ba sa kgone go ema ema le metse?
 - A. Ditsela di be di senyegile.
 - B. Ba be ba sena tšhelete ya senamelwa.
 - C. Ba be ba sa dumeletšwe go tšwa malapeng.
 - D. Ba be ba sa lokela tsela.
10. Go ya ka batsebi, ditaba tša mafula di hlotšwe ke eng?
 - A. Mafula a Mozambique.
 - B. E L Nino.
 - C. Go kokota ga ngwagakgolo wa 2000.

D. Go fela ga ngwana wa 1999.

APPENDIX I

Oral reading fluency test for English reading (university participants)

Diversity issues children need to be aware of

Diversity is an important issue children need to be aware of at a young age. These issues include race, culture, language and religious beliefs. Babies need to be introduced to babies from a different race, for example at a mother and baby group, if possible. This will prepare the child for playgroup/nursery, where there are likely to be other children from different races and they will accept this as the norm, 'children as young as three can exhibit an awareness of racial distinction.' (Culture and Children, 2010)

Diversity occurs within the family structure, which a child will become aware of. They can grow up in different types of families. A nuclear family is where children live with their parents and do not see other relatives often. In an extended family, children and parents may live near or together with relatives, such as grandparents. They could be there to look after children and may sometimes offer emotional support. A step family is formed when two separate parents and their children form a relationship. In a single-parent family, in most cases the mother is looking after the child or children. Within this family diversity, the most important thing for the child is that they feel loved and secure.

It is important that children are made aware of the differences in cultures in the world. They will be made familiar with the other religions that form our multi-cultural society, even at nursery. As they progress through school they will learn in more depth about this and to respect other children's beliefs. Alongside Christianity and its festivals at Easter and Christmas, they will learn about Hinduism and Sikhism and Diwali, the festival of lights. They will also learn about Eid which Muslims celebrate after Ramadam. During these times, schools must introduce different foods from these cultures. Asian snacks such as samosas are offered to give the children a chance to sample foods they may not have the opportunity to taste elsewhere. It is important for children to respect different cultural beliefs and attitudes and provide enrichment.

APPENDIX J

Oral reading fluency test for Sepedi reading (university participants)

Naa balemi ba Afrika ba ka tšweletša dijo tše di lekanego bjang?

Lefapha la dipolaseng la dinaga tša Afrika le hlokile tšweletšo kudu mo mengwagasomeng ye mentši. Tšweletšo ya tša temo e gateletšwe ke go hlatloga ga ditshenyegelo tša tšweletšo ya dijo. Phadišano ye e tseneletšego go tšwa ka dinageng tše di hlabologilego e rometše dithoro tša mabele ka mebarakeng ya tšona ka ditheko tše di bego di le fase ka mebarakeng ya ditoropong go feta ditheko tša dithoro tša mabelo tše di tšweleditšwego ka dinageng tša Afrika. Se go a kgonagala gore ka seripa se ka be se bakilwe ke ditheko tša mašeleng tša godimo tše balemi ba ka dinageng tše ba bego ba di hwetša, tše di bakilego gore ba šome ka maemo a godimo, le ka diekonomi tšamaemo ka tšweletšong. Se gape se bakilwe ka seripa ke ka lebaka la ditsela tša dipolaseng tše di bego di le maemong ao a sa kgahlišego tše di okeditšego ditshenyegelo tša maloko a ka nageng ge ba iša ditšweletšwa tša bona mebarakeng ya ditoropong. Balemi ba Afrika ga ba kgone go phadišana le ditšweletšwa tša dithoro tša mabelo tše di tsentšwego ka dinageng tša bona go tšwa dinageng tše dingwe (kudukudu bao ba lego mafelong a kgole) gomme ba ile ba gapeletšega go tšweletša fela dijo tše ba tlogo di ja. Ka lebaka la se, kabelo ya setšhaba seo se bolawago ke tlala sa ka Borwa bja Afrika ka go lefase ka bophara e oketšegile kudukudu, go tloga go dipersente tše 19 ka 1990 go fihla go dipersente tše 31 ka 2004. Mo mengwageng ye, mathata a dijo ka dinageng tša Afrika a ile a efogwa, le ge go le bjale, ka lebaka la kabo ye e tšwelago pele ya thušo ya dijo le go tsenya dijo ka dinageng tša Afrika ka ditheko tša fase go tšwa ka dinageng tša European Union le ka United States. Le ge go le bjale, tlhokego ya godimo kudu ya dijo e tšweletše kgafetšakgafetša kudu ka dileteng tše 200 tša mehutahuta ka lebaka la komelelo goba ka lebaka la dintwa tša bana ba thari.

Dijo tše di tsenywago ka dinageng tša Afrika ka theko ya fase di fihleletše kudu setšhaba sa ditoropong. Eupša se se ile sa ba le tshenygo kudu go balemi ba ka dinageng tša Afrika fao ba ilego ba palelwa ke go rekiša ditšweletšwa tša bona ka mmarakeng wa ditoropong. Se ke ka lebaka la gore ba ile ba palelwa ke go phadišana le dithoro tša mabele tše di bego di thušwa kudu ka mašeleng go tšwa ka dinageng tša ka Yuropa. Go balemi ba, ke ba mmalwa fela bao ba ilego ba kgona go fetoša sebopego sa tšweletšo ya bona. Godimo ga fao, gore ba dire phetogelo go tšweletšo ya tša temo yeo e ka kgonago go romelwa dinageng tša ka ntle ka lebaka la didirišwa tše di bego di sa ba kgontšhego go rekiša ka hlwahlwa ya godimo. Tlhatlogo ya theko ya dijo tša temo go tloga ka 2005 le mathata a dijo ka mengwaga ya bo 2007–2008 e bile le seabe seo se sa kgahlišego go dinaga tša Afrika. Tlhatlogo ya godimo ya ditheko tša dijo le go phuhlama ka pela ga thušo ya dijo go feleditše ka tlhatlogo ye e šiišago ya ditheko tša dijo ka mafelong a ditoropong gomme se sa baka tlhaelelo ye kgolo ya dijo. Ka mafelong a dinagamagaeng, setšhaba se ile sa angwa gannyane ke tlhaelelo ya dijo.

APPENDIX K: Oral reading fluency test for English reading (school participants)

Health is wealth

Nowadays, a good health is just like a boon given by God. It is a fact that good health is the real money of life. Good health is considered as the precious earning of a human throughout his or her life. If one loses his health, he has lost all the charms of life. A good wealth can be earned anytime using a good health, however; a good health can never be earned again in the life if once destroyed. In order to maintain a good health, we need to do regular physical exercises, yoga, meditation, balanced food, good thoughts, cleanliness, personal hygiene, regular health check-ups, proper sleep, rest, etc. If one is healthy, he or she does not need to spend money on his or her health in buying medicines or visiting doctors. A healthy person just needs to spend some money only on his health on regular basis. However, on the other hand, a lazy, diseased or sluggish person needs to spend more money throughout his life.

People generally fail in their life to maintain a good health just because of their laziness and idle habits. They think that what they are doing is right but time has already gone whenever they understand their mistakes. A good health is one which keeps us healthy in all aspects like mentally, physically, socially and intellectually. A good health provides us freedom from all the sickness and diseases. A good health is the feeling of mental, physical and social well-being. It is a costly and most precious gift of the life and necessary for living a purposeful life.

A good health allows us to work for more time without getting tired. A good health is the real pleasures and charm of life. An unhealthy person always worries about his or her physical or physiological complications. So, it is good to maintain the good health to get rid of all the complications of the body as well as successfully face all the challenges of life.

APPENDIX L

Oral reading fluency test for Sepedi reading (school participants)

Šireletša mmele wa gago

Batho ba gopola gore ke didirišwa tša bona fela tšeo ba ka di seketšago goba go di boloka. Seo ke se lemogilego ke gore go nyakega gore batho ba boloke le go šireletša maphelo a bona ka dinako tšohle. Go fa mohlala, go se tsenele thobalano ka pela go ka okeletša matšatši a bophelo, ka ge o tla be o ipolokile kgahlanong le malwetši a go swana le HIV goba a mangwe a thobalano pele o eba le tsebo ye e tseneletšego ka ona. Go tsenela tša thobalano o šetše o kwešiša maikarabelo ao o nago le ona, go ka go thuša go efoga malwetši ao.

Taba ye nngwe gape ke gore dijo tšeo re di jago di ka re thuša go boloka mebele ya rena go dira gore re dule re na le matšato le mafolofolo ebile go ka thuša go boloka maphelo a rena gomme ra phela nako ye telele ntle le malwetši. Le ge mebele ya rena e nyaka dikhabohaetreiti, diproteine le dibithamine, go bohlokwa gore re je merogo ye mentši gore re dule re phetše gabotse. Merogo ya go swana le sepinitšhi, khabetšhe le tamati, le dienywa tša go fapana di thuša mebele ya rena go lwantšha ditwatši tša mehutahuta. Ka gona, go a nyakega gore re hlokomele mebele ya rena.

Leka ka dinako tšohle go itšhudulla gore o dule o le matšato, o na le maatla le mafolofolo. O ka itšhudulla ka go sepela tekano ya metsotso ye 30 letšatši ka letšitši, goba o ka kitima. Se sengwe seo o ka se dirago ke go bapala papadi yeo e itšego, e ka ba kgwele ya matsogo, kgwele ya maoto, rakbi, tša mabelo, bjalo.bjalo. Ka go dira bjalo o tla tiiša pelo ya gago, gomme wa se sware ke malwetši a go swana le a pelo.

Bothata bjo bongwe bjo re swanetšego go ithuta kgahlanong le bjona ke bja dikotsi tša mebileng. Ge o le mosepelakadinao, netefatša gore o sepela ka letsogong la maleba la tsela ebile o apara diaparo tša go kganya, gore baotledi ba kgone go go bona. Ge o le motho wa go itšhudulla, netefatša gore o apara diaparo tša go kganya gore baotledi le bona ba kgone go go bona.

APPENDIX M

Language, perception and attitude questionnaire for university participants

ATTITUDES AND OPINIONS ABOUT LANGUAGES

INTRODUCTION

With this questionnaire I want to learn more about your attitudes and opinions of languages. An attitude or an opinion is a way of thinking about something. It is important that you remember that there are no RIGHT or WRONG answers to any of the questions I ask. Your attitude or opinion about languages cannot be right or wrong. Therefore, I ask you to please give me your honest feelings about these issues.

Your answers to these questions will in NO WAY penalise your marks at university. The information that you give me in this questionnaire will only be used for research or study purposes. If you are interested, I will also give you feedback after the study is completed.

