

The influence a reading intervention programme for grade 8 learners in their first language (Afrikaans) has on their first and second language (English) reading skills

Elmarie Stofberg

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Department of General Linguistics

University of Stellenbosch

Supervisor: Dr S. Conradie

Co-supervisors: Dr F. Southwood and Dr T.J. van Dyk

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Declaration

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the owner of the copyright thereof (unless to the extent explicitly otherwise stated) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Elmarie Stofberg

December 2011

*Ring the bells that still can ring
Forget your perfect offering
There is a crack, a crack in everything
That's how the light gets in*

- Leonard Cohen -

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Summary

An increasing number of studies indicate that South African learners' literacy levels are deplorably low. According to one international study, the Progress in International Literacy Study (PIRLS), conducted in 2006, South African grade 4 learners' literacy levels are the lowest of the 40 countries that participated in the study. The results of the first Annual National Assessment (ANA), conducted in 2011, show that the average literacy performance of grade 3 learners in South Africa lies at 35%. Even though numerous reasons can be presented for these low literacy levels - amongst others, large classes, insufficient teacher training, insufficient educational practices (especially the fact that so little time is spent on reading instruction), and a lack of teaching material - the blame is often cast on the insufficient language proficiency of South African learners. South African learners often receive education in a language which is not their first language. A large number of learners only receive education in their first language for the first three years of their school career and thereafter English usually becomes the language of learning and teaching. It is, however, not only those learners who receive education in their second language who have low literacy skills. Learners who receive education in their first language also encounter problems. The aim of this study was to determine whether a reading intervention programme, designed on the basis of the most recent research on reading, could improve the reading comprehension skills of grade 8 learners in their first language Afrikaans and whether these skills could be transferred to their second language English. The study showed that there was a significant improvement in the participating learners' reading comprehension skills in their first language Afrikaans, as well as in their second language English, even though the reading intervention was only offered in Afrikaans. According to the results of this study, it seems that reading comprehension skills which are acquired in the first language can indeed be transferred to a second language. The implications of these findings for first and second language literacy development are discussed in the final chapter of the thesis.

Opsomming

'n Toenemende aantal studies dui daarop dat Suid-Afrikaanse leerders se geletterdheidsvlakke kommerwekkend laag is. Volgens een internasionale studie, die Progress in International Literacy Study (PIRLS), wat in 2006 gedoen is, is Suid-Afrikaanse graad 4-leerders se geletterdheidsvlakke die laagste van die 40 lande wat deelgeneem het. Die resultate van die eerste Annual National Assessment (ANA) wat in 2011 gedoen is, wys dat graad 3-leerders in Suid-Afrika se gemiddelde prestasie vir geletterdheid slegs 35% is. Hoewel talle redes vir hierdie lae geletterdheidsvlakke aangebied kan word - waaronder groot klasse, onvoldoende onderwyseropleiding, onvoldoende onderrigpraktyke (veral dat daar te min tyd aan leesonderrig bestee word) en 'n gebrek aan onderrigmateriaal - word die blaam dikwels geplaas op die onvoldoende taalvaardighede van Suid-Afrikaanse leerders. Suid-Afrikaanse leerders gaan dikwels skool in 'n taal wat nie hul eerste taal is nie. Talle leerders ontvang slegs vir die eerste drie jaar van hul skoolloopbaan onderrig in hul eerste taal en daarna word Engels gewoonlik die taal van leer en onderrig. Dit is egter nie net die leerders wat in hul tweede taal onderrig ontvang, wat lae geletterdheidsvlakke het nie. Leerders wat in hul eerste taal onderrig ontvang, ondervind ook probleme. Die doel van hierdie studie was om vas te stel of 'n leesintervensieprogram, wat geskoei is op die nuutste navorsing oor lees, die leesbegripsvaardighede van graad 8-leerders in hul eerste taal Afrikaans kan verbeter en of hierdie vaardighede oorgedra kan word op hul tweede taal Engels. Die studie het aangedui dat daar 'n beduidende verbetering in die leerders se leesbegripsvaardighede in hul eerste taal Afrikaans sowel as hul tweede taal Engels was, alhoewel die leesintervensie slegs in Afrikaans aangebied is. Volgens die resultate van die studie wil dit voorkom asof leesbegripsvaardighede wat in die eerste taal verwerf word, oorgedra kan word na 'n tweede taal. Die implikasies van hierdie bevindinge vir die ontwikkeling van geletterdheid in 'n eerste en tweede taal, word in die finale hoofstuk van die tesis bespreek.

TABLE OF CONTENTS

Chapter 1: Introduction	1
1.1 Background: South African learners' literacy levels	1
1.2 Research questions	10
1.3 Hypotheses	10
1.4 Research design	11
1.5 Thesis outline	12
Chapter 2: Literature Overview: L1 and L2 reading and instruction	13
2.1 The process of reading	13
2.2 Reading instruction	18
2.2.1 Fluency	18
2.2.2 Vocabulary	21
2.2.3 Comprehension	22
2.3 Reading in an L2	23
Chapter 3: Literature Overview: Rationale for and nature of the RPRP	27
3.1 The role of the reader in the reading process	28
3.2 The role of the text in the reading process	30
3.3 The different phases of the reading process - what good readers do during each phase and how to mediate readers during each phase	32
3.4 The RPRP	34
3.4.1 Ogle's (1986) K-W-L strategy and Bloom's (1956) taxonomy	35
3.4.2 Structure of a typical RPRP lesson	38

3.4.3	Example of an RPRP lesson	40
3.4.4	Investigating the effect of the RPRP on reading skills	44
Chapter 4: A study on the effect of L1 reading instruction on L1 and L2 reading skills		
	skills	45
4.1	Participants	45
4.2	Experimental procedures	46
4.2.1	The L1 Afrikaans and L2 English reading tests	46
4.2.2	Issues of reliability and validity	49
4.3	Results	52
4.3.1	Effect of L1 reading intervention on performance on L1 reading test	52
4.3.2	Effect of L1 reading intervention on performance on L2 reading test (transfer of skills)	56
4.3.3	Individuals' results: six case studies	62
4.3.3.1	Poor readers: E12 and C12	63
4.3.3.2	Average readers: E9 and C9	64
4.3.3.3	Good readers: E13 and C13	65
4.3.3.4	Summary	66
Chapter 5: Conclusion		68
5.1	Strengths and limitations	68
5.2	Suggestions for future research	69
5.3	Implications for L1 and L2 literacy development	70

Bibliography	72
Appendices	
Appendix A Example Lesson: Text (English original)	78
Appendix B Example Lesson: Text (Afrikaans translation)	79
Appendix C Example Lesson: Words and Phrases	80
Appendix D Example Lesson: Retention Test (Afrikaans)	81
Appendix E Example Lesson: Retention Test (English translation)	82
Appendix F Example Lesson: Comprehension Test (Afrikaans)	83
Appendix G Example Lesson: Comprehension Test (English translation)	84
Appendix H Language Background Questionnaire	85
Appendix I Text for L1 Afrikaans reading test	87
Appendix J L1 Afrikaans reading test	88
Appendix K Text for L2 English reading test	90
Appendix L L2 English reading test	91
Appendix M Individual results on L1 and L2 reading tests	93

CHAPTER 1

INTRODUCTION

In this chapter, I provide some background to the study reported in this thesis (section 1.1), introduce the study's research questions (section 1.2), hypotheses (section 1.3) and research design (section 1.4), and set out the organisation of the remainder of the thesis (section 1.5).

1.1 Background: South African learners' literacy levels

An increasing number of research studies indicate that South African learners have deplorably low literacy levels. Some of these studies include the Systemic Evaluations of the Foundation Phase (grade 3) in 2003 and grade 6 in 2006, conducted by the National Department of Education; the Progress in International Literacy Study (PIRLS) 2006; and the Annual National Assessments (ANA) for 2011. The link between low literacy levels and low academic achievement in South Africa is also well documented in other smaller scale research with grade 7 and 8 learners conducted by Macdonald (2002); Pretorius (2002); Matjila and Pretorius (2004); and Pretorius and Mampuru (2007).

The Systemic Evaluations of the Foundation Phase (grade 3) in 2003, found that the average score of grade 3 learners in reading and writing was 39%, while more than two-thirds of grade 6 learners performed below required levels in 2006.

The PIRLS 2006 assessment is an international comparative study of reading literacy of grade 4 learners that is undertaken in five-year cycles. The PIRLS 2006 reading assessment was administered to a sample of 16 073 grade 4 learners in all 11 official languages in South

Africa. The results of the PIRLS study as reported by Van Staden and Howie (2006) and Mullis, Martin, Kennedy and Foy (2007) show that South African learners came last of the 40 participating countries and that 78% of the grade 4 learners could not even achieve the lowest required reading literacy levels. Learners who completed the PIRLS 2006 assessment in Afrikaans achieved the highest average score, closely followed by learners who completed the assessment in English. Learners who completed the assessment in African languages achieved the lowest scores. Setswana learners achieved the highest scores of the African languages, while isiNdebele and isiXhosa learners achieved the lowest average scores (Van Staden and Howie 2006:5).

The ANA tests were conducted nationally; nearly 6 million South African children were tested on their literacy and numeracy skills in February 2011. The results revealed that in grade 3, the national average performance in literacy stands at 35%. In grade 6, the national average performance in Languages is 28%. In her report, Angie Motshekga, Minister of Basic Education, said: "This performance is something that we expected given the poor performance of South African learners in recent international and local assessments." (Statement by Angie Motshekga, Minister of Basic Education, on the release of the annual national assessments results for 2011, [s.a.]).

Various reasons are proposed for South African learners' poor reading abilities, including inadequate teacher education and training, big classes, insufficient instructional practices and a lack of instructional material (Howie, Venter, Van Staden, Zimmerman, Long, Scherman and Archer 2007:3). Each of these factors is briefly considered below.

Teachers of the South African grade 4 learners who participated in PIRLS 2006 completed a teacher questionnaire. The results of this questionnaire showed a lack of new, young teachers. According to Howie et al. (2007:45), the teachers had an average of 15 years' teaching experience overall and an average of 6 years' experience teaching grade 4 learners specifically. Only 1% of learners were being taught by teachers under the age of 25 years, and only an additional 4% by teachers between the ages of 25 and 29 years. This is undesirable given that the average achievement of grade 4 learners taught by teachers under the age of 25 years and teachers over the age of 60 years was considerably higher than the average achievement of learners taught by teachers between the ages of 30 and 59 years. Although the number of teachers-in-training at a few tertiary teacher education institutions across South Africa is sufficient, many young teachers prefer to leave South Africa for more profitable teaching positions overseas, or they choose to leave the profession entirely after a short period of teaching (Van Staden and Howie 2006:6). The PIRLS data emphasise the need for strategies to retain younger teachers and to make use of the valuable experience of teachers close to retirement.

The PIRLS teacher questionnaire also enquired about the knowledge domains or areas of specialization of the teachers. The teachers' answers revealed that most of them had received training in language, literature, pedagogy, teaching reading, psychology, children's language development and second language (L2) learning. Approximately 50% of the teachers had received training in which the emphasis was on L2 learning. However, teachers reported having little to no training in special education and remedial reading: 40% of the teachers indicated that remedial reading was only covered in an introductory manner during their training, while an additional 39% reported having received no training in remedial reading at all. This is disconcerting in view of the grade 4 learners' poor performance in PIRLS 2006,

which indicates a need for remedial reading (Howie et al. 2007:46). Taken together, the teacher and learner data of the PIRLS study indicate that teachers might not be adequately trained to teach reading in cases where remediation is required and that there is an urgent need for Intermediate Phase teachers' continuous professional development.

Big classes also seem to contribute to South African learners' poor reading abilities. The South African grade 4 classes included in PIRLS 2006 had an average of 46 learners per class, making South Africa the participating country with the highest number of learners per class (the international average being 24 learners per class). The highest overall average achievement was obtained by grade 4 learners in classes with 21 to 30 learners (Van Staden and Howie 2006:9).

Turning to instructional practices, Mullis et al. (2007:178) report that internationally 30% of instruction time is devoted to language instruction and 20% to reading instruction, with about 25% of learners receiving reading instruction for more than six hours a week. In contrast, according to South African teachers' reports, only 10% of South African learners receive reading instruction for more than 6 hours per week, 18% for between 3 and 6 hours per week, and a staggering 72% for less than 3 hours per week (Van Staden and Howie 2006:9). However, it should be noted that the PIRLS 2006 study does not show a clear relationship between hours of reading instruction and achievement, since time spent on reading instruction is not necessarily a reliable indicator of quality of instruction (Van Staden and Howie 2006:9) and instruction time is "not always spent in effective, productive ways" (Mullis et al. 2007:178).

In terms of reading activities, the top performing countries in PIRLS 2006 report that silent reading is a daily activity in their classes (Howie et al 2007:47). South African grade 4 teachers reportedly spend most of the reading instruction time reading aloud to the class, and silent reading takes place least frequently of all of the listed everyday reading activities. Furthermore, an alarming 7% of teachers indicated that the learners never or almost never engage in independent reading in class, and an additional 27% reported that reading independently occurs as little as once or twice a month. From these data it is evident that in South African schools the little time that is spent on reading instruction is teacher-centred rather than learner-centred and does not promote independent reading.

Lack of instructional material is another serious problem in South Africa. Only 57% of the teachers reported using textbooks on a(n almost) daily basis and only 12% of the teachers reported using a variety of children's books for reading instruction on a(n almost) daily basis (Howie et al. 2007:46). Furthermore, even in cases where teachers report using textbooks, this use is often restricted to the teacher reading to the learners from the textbook; learners are not given the opportunity to read from these textbooks silently or independently and they are not allowed to take the books home for fear of damage or loss.