INSTRUCTIONS

- 1 Please follow the instructions at each question carefully.
- 2 There is no time limit - you may use all the time you need.
- 3 There are no "right" or "wrong" answers. Please give the answer you honestly feel to be the most "true" response.
- 4 Please remember it is not "good" or "bad" to know many (or few) languages. I am interested in the language or languages you know – whether it is one language or many languages.
- 5 Please answer ALL the questions.
- 6 REMEMBER: the data is handled anonymously. This means that your real name will not be linked with your answers. You must choose a "fictional name" name and write it down at question 1 of the questionnaire that follows. I will keep a list with your real name and the "fictional" name that you choose today. I will ask you to please use the SAME "fictional" name for all the tasks that you will complete as part of the study. This will help me to match your answers to this questionnaire with the answers in other tasks that you complete in the study. People who read about the study will never know who you are. Please answer HONESTLY and TRUTHFULLY.
- 7 If any of the questions are rude or unpleasant to you – please put a circle around the question number of that question.

THANK YOU FOR ANSWERING THE QUESTIONNAIRE HONESTLY AND TRUTHFULLY.

SECTION A: BIOGRAPHICAL DATA

1. My “fictional” name is

Please put a tick (✓) over the number in the block of your answer to the following questions.

2. GENDER

Female	1	Male	2

3. AGE

Please write down your **age** (how old you are at this moment) in the following block:

I am years old at this moment.

4. How would you describe yourself in terms of the population groups in South Africa? Please tick (✓) the category you are most comfortable with.

Population groups in South Africa as defined by Statistics South Africa for Census purposes	Category I am most comfortable with
Black African	1
Coloured	2
Indian or Asian	3
White	4
Other: Please specify	5

5. What is the **HIGHEST** educational qualification of your father? Please mark the appropriate block with a tick (✓).

My father died when I was still very young – I do not know	1
I Do not know my father	2
My father did not attend school	3
My father completed Grade 5 or lower	4
My father completed Grade 6 or 7	5
My father completed Grade 8 or 9	6
My father completed Grade 10 or 11	7
My father completed Grade 12 / Qualification similar to Grade 12	8
My father went to a post-school institution (like a university or college) and did a part of a post-school qualification but he did not complete the qualification	9
My father completed a first degree / diploma at a post-school institution	10
I do not know	11

6. What is the **HIGHEST** educational qualification of your mother? Please mark the appropriate block with a tick (✓).

My mother died when I was still very young – I do not know	1
I do not know my mother	2
My mother did not attend school	3
My mother completed Grade 5 or lower	4
My mother completed Grade 6 or 7	5
My mother completed Grade 8 or 9	6
My mother completed Grade 10 or 11	7
My mother completed Grade 12 / Qualification similar to Grade 12	8
My mother went to a post-school institution (like a university or college) and did a part of a post-school qualification but he did not complete the qualification	9
My mother completed a first degree / diploma at a post-school institution	10
I do not know	11

7. Please write down the name of the High/Secondary School that you attended.

8. Please write down the **NAME** of the **TOWN** and the **PROVINCE** where you attended High/Secondary School.

Name of town: _____ Name of Province: _____

9. Please write down the name of the **DIPLOMA/DEGREE** you are registered/enrolled for at this moment.

11. Please mark the **SCHOOL** in which you study. Please put a cross (X) in the appropriate block.

Behavioural Sciences	1
Languages	2
Basic Sciences	3
Education Sciences	4
Accounting Sciences	5
Information Technology	6
Economic Sciences	7
Other	8
Write the name of the school	

SECTION B: YOUR ATTITUDES, OPINIONS AND USE OF LANGUAGES

10. What language do you speak at home most of the time?

Please look at the following grid with languages and codes for each language. In this question, please mark the **ONE** language you use **AT HOME** in the block provided. Please put a tick (✓) over the number in the appropriate block.

Afrikaans	1	Shona	12
Dutch	2	Southern Sotho	13
English	3	Spanish	14
French	4	Swati	15
German	5	Xitsonga	16
Hebrew	6	Tswana	17
Italian	7	Venda	18
Ndebele	8	Xhosa	19
Ndonga	9	Zulu	20
Sepedi/Northern Sotho	10	Other (specify):	21
Portuguese	11		

11. If you use more than one language at home, please write down the names of the other languages that you use at home every day:

12. Please indicate **ALL** the languages that you can speak and understand. Please put ticks (✓) in **ALL** the appropriate blocks.

Afrikaans	1	Shona	12
Dutch	2	Southern Sotho	13
English	3	Spanish	14
French	4	Swati	15
German	5	Xitsonga	16
Hebrew	6	Tswana	17
Italian	7	Venda	18
Ndebele	8	Xhosa	19
Ndonga	9	Zulu	20
Sepedi/Northern Sotho	10	Other (specify):	21
Portuguese	11		

- 13.** Please list all the languages that you know in the order that you learnt them as best as you can remember. In other words, based on your memory, which language did you learn first, second, third etc.? Please keep in mind ALL the languages you know when you answer this question. Please write down the number of the language you learnt as they are coded on question 10.

Order of acquisition or learning of languages	Please write down the NUMBER for the languages you learnt as they are coded on these parate page. For example: if you learnt "Southern Sotho" first, you would write "13" next to "Language I learnt FIRST" below.
Language I learnt FIRST	
SECOND language that I learnt	
THIRD language that I learnt	
FOURTH language that I learnt	
FIFTH language that I learnt	

- 14.1** Please rate your skills in Sepedi. Put a tick (✓) in the block that indicates how good you think you are at Sepedi.

	Very poor	Poor	OK	Successful	Very successful
I SPEAK Sepedi	1	2	3	4	5
I WRITE Sepedi	1	2	3	4	5
I READ Sepedi	1	2	3	4	5
I UNDERSTAND Sepedi	1	2	3	4	5

- 14.2** I am satisfied with my current ability to speak Sepedi

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	2	3	4	5

15.1 Please rate your skills in ENGLISH. Put a tick (✓) in the block that indicates how good you think you are at English.

	Very poor	Poor	OK	Successful	Very successful
I SPEAK English	1	2	3	4	5
I WRITE English	1	2	3	4	5
I READ English	1	2	3	4	5
I UNDERSTAND English	1	2	3	4	5

15.2 I am satisfied with my current ability to speak English

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	2	3	4	5

SECTION C: QUESTIONS ABOUT THE LANGUAGES THAT YOU KNOW

Please remember it is not “good” or “bad” to know many (or few) languages. I am interested in the language or languages you know – whether it is one language or many languages.

In this section of the questionnaire, you are asked the same set of questions about all the languages you know.

What does it mean to “know a language” in this questionnaire?

People who know more than one language usually do not know them all equally well or at the same level of proficiency and they use them for different communication functions. They use the language they know to:

- Listen and understand or
- Speak or
- Read or
- Write

You are asked to answer the questions in this section in a specific order starting with your strongest language, then your second strongest language and then your third strongest language (if you know 3 languages).

What do we mean with your “strongest language” in the questionnaire?

Your strongest language is the language that is the easiest for you to use to express yourself and people who know your strongest language understand what you want to communicate with ease in this language. This is the language in which you are the most proficient or the “best” in, in your opinion.

Your second strongest language is the language which you feel you can use with second most ease and it is the language you feel second most proficient in, or second “best” in etc.

16. Questions about your STRONGEST language

MY STRONGEST LANGUAGE

This is the language that I am the most proficient in, or my STRONGEST language. All questions below refer to my CURRENT knowledge of (please write in the name of your STRONGEST language here):

Note:

STRONGEST refers to your perception of your abilities/proficiency of this language in your life, not to language you learnt first, second etc.

- 16.1. On the scale from 1 to 5, please select your level of proficiency for each of the following skills in your STRONGEST language. Please put a tick (✓) in the appropriate block below for each of the skills.**

Language Skills	My perception of my proficiency in my STRONGEST language for these skills				
	Very poor	Poor	Average	Good	Very good
a. Speaking	1	2	3	4	5
b. Listening/ Understanding	1	2	3	4	5
c. Reading	1	2	3	4	5
d. Writing	1	2	3	4	5

- 16.2. What do you READ in your STRONGEST language and how well do you READ each of the following types of reading materials in your STRONGEST language?**

Types of READING material you read in your STRONGEST language	COLUMN A					COLUMN B				
	Please indicate <u>how often you READ</u> all the different types of material indicated in COLUMN A in your STRONGEST language by putting a cross (X) next to all the appropriate items.					Please indicate <u>how well you READ</u> the following reading materials in your STRONGEST language in COLUMN B.				
	<i>Never</i>	<i>Seldom</i>	<i>Sometimes</i>	<i>Often</i>	<i>Very often</i>	<i>Very poor</i>	<i>Poor</i>	<i>Average</i>	<i>Good</i>	<i>Very good</i>
a. Magazines	1	2	3	4	5	1	2	3	4	5
b. Newspapers	1	2	3	4	5	1	2	3	4	5
c. textbooks	1	2	3	4	5	1	2	3	4	5
d. story books	1	2	3	4	5	1	2	3	4	5
e. The bible/other reading material	1	2	3	4	5	1	2	3	4	5
f. Texts on WhatsApp, Facebook,	1	2	3	4	5	1	2	3	4	5

twitter and Instagram										
g. Text messages on my cell phone	1	2	3	4	5	1	2	3	4	5
h. Material on the internet	1	2	3	4	5	1	2	3	4	5
i. Other types of texts (Specify below)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

16.3. How often and how well do you WRITE in your strongest language?

Types of texts you WRITE in your STRONGEST language	COLUMN A					COLUMN B				
	Please indicate how often you <u>WRITE</u> all the different types of texts in your STRONGEST language in COLUMN A below by putting a (X) next to all the appropriate items.					Please indicate how well you <u>WRITE</u> the following texts materials in your STRONGEST language in COLUMN B				
	Never	Seldom	Sometimes	Often	Very often	Very poor	Poor	Average	Good	Very good
a. Text message on my cell phone	1	2	3	4	5	1	2	3	4	5
b. Texts on WhatsApp, Facebook, twitter and Instagram	1	2	3	4	5	1	2	3	4	5
c. Lists (grocery list, to do list)	1	2	3	4	5	1	2	3	4	5
d. Longer documents for study purposes	1	2	3	4	5	1	2	3	4	5
e. Longer documents for personal purposes (e.g. journal/ letters)	1	2	3	4	5	1	2	3	4	5
f. other types of texts (please specify below?)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

16.4. On the scale from 1-4, please select how much the following factors contributed to you LEARNING your strongest language. Please put a tick (✓) in the appropriate block below for each of the skills.

Context	Rating of contribution to <u>LEARNING</u> your STRONGEST language in the following contexts			
	Did not contribute at all	Small contribution	Medium contribution	Large contribution
a. Interacting with friends	1	2	3	4
b. Interacting with family	1	2	3	4

c. Reading	1	2	3	4
d. Language CDs and DVDs for self- instruction	1	2	3	4
e. Watching TV	1	2	3	4
f. Listening to the radio/music	1	2	3	4
g. Used at school / university	1	2	3	4

16.5. Please rate to what extent you are CURRENTLY EXPOSED TO your STRONGEST language in the following contexts. Please put a tick (✓) in the appropriate block below for each of the skills.