Despite inadequate teacher education and training, big classes, insufficient instructional practices and a lack of instructional material, many researchers still attribute South African learners' poor literacy levels to low levels of proficiency in the language of instruction. In South Africa many children receive schooling in a language that is not their first language (L1) (Pretorius 2002:174). Schooling in the L1 from grades 1 to 3 is strongly recommended by the Department of Education, but it is not enforced. Schools can decide on their language policy and most schools that provide initial literacy in an African home language usually

change to English as Language of Learning and Teaching (LoLT) in grade 4 (Pretorius and Currin 2010:67).

Fleish (2007:118) confirms that an overwhelming majority of learners are attending classes where the LoLT is different from their L1 but states that caution should be exercised in making assumptions about the extent to which language practices are responsible for the poor reading results of South African primary school learners. Fleish (2007:118) poses the question: "Do children fail because they do not understand the LoLT or because of a host of specific issues related to living in poverty or because they attend inadequate schools?"

Matjila and Pretorius (2004:17) are adamant that "[t]he problem that many learners presently have is not simply a language problem; it is essentially a literacy problem" and that "[l]earners will continue to struggle unless the question of literacy ... is seriously addressed." Pretorius and Currin (2010), Pretorius and Machet (2004), and Bloch (1999) agree that the poor literacy levels of South African learners cannot be ascribed solely to low language proficiency ("a language problem"), because learners are struggling with literacy in their L1 as well as in their L2. Pretorius and Currin (2010:68) argue that this struggle with L1 and L2 literacy is due to the fact that in many South African schools reading instruction is not sufficient to ensure substantial reading development. During grades 1 to 3 much of the emphasis of reading instruction is on the teaching of decoding skills (i.e. the skills that will enable a learner to recognise and perceive the graphic symbols used to present language – see section 2.1) in a superficial, decontextualised way. It is often assumed that if learners can decode they can read and very little attention is paid to reading comprehension. During this stage the focus is almost entirely on "learning to read" and learners are not sufficiently prepared to make the important transition from "learning to read" to "reading to learn" when they start grade 4.

Consequently, many learners simply do not make the transition from merely decoding words to meaningful reading (Macdonald 1990; Straus 1995; Pretorius and Mampuru 2007).

The underlying assumption of the argument that South African learners do poorly in school because their LoLT is not their home language, is that language and reading are basically the same, and that being proficient in a language enables one to read in that language. Although language and reading are related, being proficient in a language does not ensure that one can read in that language (Matjila and Pretorius 2004:3). Language proficiency is a necessary, but not a sufficient, requirement for reading since a specific kind of language proficiency is required for reading (Cummins 1981, 2000).

Cummins (1981) proposed a distinction between two kinds of language proficiency, based on the context in which the language is acquired and the functions that it serves. Cummins (1981, 2000) referred to these two types of language proficiency as Basic Interpersonal Communicative Skills (BICS) and Cognitive Academic Language Proficiency (CALP). While BICS is used in everyday communication, CALP involves language associated with written language and with the more formal aspects of classroom and teaching communication typical of the formal learning context (Cummins 2000:67).

All learners have acquired BICS in their L1 by the time they start school, but, as mentioned above, simply knowing a language does not guarantee that one can read effectively in that language. Although many learners may acquire high levels of proficiency in a language (L1 or L2), if it is mainly BICS proficiency, they are unlikely to succeed in the academic learning context. To succeed in a formal learning context, learners need CALP in the LoLT(s) and they have to understand the nature of written language (Matjila and Pretorius 2004:3).

Cummins (2000:67) defines academic language proficiency as "the extent to which an individual has access to and command of the oral and written academic registers of schooling." The linguistic proficiency that supports reading ability is CALP-based and is only acquired through extensive exposure to written discourse (Alderson 2000:23).

Using the L1 as LoLT entails that learners will develop CALP in their L1. But according to Matjila and Pretorius (2004:4) this does not always happen, because there seems to be too much emphasis in South African schools on the instruction of formal linguistic aspects of language and not enough opportunity for learners to develop proficiency in interpreting and using written forms of the L1.

In a pilot study, Matjila and Pretorius (2004:1) examined the reading abilities of grade 8 learners in their L1 Setswana as well as in English, the LoLT. The learners' reading rates in both languages was unsatisfactory, the mean rates corresponding to those set as requirements for grades 3 to 4 and the learners reading even more slowly in their L1 than in their L2. Such low reading rates are bound to have a negative impact on learning, especially when learners are expected to "read to learn". Furthermore, 60% of the learners obtained reading comprehension scores below 50% for both of the languages. The learners' reading performance (reading rate and comprehension) in their L1 was thus not better than it was in their L2. These findings confirm that even a native speaker level of proficiency in a language is not sufficient to ensure good reading skills. In cases where learners' L1 differs from the LOLT, they need meaningful opportunities to develop their reading skills in both languages, as well as exposure to reading materials in both languages, in order to cope with the literacy demands of the twenty-first century.

As mentioned earlier, in their report on the PIRLS study, Howie et al. (2007) conclude that inadequate time is spent on reading instruction in South African schools. The results of the PIRLS study indicate that performance on the PIRLS assessment is more closely correlated with the reading instruction that learners receive than it is with the language in which learners completed the PIRLS assessment and, specifically, whether or not it was their home language. About 75% of the learners completed the PIRLS assessment in a language spoken by at least one of their parents, while 22% of grade 4 learners and 21% of grade 5 learners completed the PIRLS assessment in a language that neither of their parents spoke. Intriguingly, there was hardly any difference in mean learner performance between learners who completed the test in their home language and those who completed it in another language (Howie et al. 2007:47).

From the discussion in this section, it should be clear (i) that the majority of South African learners' literacy levels are so low that this hinders their academic development, (ii) that this problem involves L1 as well as L2 literacy levels, and (iii) that this problem is intensified by the current lack of sufficient reading instruction in schools. The study reported in this thesis set out to investigate whether a specific reading intervention programme can improve reading skills (specifically, reading comprehension) in the L1 and whether these improved reading skills are transferred to the L2. The specific reading intervention programme that was used for this research is one that I have been developing and employing since 1998 and which is based on the theoretical principles discussed in chapters 2 and 3. For the purposes of this thesis, I will refer to the programme as the "Read Plus Reading Support and Enrichment Programme" (RPRP).

1.2 Research questions

The specific research questions for this study were the following:

- (i) Is there a significant increase in learners' scores on an L1 reading test (specifically in terms of reading comprehension) from before to after intervention (by means of the RPRP)?
- (ii) Is there a significant increase in learners' scores on an L2 reading test (specifically in terms of reading comprehension) from before to after intervention (by means of the RPRP) even though the intervention was provided in their L1?

1.3 Hypotheses

The hypotheses corresponding to the research questions in section 1.2 above are the following:

- (i) There will be a significant increase in learners' scores on an L1 reading test (specifically in terms of reading comprehension) from before to after intervention by means of the RPRP.
- (ii) There will be a significant increase in learners' scores on an L2 reading test (specifically in terms of reading comprehension) from before to after intervention (by means of the RPRP).

Hypothesis (i) is based on my personal experience and observations during the past 12 years with learners who attend the RPRP and seem to show considerable improvement in terms of

their reading skills. Before conducting the research reported in this thesis, I had not measured learners' improvement by having them complete the same reading test before and after they attended the RPRP or by comparing them with a control group of learners who did not attend the RPRP. My first aim (corresponding to research question (i) and hypothesis (i)) was thus to scientifically investigate the effect of the RPRP on learners' reading skills. Hypothesis (ii) is based on Cummins' (2000) Interdependence hypothesis (cf. section 2.3), which, in short, states that L1 academic skills can be transferred to a learner's L2 (see section 2.3 for a more detailed discussion of Cummins' hypotheses).

1.4 Research design

Data were collected by means of a pre- and post-test of the L1 Afrikaans and L2 English reading skills of a group of 54 grade 8 learners from an Afrikaans-medium high school in the Western Cape. Twenty-seven learners voluntarily attended the RPRP. These 27 learners received explicit reading instruction in their L1 (Afrikaans) with the aim of improving their reading comprehension by increasing their reading rate, retention, vocabulary and comprehension. Throughout this thesis, these 27 learners are referred to as "the experimental group". An additional 27 learners served as a control group and did not receive any reading intervention. These learners were matched as closely as possible to the experimental group in terms of gender, age, L1, L2, and scores on the pre-intervention L1 and L2 reading tests. After 15 contact sessions of 45 minutes each, received over 15 weeks, all 54 participants were tested again. The pre- and post-tests involved exactly the same L1 reading test and exactly the same L2 reading test. Within each group the data of their pre-test were compared with that of their post-test and the data of the two groups were also compared to each other.

Both the L1 reading test and the L2 reading test involved the learners reading a 300-word text to determine their reading fluency in words per minute and then answering a number of fairly simple questions that test for retention, comprehension and vocabulary. These tests are described in detail in section 4.2.1 and attached in Appendices J to L.

1.5 Thesis outline

The literature overview for the study reported in this thesis is distributed over two chapters: Chapter 2 describes the process of L1 reading, L1 reading instruction, and L2 reading, in general terms, while chapter 3 describes the RPRP as well as the specific insights into reading which led to the development of the RPRP. In chapter 4, the participants, test instruments and research design are described in detail and the results of the study are reported. Finally, chapter 5 provides a discussion of the results, the strengths and limitations of the study, and the implications of the study's results for L1 and L2 literacy development, and provides some suggestions for future research.

CHAPTER 2

Literature Overview:

L1 and L2 reading and instruction

In this chapter, I first provide an overview of literature on the process of reading (section 2.1) and on reading instruction (section 2.2). In section 2.3 I discuss the phenomenon of reading in an L2, specifically referring to Cummins' (1981, 2000) Interdependence and Threshold Hypotheses.

2.1 The process of reading

Reading is complex to such an extent that it is difficult to offer a single, comprehensive definition for 'reading' and the 'reading process'.

Burns, Roe and Ross (1999:6) as well as Harris and Sipay (1990:9) delineate reading comprehension as the result of the interaction between and among the reader's recognition and perception of the graphic symbols used to present language (decoding skills), linguistic knowledge (language skills), cognitive skills and knowledge about a specific topic and the world in general (prior knowledge). According to Harris and Sipay (1990:10), weaknesses in any of these areas or breakdowns in processing and integrating information from any of them, can disrupt reading comprehension. Reading skills and comprehension may also be influenced by the reader's motivation, educational background, purpose for reading and the context in which the reading act takes place (Burns et al. 1999:6).

Motivation is strongly related to reading comprehension and good reading abilities, because motivated readers are intent on reading to understand. They are strategic in using multiple approaches to comprehend text and they use knowledge actively to construct new understanding from text. Motivated readers can focus on meaning, avoid distractions and employ reading strategies such as self-monitoring and inferencing. Readers who are intrinsically motivated to read for knowledge and enjoyment, are also referred to as "engaged" readers. Engagement in reading is a merger of multiple qualities that entails holding a purpose, seeking to understand, believing in one's own capability, and taking responsibility for learning. Engaged readers comprehend a text not only because they can but because they are motivated to (Guthrie 2001).

The purpose for reading is closely connected to a person's motivation for reading. A reader reads a text to understand its meaning and to put that understanding to use. Good readers always have a reading purpose before they read a text and choose appropriate reading strategies to reach their reading purpose. Good readers read a text to learn, to gain information, to be entertained or to reflect. The reading purpose will affect the way a text is read and what strategies are employed; for instance, we read a dictionary in a different way than we read a novel (Pearson 1991: 815).

In my experience too many readers never learn to read for a purpose that they have set. This is one of the main reasons why learners read without comprehension. The reason why so many learners do not read with a purpose is because they only have to read aloud in class and, therefore, need only be able to decode (not comprehend) the text. They seldom have the opportunity to choose their own reading material. Instead, they receive a text from the teacher and are requested to read it out loud. In this case, their purpose is simply to read the text as fluently as possible. In other words, the learners seldom have the opportunity to read what

they want to read, to decide what they want to know, why they want to read the text and how to read the text. Reading is then merely decoding words on a page and not a process of constructing meaning. If one wishes to improve learners' reading skills, one must get them to do "real reading" (decoding plus comprehending plus constructing meaning) for "real purposes" (e.g. learning, gaining information or being entertained).

Educational background and socio-economic status are often inter-related. If learners come from a community where neither their home nor their school contexts provide sufficient practice in reading skills and exposure to books, then learners may find both "learning to read" and "reading to learn" difficult (Matjila and Pretorius 2004:7). As Pretorius and Ribbens (2005:145) note: only reading improves reading.

The context in which the process of reading takes place can also influence reading comprehension, because reading comprehension is about relating prior knowledge to new knowledge contained in written texts. Prior knowledge, in turn, depends on lived experience. Topics that are familiar and openly discussed in one culture, group or community may be unacceptable in another. Children growing up in rural communities will have different experiences from those growing up in an urban environment. Having rich but different types of prior knowledge will also affect our understanding and appreciation of written text. For example, jokes and humour depend on shared cultural knowledge between the writer and reader (Burns et al 1999:7).

Burns et al. (1999), Gough and Tunmer (1986), Gough (1992), Anderson, Hiebert, Scott and Wilkinson (1985) and Harris and Sipay (1990) affirm that it cannot be overemphasised that meaningful comprehension is at the heart of the reading process. Although reading is a

complicated process, one of the most widely supported models of reading is known as the Simple View of Reading (SVR). The SVR, which is associated with Gough (1992), Hoover and Gough (1990) and Gough and Tunmer (1986), holds that there are two major elements that are equally important to reading comprehension. One is decoding skills and the other is language comprehension ability. To read with comprehension, readers need to be able to decode the words on the page and then make sense of those words. The former is made possible by decoding skills and the latter by language comprehension ability. Decoding skills encompass sub-skills such as: cipher knowledge, lexical knowledge, letter knowledge, phoneme awareness and concepts about print. Cipher knowledge entails the systematic relationship between spoken and written language, i.e. when one can pronounce a word correctly by sounding out its separate letters, as is the case with, for example, the word *cat*. Lexical knowledge, on the other hand, involves exceptions to the systematic relationship between spoken and written language, i.e. when sounding out the separate letters of the word leads to an incorrect pronunciation, as is the case with, for example, the word *sugar*, in which the first letter is pronounced [ʃ] and not [s].

Letter knowledge is the ability to recognize and manipulate units of the writing system, while phoneme awareness is the ability to recognize and manipulate units of spoken words. Finally, to decode effectively readers also need to grasp certain concepts about print, for example, the fact that in Afrikaans and English we write and, therefore, read from the top to the bottom of a page and from the left to the right (Gough 1992:130).

If readers cannot decode the words on the page, they will not be able to achieve reading comprehension, no matter how much oral language they can understand. But even if readers can decode the words on the page, this still does not guarantee reading comprehension. If the

sentences the readers are attempting to read, are sentences they could not understand if the sentences were read aloud to them, then the readers will not understand the same sentences during independent reading either (Hoover and Gough 1990:205).

In order to comprehend written texts, readers also draw on their linguistic knowledge. Linguistic knowledge consists of two main components, namely background or prior knowledge and linguistic knowledge. Harris and Sipay (1990:556) define prior knowledge as:

all the information stored in an individual's long-term memory including information about such diverse things as events one has experienced; what words mean; what constitutes an acceptable sentence or how to decode unknown words. In short, prior knowledge includes information about what, how and why.

Linguistic knowledge includes phonological, morphological, syntactic and semantic knowledge. Phonological knowledge refers to the knowledge readers have of the sound system of a language. Morphological knowledge deals with the patterns of word formation in a language. Syntactic knowledge is the system of rules governing word order in sentences, clauses and phrases of a language, while semantic knowledge deals with the meaning components of language, from morphemes and words to sentences (Harris and Sipay 1990:20). Researchers like Gough (1992), Hoover and Gough (1990) and Gough and Tunmer (1986) have shown that, when a reader has deficits in reading comprehension, the reader usually has deficits in either language comprehension or decoding skills, or both. The SVR can thus account for reading failures as well as reading success.

The National Reading Panel (NRP) (2000) of the United States defines 'reading' as:

a complex system of deriving meaning from print that requires an understanding of how speech sounds are related to print (phonemic awareness), decoding (word identification) skills, fluency, vocabulary and prior knowledge, active comprehension strategies, and a motivation to read.

These key elements of the reading process also inform the content of reading instruction programmes, as described in the following section.

2.2 Reading instruction

The four major components of reading instruction as identified by the NRP (2000) include (i) phonemic awareness and word analysis, (ii) fluency, (iii) vocabulary and (iv) reading comprehension (Nel, Dreyer and Klopper 2004:95-96). My main objective in developing the RPRP – the programme that was used for reading instruction in the study reported in this thesis – was to improve learners' reading comprehension by providing instruction in all four of these components. In this study however, phonemic awareness and word analysis are not assessed or instructed, because they are only relevant for beginning and intermediate readers, and the participants in this study can be categorised as so-called "functional readers" (see section 3.1 regarding the different reading stages).

2.2.1 Fluency

Reading fluency deals with mastery of the surface level of text, that is, learning to recognize and decode words in a passage automatically or effortlessly as well as accurately and to interpret those words in a meaningful manner when reading (Rasinski, Padak, McKeon,

Wilfong, Friedauer and Heim 2005:22). It is important to make a distinction between silent and oral reading rates. Silent reading rates and processing are limited by abilities such as eye movements and sub-vocalization (Hiebert, Samuels and Jay 2010:4), but oral reading rates are even more constrained by the speed of speech production. Therefore, silent reading rates exceed oral reading rates early in the acquisition of reading proficiency. Information on oral and silent reading norms as reported by Hiebert et al. (2010) show that once speech production becomes stable in early adolescence, the number of words that can be read silently becomes substantially greater than the number that can be read orally. Table 1 provides averages for oral and silent reading rates by grade level, as found in Hasbrouk and Tindal (2006:636) and Anderson (2008:3), respectively.

Table 1. Oral and silent reading rates in words per minute (WPM) (from Hasbrouk and Tindal (2006) and Anderson (2008), respectively)

GRADE	WPM	
	ORAL READING RATES (Hasbrouk and Tindal 2006:636)	SILENT READING RATES (Anderson 2008:3)
1	53	80
2	89	115
3	107	138
4	123	158
5	139	173
6	150	185
7	150	195
8	151	204

It is important to note that these reading rates represent the optimal reading rate for each grade. Of course, readers will not always be able to read at a rate that is set as the goal for their grade, especially not at the beginning of the year.

Silent reading rate is always accompanied by appropriate levels (70% or more) of retention and comprehension. In other words, one would only say that a grade 2 learner can read 85 words per minute (WPM) silently, if the learner also exhibits 70% or more retention and comprehension of the text. Comprehension and reading rate are thus inseparable.

Fluency is widely recognized as a critical requirement for efficient and proficient reading and comprehension (Nel et al. 2004:65). One hypothesis regarding the connection between fluency and comprehension comes from LaBerge and Samuels' (1974) theory of automaticity in reading (Taguchi, Gorsuch and Sasamoto 2006:2). According to this theory, readers who have not yet achieved automaticity in word recognition (fluency) must apply a significant amount of their cognitive energy to intentionally decoding the words while reading. The more cognitive attention has to be applied to the low-level decoding task, the less cognitive energy is available for the task of comprehending the text. Thus, comprehension is negatively affected by a reader's lack of fluency (Samuels and Farstrup 1992:126-129).

Reading rate comprises both word level automaticity and the speed and fluidity with which a reader moves through a text (Hudson, Lane and Pullen 2005:704). Although reading rate does not capture the full meaning of "fluency", it is considered a useful and valid measure of fluency (Rasinski et al. 2005:27). Harris and Sipay (1990:636) define "reading rate" as the number of words that a reader can read in one minute (i.e. WPM) or the speed with which a reader can gain information from text. "Reading fluency", as defined by Anderson (2008:3), is: "reading at an appropriate rate with adequate comprehension". Since comprehension requires higher order processes that cannot become automatic, it is word identification which must become automatic. Thus there is strong evidence that increased reading rate is related to higher levels of comprehension in average and poor readers and that slow reading can result

in weakened comprehension (Hudson et al. 2005:704). However, Harris and Sipay (1990:636) argue that no one rate of reading is appropriate in all situations. Reading rate depends on the reader's cognitive and reading abilities, their purposes for reading and the difficulty of the material. The ability to read as fast or as slowly as needed to comprehend what needs to be understood is referred to as "reading flexibility" (see Table 2 in section 3.3). For the purposes of this study, "fluency" was equated with a reader's silent reading rate and measured in WPM. Because the participants in this study were in grade 8 and their silent reading rate was higher than their oral reading rate, only silent reading rate was assessed and targeted.

2.2.2 Vocabulary

Although fluency is necessary for comprehension, it is not sufficient. Vocabulary is vital to reading comprehension at all levels (McShane 2005:14). Defining vocabulary is complicated, because there are different types of vocabularies. Harris and Sipay (1990:510), the NRP (2000:15-16) and Sedita (2005:35) distinguish between receptive vocabulary and productive vocabulary. Receptive vocabulary is the vocabulary that a person can understand when it is presented in text (i.e. reading vocabulary) or as we listen to others speak, while productive vocabulary is the vocabulary a person can use or uses in writing or when speaking to others (i.e. oral vocabulary). In general, receptive vocabulary is much larger than productive vocabulary since we often recognize words that we seldom use. According to the NRP (2000:4-15), oral vocabulary is a means to learning and essential to making the conversion from oral to written forms, whereas reading vocabulary is critical to the comprehension processes of a skilled reader.

However, as Alderson (2000:99), Nel et al. (2004: 96), Harris and Sipay (1990:510-530) and Sedita (2005:36) indicate, the relationship between vocabulary knowledge and reading comprehension is extremely complex. Although there is a strong positive correlation between vocabulary knowledge and comprehension, it is probably the case that comprehension is the result of prior knowledge that a reader brings to the text, rather than vocabulary knowledge alone (Alderson 2000:99). Unless readers have some prior knowledge about the topic of a text, text structure and vocabulary related to the topic to bring to a text, they are unlikely to be able to construct the meaning of the text. To comprehend texts, readers need to develop an understanding of how words can be used in different contexts and they need to be able to access the relevant meaning of words quickly while reading. Proficient readers acquire new words by wide reading and repeated exposure to words in varying contexts (Nel et al. 2004:96).

Burns et al. (1999), Harris and Sipay (1990), and the NRP (2000) agree that vocabulary should be taught both directly and indirectly. Direct instruction entails teaching specific words, such as pre-teaching vocabulary prior to reading a text. However, it is not possible to teach readers all of the words they need to learn. Therefore, vocabulary instruction should also include indirect instruction methods, such as exposing readers to many new words in different texts and contexts and encouraging them to read as much as possible (Sedita 2005:2-3).

2.2.3 Comprehension

Reading comprehension can be described as understanding a text that is read, or the process of constructing meaning from a text (NRP 2000; Anderson et al. 1985; Burns et al. 1999;

Harris and Sipay 1990). In order to read with comprehension, readers employ comprehension strategies to draw meaning from text. Comprehension strategies assist readers to engage with the text, to monitor their comprehension, and to repair comprehension when it has failed (Nel et al. 2004:96). The comprehension strategies good readers employ include the following: being aware of why they are reading a text; gaining an overview of the text before reading; making predictions about the upcoming text; reading selectively based on their overview; associating ideas in the text with what they already know (prior knowledge); noting whether their expectations about text content are being met; revising their prior knowledge upon encountering compelling new ideas conflicting with prior knowledge; figuring out the meaning of unfamiliar vocabulary based on contextual clues; rereading, making notes and paraphrasing in order to remember important points; interpreting the text; evaluating its quality; reviewing important points as they conclude reading; and thinking about the ideas encountered in the text. Pearson and Fielding (1991:815-817) note that reading researchers believe that if readers are taught to use a repertoire of comprehension strategies, their comprehension of text will increase.

2.3 Reading in an L2

Goodman (1970) asserts that readers display similar patterns of behaviour whether they are reading in their L1 or L2. As in L1 reading, L2 readers use text, they learn from it, and they make decisions based on what they learn. The L2 reading process has to be fundamentally the same as the L1 reading process, because cognitive connections are established within the cognitive framework that already exists for reading in the L1. Grabe and Stoller (2002), however, note that there are also important differences between the L1 and L2 reading processes. The most significant difference between L1 and L2 reading is that the L2 reading

process involves the interaction of two language systems. L2 readers have access to their L1 and can make use of knowledge of their L1, as well as their L1 reading skills, during L2 reading, especially for the purposes of reading comprehension (Durgunoglu, Nagy and Hancin 1991:4; Koda 2005:13; Bernhardt and Kamil 1995:15-17). Alderson (1984) posed the question: "Reading in a foreign language: a reading problem or a language problem?" (Alderson 2000:23) In the context of reading the term "language problem" refers to a weakness in the knowledge and skills required for processing L2 linguistic properties - i.e. orthographic, phonological, lexical, syntactic, and discursal knowledge specific to the L2 - whereas the term "reading problem" refers to a weakness in higher level mental operations such as predicting, analysing, synthesising, inferencing, and retrieving relevant background knowledge.

In their studies on L1 and L2 reading, Bernhardt and Kamil (1995) found that while L1 literacy is a strong predictor of L2 reading, it is L2 linguistic knowledge that accounts for success in L2 reading. Alderson (2000) concluded that the difficulties in L2 reading derive both from a language problem and a reading problem, and, specifically, that difficulties in L2 reading seem to involve a language problem for readers at lower levels of L2 proficiency and a reading problem for readers at higher levels of L2 proficiency.

Despite the debate regarding the nature of L2 reading difficulties, there is general agreement that transfer of reading skills from L1 to L2 does occur (Koda 2005:13). Recall that Cummins (1981) distinguishes between two types of linguistic proficiency, namely BICS and CALP (see section 1.1). He proposes that bilingual learners use a "common underlying proficiency" to perform academic tasks, such as reading, in the L1 and L2 (Cummins 2000:38), stating that "[t]his is because at deeper levels of conceptual and academic functioning, there is

considerable overlap or interdependence across languages" and, therefore, "[c]onceptual knowledge developed in one language helps to make input in the other language comprehensible." (Cummins 2000:39) Consistent with Cummins' proposal, Alderson (2000:23) claims that once a set of language operations such as reading and writing has been acquired in the L1, it will also be available within L2 contexts. It is important to note that there are prerequisites for successful transfer of CALP from the L1 to the L2, namely (i) successful acquisition of CALP in the L1 (cf. Cummins' (2000) Threshold Hypothesis)¹, (ii) a certain level of general L2 proficiency (cf. Alderson 2000:23), (iii) sufficient exposure to the L2 (in a natural or classroom setting), and (iv) sufficient motivation to learn the L2. Taken together, these proposals constitute Cummins' (1981) Interdependence Hypothesis: "To the extent that instruction in L_x is effective in promoting proficiency in L_x, transfer of this proficiency to L_y will occur provided there is adequate exposure to L_y (either in school or environment) and adequate motivation to learn L_y" (Cummins 2000:38), where, for the purposes of this thesis "L_x" refers to the reader's L1 and "L_y" refers to the reader's L2.