Context	Rating of <u>CURRENT exposure</u> to your STRONGEST language in the following contexts at this moment			
	Not exposed at all	Irregular exposure	Regular exposure	Constant exposure
a. Interacting with friends	1	2	3	4
b. Interacting with family	1	2	3	4
c. Reading	1	2	3	4
d. Language CDs and DVDs for self- instruction	1	2	3	4
e. Watching TV	1	2	3	4
f. Listening to the radio/music	1	2	3	4
g. Used at school / university	1	2	3	4

17. Questions about your SECOND STRONGEST language

MY SECOND STRONGEST LANGUAGE

This is the language that I am the most proficient in, or my second STRONGEST language. All questions below refer to my CURRENT knowledge of (please write in the name of your second STRONGEST language here):

17.1. On the scale from 1 to 5, please select your level of proficiency for each of the following skills in your second STRONGEST language. Please put a tick (✓) in the appropriate block below for each of the skills.

Language Skills	My perception of my proficiency in my second STRONGEST language for these skills				
	Very poor	Poor	Average	Good	Very good
a. Speaking	1	2	3	4	5
b. Listening/ Understanding	1	2	3	4	5
c. Reading	1	2	3	4	5
d. Writing	1	2	3	4	5

17.2. What do you READ in your second STRONGEST language and how well do you READ each of the following types of reading materials in your second STRONGEST language?

Types of READING material you read in your	COLUMN A	COLUMN B
	Please indicate how often you READ all the different types of material indicated	Please indicate how well you READ the following reading materials in your second

second STRONGEST language	in COLUMN A in your second STRONGEST language by putting a cross (X) next to all the appropriate items.					STRONGEST language in COLUMN B.				
	<i>Never</i>	<i>Seldom</i>	<i>Sometimes</i>	<i>Often</i>	<i>Very often</i>	<i>Very poor</i>	<i>Poor</i>	<i>Average</i>	<i>Good</i>	<i>Very good</i>
a. Magazines	1	2	3	4	5	1	2	3	4	5
b. Newspapers	1	2	3	4	5	1	2	3	4	5
c. textbooks	1	2	3	4	5	1	2	3	4	5
d. story books	1	2	3	4	5	1	2	3	4	5
e. The bible/other reading material	1	2	3	4	5	1	2	3	4	5
f. Texts on WhatsApp, Facebook, twitter and Instagram	1	2	3	4	5	1	2	3	4	5
g. Text messages on my cell phone	1	2	3	4	5	1	2	3	4	5
h. Material on the internet	1	2	3	4	5	1	2	3	4	5
i. Other types of texts (Specify below)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

17.3. How often and how well do you WRITE in your second strongest language?

Types of texts you WRITE in your second STRONGEST language	COLUMN A					COLUMN B				
	Please indicate <u>how often you WRITE</u> all the different types of texts in your second STRONGEST language in COLUMN A below by putting a (X) next to all the appropriate items.					Please indicate <u>how well you WRITE</u> the following texts materials in your second STRONGEST language in COLUMN B				
	<i>Never</i>	<i>Seldom</i>	<i>Sometimes</i>	<i>Often</i>	<i>Very often</i>	<i>Very poor</i>	<i>Poor</i>	<i>Average</i>	<i>Good</i>	<i>Very good</i>
a. Text message on my cell phone	1	2	3	4	5	1	2	3	4	5
b. Texts on WhatsApp, Facebook, twitter and Instagram	1	2	3	4	5	1	2	3	4	5
c. Lists (grocery list, to do list)	1	2	3	4	5	1	2	3	4	5
d. Longer documents for study purposes	1	2	3	4	5	1	2	3	4	5

e. Longer documents for personal purposes (e.g. journal/ letters)	1	2	3	4	5	1	2	3	4	5
f. other types of texts (please specify below?)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

17.4. On the scale from 1-4, please select how much the following factors contributed to you LEARNING your second strongest language. Please put a tick (✓) in the appropriate block below for each of the skills.

Context	Rating of contribution to <u>LEARNING</u> your second STRONGEST language in the following contexts			
	Did contribute all	not at Small contribution	Medium contribution	Large contribution
a. Interacting with friends	1	2	3	4
b. Interacting with family	1	2	3	4
c. Reading	1	2	3	4
d. Language CDs and DVDs for self- instruction	1	2	3	4
e. Watching TV	1	2	3	4
f. Listening to the radio/music	1	2	3	4
g. Used at school / university	1	2	3	4

17.5. Please rate to what extent you are CURRENTLY EXPOSED TO your second STRONGEST language in the following contexts. Please put a tick (✓) in the appropriate block below for each of the skills.

Context	Rating of <u>CURRENT exposure</u> to your second STRONGEST language in the following contexts at this moment			
	Not exposed at all	Irregular exposure	Regular exposure	Constant exposure
a. Interacting with friends	1	2	3	4
b. Interacting with family	1	2	3	4
c. Reading	1	2	3	4
d. Language CDs and DVDs for self- instruction	1	2	3	4
e. Watching TV	1	2	3	4
f. Listening to the radio/music	1	2	3	4
g. Used at school / university	1	2	3	4

18. Questions about your THIRD STRONGEST language

MY THIRD STRONGEST LANGUAGE

This is the language that I am the most proficient in, or my third STRONGEST language. All questions below refer to my CURRENT knowledge of (please write in the name of your third STRONGEST language here):

- 18.1. On the scale from 1 to 5, please select your level of proficiency for each of the following skills in your third STRONGEST language. Please put a tick (✓) in the appropriate block below for each of the skills.

Language Skills	My perception of my proficiency in my STRONGEST language for these skills				
	Very poor	Poor	Average	Good	Very good
a. Speaking	1	2	3	4	5
b. Listening/ Understanding	1	2	3	4	5
c. Reading	1	2	3	4	5
d. Writing	1	2	3	4	5

- 18.2. What do you READ in your third STRONGEST language and how well do you READ each of the following types of reading materials in your third STRONGEST language?

Types of READING material you read in your third STRONGEST language	COLUMN A					COLUMN B				
	Please indicate <u>how often you READ</u> all the different types of material indicated in COLUMN A in your third STRONGEST language by putting a cross (X) next to all the appropriate items.					Please indicate <u>how well you READ</u> the following reading materials in your third STRONGEST language in COLUMN B.				
	<i>Never</i>	<i>Seldom</i>	<i>Sometimes</i>	<i>Often</i>	<i>Very often</i>	<i>Very poor</i>	<i>Poor</i>	<i>Average</i>	<i>Good</i>	<i>Very good</i>
a. Magazines	1	2	3	4	5	1	2	3	4	5
b. Newspapers	1	2	3	4	5	1	2	3	4	5
c. textbooks	1	2	3	4	5	1	2	3	4	5
d. story books	1	2	3	4	5	1	2	3	4	5
e. The bible/other reading material	1	2	3	4	5	1	2	3	4	5
f. Texts on WhatsApp, Facebook, twitter and Instagram	1	2	3	4	5	1	2	3	4	5
g. Text messages on my cell phone	1	2	3	4	5	1	2	3	4	5
h. Material on the internet	1	2	3	4	5	1	2	3	4	5
i. Other types of texts (Specify below)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

18.3. How often and how well do you WRITE in your third strongest language?

Types of texts you WRITE in your third STRONGEST language	COLUMN A					COLUMN B				
	Please indicate how often you WRITE all the different types of texts in your third STRONGEST language in COLUMN A below by putting a (X) next to all the appropriate items.					Please indicate how well you WRITE the following texts materials in your third STRONGEST language in COLUMN B				
	Never	Seldom	Sometimes	Often	Very often	Very poor	Poor	Average	Good	Very good
a. Text message on my cell phone	1	2	3	4	5	1	2	3	4	5
b. Texts on WhatsApp, Facebook, twitter and Instagram	1	2	3	4	5	1	2	3	4	5
c. Lists (grocery list, to do list)	1	2	3	4	5	1	2	3	4	5
d. Longer documents for study purposes	1	2	3	4	5	1	2	3	4	5
e. Longer documents for personal purposes (e.g. journal/ letters)	1	2	3	4	5	1	2	3	4	5
f. other types of texts (please specify below?)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

18.4. On the scale from 1-4, please select how much the following factors contributed to you LEARNING your third strongest language. Please put a tick (✓) in the appropriate block below for each of the skills.

Context	Rating of contribution to <u>LEARNING</u> your third STRONGEST language in the following contexts				
	Did contribute all	not at	Small contribution	Medium contribution	Large contribution
a. Interacting with friends	1		2	3	4
b. Interacting with family	1		2	3	4
c. Reading	1		2	3	4
d. Language CDs and DVDs for self- instruction	1		2	3	4
e. Watching TV	1		2	3	4
f. Listening to the radio/music	1		2	3	4
g. Used at school / university	1		2	3	4

- 18.5. Please rate to what extent you are CURRENTLY EXPOSED TO your third STRONGEST language in the following contexts. Please put a tick (✓) in the appropriate block below for each of the skills.

Context	Rating of <u>CURRENT exposure</u> to your third STRONGEST language in the following contexts at this moment			
	Not exposed at all	Irregular exposure	Regular exposure	Constant exposure
a. Interacting with friends	1	2	3	4
b. Interacting with family	1	2	3	4
c. Reading	1	2	3	4
d. Language CDs and DVDs for self-instruction	1	2	3	4
e. Watching TV	1	2	3	4
f. Listening to the radio/music	1	2	3	4
g. Used at school / university	1	2	3	4

SECTION D: ATTITUDES TOWARDS SEPEDI

19. Read the sentences below and decide if you agree or disagree and then put a tick (✓) in the appropriate block.

Statements about my attitude towards Sepedi	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. If given an opportunity I would prefer to use Sepedi at university for all my subjects.	1	2	3	4	5
2. I think the use of Sepedi for education would be a good idea.	1	2	3	4	5
3. I think having more textbooks written in Sepedi for education is a good idea.	1	2	3	4	5
4. I would take an extra Sepedi subject at university to enrich myself.	1	2	3	4	5
5. I feel confident to use Sepedi around other people at university.	1	2	3	4	5
6. I think that I maintain (continue to use) my Sepedi well.	1	2	3	4	5
7. I think that my Sepedi is declining because I do not learn it as a university subject.	1	2	3	4	5
8. I think that Sepedi can help me to understand English material.	1	2	3	4	5
9. I think that if I were allowed to use Sepedi to answer test and examination questions I would perform better.	1	2	3	4	5
10. If more materials in education are available in Sepedi, people will want to learn in Sepedi.	1	2	3	4	5

20. Read the sentences below and decide if you agree or disagree. Put a tick (✓) in the appropriate block.

Statements	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Strongly Disagree
1. It is important for me to know Sepedi.	1	2	3	4	5
2. Sepedi is very important (vital) to my identity (root) as a person.	1	2	3	4	5
3. Sepedi is a valuable language.	1	2	3	4	5
4. I feel that most people in the university	1	2	3	4	5

community are not interested in keeping Sepedi alive.					
5. Sepedi should be taught at schools as a subject.	1	2	3	4	5
6. It is important that Sepedi is encouraged and used in workplaces.	1	2	3	4	5
7. It is important that Sepedi is used in university community gatherings.	1	2	3	4	5
8. It is important that Sepedi is used in traditional and ceremonial gatherings.	1	2	3	4	5
9. It is important that Sepedi is used in government activities.	1	2	3	4	5
10. Enough is being done to support the use of Sepedi in the university community.	1	2	3	4	5
11. Enough is being done to support Sepedi in South Africa.	1	2	3	4	5
12. The use of Sepedi helps me and others to succeed with my studies.	1	2	3	4	5
13. Sepedi is difficult to read.	1	2	3	4	5
14. Sepedi should be used as a language of teaching and learning to teach some subjects taught at school.	1	2	3	4	5
15. Sepedi should be used as a language of teaching and learning to teach some subjects at university.	1	2	3	4	5

21. Read the sentences below and decide if you will participate in the activities discussed. Put a tick (✓) in the appropriate block.