One could argue that the Interdependence Hypothesis implies that L2 reading instruction is not necessary at all when L2 readers have learned to read in their L1, since they can simply utilise their L1 reading skills for L2 reading. In other words, reading skills will automatically be transferred from the L1 to the L2. However, Cummins (2000:39) states explicitly that some formal instruction in the target L2 is indeed necessary:

the relationship between first and second language literacy skills suggests that effective development of primary language [i.e. L1 – ES] literacy skills can provide a conceptual foundation for long-term growth in English [i.e. L2 – ES] literacy skills. This does not imply, however, that transfer of literacy and academic language knowledge will happen

¹ Briefly, Cummins' (2000:38) Threshold Hypothesis states that transfer of L1 reading skills to the L2 is only possible if the reader has already reached a certain level of L1 readings skills.

automatically; there is usually also a need for formal instruction in the target language [i.e. the target L2 – ES] to realize the benefits of cross-linguistic transfer.²

The next chapter offers a description of the RPRP as well as a discussion of some insights into the reading process and reading instruction on which the RPRP is based.

² Although I did not provide the participants in this study with L2 reading instruction, they all had English as an Additional Language as a subject. For this reason, my hypothesis for this study was still that transfer of reading skills from L1 to L2 would occur (cf. hypothesis (ii) in section 1.3).

CHAPTER 3

LITERATURE OVERVIEW:

RATIONALE FOR AND NATURE OF THE RPRP

The RPRP is grounded in the view that if we understand the reading process and know what good readers do during the different phases of reading, we will be able to instruct learners at different reading levels on this. The RPRP is thus informed by what good readers do before, during and after reading. These skills are instructed by means of authentic texts which are appropriate to the learner's reading level and are likely to appeal to the learner's interests (given, for example, their age). In sections 3.1 to 3.3, the RPRP is described in more detail, with reference to factors that informed the development of the programme, namely the role of the reader (3.1) and the text (3.2) in the reading process, and the activities undertaken by the good reader during the different phases of reading (3.3). Finally, the RPRP is described in section 3.4, with reference to an example lesson from the programme.

The RPRP aims to improve reading comprehension specifically by teaching decoding skills, fluency, vocabulary and prior knowledge, and comprehension strategies. As should be clear from the previous chapter, successful comprehension depends on many factors, and a thorough understanding of the reading process is required to make informed instructional decisions. Reading is an interactive process that involves the mediator³ (i.e. the teacher), the text and the reader. The reading process takes place in phases, namely before, during and after

³ The words "mediate" and "mediator" are used instead of "teach" and "teacher" because the mediator's role is more supportive than instructional in nature. During the reading process the reader will at times need support (scaffolding), and the mediator should then make informed decisions (grounded in his/her knowledge of the reading process) as to how to support the reader. The mediator thus mediates the reading process and provides support when this is needed but also at times allows the reader to continue independently when there is no need for support.

reading. During each phase good readers apply certain strategies to construct meaning from the text.

3.1 The role of the reader in the reading process

Readers bring their capabilities and dispositions to the reading process. Reading comprehension may be hampered if readers lack sufficient prior knowledge of the topic, vocabulary or knowledge of the text type and structure of a text. Insufficient language skills, decoding skills and perceptual and sensory abilities, as well cognitive abilities may also impede reading comprehension (Burns et al. 1999:215). The capabilities and dispositions that readers bring to the task of reading are furthermore shaped by cultural and sub-cultural influences, socio-economic status, home and family background, peer influences, classroom culture and instructional history (Pearson and Fielding 1991:816). Although it is assumed that readers in one class should typically be able to read at the same level, this is usually not the case. Since learners in one class can be at several different points along a continuum of reading levels, the RPRP utilizes Chall's (1983) stages of reading development to determine what readers should be able to do at a certain grade level (i.e. what the target of instruction should be) and to match texts to the reading levels of readers.

Chall (1983) described the development of reading ability with reference to six broad stages, ranging from pre-reading to the advanced reading typical of tertiary level students. These stages refer to the ideal progression of learning to read and developing one's reading skills further. The first stage, corresponding to the period from birth to 6 years, is the *Pre-reading stage*. Readers in this stage are referred to as "emergent readers". During this stage, the child develops concepts about the forms and functions of literacy. Four areas are most important for

success in initial reading, namely: phoneme awareness, or the ability to manipulate sounds in spoken words; awareness of the concepts of print, such as directionality and print conventions; letter knowledge; and knowledge of the language that one is learning to read.

From the age of 6 or 7 (i.e. in grades 1 and 2) readers are in the *Decoding stage* and are referred to as "initial readers". Readers begin to learn about sound-symbol correspondences and are now "glued to the text" because they are trying to carefully reproduce what the text says. Readers now know all the letters and sounds and begin to read simple texts (Samuels and Farstrup 1992:127).

During the *Confirmation and Fluency stage*, ages 7-8 (grades 2-3), the "developing readers" learn to decode words fluently and to orchestrate the use of syntactic and semantic information in text to confirm word recognition. Readers start reading more complex texts and at the end of this stage, they should be able to decode much of what is in their knowledge base, limited mainly by vocabulary knowledge and prior knowledge (Jordan 1997:238).

The *Reading to Learn stage*, ages 9-13 (grades 4-9), is when the readers' language, knowledge and vocabulary expand and they start using reading as a tool for learning. They are now "proficient readers" and start reading expository texts that go beyond their immediate frame of reference (Pretorius and Ribbens 2005:104). Proficient readers are expected to learn from content area textbooks, with increasingly less teacher guidance.

The *Multiple points of View stage* usually develops during the high school years (ages 14-18). These readers are now "functional readers" and acquire a range of reading comprehension skills. Through formal education, functional readers learn to work with multiple sources of

print. During this phase they should develop critical and evaluative reading skills (Jordan 1997:239).

Readers in the *Construction and Reconstruction stage* (age 18 and above), are referred to as "advanced functional readers" and are able to read rapidly and efficiently (Jordan 1997:239). Advanced functional readers are able to construct their own viewpoint of what they have read and they can critically analyse the viewpoints of others; they can integrate, synthesise and critically evaluate information from a range of sources and acquire new knowledge through reading (Pretorius and Ribbens 2005:104).

Based on these stages of reading development, different sets of material were developed as part of the RPRP to instruct learners at different grade levels. The participants in the study reported in this thesis were grade 8 learners and the material used to instruct them was thus aimed at assisting them to develop from proficient readers to functional readers.

3.2 The role of the text in the reading process

The text itself, of course, also affects comprehension. A text should neither be so difficult that it makes learning or enjoyment impossible nor so easy that it does not hold the reader's attention – it should match the reader's interests and reading abilities (Burns et al. 1999:215).

Texts in which the reader finds more than one in ten words difficult and reads with less than 50% comprehension are on the reader's so-called "frustration level". These texts are too difficult for the reader. Instructional level texts, on the other hand, are challenging, but manageable and the reader finds no more than approximately one in ten words difficult to

read. Readers should be able to read instructional level texts with 75% comprehension. Such texts are suitable for use in classroom instruction. Texts in which the reader finds not more than one in 20 words difficult and can read fluently with at least 90% comprehension, are on the reader's independent level and are generally suitable for recreational reading (Harris and Sipay 1990:226).

As mentioned earlier, the RPRP makes use of authentic texts. Authentic texts can be defined as real-life texts, i.e. texts which have not been written for pedagogic purposes. The sources of authentic texts are numerous, but the most general are newspapers, magazines, TV programs, movies, songs, books from all genres, and internet sites. The RPRP makes use of authentic materials because this enables learners to interact with real language and content. To be selected for use in the RPRP, texts are required to adhere to three main criteria offered by Berado (2006:63), namely, suitability of content, exploitability and readability. Suitability of content is considered the most important criterion, since the reading material should interest the learners as well as be relevant to their needs. The texts should motivate and inspire readers. Exploitability refers to the extent to which the text can be used to develop the learners' competence as readers. Readability entails the combination of the structural and lexical difficulty of a text, as well as the amount of new vocabulary and any new grammatical forms. In considering texts for inclusion in the RPRP offered to learners at a particular grade level, the three criteria are of course interpreted in relation to the learners' grade level and stage of reading development.

The RPRP also considers variety and presentation when selecting authentic texts. Whether the text looks authentic or not, is very important. "Authentic" presentation, through the use of pictures, diagrams, and photographs, helps put the text into a context. Care is also taken to

expose learners to a variety of different text types, for example, narrative or informative texts, and in terms of the topics covered and the sources from which the texts are selected. A more "attractive" text appeals to learners and motivates them to read, because the appearance of a text is the first thing that a reader notices. An "attractive" text is more likely to grab the reader's attention than a page filled with words only (Berado 2006:64). Other factors taken into consideration when selecting authentic material for the RPRP are: whether the text challenges the readers' cognitive abilities without making unreasonable linguistic demands; whether the language used in the text is natural; and whether the text lends itself to being studied and used for instruction (i.e. whether suitable questions can be formulated about the text and whether suitable tasks can be developed from it). Above all, though, the text should make learners want to read for themselves, it should tell them something they do not know and introduce them to new and relevant ideas (Berado 2006:64).

3.3 The different phases of the reading process - what good readers do during each phase and how to mediate readers during each phase

Given the understanding about what good readers do when they read, the RPRP strives to assist learners in acquiring the strategies and cognitive skills used by good readers to improve their overall comprehension of texts. As mentioned earlier, the process of reading takes place in three phases: before reading, during reading and after reading. During each phase, good readers employ certain strategies to construct meaning from a text. Mediators have to make informed decisions, based on their knowledge and understanding of the reading process, about when and how to support readers during each reading phase.

Before they read, good readers preview a text. They start predicting and anticipating what the text is about. Good readers activate their prior knowledge and identify a purpose for reading, in other words, good readers have a reading goal. They choose an appropriate reading strategy to meet their reading goal. The chosen reading strategy determines the reader's reading rate. According to Harris and Sipay (1990:637), choosing a reading rate that is inappropriate for the successful completion of a particular reading task, can lead to comprehension problems. During the course of the RPRP, learners are trained to employ four major reading rates and to select the reading rate that is appropriate for the reading task at hand. These reading rates are presented in Table 2 below.

Tabel 2. The four major reading rates (taken from Yoakam 1995 (in Harris and Sipay 1990:636))

READING RATE	FUNCTIONS
1. Skimming rate	To find a reference; to locate new material; to answer a specific question; to get the general idea of a selection
2. Rapid reading	To review familiar material; to get the main idea; to get information for temporary use
3. Normal rate	To find answers to specific questions; to note details; to solve a problem; to grasp relation of details to main ideas; to read material of average difficulty
4. Careful rate	To master content including details; to evaluate material; to get details in sequence, as in following directions; to outline, summarise or paraphrase; to analyse author's presentation; to solve a problem

During the before reading phase, the mediator should encourage the readers to consider what they know about the topic of the text. The mediator should therefore (i) activate and provide the necessary prior knowledge about the topic, vocabulary and text type; (ii) guide readers to anticipate and predict what the text will be about; (iii) provide or determine the readers'

reading purpose and (iv) allow them to choose an appropriate reading strategy to match their reading purpose.

As they read, good readers frequently make predictions about what they think is ahead. They construct meaning from the text but also question and, where necessary, revise this meaning. They draw upon, compare and integrate their prior knowledge with the new information provided by the text. Good readers monitor their understanding of the text and make adjustments in their reading as necessary. They try to determine the meaning of unfamiliar words and concepts in the text. During reading the role of the mediator is to provide a framework for thinking about the text and sharing ideas with others. Discussions should provoke thoughtful consideration of texts.

For good readers, text processing occurs not only during reading, but even after reading has been completed (Duke and Pearson 2002:1). Good readers reflect on what was read and summarise the main ideas of the text for themselves. During this phase mediators should provide opportunities for dynamic interaction with text and others and motivate readers to read more.

3.4 The RPRP

The RPRP is currently being offered at six schools in the Western Cape (five primary schools and one high school). Some of these schools implement the RPRP as part of their reading curriculum, utilising it during the compulsory reading period. In such cases, classes range from about 38 to 45 learners. At other schools, the RPRP forms part of the school's co-curricular learning support and enrichment services, and this usually involves smaller groups

of between five and 15 learners. In both cases (during as well as after school), the learners have one contact session per week, lasting 40 to 45 minutes (by no means ideal but the only time that schools have available or that learners can fit into their schedules after school). This amounts to eight lessons per term, 32 lessons per year.

The RPRP provides reading support for struggling readers, reading development for average readers and reading enrichment for good readers. Since the RPRP focuses on comprehension, it is currently only offered to readers who have progressed beyond the decoding stage (i.e. grades 3-12), and no longer have to pay most of their attention to the decoding of the text.

RPRP lessons proceed principally on the K-W-L strategy as developed by Ogle (1986) and Bloom's (1956) taxonomy, described in section 3.4.1. Section 3.4.2 explains the structure of a typical RPRP lesson in general terms, and section 3.4.3 walks the reader through an example of an actual RPRP lesson.