Activities	I would not participate	I would participate	I have already participated
1. Reading newspapers/newsletters in Sepedi.	1	2	3
2. Watching Sepedi TV programmes.	1	2	3
3. Listening to Sepedi radio station/s.	1	2	3
4. Attending Sepedi concerts e.g. comedy, music shows.	1	2	3
5. Viewing Sepedi language websites.	1	2	3
6. Using Sepedi as a language to learn mathematics and science at school.	1	2	3
7. Using Sepedi as a language to learn history and geography at school.	1	2	3
8. Using Sepedi as a language to learn Life Orientation at school.	1	2	3
9. Recording Sepedi speakers when they use Sepedi today.	1	2	3
10. If I ever have children, I will make sure that they learn Sepedi well.	1	2	3
11. If I ever have children, I will send them to a school where they learn in Sepedi until at least Grade 4.	1	2	3
12. If I ever have children, I will send them to a university where they can learn in Sepedi.	1	2	3

22. Who do you think speak in Sepedi and how often? Please tick (✓) the most appropriate answers for each category of people mentioned in the table below.

Person(s)	Always	Often	Sometimes	Rarely	Never	Not applicable

1. Your boyfriend/girlfriend.	1	2	3	4	5	6
2. Your friends at university	1	2	3	4	5	6
3. Your lecturers at university	1	2	3	4	5	6
4. Your grandparents.	1	2	3	4	5	6
5. Your parents.	1	2	3	4	5	6
6. Your siblings (brothers / sisters).	1	2	3	4	5	6
7. Your other family members (uncles / aunts / cousins / nieces / nephews).	1	2	3	4	5	6
8. Community members that are not related to you.	1	2	3	4	5	6
9. Community leaders that are not related to you.	1	2	3	4	5	6

23. **Where and how often** do you hear the Sepedi language being spoken? Please tick (✓) the appropriate answer in the table below.

Where	Always	Often	Sometimes	Rarely	Never
1. Community centre	1	2	3	4	5
2. At my home	1	2	3	4	5
3. At the shops	1	2	3	4	5
4. At other family members' homes	1	2	3	4	5
5. At a friend's home	1	2	3	4	5
6. At university	1	2	3	4	5
7. At church	1	2	3	4	5
8. At sporting events	1	2	3	4	5
9. In town	1	2	3	4	5
10. At the municipality offices	1	2	3	4	5

24. Is there any additional information about languages or Sepedi specifically that you would like to communicate to me/share with me? Please write down the information below.

END OF THE QUESTIONNAIRE

Thank you for your time

APPENDIX N

Language, perception and attitude questionnaire for (school participants)

ATTITUDES AND OPINIONS ABOUT LANGUAGES

INTRODUCTION

With this questionnaire I want to learn more about your attitudes and opinions of languages. An attitude or an opinion is a way of thinking about something. It is important that you remember that there are no RIGHT or WRONG answers to any of the questions I ask. Your attitude or opinion about languages cannot be right or wrong. Therefore, I ask you to please give me your honest feelings about these issues.

Your answers to these questions will in NO WAY penalise your marks at school. The information that you give me in this questionnaire will only be used for research or study purposes. If you are interested, I will also give you feedback after the study was completed.

INSTRUCTIONS

- Please follow the instructions at each question carefully.
 - There is no time limit - you may use all the time you need.
 - There are no "right" or "wrong" answers. Please give the answer you honestly feel to be the most "true" response.
 - Please remember it is not "good" or "bad" to know many (or few) languages. I am interested in the language or languages you know – whether it is one language or many languages.
 - Please answer ALL the questions.
-
- REMEMBER: the data is handled anonymously. This means that your real name will not be linked with your answers. You must choose a "fictional" name and write it down at question 1 of the questionnaire that follows. I will keep a list with your real name and the "fictional" name that you choose today. I will ask you to please use the SAME "fictional" name for all the questionnaires or tasks that you will complete as part of the study. This will help me to match your answers to this questionnaire with the answers in other tasks that you complete in the study. People who read about the study will never know who you are. Please answer HONESTLY and TRUTHFULLY.
 - If any of the questions are rude or unpleasant to you – please put a circle around the question number of that question.

THANK YOU FOR ANSWERING THE QUESTIONNAIRE HONESTLY AND TRUTHFULLY.

SECTION A: BIOGRAPHICAL DATA

1. My "fictional" name is

Please put a tick (✓) over the number in the block of your answer to the following questions.

2. GENDER

Girl	1	Boy	2

3. AGE

Please write down your **age** (how old you are at this moment) in the following block:

I am years old at this moment.

4. How would you describe yourself in terms of the population groups in South Africa? Please tick (✓) the category you are most comfortable with.

Population groups in South Africa as defined by Statistics South Africa for Census purposes	Category I am most comfortable with
Black African	1
Coloured	2
Indian or Asian	3
White	4
Other: Please specify	5

5. What is the **HIGHEST** educational qualification of your father? Please mark the appropriate block with a tick (✓).

My father died when I was still very young – I do not know	1
I Do not know my father	2
My father did not attend school	3
My father completed Grade 5 or lower	4
My father completed Grade 6 or 7	5
My father completed Grade 8 or 9	6
My father completed Grade 10 or 11	7
My father completed Grade 12 / Qualification similar to Grade 12	8
My father went to a post-school institution (like a university or college) and did a part of a post-school qualification but he did not complete the qualification	9
My father completed a first degree / diploma at a post-school institution	10
I do not know	11

6. What is the **HIGHEST** educational qualification of your mother? Please mark the appropriate block with a tick (✓).

My mother died when I was still very young – I do not know	1
I do not know my mother	2
My mother did not attend school	3
My mother completed Grade 5 or lower	4
My mother completed Grade 6 or 7	5

My mother completed Grade 8 or 9	6
My mother completed Grade 10 or 11	7
My mother completed Grade 12 / Qualification similar to Grade 12	8
My mother went to a post-school institution (like a university or college) and did a part of a post-school qualification but he did not complete the qualification	9
My mother completed a first degree / diploma at a post-school institution	10
I do not know	11

7. Please write down the name of the Primary School that you attended.

8. Please write down the NAME of the TOWN and the PROVINCE where you attended Primary School.

Name of town: _____

Name of Province: _____

9. Please mark the GRADE that you are currently in. Please put a tick (✓) in the appropriate block.

Grade 8	1
Grade 9	2

SECTION B: YOUR ATTITUDES, OPINIONS AND USE OF LANGUAGES

10. What language do you speak at home most of the time?

Please look at the following grid with languages and codes for each language. In this question, please mark the **ONE** language you use **AT HOME** in the block provided. Please put a tick (✓) over the number in the appropriate block.

Afrikaans	1	Shona	12
Dutch	2	Southern Sotho	13
English	3	Spanish	14
French	4	Swati	15
German	5	Xitsonga	16
Hebrew	6	Tswana	17
Italian	7	Venda	18
Ndebele	8	Xhosa	19
Ndonga	9	Zulu	20
Sepedi/Northern Sotho	10	Other (specify):	21
Portuguese	11		

11. If you use more than one language at home, please write down the names of the other languages that you use at home every day:
-

12. Please indicate **ALL** the languages that you can speak and understand. Please put ticks (✓) in **ALL** the appropriate blocks.

Afrikaans	1	Shona	12
Dutch	2	Southern Sotho	13
English	3	Spanish	14
French	4	Swati	15
German	5	Xitsonga	16
Hebrew	6	Tswana	17
Italian	7	Venda	18
Ndebele	8	Xhosa	19
Ndonga	9	Zulu	20
Sepedi/Northern Sotho	10	Other (specify):	21
Portuguese	11		

13. Please list all the languages that you know in the order that you learnt them as best as you can remember. In other words, based on your memory, which language did you learn first, second, third etc.? Please keep in mind ALL the languages you know when you answer this question. Please write down the number of the language you learnt as they are coded on the separate page.

Order of acquisition or learning of languages	Please write down the NUMBER for the languages you learnt as they are coded on the separate page. For example: if you learnt "Southern Sotho" first, you would write "13" next to "Language I learnt FIRST" below.
Language I learnt FIRST	
SECOND language that I learnt	
THIRD language that I learnt	
FOURTH language that I learnt	
FIFTH language that I learnt	

14. Please rate your skills in Sepedi. Put a tick (✓) in the block that indicates how good you think you are at Sepedi.

	Very poor	Poor	OK	Successful	Very successful
I SPEAK Sepedi	1	2	3	4	5
I WRITE Sepedi	1	2	3	4	5
I READ Sepedi	1	2	3	4	5
I UNDERSTAND Sepedi	1	2	3	4	5

14.1 I am satisfied with my current ability to speak Sepedi

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	2	3	4	5

15. Please rate your skills in ENGLISH. Put a tick (✓) in the block that indicates how good you think you are at English.

	Very poor	Poor	OK	Successful	Very successful
I SPEAK English	1	2	3	4	5
I WRITE English	1	2	3	4	5
I READ English	1	2	3	4	5
I UNDERSTAND English	1	2	3	4	5

15.1 I am satisfied with my current ability to speak English

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	2	3	4	5

SECTION C: QUESTIONS ABOUT THE LANGUAGES THAT YOU KNOW

Please remember it is not “good” or “bad” to know many (or few) languages. I am interested in the language or languages you know – whether it is one language or many languages.

In this section of the questionnaire, you are asked the same set of questions about all the languages you know.

What does it mean to “know a language” in this questionnaire?

People who know more than one language usually do not know them all equally well or at the same level of proficiency and they use them for different communication functions. They use the language they know to:

- Listen and understand or
- Speak or
- Read or
- Write

You are asked to answer the questions in this section in a specific order starting with your strongest language, then your second strongest language and then your third strongest language (if you know 3 languages).

What do we mean with your “strongest language” in the questionnaire?

Your strongest language is the language that is the easiest for you to use to express yourself and people who know your strongest language understand what you want to communicate with ease in this language. This is the language in which you are the most proficient or the “best” in, in your opinion.

Your second strongest language is the language which you feel you can use with second most ease and it is the language you feel second most proficient in, or second “best” in etc.