3.4.1 Ogle's (1986) K-W-L strategy and Bloom's (1956) taxonomy

Ogle (1986), who worked with theories of cognition and metacognition, developed the K-W-L strategy that requires learners to ask themselves the following questions: What do I Know about the text? (K); What do I Want to learn from the text? (W); and What did I Learn from the text? (L). The strategy is effective not only as a questioning routine but as a means of helping learners develop strategic approaches to reading. The K-W-L strategy guides learners' strategy use and their reading, as well as promoting text-based comprehension. In order to employ the K-W-L strategy effectively to efficiently mediate the readers, before, during and after reading, the mediator has to ask appropriate questions to guide the readers in learning to

generalize from what they read, to critically question the texts they read, and to apply what is learned from reading.

Pearson and Johnson (1978) (in Afflerbach 2007:54) propose three broad categories of questions, namely textually explicit, textually implicit, and scripturally implicit. It is important that the mediator should understand each of the characterizations, because they describe the types of thinking and answering that learners must use to read with comprehension. Textually explicit questions require learners to locate answers that have exact wording in the texts they read. The answers are "right there" in the text. Textually implicit questions require that learners gather information from at least two different parts of text to successfully answer the question. Scripturally implicit questions require that students integrate information from the text with information in their prior knowledge to successfully answer questions. The question types may also provide information related to what and how much prior knowledge learners have (or need) for a particular text. Each of the question types can reflect the ongoing development of how learners read, think and understand (Afflerbach 2007:55).

Bloom's (1956) taxonomy offers a more refined theoretical means to categorise questions of the three types proposed by Pearson and Johnson (1978). From relatively simple to increasingly complex, the taxonomy provides possible outcomes of learners' reading and associated learning. It can serve as an aid to develop appropriate questions to ask learners before, during and after reading. The taxonomy contains six levels, which are arranged hierarchically, from the lowest level of cognition to the highest level of cognition (or from the least complex to the most complex): knowledge, comprehension, application, analysis, synthesis and evaluation. Each of these levels is briefly described below.

Knowledge questions represent the lowest level of questions and require students to recall information, usually essentially in the same form as it was presented. Words often used in knowledge questions include *know, who, define, what, name, where, list, and when*.

Comprehension questions ask students to take several bits of information and put them into a single category or grouping. These questions go beyond simple recall and require students to combine data. Words often used in comprehension questions include *describe, use your own words, outline, explain, discuss, and compare*.

At the application level, the mediator asks learners to take information they already have and apply it to a new situation; in other words, they must use their knowledge to determine a correct response. Words often used in application questions include *apply, manipulate, put to use, employ, dramatize, demonstrate, interpret, and choose*.

Analysis questions require learners to break something down into its component parts. To analyze requires learners to identify reasons, causes, or motives and reach conclusions or make generalizations. Words often used in analysis questions include *analyze, why, take apart, diagram, draw conclusions, simplify, distinguish, and survey*.

Synthesis questions challenge learners to engage in creative and original thinking. These questions invite learners to produce original ideas and solve problems. There is always a variety of potential responses to synthesis questions. Words often used in synthesis questions include *compose, construct, design, revise, create, formulate, produce, and plan*.

Evaluation questions require learners to make a judgment about something. Learners are asked to judge the value of an idea, a situation, a text, or a solution to a problem. When students are engaged in decision-making and problem-solving, they should be thinking at this level. Words often used in evaluation questions include *judge, rate, assess, evaluate, what is the best ... , value, criticize, and compare* (Fredericks 2005:128-130).

3.4.2 Structure of a typical RPRP lesson

Ogle's (1986) K-W-L strategy and Bloom's (1956) taxonomy guide the researcher in developing every RPRP lesson and mediating the reading process during the lesson. A typical RPRP lesson proceeds as follows: Readers in grades 3 to 5 spend two lessons on a text. During every lesson, reading is mediated with reference to the three stages of reading and what a good reader does during each stage. The first lesson covers the before reading, during reading and after reading phases. The mediator activates and provides prior knowledge on the topic, the text type, and the vocabulary of the text, and guides readers to predict and anticipate and to set a reading goal. The readers then receive a text which is appropriate to their level of reading skills and they read the text keeping their reading goal in mind. After reading the text, they write down what they have read. Then the readers orally reflect on and communicate about what they have read. During the second lesson they reread the text to complete differentiated comprehension tasks.

From grade 6 onwards, the same procedure is followed, but during the first lesson the focus is also on reading fluency. To increase readers' fluency they have to be able to recognise and read the words in the text and their eye movements from left to right and from top to bottom must be fluent. Word recognition and eye movement exercises are used to "train" the readers

to reduce regressions and to increase eye span in order to become more fluent. During the first lesson, readers will be asked to read words (from the text that they are about to read) being flashed on a white board or manually with flash cards (when a white board is not available). Thereafter phrases from the text are flashed in different ways – a phrase (three to four words) appears on the white board for three to four seconds or a phrase appears and its words immediately start disappearing from left to right. Manually, this is done by moving a paper strip over words displayed on an overhead projector. The aim is to exercise readers' eye movements and to increase their eye span. During reading the eyes move in alternating jumps and pauses across a line of text. The jumping movements, called saccades, take approximately 20 milliseconds, whilst the pauses, called fixations, last approximately 150 to 300 milliseconds. It is during fixation that perception takes place. The number of fixations is significant because it indicates the number of separate perceptions that must be made and then combined to realise the meaning of the whole. When excess fixations and regressions (reverse fixations, i.e. eye movements in a right-to-left direction) are used to recognise words, this results in the expenditure of more time and energy which, in turn, will reduce reading rate and inhibit ease and comfort in reading (Nel et al. 2004:96).

After completing the exercises set out above, the readers should be able to predict what the text will be about and the mediator provides them with the necessary vocabulary and prior knowledge relevant to the text that they are about to read. Next, the readers complete a timed reading test of the text and answer true or false questions, or they complete a close test without referring to the text, in order to determine retention. During the second lesson, comprehension instruction takes place and the readers have to reread the text to answer comprehension questions (formulated according to Bloom's 1956 taxonomy). These

procedures are repeated in 32 lessons, distributed over a year. An example of an actual RPRP lesson is described in detail below, to illustrate the general steps set out in this section.

3.4.3 Example of an RPRP lesson

The mediator chooses a text that is suitable for the readers' reading level and interests and for the strategy which will be taught during the two lessons based on the text. One such text is an article titled "Giant rats haunt Cape Town", taken from the Cape Argus newspaper (5 May 2003) (see Appendix A) and adapted and translated into Afrikaans (see Appendix B). (Recall that the RPRP is instructed in Afrikaans, hence readers receive the Afrikaans text (Appendix B).)

During the first lesson, different reading strategies are taught simultaneously. The mediator must mediate readers to do what a good reader would do during each phase of the reading process. The reader's decoding skills are instructed by means of the word recognition tests, rhythmic eye movement exercises and speed reading exercise. At the same time, the reader's comprehension skills are instructed by ensuring that readers employ the strategies that good readers would employ during the before reading phase. Their prior knowledge of the topic and related vocabulary are elaborated, they learn how to predict and anticipate before reading, how to preview a text, and how to set a reading purpose and choose an appropriate reading strategy. All of these skills are vital to ensure reading comprehension and are also the skills that poor readers usually lack.

As a first step, core words are taken from the text (see Appendix C). These words are used to activate the readers' prior knowledge on the topic of the text, to elaborate their vocabulary and

to improve their decoding skills and, specifically, their fluency. The words are flashed to the readers in one of three ways: by means of an interactive whiteboard, flash cards or an overhead projector, depending on what is available in the classroom. Before proceeding to the next step, the readers must be able to read these words without hesitation, i.e. to immediately recognise the words without having to spend time and cognitive energy decoding them in the way that they would do with new words. This will help readers to read the text more fluently since these words will not be new to them. Thereafter, phrases (see Appendix C) are flashed to the readers, in the same way and for the same purposes as the core words – again, they have to be able to read the phrases without hesitation. Finally, the list of core words and phrases is shown to the readers again and the mediator asks the readers to predict what the topic of the text is. Usually, the readers respond correctly by predicting that the text is on rats. If they are unable to predict what the text is about, the mediator leads them with questions such as "Why do you think words such as *rat infestation*, *infected animals* and *Norwegian rat* appear here?" until they can predict that the text is on rats.

Next, the meaning of words and phrases from the text which the mediator thinks the readers might not understand (for example, *infrastructure*, *control measures* and *paraplegic*) are explained. During this explanation of words and phrases, the mediator also tells the readers more about the text, in this case the rat infestation, while holding back the details of the text. The purpose of this is to make the readers curious about the topic of the text, for example, how serious this rat infestation really is, so that readers can set reading goals. The text on the rat infestation is then handed out to them and the mediator explains how the readers should go about previewing the text: they should read the heading and then move over the entire text with their index finger, either in a large s-movement or from left to right below each line of the text but at a speed much faster than their normal reading speed. While they are doing this,

they have to try and spot some information about the rats. This exercise not only increases their fluency but also teaches them how to preview a text.

The mediator makes sure that each reader has set a suitable reading goal and then explains the speed reading process as follows: The readers have to read as fast as they can, but not so fast that they cannot remember what they have read, because they have to answer questions about the text afterwards. They have to read with the goal to grasp the main ideas of the text, considering throughout what they now know about rats. The mediator instructs the readers to start speed reading the text and to look up and say "STOP" once they have read through the whole text. The mediator has a stop watch and when a reader says "STOP", she gives the reader a time (i.e. how long the reader took to speed read the text). The reader writes their time down at the bottom of the text and then immediately turns the page and answers the retention questions without referring back to the text – see Appendix D for the Afrikaans version of the retention test and Appendix E for its English translation. Once a reader has completed the speed reading and retention test, the mediator calculates the reader's reading rate in WPM by dividing the number of words in the text (here: 552) by the time that it took the reader to speed read the text. This WPM is written down and the mediator proceeds to mark the reader's responses to the retention questions, while the reader is still present.

At the beginning of the second lesson, the mediator hands out the same text used in the first lesson, together with a set of comprehension questions. The Afrikaans version of the comprehension test for the rat infestation text is provided in Appendix F and its English translation in Appendix G. The mediator explains that this lesson focuses on reading with comprehension. Good readers constantly monitor their comprehension during the reading process and are continually receiving new information and integrating it with existing

information. To convey this process to the readers, the mediator explains that they will now "strip" the text. This involves the reader reading one paragraph at a time, covering the paragraph with a 3cm strip of paper and cryptically summarising the gist or core idea of the paragraph on the strip of paper. The mediator demonstrates this process with the first paragraph of the text, reading the paragraph out loud and writing a cryptic summary of the paragraph on the board. The readers then proceed to do this with the rest of the paragraphs of the text.

Next, the mediator explains to the readers what is expected of them in responding to questions at different levels of Bloom's taxonomy – comprehension, application, analysis, synthesis and evaluation – and goes through one question per level in the comprehension test. This explanation is only provided in the first reading comprehension lesson (i.e. the second lesson of the RPRP); in subsequent lessons readers are expected to complete the questions on the comprehension test independently. As soon as a reader has completed the comprehension test, they sit next to the mediator while she marks their responses. The mediator points problems out to the reader and suggests solutions for the problems. This communication with and feedback to the reader is very important since the reader has to understand where their comprehension of the text broke down and how to correct this. Two of the most common problems are (i) that readers misinterpret the instructions and/or questions and (ii) that their responses to the questions are incomplete. As an example, consider question 11 of the comprehension test, namely "Could it really happen that rats eat someone alive? Provide at least two reasons for your answer." Often readers will respond with a simple *yes* or *no*, without providing a reason for their answer, or they will only provide one reason, instead of two. Their answers are also often more or less accurate but not formulated very clearly or succinctly. If this is the case, the reader is asked to provide the answer verbally and if the

answer is correct, the reader has to write down what they said. The inability of readers to express themselves well is a significant gap but if they are often asked to answer verbally and then write down their answer, it becomes easier for them to provide more complete and clearly formulated answers.

3.4.4 Investigating the effect of the RPRP on reading skills

Against the background provided by the literature overview in chapter two and this chapter, the study reported in the remainder of the thesis set out to investigate (i) whether L1 (Afrikaans) reading instruction, in the form of the RPRP, can lead to significant improvement in learners' L1 reading skills (as indicated by their pre- and post-intervention performance on an L1 reading task, compared to the performance of a control group) and (ii) whether such L1 reading instruction can lead to significant improvement in learners' L2 (English) reading skills (again, as indicated by their pre- and post-intervention performance on an L2 reading task, compared to the performance of a control group). In the following chapter the methodology of the investigation is described in more detail and the results of the study are reported.

CHAPTER 4
A STUDY ON THE EFFECT OF L1 READING INSTRUCTION
ON L1 AND L2 READING SKILLS

In this chapter, I will report on an original study on the effect of L1 reading instruction, in the form of the RPRP (set out in section 3.4), on L1 and L2 reading skills. I will first introduce the participants (section 4.1) and describe the L1 and L2 reading tests which were used to determine the participants' L1 and L2 reading skills pre- and post-intervention (section 4.2), and then report the results of the study (section 4.3).