16. Questions about your STRONGEST language

MY STRONGEST LANGUAGE

This is the language that I am the most proficient in, or my STRONGEST language. All questions below refer to my CURRENT knowledge of (please write in the name of your STRONGEST language here):

Note:

STRONGEST refers to your perception of your abilities/proficiency of this language in your life, not to language you learnt first, second etc.

16.1. On the scale from 1 to 5, please select your level of proficiency for each of the following skills in your STRONGEST language. Please put a tick (✓) in the appropriate block below for each of the skills.

Language Skills	My perception of my proficiency in my STRONGEST language for these skills				
	Very poor	Poor	Average	Good	Very good
a. Speaking	1	2	3	4	5
b. Listening / Understanding	1	2	3	4	5

c. Reading	1	2	3	4	5
d. Writing	1	2	3	4	5

16.2. What do you READ in your STRONGEST language and how well do you READ each of the following types of reading materials in your STRONGEST language?

Types of READING material you read in your STRONGEST language	COLUMN A					COLUMN B				
	Please indicate <u>how often you READ</u> all the different types of material indicated in COLUMN A in your STRONGEST language by putting a cross (X) next to all the appropriate items.					Please indicate <u>how well you READ</u> the following reading materials in your STRONGEST language in COLUMN B.				
	<i>Never</i>	<i>Seldom</i>	<i>Sometimes</i>	<i>Often</i>	<i>Very often</i>	<i>Very poor</i>	<i>Poor</i>	<i>Average</i>	<i>Good</i>	<i>Very good</i>
a. Magazines	1	2	3	4	5	1	2	3	4	5
b. Newspapers	1	2	3	4	5	1	2	3	4	5
c. textbooks	1	2	3	4	5	1	2	3	4	5
d. story books	1	2	3	4	5	1	2	3	4	5
e. The bible/other reading material	1	2	3	4	5	1	2	3	4	5
f. Texts on WhatsApp, Facebook, twitter and Instagram	1	2	3	4	5	1	2	3	4	5
g. Text messages on my cell phone	1	2	3	4	5	1	2	3	4	5
h. Material on the internet	1	2	3	4	5	1	2	3	4	5
i. Other types of texts (Specify below)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

16.3. How often and how well do you WRITE in your strongest language?

Types of texts you WRITE in your STRONGEST language	COLUMN A	COLUMN B
	Please indicate <u>how often you WRITE</u> all the different types of texts in your STRONGEST language in COLUMN A below by putting a (X) next to all the appropriate items.	Please indicate <u>how well you WRITE</u> the following texts materials in your STRONGEST language in COLUMN B

	Never	Seldom	Sometimes	Often	Very often	Very poor	Poor	Average	Good	Very good
a. Text message on my cell phone	1	2	3	4	5	1	2	3	4	5
b. Texts on WhatsApp, Facebook, twitter and Instagram	1	2	3	4	5	1	2	3	4	5
c. Lists (grocery list, to do list)	1	2	3	4	5	1	2	3	4	5
d. Longer documents for study purposes	1	2	3	4	5	1	2	3	4	5
e. Longer documents for personal purposes (e.g. journal/ letters)	1	2	3	4	5	1	2	3	4	5
f. other types of texts (please specify below?)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

16.4. On the scale from 1-4, please select how much the following factors contributed to you LEARNING your strongest language. Please put a tick (✓) in the appropriate block below for each of the skills.

Context	Rating of contribution to <u>LEARNING</u> your STRONGEST language in the following contexts				
	Did contribute all	not at	Small contribution	Medium contribution	Large contribution
a. Interacting with friends	1		2	3	4
b. Interacting with family	1		2	3	4
c. Reading	1		2	3	4
d. Language CDs and DVDs for self- instruction	1		2	3	4
e. Watching TV	1		2	3	4
f. Listening to the radio/music	1		2	3	4
g. Used at school / university	1		2	3	4

16.5. Please rate to what extent you are CURRENTLY EXPOSED TO your **STRONGEST language in the following contexts. Please put a tick (✓) in the appropriate block below for each of the skills.**

Context	Rating of <u>CURRENT exposure</u> to your STRONGEST language in the following contexts at this moment			
	Not exposed at all	Irregular exposure	Regular exposure	Constant exposure
a. Interacting with friends	1	2	3	4
b. Interacting with family	1	2	3	4
c. Reading	1	2	3	4
d. Language CDs and DVDs for self- instruction	1	2	3	4
e. Watching TV	1	2	3	4
f. Listening to the radio/music	1	2	3	4
g. Used at school / university	1	2	3	4

17. Questions about your SECOND STRONGEST language

MY SECOND STRONGEST LANGUAGE

This is the language that I am the most proficient in, or my second STRONGEST language. All questions below refer to my CURRENT knowledge of (please write in the name of your second STRONGEST language here):

17.1. On the scale from 1 to 5, please select your level of proficiency for each of the following skills in your second STRONGEST language. Please put a tick (✓) in the appropriate block below for each of the skills.

Language Skills	My perception of my proficiency in my second STRONGEST language for these skills				
	Very poor	Poor	Average	Good	Very good
a. Speaking	1	2	3	4	5
b. Listening / Understanding	1	2	3	4	5
c. Reading	1	2	3	4	5
d. Writing	1	2	3	4	5

17.2. What do you READ in your second STRONGEST language and how well do you READ each of the following types of reading materials in your second STRONGEST language?

Types of READING material you read in your second STRONGEST language	COLUMN A					COLUMN B				
	Please indicate <u>how often you READ</u> all the different types of material indicated in COLUMN A in your second STRONGEST language by putting a cross (X) next to all the appropriate items.					Please indicate <u>how well you READ</u> the following reading materials in your second STRONGEST language in COLUMN B.				
	<i>Never</i>	<i>Seldom</i>	<i>Sometimes</i>	<i>Often</i>	<i>Very often</i>	<i>Very poor</i>	<i>Poor</i>	<i>Average</i>	<i>Good</i>	<i>Very good</i>
a. Magazines	1	2	3	4	5	1	2	3	4	5
b. Newspapers	1	2	3	4	5	1	2	3	4	5
c. textbooks	1	2	3	4	5	1	2	3	4	5
d. story books	1	2	3	4	5	1	2	3	4	5
e. The bible/other reading material	1	2	3	4	5	1	2	3	4	5
f. Texts on WhatsApp, Facebook, twitter and	1	2	3	4	5	1	2	3	4	5

Instagram										
g. Text messages on my cell phone	1	2	3	4	5	1	2	3	4	5
h. Material on the internet	1	2	3	4	5	1	2	3	4	5
i. Other types of texts (Specify below)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

17.3. How often and how well do you WRITE in your second strongest language?

Types of texts you WRITE in your second STRONGEST language	COLUMN A					COLUMN B				
	Please indicate <u>how often you WRITE</u> all the different types of texts in your second STRONGEST language in COLUMN A below by putting a (X) next to all the appropriate items.					Please indicate <u>how well you WRITE</u> the following texts materials in your second STRONGEST language in COLUMN B				
	Never	Seldom	Sometimes	Often	Very often	Very poor	Poor	Average	Good	Very good
a. Text message on my cell phone	1	2	3	4	5	1	2	3	4	5
b. Texts on WhatsApp, Facebook, twitter and Instagram	1	2	3	4	5	1	2	3	4	5
c. Lists (grocery list, to do list)	1	2	3	4	5	1	2	3	4	5
d. Longer documents for study purposes	1	2	3	4	5	1	2	3	4	5
e. Longer documents for personal purposes (e.g. journal/ letters)	1	2	3	4	5	1	2	3	4	5
f. other types of texts (please specify below?)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

17.4. On the scale from 1-4, please select how much the following factors contributed to you LEARNING your second strongest language. Please put a tick (✓) in the appropriate block below for each of the skills.

Context	Rating of contribution to <u>LEARNING</u> your second STRONGEST language in the following contexts			
	Did not contribute at all	Small contribution	Medium contribution	Large contribution
a. Interacting with friends	1	2	3	4
b. Interacting with family	1	2	3	4

c. Reading	1	2	3	4
d. Language CDs and DVDs for self- instruction	1	2	3	4
e. Watching TV	1	2	3	4
f. Listening to the radio/music	1	2	3	4
g. Used at school / university	1	2	3	4

17.5. Please rate to what extent you are CURRENTLY EXPOSED TO your second STRONGEST language in the following contexts. Please put a tick (✓) in the appropriate block below for each of the skills.

Context	Rating of <u>CURRENT</u> exposure to your second STRONGEST language in the following contexts at this moment			
	Not exposed at all	Irregular exposure	Regular exposure	Constant exposure
a. Interacting with friends	1	2	3	4
b. Interacting with family	1	2	3	4
c. Reading	1	2	3	4
d. Language CDs and DVDs for self- instruction	1	2	3	4
e. Watching TV	1	2	3	4
f. Listening to the radio/music	1	2	3	4
g. Used at school / university	1	2	3	4

18. Questions about your THIRD STRONGEST language

MY THIRD STRONGEST LANGUAGE

This is the language that I am the most proficient in, or my third STRONGEST language. All questions below refer to my CURRENT knowledge of (please write in the name of your third STRONGEST language here):

18.1. On the scale from 1 to 5, please select your level of proficiency for each of the following skills in your third STRONGEST language. Please put a tick (✓) in the appropriate block below for each of the skills.

Language Skills	My perception of my proficiency in my STRONGEST language for these skills				
	Very poor	Poor	Average	Good	Very good
a. Speaking	1	2	3	4	5
b. Listening / Understanding	1	2	3	4	5
c. Reading	1	2	3	4	5
d. Writing	1	2	3	4	5

18.2. What do you READ in your third STRONGEST language and how well do you READ each of the following types of reading materials in your third STRONGEST language?

Types of READING material you read in your third STRONGEST language	COLUMN A					COLUMN B				
	Please indicate <u>how often you READ</u> all the different types of material indicated in COLUMN A in your third STRONGEST language by putting a cross (X) next to all the appropriate items.					Please indicate <u>how well you READ</u> the following reading materials in your third STRONGEST language in COLUMN B.				
	<i>Never</i>	<i>Seldom</i>	<i>Sometimes</i>	<i>Often</i>	<i>Very often</i>	<i>Very poor</i>	<i>Poor</i>	<i>Average</i>	<i>Good</i>	<i>Very good</i>
a. Magazines	1	2	3	4	5	1	2	3	4	5
b. Newspapers	1	2	3	4	5	1	2	3	4	5
c. textbooks	1	2	3	4	5	1	2	3	4	5
d. story books	1	2	3	4	5	1	2	3	4	5
e. The bible/other reading material	1	2	3	4	5	1	2	3	4	5
f. Texts on WhatsApp, Facebook, twitter and Instagram	1	2	3	4	5	1	2	3	4	5
g. Text messages on my cell phone	1	2	3	4	5	1	2	3	4	5
h. Material on the internet	1	2	3	4	5	1	2	3	4	5
i. Other types of texts (Specify below)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

18.3. How often and how well do you WRITE in your third strongest language?

Types of texts you WRITE in your third STRONGEST language	COLUMN A	COLUMN B
	Please indicate <u>how often you WRITE</u> all the different types of texts in your third STRONGEST language in COLUMN A below by putting a (X) next to all the appropriate items.	Please indicate <u>how well you WRITE</u> the following texts materials in your third STRONGEST language in COLUMN B

	Never	Seldom	Sometimes	Often	Very often	Very poor	Poor	Average	Good	Very good
a. Text message on my cell phone	1	2	3	4	5	1	2	3	4	5
b. Texts on WhatsApp, Facebook, twitter and Instagram	1	2	3	4	5	1	2	3	4	5
c. Lists (grocery list, to do list)	1	2	3	4	5	1	2	3	4	5
d. Longer documents for study purposes	1	2	3	4	5	1	2	3	4	5
e. Longer documents for personal purposes (e.g. journal/ letters)	1	2	3	4	5	1	2	3	4	5
f. other types of texts (please specify below?)	1	2	3	4	5	1	2	3	4	5

Please write in the types of texts if you selected "OTHER TYPES OF TEXTS" above:

18.4. On the scale from 1-4, please select how much the following factors contributed to you **LEARNING** your third strongest language. Please put a tick (✓) in the appropriate block below for each of the skills.

Context	Rating of contribution to LEARNING your third STRONGEST language in the following contexts			
	Did contribute at all	Small contribution	Medium contribution	Large contribution
a. Interacting with friends	1	2	3	4
b. Interacting with family	1	2	3	4
c. Reading	1	2	3	4
d. Language CDs and DVDs for self- instruction	1	2	3	4
e. Watching TV	1	2	3	4
f. Listening to the radio/music	1	2	3	4
g. Used at school / university	1	2	3	4

18.5. Please rate to what extent you are **CURRENTLY EXPOSED TO** your third **STRONGEST** language in the following contexts. Please put a tick (✓) in the appropriate block below for each of the skills.

Context	Rating of CURRENT exposure to your third STRONGEST language in the following contexts at this moment			
	Not exposed at all	Irregular exposure	Regular exposure	Constant exposure
a. Interacting with friends	1	2	3	4
b. Interacting with family	1	2	3	4
c. Reading	1	2	3	4

d. Language CDs and DVDs for self-instruction	1	2	3	4
e. Watching TV	1	2	3	4
f. Listening to the radio/music	1	2	3	4
g. Used at school / university	1	2	3	4

SECTION D: ATTITUDES TOWARDS SEPEDI

19. Read the sentences below and decide if you agree or disagree and then put a tick (✓) in the appropriate block.

Statements about my attitude towards Sepedi	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. If given an opportunity I would prefer to use Sepedi at university for some my subjects.	1	2	3	4	5
2. I think the use of Sepedi for education would be is a good idea.	1	2	3	4	5
3. I think having more textbooks written in Sepedi for education is a good idea.	1	2	3	4	5
4. I would take an extra Sepedi subject at School to enrich myself.	1	2	3	4	5
5. I feel confident to use Sepedi around other people at School.	1	2	3	4	5
6. I think that I maintain (continue to use) my Sepedi well.	1	2	3	4	5
7. I think that my Sepedi will decline (use it less) if I stop to learn it as a subject at School.	1	2	3	4	5
8. I think that Sepedi helps me to understand English material.	1	2	3	4	5
9. I think that if I were allowed to use Sepedi to answer test and examination questions I would perform better.	1	2	3	4	5
10. If more materials in education are available in Sepedi, people will want to learn in Sepedi.	1	2	3	4	5

20. Read the sentences below and decide if you agree or disagree. Put a tick (✓) in the appropriate block.

Statements	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Strongly Disagree
1. It is important for me to know Sepedi.	1	2	3	4	5
2. Sepedi is very important (vital) to my identity (root) as a person.	1	2	3	4	5
3. Sepedi is a valuable language.	1	2	3	4	5
4. I feel that most people in my community are not interested in keeping Sepedi alive.	1	2	3	4	5
5. Sepedi should be taught at schools as a subject.	1	2	3	4	5
6. It is important that Sepedi is encouraged and used in workplaces.	1	2	3	4	5
7. It is important that Sepedi is used in community gatherings.	1	2	3	4	5

8. It is important that Sepedi is used in traditional and ceremonial gatherings.	1	2	3	4	5
9. It is important that Sepedi is used in government activities.	1	2	3	4	5
10. Enough is being done to support the use of Sepedi in my community.	1	2	3	4	5
11. Enough is being done to support for Sepedi in South Africa.	1	2	3	4	5
12. The use of Sepedi helps me and others to succeed with my studies.	1	2	3	4	5
13. Sepedi is difficult to read.	1	2	3	4	5
14. Sepedi should be used as a language of teaching and learning to teach all subjects taught at school.	1	2	3	4	5
15. Sepedi should be used as a language of teaching and learning to teach subjects at university.	1	2	3	4	5

21. Read the sentences below and decide if you will participate in the activities discussed. Put a tick (✓) in the appropriate block.

Activities	I would not participate	I would participate	I have already participated
1. Reading newspapers/newsletters in Sepedi.	1	2	3
2. Watching Sepedi TV programmes.	1	2	3
3. Listening to Sepedi radio station/s.	1	2	3
4. Attending Sepedi concerts e.g. comedy, music shows.	1	2	3
5. Viewing Sepedi language websites.	1	2	3
6. Using Sepedi as a language to learn mathematics and science at school.	1	2	3
7. Using Sepedi as a language to learn history and geography at school.	1	2	3
8. Using Sepedi as a language to learn Life Orientation at school.	1	2	3
8. Recording Sepedi speakers when they use Sepedi today.	1	2	3
9. If I ever have children, I will make sure that they learn Sepedi well.	1	2	3
10. If I ever have children, I will send them to a school where they learn in Sepedi until at least Grade 4.	1	2	3
11. If I ever have children, I will send them to a university where they can learn in Sepedi.	1	2	3

22. Who do you think speak in Sepedi and how often? Please tick (✓) the most appropriate answers for each category of people mentioned in the table below.

Person(s)	Always	Often	Sometimes	Rarely	Never	Not applicable
1. Your boyfriend/girlfriend.	1	2	3	4	5	6
2. Your friends at school.	1	2	3	4	5	6
3. Your teachers at school.	1	2	3	4	5	6
4. Your grandparents.	1	2	3	4	5	6
5. Your parents.	1	2	3	4	5	6
6. Your siblings (brothers / sisters).	1	2	3	4	5	6
7. Your other family members (uncles / aunts / cousins / nieces / nephews).	1	2	3	4	5	6

8. Community members that are not related to you.	1	2	3	4	5	6
9. Community leaders that are not related to you.	1	2	3	4	5	6

23. **Where and how often do you hear the Sepedi language being spoken? Please tick (✓) the appropriate answer in the table below.**

Where	Always	Often	Sometimes	Rarely	Never
1. Community centre	1	2	3	4	5
2. At my home	1	2	3	4	5
3. At the shops	1	2	3	4	5
4. At other family members' homes	1	2	3	4	5
5. At a friend's home	1	2	3	4	5
6. At school	1	2	3	4	5
7. At church	1	2	3	4	5
8. At sporting events	1	2	3	4	5
9. In town	1	2	3	4	5
10. At the municipality offices	1	2	3	4	5

24. Is there any additional information about languages or Sepedi specifically that you would like to communicate to me/share with me? Please write down the information below.

END OF THE QUESTIONNAIRE

Thank you for your time

APPENDIX O

Authorisation letter to parents to allow learners to travel to NWU for the reading experiments



NORTH-WEST
UNIVERSITY YUNIBESITHI
YA BOKONE-BOPHIRIMA
NOORDWES-
UNIVERSITEIT VAAL
TRIANGLE CAMPUS

Parent/Guardian Informed Consent

Identification of the researcher & Purpose of Study

Your child is being asked to participate in a research study conducted by (Pheladi Fakude) from North-West University. The purpose of this study is to get learners to read and answer comprehension questions to evaluate their reading level. The study will further investigate reading behaviours by making use of eye-tracking equipment. This study will contribute to the researcher's completion of her PhD thesis.

The researcher requests permission to take your child to the university (North-West University) to complete any eye tracking experiment. The reason for recording the data at university and not the school is because the environment is not conducive for the type of the study. Should you decide to allow your child to participate in this research study, you will be asked to sign this consent form once all your questions have been answered to your satisfaction.

Time Required

Your child will be taken to the university for one day or two days if required and the experiment is not complete.

Risks

The researcher does not perceive more than minimal risks from your child's involvement in this study (that is, no risks beyond the risks associated with everyday life). Your child will travel with me as the driver of the vehicle. I will collect the child from school and I will bring them back once they are done. I will ensure about the safety of your child and make sure that they wear a seatbelt. We will be driving with the university car and the university ensures that the car is roadworthy for travel.

Participation & Withdrawal

Your child's participation is entirely voluntary. He/she is free to choose not to participate. Should you and your child choose to participate, he/she can withdraw at any time without consequences of any kind.

Questions about the Study

If you have questions or concerns during the time of your child's participation in this study, or about the trip to the university, please contact:

Researcher's Name	Pheladi Fakude
Department	School of languages
North-West University	Vaal Triangle Campus
Email Address	24474134@nwu.ac.za
Cell phone number:	072 089 1419

Giving of Consent

I have read this consent form and I understand what is being requested of my child as a participant in this study. I freely consent for my child to participate and travel with you to the university and I will not hold you countable for anything that you have no control over. I have been given satisfactory answers to my questions. The researcher provided me with a copy of this form. I certify that I am at least 18 years of age.

☐ I give consent for my child to travel to the university in order to participate in the study.

Parent's name and Surname

Name of Child and Surname

Date:

APPENDIX P

Consent form and letter of invitation for university participants



NORTH-WEST UNIVERSITY
YUNIBESITHI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
INSTITUTIONAL OFFICE

Student nr:

Information and consent

1. This questionnaire includes questions about your language history, experience, proficiency and use. This questionnaire forms part of a PhD study titled "A description of South African readers reading in Sepedi and English: implications for education" with the aims to understand the relationships between languages and factors that influence academic success at higher education in South Africa better. The questionnaire data will be incorporated into a PhD study upon completion.
2. The information provided by participants will be used for research purposes as well as to inform academics and academic managers at the NWU about the best possible ways to provide academic support to students. It will not influence your academic results in any way. The data will be reported anonymously in books, academic journals, at academic conferences, and reports to academic managers at the NWU.
3. When you agree to participate by completing this questionnaire, you give permission to the researcher to:
 - (a) Access your academic record (including matriculation results) and applications for admission at the NWU;
 - (b) Access relevant psychometric and other tests that you took at the NWU; and
 - (c) Report the data gathered with this questionnaire, your academic record, applications and relevant psychometric and other tests you took at the NWU anonymously in books, academic journals, academic conferences, and as part of institutional reports at the NWU;

I, (please write out your full names and surname)

_____ give permission to the researcher, Ms Pheladi Fakude and members of her research team, to report the data gathered in this questionnaire, as well as data from my academic record, applications to the NWU, psychometric and other tests I took at the NWU anonymously in books, academic journals, academic conferences and institutional reports at the NWU.