4.1 Participants

The study reported in this thesis was conducted in an Afrikaans-medium high school in the Western Cape, where 190 grade 8 learners enrolled for 2011. The school requires that all learners entering grade 8 should be tested on Maths, Science and academic literacy in Afrikaans and English in order to determine where learning support might be necessary. The L1 Afrikaans and L2 English assessments took the form of reading tests conducted by myself and described in section 4.2. Although all 190 learners completed the tests, only 54 of these learners participated in the study. Six were girls and the rest were boys, all between the ages of 13 and 14 years. Twenty-seven learners enrolled for the programme. They constituted the experimental group and received explicit reading instruction for 15 lessons of 45 minutes each, in their L1 Afrikaans with the aim of improving their reading comprehension by increasing their reading rate, retention, vocabulary and comprehension (see chapter 3 for a detailed description of the RPRP). An additional 27 learners from the group of 190 grade 8 learners served as a control group and did not receive any reading intervention. These

participants were selected by matching each individual learner in the experimental group as closely as possible to a learner from the remaining 163 grade 8 learners in terms of gender, age, L1 (Afrikaans), L2 (English), their score on the L1 Afrikaans pre-intervention reading test, and their score on the L2 English pre-intervention reading test.

4.2 Experimental procedure

After the experimental group had completed 15 lessons (one semester) of the RPRP, the 27 experimental group participants and the 27 control group participants completed the two reading tests again.

All participants completed an assent form (a consent form was also completed by each participant's parents), a language background questionnaire (see Appendix H), and the two reading tests (L1 Afrikaans and L2 English – see Appendices I to L). Section 4.2.1 describes the two reading tests, while section 4.2.2 addresses issues of reliability and validity related to reading tests.

4.2.1 The L1 Afrikaans and L2 English reading tests

Two different informative texts were selected for the L1 Afrikaans and the L2 English reading tests, respectively. As mentioned above, the main objective of these tests was to determine the academic literacy of the new grade 8 learners in their L1 and L2. The L1 Afrikaans text was slightly more difficult than the L2 English text in terms of vocabulary, sentence constructions and topic, because it was assumed that the learners' L1 proficiency and reading skills would be at a higher level than their L2 proficiency and reading skills.

The topic of the 377-word Afrikaans text (see Appendix I) was a software programme that allows learners to receive additional mathematics lessons on their cellular phones. The text, titled *Selkletsdiens bied nou wiskundelesse* ("Cellular chat service now offers maths lessons"), was taken from the newspaper *Die Burger* (6 June 2009) and was selected because it was presumed that the learners would have enough prior knowledge of MXit and would be interested in a new way of studying Maths on MXit. The 320-word English text (see Appendix K), titled *Spitting to survive*, was retrieved from the internet (www.jlawrance.com/Spitting_to_Survive.doc, accessed in November 2010) and its topic was the cunning ways in which animals use their spit to survive. The text was chosen because it provided interesting information and was fairly simple and, therefore, suitable for L2 readers.

The L1 Afrikaans reading test is provided in Appendix J and the L2 English reading test in Appendix L. Both tests consist of a one minute timed reading test to determine learners' reading fluency in WPM, as well as three sections with questions on the texts referred to above, testing retention, comprehension and vocabulary, respectively. The questions were compiled according to Bloom's (1956) taxonomy of critical thinking (cf. section 3.4.1).

Sections 1 (Retention) and 3 (Vocabulary) of the Afrikaans test are identical in structure to those of the English test. Section 1 (Retention) consists of five multiple choice questions, with four response options for each question. These five lower order questions are on the knowledge level – asking *who ...*, *how many ...*, *how much ...*, and *what ...*, and had to be answered without referring to the text. Section 3 (Vocabulary) consists of five vocabulary questions that test the learner's ability to infer the meaning of words when contextual clues are provided in the text. These words are in bold print in the text. Three of the questions require

synonyms for words which appear in the text, while the other two questions require learners to explain the meaning of a word or to use it in a clarifying sentence.

In section 2 (Comprehension) learners had to answer 5 comprehension questions, using full sentences. It was assumed that since Afrikaans is the learners' L1 they would have the language proficiency to answer questions that require higher levels of thinking. Therefore, the comprehension questions for the Afrikaans test include questions that require understanding and applying, analysing, synthesis and evaluating (cf. the cognitive taxonomy of Bloom (1956) referred to in section 3.4.1).

Section 2 of the English test only include questions on the comprehension level (for example, *List ...*, *Name ...*, *How ...*, *What ...*) and do not include questions on evaluation, analysis or synthesis, because it would be unfair to measure higher order skills in an L2 if the purpose of the test is to determine learners' L2 comprehension. Furthermore, it was assumed that L2 learners have limited L2 language abilities that could adversely affect their higher order thinking.

Questions 1 and 2 of section 2 of the Afrikaans test are on the comprehension level and required learners to understand information as presented in the text, for example: *Describe / what does it mean...* Question 3 is on the application level and the learners had to apply information acquired from the text to new situations, for example: *Can you think of 2 other ways...* Question 4 is on the analysis level and required learners to *List the 3 most important reasons why...*, while question 5 was on the evaluation level and learners were asked: *What do you think...*

4.2.2 Issues of reliability and validity

In order to obtain a comprehensive reading assessment profile of every learner involved in this study, all the components of reading, namely fluency, vocabulary and comprehension, were assessed. However, assessing reading is neither easy nor straightforward. All measures of reading comprehension are indirect because we cannot directly observe the actual process in the reader's mind, which complicates establishing the reliability and validity of reading tests (Harris and Sipay 1990:181). A *reliable* test can be described as consistent, dependable and stable, while a *valid* test measures what it purports to measure (Harris and Sipay 1990:181). The reliability and validity of reading tests in general and of the two specific reading tests used in this study (cf. section 4.2.1 above) are briefly discussed below.

According to Harris and Sipay (1990:182-184), reliability is the consistency with which a test measures any attribute and it indicates the degree to which it provides consistent test-retest results. Test reliability is affected by factors such as the following:

- (i) Number of items in a test. Longer tests are generally more reliable.
- (ii) Heterogeneity of the learner group. Reliability is higher when test scores are spread over a range of abilities. On the other hand, measurement errors are smaller in the case of a group that is more homogeneous in ability.
- (iii) Reliability is higher when the test items are of moderate difficulty because this spreads the scores over a greater range than a test composed of mainly difficult or mainly easy items (Harris and Sipay 1990: 553).

Alderson (2000:86-87) states that the language of the questions should be easy to understand and that the questions of a reliable reading test should include textually explicit questions, textually implicit questions and scripturally implicit questions (see section 3.4.1).

It is important to bear in mind that it is not only question difficulty that plays a role in the reliability of a reading test; text difficulty also has to be taken into consideration. The difficulty of a text depends on how much prior knowledge of the topic and text type a reader has, the language of the text and the length of the text. The more prior knowledge a reader has about the topic, the easier the text will be for the reader. If the reader is unfamiliar with the language and vocabulary of a text, the text will be perceived as difficult. The length of the text should match the purpose of the text.

Validity refers to how well a test measures what it is intended to measure. A test with low reliability cannot be valid, but high reliability does not ensure validity (Harris and Sipay 1990:183). There are different kinds of validity, namely content validity, face validity, developmental validity and predictive validity. Content validity refers to the extent to which the items on an instrument are representative of the key aspects of the domain the instrument is supposed to measure. Face validity deals with appearance rather than content. A test has face validity if it appears to measure what it purports to measure. In assessing young children, two aspects of validity have special importance – developmental validity and predictive validity. If a test is developmentally valid this means that the performance items being measured are developmentally suitable for the children being assessed. Predictive validity is the correlation between a test score and future performance on a relevant criterion. A test would be said to have strong predictive validity, for example, if superior performance on the test was strongly associated with a high level of achievement later in school.

There is not one type of validity that is most appropriate across tests, because tests are only valid for a specific purpose. There are various types of tests and assessment procedures to determine reading comprehension. A simple answer to the question of what a reading comprehension test measures is that it measures a reader's ability to demonstrate his or her comprehension of the material contained in the text which was read for a particular purpose and under particular circumstances (Harris and Sipay 1990:234).

Although the reliability and validity of the two reading tests employed in the study reported in this thesis were not formally tested, the above-mentioned issues were kept in mind in designing the tests and selecting the accompanying texts.

Furthermore, in terms of *reliability*, it is worth noting that, as set out in section 4.2.1, the two reading tests include a range of items in terms of test item types (multiple choice as well as more open-ended questions) and difficulty level (low order and high order questions, of which there were an equal number, in accordance with Bloom's 1956 taxonomy).

In terms of *validity*, the following three points are worth mentioning: Firstly, the items on the two tests are indeed representative of the key aspects of the domain the instrument is supposed to measure, namely reading skills, in that the tests set out to measure reading rate (fluency), retention, vocabulary and comprehension, instead of just one of these aspects of reading skills. Secondly, as explained in section 4.2.1 above, the age of the participants is taken into account in selecting texts on which the tests are based – the texts on which the two reading tests are based (cf. Appendices I and K) were selected because they were likely to (i) be interesting to grade 8's and (ii) provide the readers with new information in language that

they would find easily accessible. Thirdly, the reason why the two reading tests – L1 and L2 – differ from each other in terms of the difficulty level of the texts and the test items, is precisely because I wanted each test to measure what it set out to measure, specifically, I wanted the L2 reading test to measure learners' reading skills *in an L2*, not to measure their reading skills in their L2 as if they were native speakers of the language.

In the next section, we turn to the results of the study.

4.3 Results

Recall that this study set out to investigate two research questions: (i) whether or not there would be a significant increase in learners' scores on an L1 reading test from before to after intervention (by means of the RPRP), and (ii) whether or not there would be a significant increase in learners' scores on an L2 reading test from before to after intervention (by means of the RPRP) even though the intervention was provided in their L1. Sections 4.3.1 and 4.3.2, respectively, report the group results which are relevant to the two research questions, while section 4.3.3 describes six case studies (three participants from the experimental group and three from the control group) in order to provide an indication of how the intervention seems to have affected individual learners' reading skills.

4.3.1 Effect of L1 reading intervention on performance on L1 reading test

The group results of the L1 Afrikaans and L2 English *pre-tests*, i.e. the reading tests conducted at the beginning of the year, are presented in Table 3 below for the two groups (the experimental (E-)group and the control (C-)group).

Table 3. Group results of pre-tests, presented as average scores on the different sections of the tests

	L1 Afrikaans pre-test					L2 English pre-test				
	WPM	RET n=10	COMP n=10	VOC n=10	TOT n=30	WPM	RET n=10	COMP n=10	VOC n=10	TOT n=30
E-group n=27	135.33	8	4	3	14.7	117.074	7.88	5.13	4.37	17.40
C-group n=27	132.81	7.33	4.59	3.18	15.11	126.85	7.70	5.40	4.25	17.36
p-values⁴	0.855	0.320	0.182	0.784	0.785	0.480	0.721	0.628	0.861	0.976

Note: "WPM" = words per minute; "RET" = retention; "COMP" = comprehension; "VOC" = vocabulary; and "TOT" = total (i.e. overall score on test).

The results for the individual members of the two groups on the two pre-tests and the two post-tests are presented in Appendix M. From the individuals' and the groups' scores on the two pre-tests, it should be clear that the two groups are highly comparable, a direct result of matching each individual from the E-group to one of the learners from the remainder of the grade 8 class that did not enroll in the RPRP, in terms of their scores on the L1 Afrikaans and the L2 English pre-tests (cf. section 4.1). The p-values in the last row of Table 3 show that statistical analyses confirmed that there were no significant differences between the E-group and the C-group on the L1 Afrikaans pre-test or the L2 English pre-test, neither on one of the tests overall nor on any of the sections of either of the two tests.

To determine whether each group had improved significantly on the different sections of the L1 Afrikaans test, I compared each group's scores on the pre-test to their scores on the post-test, administered after the E-group had completed 15 lessons of the RPRP. The results of this comparison are presented for the E-group in Table 4.

⁴ Throughout, alpha – the level of significance – is set at 0.05 so that only p-values below 0.05 are taken to indicate significant differences. In Tables 4 to 10, all p-values below 0.05 are printed in bold and italicised.

Table 4. E-group results of L1 Afrikaans pre-test and post-test, presented as average scores on the different sections of the test

	L1 Afrikaans E-group				
	WPM	RET n=10	COMP n=10	VOC n=10	TOT n=30
pre-test	135.33	8	4	3	14.78
post-test	238	7.40	7.11	5.51	20.03
p-value	<0.001	0.339	<0.001	<0.001	<0.001

As can be seen from the p-values in the last row of Table 4, the E-group improved significantly in terms of their performance on the test overall and also on the measures WPM, comprehension and vocabulary. The only measure for which the E-group did not improve significantly was retention: the difference between the group's scores for retention on the pre-test and their scores for retention on the post-test is not significant.

The results of the comparison between the L1 Afrikaans pre- and post-test scores of the C-group are presented in Table 5.

Table 5. C-group results of L1 Afrikaans pre-test and post-test, presented as average scores on the different sections of the test

	L1 Afrikaans C-group				
	WPM	RET n=10	COMP n=10	VOC n=10	TOT n=30
pre-test	132.81	7.33	4.59	3.18	15.11
post-test	191	8.29	4.48	4.74	17.51
p-value	<0.001	0.041	0.791	0.004	0.007

As can be seen from the p-values in the last row of Table 5, the C-group improved significantly on the test overall, as well as on the measures WPM, retention and vocabulary. The only measure for which the C-group did not improve significantly was comprehension: the difference between the group's scores for comprehension on the pre-test and their scores for comprehension on the post-test is not significant.