Signature and Date

LETTER TO PROSPECTIVE PARTICIPANTS

06/04/2017

A description of South African readers reading in Sepedi and English: implications for education

Dear Prospective Participant

My name is Pheladi Fakude and I am doing research with Prof Kenneth Holmqvist (Lund University in the Department of Psychology), and Prof Susan Coetzee-VanRooy (North-West University in the Faculty of Humanities), as well as Dr Esté Hefer-Jordaan (North-West University in the school of languages) towards the degree of Doctor of Philosophy in Linguistics and Literary theory studies at North-West University. We are inviting you to participate in a study entitled "A description of South African readers reading in Sepedi and English: implications for education".

WHAT IS THE AIM/PURPOSE OF THE STUDY?

The aim of the study is to better understand how bilingual students in a multilingual higher education institution use their language skills to process academically. As part of the study you will be asked questions about your language history and your perception and attitude towards the languages you know and use at university. You will also be asked to participate in some test of knowledge abilities.

WHY AM I BEING INVITED TO PARTICIPATE?

You have been selected to participate in this study since you fulfil the criteria of being a home language user of Sepedi that is a first year student of a higher education institution that accepts multilingual students in South Africa. Approximately 60 participants will take part in this study.

WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY / WHAT DOES THE RESEARCH INVOLVE?

The study involves the completion of questionnaires that gather information about your language history and attitude from time to time. The type of questions would concern a participant's language history and your perceptions and attitudes towards the languages you know. You will be asked to participate in language proficiency tests from time to time. These would include the use of an eye tracker to capture your eye-movements while you read passages in the languages you know. After these tests you would be asked brief comprehension questions about the passages you read, as well as questions about your experience as a participant.

WILL WHAT I SAY BE KEPT CONFIDENTIAL?

Information will be kept confidential; your information will be replaced by a pseudonym. In this manner there will be no way to connect your answer to your name in any publications. Myself, Prof Holmqvist, Prof Coetzee-VanRooy, Dr. Hefer-Jordaan and the statistician will have access to the data. Moreover, the statistician will sign a confidentiality agreement. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report.

HOW WILL INFORMATION BE STORED AND ULTIMATELY DESTROYED?

The raw data itself will be kept by myself locked in a cabinet at my place of work for a period of 7 years after the completion of my study.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

A token of appreciation will be given to the participants

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

This study has received written approval from the Research Ethics Committee.

HOW WILL I BE INFORMED OF THE FINDINGS/RESULTS?

If you would like to be informed of the final research findings, please contact Pheladi Fakude on 0720891419. Should you require any further information or want to contact the researcher about any aspect of this study, please contact Pheladi Fakude on 0720891419 or alternatively email 24474134@nwu.ac.za.

CAN I WITHDRAW FROM THE STUDY?

Being in this study is voluntary and you are under no obligation to participate. If you do decide to take part, you will be given this information sheet to keep. You are free to withdraw from the study at any time. However, once your committed to participate, I would please like to urge you to stay in the study for the full period, because if you withdraw, your data would not form part of the study anymore. This could result in the sad event that the important findings might be less significant that it could possibly not be reported.

Thank you for taking time to read this information sheet and for participating in this study.

Thank you,

Pheladi Fakude



NORTH-WEST
UNIVERSITY YUNIBESITHI
YA BOKONE-BOPHIRIMA
NOORDWES-
UNIVERSITEIT VAAL
TRIANGLE CAMPUS

Parent/Guardian Informed Consent

Attention: Parents or guardian

Identification of the researcher & Purpose of Study

Your child is being asked to participate in a research study conducted by (Pheladi Fakude) from North-West University. The purpose of this study is to get learners to read and answer comprehension question to evaluate their reading level. The study will further investigate reading behaviours by making use of eye-tracking equipment. This study will contribute to the researcher's completion of her PhD thesis.

Research Procedures

Should you decide to allow your child to participate in this research study, you will be asked to sign this consent form once all your questions have been answered to your satisfaction. This study consists of comprehension texts, oral reading fluency texts and questionnaires to complete an extended reading program that will be administered to individual participants at the school. Your child will be asked to provide answers to a series of questions related to comprehension texts that they read. Your child will do the following:

- Complete an attitudinal questionnaire
- Read 4 texts for both Sepedi and English; a generic text and an academic text and you will later answer comprehension question.
- Take part in an extended reading program, where you will read 40 texts within 10 weeks. These texts will be compiled in a booklet and the booklet needs to be submitted after 10 weeks of receiving it.
- After 10 weeks you will read 4 texts again. The same texts you have read before the extended reading program.
- You will read aloud in both English and Sepedi, before the 10 weeks extended reading program and after the program.

Time Required

Participation in this study will require an extended reading program of 10 weeks in addition to the time spend on the experiment. There is no time limit here for the learners, but it is estimated that learners will spend 30-45 minutes on each text of the four texts for the experiment. The experiment will start mid-February and end the beginning of June 2017. The data will be collected in multiple session; mid-February and the beginning of June 2017. Learners will be given booklets that have 40 texts to read and complete within 10 weeks.

Risks

The researcher does not perceive more than minimal risks from your child's involvement in this study (that is, no risks beyond the risks associated with everyday life).

Benefits

The project will benefit the school, because Sepedi is a minority language in the community and teachers have highlighted that they do not receive good grades in matric for Sepedi. The proposed project will serve as an additional support for both the teachers and the learners.

Payment for participation

Learners will not get any money if they take part in the research, but a token of appreciation will be given to them. When I have finished the research, I will write a report about what I have learned, and I will tell you and the other teachers. The report will not include the name of your name, so that I can protect him/her. If she/he takes part in the research it will not cause them to pass or fail.

Confidentiality

All data will be reported anonymously, i.e. the names of pupils who participated in the study will be confidential and will not be mentioned in the study. Learners will be referred to as "learner 1" and schools will be referred to as "School A".

The aim of gathering this data is for research purposes. I.e. the study wants to investigate how learners read for comprehension when using eye-tracking equipment. The information will only be reported in the dissertation and in academic articles or books. No additional reports will be written from this data. The results of this research will be presented at (classroom, conference, etc.). Your child will be identified in the research records by a code name or number. The researcher(s) retain(s) the right to use and publish non-identifiable data. When the results of this research are published or discussed in conferences, no information will be included that would reveal your child's identity. All data will be stored in a secure location accessible only to the researcher(s). Upon completion of the study, all information that matches up individual respondents with their answers will be stored in a safe electronic excel sheet.

Participation & Withdrawal

Your child's participation is entirely voluntary. He/she is free to choose not to participate. Should you and your child choose to participate, he/she can withdraw at any time without consequences of any kind.

Questions about the Study

If you have questions or concerns during the time of your child's participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Researcher's Name	Pheladi Fakude
Department	School of languages
North-West University	Vaal Triangle Campus
Email Address	24474134@nwu.ac.za
Cell phone number:	072 089 1419

Giving of Consent

I have read this consent form and I understand what is being requested of my child as a participant in this study. I freely consent for my child to participate. I have been given satisfactory answers to my questions. The researcher provided me with a copy of this form. I certify that I am at least 18 years of age.

☐ I give consent for my child to participate in the study.

_____ (parent's initial)

Name of Child (Printed)

Name of Parent/Guardian (Printed)

Name of Parent/Guardian (Signed)

Date

Name of Researcher (Signed)

Date

ASSENT TO BE A RESEARCH PARTICIPANT (LEARNERS)

Research assent form

Who am I?

I am Pheladi Fakude, from North-West University in Vanderbijlpark. I would like you and other learners in your class to help me with my study. At university, we speak of research. I will explain to you what research means. Before I work with you, I want you to know what I want to do at your school. Then you can think about it and choose if you want to work with me or not. I will be working with someone who will help me with my project. We are the only two people who will work with you on this project.

What is this study about?

- Research studies help us to learn new things
- I want to learn new things about how school learners can learn better.
- I am going to check how you read in both Sepedi and English using a machine that takes videos of how your eyes move when you read.

To help me to make sure that you know what research is, please tick (✓) one of the choices below:

I, _____ (write in your name), understand that research is done to learn new things.

YES	NO

Why are you doing research with me?

I am doing this research to find out more about how you read in both Sepedi and English and to find out if reading a lot helps you learn better.

To help me to make sure that you know why I want to do research with you, please tick (✓) of the options below:

I, _____, (write your name) understand that the research is done to try and find out how I and other learners read in both Sepedi and English.

YES	NO

Important things that you should know:

You can decide if you want to take part or not.

You can say 'No' or you can say 'Yes'.

No one will be upset if you say "No".

You can say 'No' at any time.

I would still take good care of you even if you do not want to take part.

To help me make sure that you understand that you do not have to take part if you do not want to, please tick (✓) one of the options.

I, _____, (write in your name), understand that I do not have to take part if I do not want to.

YES	NO

What will I have to do if I take part in this research?

If you decide to take part in this research, I will ask you to do the following:

Activity 1

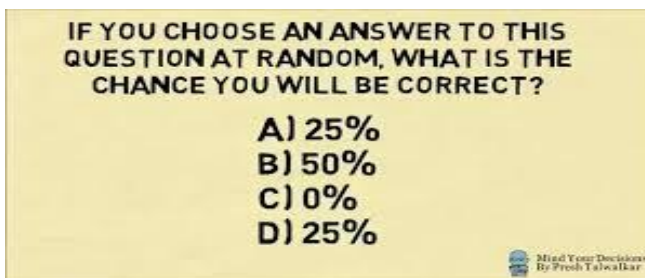
I am going to ask you to read Sepedi and English texts on a computer screen while a machine records your eye movement as you read.

In the picture below, you see how a learner is reading on the computer screen. You will be asked to do the same.



After you read on the computer screen, you will be asked to answer comprehension questions by putting a tick (✓) at the answer that you think is correct from the list of possible answers.

In the picture below, you see an example of such a question on the screen.



It will take you about 20-30 minutes to read.

Activity 2

I am going to give you a printed set of questions on paper. You will be asked to answer these questions on the paper. The questions are about the languages you know and how you use them.

Activity 3

I am going to give you a text to read while I record your voice and I will use a stop watch to determine how long it took you to read the text.

You will take part in an extended reading programme, where you will read 40 texts within 10 weeks. These texts will be compiled in a booklet and the booklet needs to be submitted after 10 weeks of receiving it.

Activity 4

After 10 weeks when you return the booklets, you are going to read again the Sepedi and English texts and answer comprehension questions.

You will be expected to complete a questionnaire again. A similar questionnaire which you complete in the beginning will have additional questions.

You will also be expected to read aloud both Sepedi and English texts

This process will take place June 2017.

To help me make sure that you know what I want you to do, please (✓) one of the options below:

I, _____, (write in your name), understand that I will have to read stories on a screen, answer questions about the stories on the screen, answer questions about any languages on paper and read 40 texts and answer questions in ten weeks.