To summarise: the E-group improved significantly on all measures except retention, while the C-group improved significantly on all measures except comprehension. As mentioned in section 3.3, good readers are flexible readers. During the RPRP, readers are guided in making use of different reading rates for different purposes. Specifically, they are "trained" to read a timed reading test at a very fast rate, even at the cost of retention – they are told that if they obtain higher than 70% retention, this is an indication that they could have read faster. This may explain why, on the L1 Afrikaans post-test, the E-group's reading rate (in terms of WPM) was significantly higher than the C-group's reading rate, but their retention was slightly lower (though not significantly so) (see Table 6 below). Important, though, is that only the E-group's reading comprehension improved significantly and that the intervention thus seems to have served its purpose, given that the aim of the specific intervention programme, the RPRP, is to improve reading comprehension.

Another way of approaching the question of whether the intervention programme did indeed serve its purpose is to compare the E-group's post-test scores to those of the C-group in the same way that the two groups' pre-test scores were compared to each other in Table 3. The results of this comparison are presented in Table 6 below.

Table 6. Group results of L1 Afrikaans post-test, presented as average scores on the different sections of the test

	L1 Afrikaans post-test				
	WPM	RET n=10	COMP n=10	VOC n=10	TOT n=30
E-group n=27	238.92	7.40	7.11	8.81	20.03
C-group n=27	191	8.29	4.48	4.74	17.51
p-values	<0.001	0.091	<0.001	0.252	0.043

The p-values in the last row of Table 5 indicate that the E-group fared significantly better than the C-group on the post-test overall, as well as on the measures WPM and comprehension. Given that there were no significant differences between the two groups on the pre-test overall or on any of its sections – cf. the last row of Table 2 – these results confirm that the intervention programme did serve its purpose of increasing reading rate as well as reading comprehension in the E-groups' L1 Afrikaans.

4.3.2 Effect of L1 reading intervention on performance on L2 reading test (transfer of skills)

As reported at the beginning of section 4.3.1 above, there were no significant differences between the E-group and the C-group in terms of their performance on the L2 English pre-test (cf. Table 3). To determine whether each group had improved significantly on the different sections of the L2 English test, I compared each group's scores on the pre-test to their scores on the post-test. The results of this comparison are presented for the E-group in Table 7.

Table 7. E-group results of L2 English pre-test and post-test, presented as average scores on the different sections of the test

	L2 English E-group				
	WPM	RET n=10	COMP n=10	VOC n=10	TOT n=30
pre-test	117.04	7.88	5.13	4.37	17.40
post-test	220	8.66	8.22	6.96	23.85
p-value	<i><0.001</i>	0.097	<i><0.001</i>	<i><0.001</i>	<i><0.001</i>

The results of the pre- versus post-test comparison for the E-group's performance on the L2 English reading test are almost identical to the results of this comparison for the E-group's performance on the L1 Afrikaans reading test – compare the last row of Table 7 to that of Table 4. Specifically, the E-group improved significantly on the L2 English reading test overall but also on the measures WPM, comprehension and vocabulary.

Table 8 presents the results of a comparison of the C-group's pre- versus post-test scores on the L2 English reading test.

Table 8. C-group results of L2 English pre-test and post-test, presented as average scores on the different sections of the test

	L2 English C-Group				
	WPM	RET n=10	COMP n=10	VOC n=10	TOT n=30
pre-test	126.85	7.70	5.40	4.25	17.366
post-test	172.07	8.81	6.59	6.62	22.03
p-value	<i><0.001</i>	<i>0.019</i>	<i>0.006</i>	<i><0.001</i>	<i><0.001</i>

As can be seen from the p-values in the last row of Table 8, the C-group improved significantly on the L2 English reading test overall but also on each of the separate measures, namely WPM, retention, comprehension and vocabulary.

From the results presented in Tables 7 and 8, one might conclude that since both the E-group and the C-group improved significantly on the L2 English reading test overall and, more importantly, on the comprehension measure, this improvement cannot be due to the intervention programme since only the E-group completed the intervention programme. However, consider Table 9 below, which offers a comparison of the E-group's post-test scores to those of the C-group.

Table 9. Group results of L2 English post-test, presented as average scores on the different sections of the test

	L2 English post-test				
	WPM	RET n=10	COMP n=10	VOC n=10	TOT n=30
E-group n=27	220.70	8.66	8.22	6.96	23.85
C-group n=27	172.07	8.81	6.59	6.62	22.03
p-values	<0.001	0.776	0.004	0.622	0.141

The p-values in the last row of Table 9 indicate that the E-group fared significantly better than the C-group on the post-test measures of reading rate (WPM) as well as comprehension. Given that there were no significant differences between the two groups on the pre-test overall or on any of its sections – cf. the last row of Table 3 – these results can be taken to indicate that the E-group is able to apply the skills that they acquired during the course of the intervention programme to their L2 English reading, despite the fact that the intervention was

provided in their L1 Afrikaans only. In this way, these results provide evidence for the Interdependence Hypothesis discussed in section 2.3, i.e. the hypothesis that L1 academic skills can be transferred to the learner's L2.

Finally, the results of comparing the two groups to each other in terms of their performance on the pre- versus post-test on the different measures of the L1 Afrikaans reading test and the L2 English reading test, respectively, are presented visually in Figures 1 to 5 below. In each of these figures (i) the two groups' performance on the L1 Afrikaans reading test is presented in the left-hand graph, while their performance on the L2 English reading test is presented in the right-hand graph, and (ii) the E-group's performance is indicated in blue while the C-group's performance is indicated in red.

Fig. 1. A comparison of the E-group's and the C-group's performance: WORDS PER MINUTE

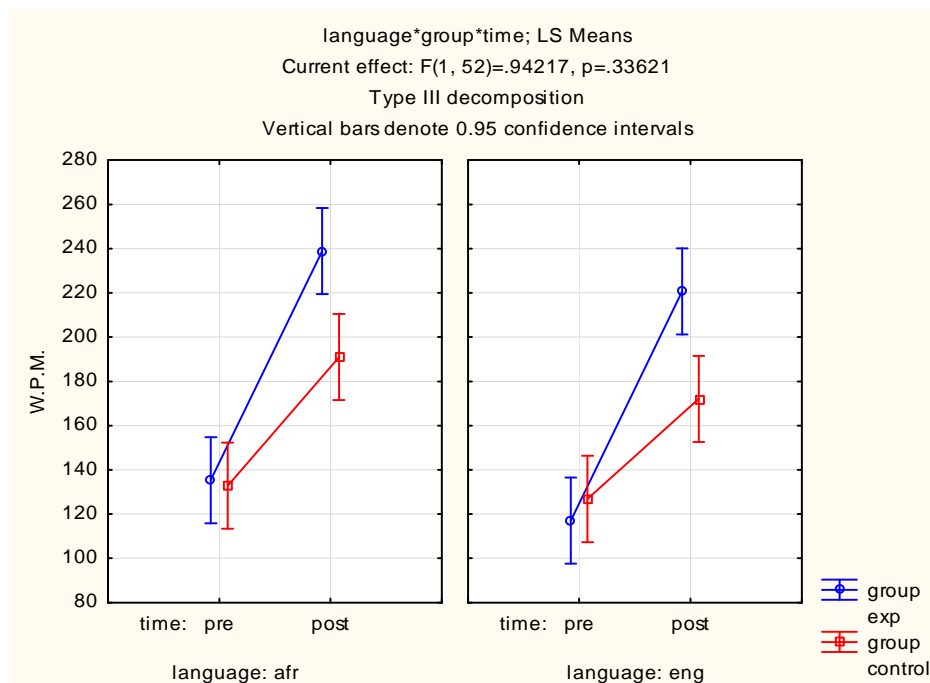


Fig. 2. A comparison of the E-group's and the C-group's performance: *RETENTION*

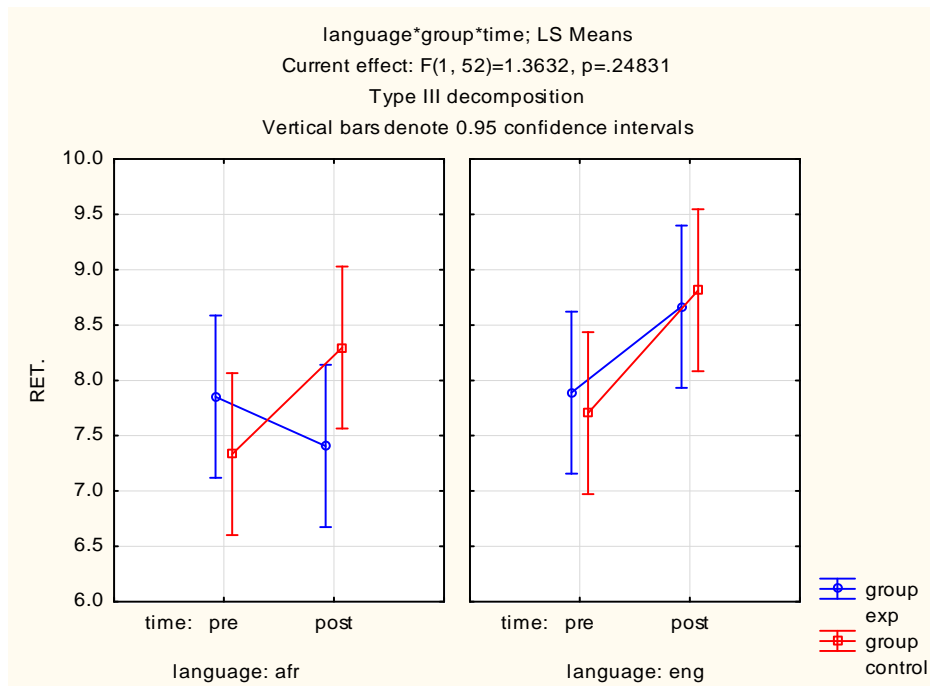


Fig. 3. A comparison of the E-group's and the C-group's performance: *VOCABULARY*

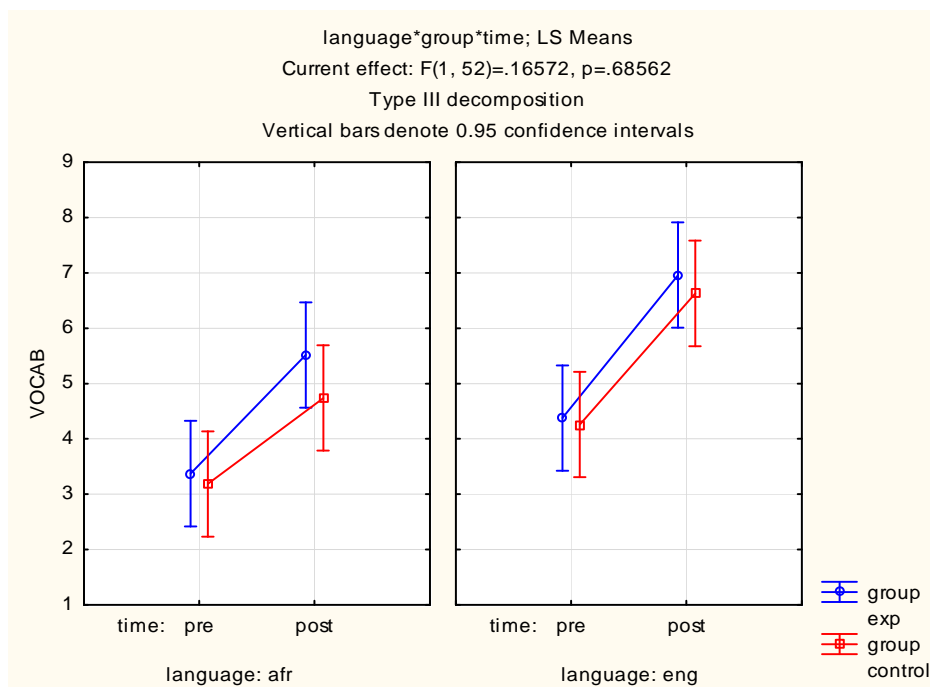


Fig. 4. A comparison of the E-group's and the C-group's performance: *TOTAL*

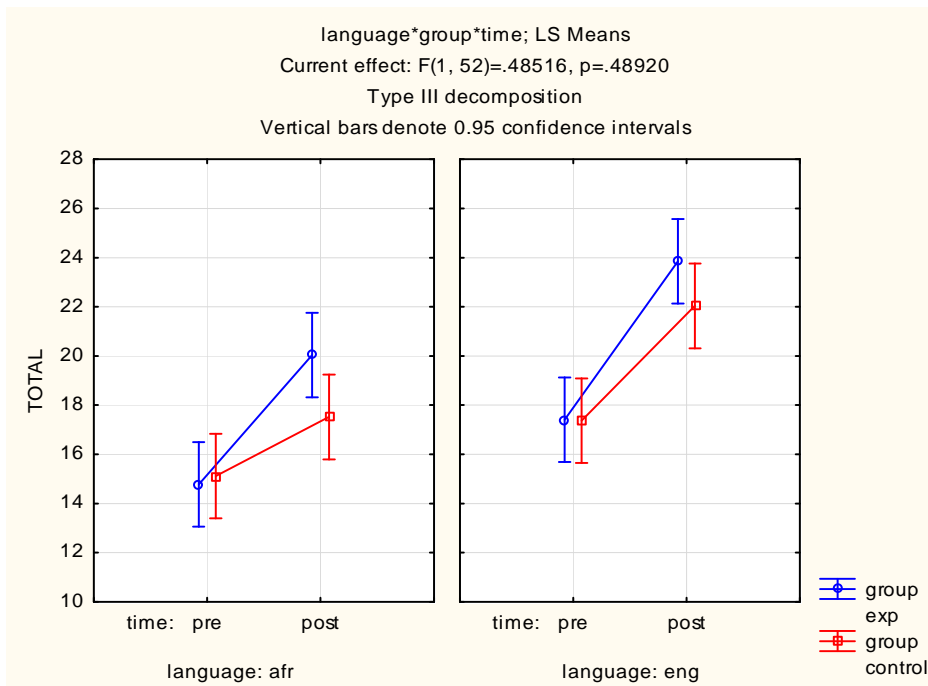


Fig. 5. A comparison of the E-group's and the C-group's performance: *COMPREHENSION*