YES	NO

Could bad things happen if I take part in this research?

No, I will not scare you, hurt you, or make you feel bad or afraid. I will also not ask you to answer too many questions. I do as you read 40 texts over 10 weeks. You will have to read one story at least 4 days a week to finish all the texts. It will take you about 20-30 minutes to read one text.

I, _____ (write in your name), understand that taking part in this research will not hurt me, and that I will have to read one story four days in a week for 20-30 minutes when I participate in the study.

Could this research help me?

- I hope that research will help you read and understand in order to learn better.
- I also hope to help other learners to learn better too.

To help me make sure that you know that the research will help you, please tick (✓) one of the options below.

I, _____ (write in your name) understand that the research can help me will my learning at school.

YES	NO

What else should I know about this research?

You will not get any money, but you will receive a token of appreciation if you take part in this research.

Your parents/guardians (the people you live with and who take care of you) know about the research too. They have given permission, so that if you want to, you can take part in it.

You do not have to take in the research, even if your parents or guardians want you to take part.

When I have finished the research, I will write a report about what I have learned, and I will tell the other teachers. The teachers will not get your name in the report.

If you take part in the research it will not cause you to pass or fail your grade.

To help me make sure that you know that the research will help you, please tick (✓) the options below:

I understand that I will not get any money if I take part.	YES	NO
I understand that my parents/guardian also know about the research	YES	NO
I understand that I do not have to take part even if my parents want me to.	YES	NO
I understand that the researcher will write a report, and tell other teachers about what she learned, but will never mention my name.	YES	NO

I understand that I will not pass or fail if I take part.	YES	NO

Is there anything else you want to ask about the research? You may ask me now

After you were told about the research, do you want to participate in it?

YES	NO

I will ask your teacher to help you write down your name below. I will also write my name.

Learner name (to be completed by learner/teacher/researcher) _____

Date: _____

The researcher's name and signature:

Pheladi Fakude

Signature: _____ Date: _____

APPENDIX R

Letter to the school principal and management for permission to conduct research



NORTH-WEST
UNIVERSITY YUNIBESITHI
YA BOKONE-BOPHIRIMA
NOORDWES-
UNIVERSITEIT VAAL
TRIANGLE CAMPUS

Mr Rakhatla

PO Box 667

Sasolburg

1949

To the Principal and school management

A request is hereby made to the principal and the school management team at Nkgopoleng Secondary School to allow the person mentioned underneath to conduct a research at the school. This research is aimed at grade 8 and 9 Sepedi home language learners.

The topic is "A description of South African readers reading in Sepedi and English: implications for education".

It is aimed at investigating the reading of learners when reading both Sepedi and English texts with the use of eye-tracking equipment. Permission to conduct this study at the school has been sought from the Free State Department of Education.

The research would entail one-on-one sessions with participating learners at the learner's convenience. The participants would have to fill out a questionnaire and meet the researcher for reading and writing tests. It is hoped that this study will run from mid-February to end of June 2017. The data will be collected in multiple sessions; mid-February and beginning of June 2017. Please note that neither the school nor the participating learners will be identifiable in the data discussion.

Your response and participation would be more than appreciated.

Kind regards

Pheladi Fakude (PhD student at North-West University)

APPENDIX S

Letter of permission to the Department of Education Free State Province



NORTH-WEST UNIVERSITY
YUNIBESITHI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
VAAL TRIANGLE CAMPUS

PO Box 1174, Vanderbijlpark
South Africa, 1900

Research Director: UPSET
"Understanding and processing language in complex
settings"

Tel: +27(16) 910-3422

Web: <http://upsetresearch.co.za/>
Email: Susan.coetzeevanrooy@nwu.ac.za

5 DECEMBER 2016

TO:

Ms Bertha Kitching

Director: Strategic planning, policy and research

Private Bag X20565

Bloemfontein

9300

Dear Ms Bertha Kitching

CONFIRMATION: PHD STATUS OF MRS PHELADI FAKUDE AT THE NWU

I hereby certify that Mrs. Pheladi Fakude is a student currently enrolled in a part-time PhD in Linguistics and Literary Theory degree in the School of Languages at the North-West University. Her student number is: 24474134.

Mrs Fakude's proposal for her PhD was already approved by the Faculty Board of Humanities (in 2016); and her ethics application at the NWU Ethics Committee for Language Matters is currently under final review. She would receive feedback on her ethics application in January 2017.

Mrs Pheladi Fakude plans to collect her data starting from February to June in 2017 for the PhD degree. Her planned data collection sites will include a high school in the Fezile Dabi district (Nkgopoleng High School), as well as data collection on the NWU Vaal Triangle Campus. Her PhD focuses on the reading skills of people who use Sepedi and English to read. She has our full support and the study she is pursuing will add valuable knowledge that will benefit the Free State Department of Education and the country at large with regard to policy development and implementation for reading in Sepedi as a home language and English as an additional language.

* Thanking you in advance for the cooperation and assistance with this matter. Please contact me if you need more information.

Kind regards,

A handwritten signature in black ink, appearing to read 'AS Coetzee-van Rooy'.

Professor AS Coetzee-van Rooy

Director: UPSET (and a co-supervisor of Mrs Fakude's PhD)

APPENDIX T

Letter of permission from the Department of Education-Free State Province

Enquiries: BM Kitching
Ref: Research Permission: PF Fakude
Tel. 051 404 9283 / 9221 / 082 454 1519
Email: berthakitching@gmail.com and B.Kitching@edu.fs.gov.za



PF Fakude
Unit 108, Carthouse
Ferranti Street
Van der Bijl Park, 1910

072 089 1419

Dear Mrs Fakude

APPROVAL TO CONDUCT RESEARCH IN THE FREE STATE DEPARTMENT OF EDUCATION

1. This letter serves as an acknowledgement of receipt of your request to conduct research in the Free State Department of Education.

Research Topic: A description of South African readers reading Sepedi and English: Implications for education.

Schools: Nkgopoleng High School, Fezile Dabi District.

Target Population: 40 Grade 8 Sepedi learners.

2. **Period of research:** From 1 March to 30 June 2017. Please note the department does not allow any research to be conducted during the fourth term (quarter) of the academic year nor during normal school hours.
3. Should you fall behind your schedule by three months to complete your research project in the approved period, you will need to apply for an extension.
4. The approval is subject to the following conditions:
 - 4.1 The collection of data should not interfere with the normal tuition time or teaching process.
 - 4.2 A bound copy of the research document or a CD, should be submitted to the Free State Department of Education, Room 319, 3rd Floor, Old CNA Building, Charlotte Maxeke Street, Bloemfontein.
 - 4.3 You will be expected, on completion of your research study to make a presentation to the relevant stakeholders in the Department.
 - 4.4 The attached ethics documents must be adhered to in the discourse of your study in our department.
5. Please note that costs relating to all the conditions mentioned above are your own responsibility.

Yours sincerely


DR JEM SEKOLANYANE
CHIEF FINANCIAL OFFICER

DATE: 07/02/2018

RESEARCH APPLICATION FAKUDI PF PERMISSION 12 JAN 2017 CORRECTED

Strategic Planning, Policy & Research Directorate

Private Bag X20565, Bloemfontein, 9300 - Room 318, Old CNA Building, 3rd Floor, Charlotte Maxeke Street, Bloemfontein

Tel: (051) 404 9283 / 9221 Fax: (086) 6678 678

APPENDIX U

Ethics certificate from North-West University



NORTH-WEST UNIVERSITY
YUNIBESITHI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Private Bag X6001, Potchefstroom,
South Africa, 2520

Tel: (018) 299-4900

Faks: (018) 299-4910

Web: <http://www.nwu.ac.za>

Institutional Research Ethics Regulatory Committee

Tel: +27 18 299 4849

Email: Ethics@nwu.ac.za

ETHICS APPROVAL CERTIFICATE OF PROJECT

Based on approval by the NWU Ethics Committee of the Language Matters (EC-LM) on 01/01/2017 after being reviewed at the meeting held on 10/10/2017, the North-West University Institutional Research Ethics Regulatory Committee (NWU-IRERC) hereby approves your project as indicated below. This implies that the NWU-IRERC grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the project may be initiated, using the ethics number below.

Project title: A description of South African readers reading in Sepedi and English: Implications for education																																											
Project Leader/Supervisor: Prof K Holmqvist																																											
Student: P Fakude																																											
Ethics number:	<table border="1"><tr><td>N</td><td>W</td><td>U</td><td>-</td><td>0</td><td>0</td><td>3</td><td>0</td><td>5</td><td>-</td><td>1</td><td>7</td><td>-</td><td>A</td><td>8</td></tr><tr><td colspan="3">Institution</td><td colspan="3">Project Number</td><td colspan="3">Year</td><td colspan="3">Status</td></tr><tr><td colspan="15">Status: S = Submission, R = Re-Submission, P = Provisional Authorisation, A = Authorisation</td></tr></table>	N	W	U	-	0	0	3	0	5	-	1	7	-	A	8	Institution			Project Number			Year			Status			Status: S = Submission, R = Re-Submission, P = Provisional Authorisation, A = Authorisation														
N	W	U	-	0	0	3	0	5	-	1	7	-	A	8																													
Institution			Project Number			Year			Status																																		
Status: S = Submission, R = Re-Submission, P = Provisional Authorisation, A = Authorisation																																											
Application Type: Single study																																											
Commencement date: 2017-01-01 Expiry date: 2017-12-31 Risk: Low																																											

Special conditions of the approval (if applicable):

- Translation of the informed consent document to the languages applicable to the study participants should be submitted to the EC-LM (if applicable).
- Any research at governmental or private institutions, permission must still be obtained from relevant authorities and provided to the EC-LM. Ethics approval is required BEFORE approval can be obtained from these authorities.

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- The project leader (principle investigator) must report in the prescribed format to the NWU-IRERC via EC-LM:
 - annually (or as otherwise requested) on the progress of the project, and upon completion of the project
 - without any delay in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.
 - Annually a number of projects may be randomly selected for an external audit.
- The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the EC-LM. Would there be deviation from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.
- The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the NWU-IRERC via EC-LM and new approval received before or on the expiry date.
- In the interest of ethical responsibility the NWU-IRERC and EC-LM retains the right to:
 - request access to any information or data at any time during the course or after completion of the project;
 - to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process.
 - withdraw or postpone approval if:
 - any unethical principles or practices of the project are revealed or suspected,
 - it becomes apparent that any relevant information was withheld from the EC-LM or that information has been false or misrepresented,
 - the required annual report and reporting of adverse events was not done timely and accurately,
 - new institutional rules, national legislation or international conventions deem it necessary.
- EC-LM can be contacted for further information via Theresa.Louw@nwu.ac.za or 018 210 3482.

The IRERC would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the IRERC or EC-LM for any further enquiries or requests for assistance.

Yours sincerely

Prof LA Du Plessis
Date: 2017.10.20
12:36:51 +02'00'

Prof Linda du Plessis
Chair NWU Institutional Research Ethics Regulatory Committee (IRERC)