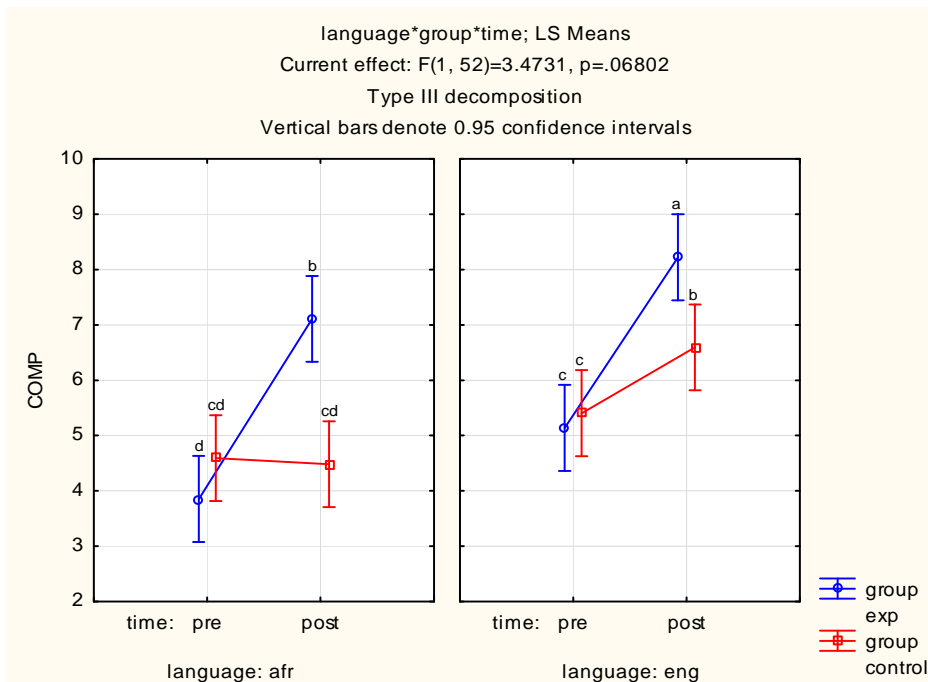


Figure 5 provides a visual representation of the relationship between the two groups' performance on the pre- and post-tests for L1 Afrikaans and L2 English in terms of the measure which is the focus of the current study, namely *reading comprehension*. The figure clearly shows that the E-group's improvement in terms of L1 Afrikaans as well as L2 English reading comprehension surpasses that of the C-group, leading to the conclusion that the intervention programme did indeed lead to a significant improvement in comprehension during L1 reading but that the relevant skills also seem to have been transferred to the domain of L2 reading.

4.3.3 Individuals' results: six case studies

Finally, before concluding this thesis in the next chapter, I offer a brief description of six participants' individual results on the L1 Afrikaans pre- and post-tests, in order to provide an indication of the effect that intervention, in the form of the RPRP, seems to have had on individual learners' reading skills. One poor, one average and one good reader were chosen from both the E-group (E12, E9 and E13) and the C-group (C12, C9 and C13), based on their performance on the L1 Afrikaans pre-test. Since participants for the C-group were chosen as matches for participants in the E-group based precisely on their (overall) performance in the L1 Afrikaans and L2 English reading tests, the two readers in each category – poor, average and good – were each other's matches, hence the corresponding participant numbers. Only the two good readers, E13 and C13, were female; the other participants referred to here were male.⁵

⁵ Although it is interesting that the best reader in each of the groups was female, a discussion of the role of gender in the development of reading skills falls outside the scope of this thesis.

For each participant, their reading rate and score on the retention test are discussed together as these two skills (reading rate and retention) are related (see section 3.3 – for example, when a reader speed reads, only 70% retention is expected). Their improvement, or lack thereof, from pre- to post-test is discussed, and their performance is also measured against that expected for grade 8 learners (who, according to the data in Table 2, should be able to read 204 WPM). Finally, the comprehension and vocabulary scores that participants obtained in the post-test are compared to the corresponding scores in the pre-test.

4.3.3.1 Poor readers: E12 and C12

In the pre-test, E12 read 138 WPM, with 60% retention. In the post-test E12's reading rate had increased to 278 WPM, with retention still at 60%. E12's reading rate had thus increased by 140 WPM, i.e. his reading rate had doubled from pre- to post-test, without retention being compromised. Also note that E12's post-test reading rate is considerably higher than that expected for grade 8 learners, namely 204 WPM. This might be the reason why E12's retention did not show improvement from pre- to post-test – had the participant read a little more slowly, his retention score in the post-test would probably have been higher. Turning to comprehension, E12's score was 10% on the pre-test, compared to 70% on the post-test, showing considerable improvement, mainly due to the fact that E12's responses to the comprehension questions were formulated much more completely in the post-test than in the pre-test. In the post-test, E12 had, for example, answered the questions with full sentences, written down three points for question 4, and given his opinion, together with two examples from the text, in response to question 5 – all things he had not done in the pre-test. Finally, E12's vocabulary score had increased from 10% in the pre-test to 80% in the post-test, which

might well have contributed to the substantial increase in his comprehension score, given that some comprehension questions, such as question 2.1, are directly related to vocabulary.

C12, E12's match in the C-group, started out reading 156 WPM, with 60% retention. In the post-test, his reading rate had increased to 216 WPM, with 80% retention. This participant had thus increased his reading rate by 60 WPM and his retention score by 20%. C12's comprehension score had also increased from 20% in the pre-test to 50% in the post-test. The most serious problem with C12's responses to the comprehension questions was the same for the pre- and post-test, namely that he provided incomplete answers, failed to write in full sentences where this was required, and could not answer question 5, which required him to give his opinion and motivate his answer. Although C12's vocabulary score had increased from 0% to 30%, this is still a very low score, and his deficient vocabulary might well be one of the reasons why his performance on the comprehension questions in the post-test was not satisfactory, given the relation, as noted above, between some of the comprehension questions and vocabulary.

4.3.3.2 Average readers: E9 and C9

In the pre-test, E9 read 172 WPM, with 80% retention. In the post-test, E9's reading rate had increased by 82 WPM to 254 WPM, with 60% retention. The reason for the decrease in E9's retention score might be attributed to the fact that E9 read 50 WPM faster than the reading rate expected for grade 8 learners. Again, had E9 read a little more slowly, he might have kept his retention score at 80%. E9's comprehension score increased from 20% to 90%, most notably because he managed to answer questions which required insight more completely in the post- than in the pre-test. Specifically, E9 was able to give his opinion and motivate it

with references to examples in the text, in response to question 5, something which he had not been able to do in the pre-test. E9's vocabulary score was 40% in the pre- as well as the post-test – in the post-test, the participant could still not provide a complete answer to question 3 and still failed to provide sufficient definitions for the relevant words.

C9, E9's match in the C-group, started at 132 WPM, with 100% retention. In the post-test, his reading rate had increased to 153 WPM, still accompanied by 100% retention. C9's comprehension score had increased from 30% to 70%, although he still was not able to provide a complete answer to question 5 – he gave his opinion but could not motivate it sufficiently with reference to the text. C9's vocabulary score had increased from 10% to 40%, which, as explained with reference to E12 and C12 above, might have contributed to the increase in his comprehension score.

4.3.3.3 Good readers: E13 and C13

In the pre-test, E13 read 245 WPM, with 80% retention. In the post-test, her reading rate had increased by 132 WPM to 377 WPM, while her retention had increased to 100%. It is quite impressive that this considerable increase in reading rate had not led to a decrease in retention. E13's comprehension score had increased from 80% to 100%, with her vocabulary score at 100% in the pre- and post-test.

C13, E13's match in the C-group, started out reading 108 WPM, with 100% retention. In the post-test, C13 still read with 100% retention but her reading rate had not really increased, measuring 113 WPM, considerably lower than the reading rate expected for grade 8 learners. C13's comprehension score increased from 60% to 80%, while her vocabulary score

decreased from 100% to 80%. Interestingly, C13 was the only participant in the C-group who managed to provide a complete and sufficient response to question 5 in the post-test.

4.3.3.4 Summary

The six participants' reading skills, as reflected by the L1 Afrikaans reading test, are summarised in Table 10 below.

Table 10. Six case studies: performance on L1 Afrikaans pre- and post-test

		WPM		RET		COMP		VOCAB		TOTAL	
		pre	post	pre	post	pre	post	pre	post	pre	post
POOR	E12	138	278	60	60	10	70	10	80	27	70
	C12	156	216	60	80	20	50	0	30	27	53
AVERAGE	E9	172	254	80	60	20	90	40	40	47	63
	C9	132	153	100	100	30	70	10	40	47	70
GOOD	E13	245	377	80	100	80	100	100	100	87	100
	C13	108	113	100	100	60	80	100	80	87	87

From the description of the six case studies in this section and the summary in Table 10, it should be clear that the trends observed for the two groups are also found for individual participants within the groups. Two specific points are worth noting. Firstly, all three of the E-group participants referred to above show a much more marked increase in reading rate than their C-group matches. Two of the three E-group participants' increases in comprehension scores are also much more marked than those of their C-group matches – the only E-group participant whose increase in comprehension score does not surpass that of his C-group

match, is the good reader E13; E13's comprehension score increased by 20%, just like that of her match, C13, but it was impossible for E13's score to increase by more than 20%, given that this led to the ceiling 100% score.

If one considers the three categories of readers (cf. Table 10) – poor, average and good – the intervention seems to have benefited the poor reader the most: E12's reading rate increased from 138 WPM to 278 WPM, his retention score remained at 60% (showing that the considerable increase in reading rate did not lead to a decrease in retention), his comprehension score increased from 10% to 70% and his vocabulary score from 10% to 80%. Although the same trend is observable in C12's performance, the improvement is much less marked than it is for E12: C12's reading rate increased from 156 WPM to 216 WPM, his retention score from 60% to 80%, his comprehension score from 20% to 50% and his vocabulary score from 0% to 30%. Recall that the RPRP's primary aim is to improve reading comprehension. On this point, it is noteworthy that E12 and C12 both started out as poor readers, E12, at 10%, faring even worse on the comprehension questions of the pre-test than C12, at 20%. Fifteen weeks later, C12 would still be categorised as a poor reader, scoring 50% for comprehension, while E12 would now (post-intervention) be categorised as a good reader, scoring 70% for comprehension.

In the next chapter I will consider the strengths and limitations of the study, make some suggestions for future research, and discuss the implications of the study's findings for L1 and L2 literacy development.

CHAPTER 5

CONCLUSION

This concluding chapter considers the strengths and limitations of the research reported in this thesis (section 5.1), makes suggestions for future research (section 5.2) and briefly discusses the implications of the research findings for L1 and L2 literacy development (section 5.3).

5.1 Strengths and limitations

In my opinion, the study reported in this thesis has three main limitations, all of which are linked to time constraints. Firstly, I would have liked to re-test readers after all 32 RPRP lessons rather than after only 15 lessons since, in my experience, the improvement that readers show in reading comprehension from before the RPRP to after the completion of the entire RPRP, is far more noticeable than the improvement that they show after the completion of half of the RPRP. Furthermore, many of the participants did not even attend all 15 lessons – the majority missed one lesson and some of the participants even missed more than one lesson. Secondly, this study was conducted at only one school with a relatively homogeneous group in terms of socio-economic status, language (L1 and L2) background and gender (the majority of the participants were male), and with only 54 learners. Finally, the reliability and validity of the two reading tests have not yet been formally measured.

The main strength of this study, in my opinion, is that it clearly addresses the research questions that it set out to address, namely: (i) Is there a significant increase in learners' scores on an L1 reading test from before to after intervention (by means of the RPRP)? and (ii) Is there a significant increase in learners' scores on an L2 reading test from before to after

intervention (by means of the RPRP) even though the intervention was provided in their L1? It should be clear from the results reported in the previous chapter that the study did indeed yield data which made it possible to address these questions in a meaningful way: Most importantly, before intervention there was no significant difference between the comprehension scores of the experimental group and the control group on the L1 reading test or the L2 reading test (cf. Table 3) but after intervention there were significant differences between the two groups' comprehension scores on both the L1 reading test (cf. Table 6) and the L2 reading test (cf. Table 9) (see also Figure 5). These results indicate (i) that the L1 reading intervention did indeed lead to an improvement in reading comprehension, and (ii) that the readers were indeed able to transfer the reading skills that they had acquired through L1 reading intervention to the domain of L2 reading.

This study contributes to much needed research on reading instruction, specifically in the South African context, where reading levels of learners are unacceptably and distressingly low, and very little reading support is available for struggling readers in the Intermediate and Further Education and Training phases. Research such as that reported in this thesis could contribute to the development of a successful reading intervention programme for learners in these phases.

5.2 Suggestions for future research

Although the study reported here indicates that the reading intervention improved readers' comprehension, further investigation is needed into the specific aspects of the intervention which might have led to this improvement. For example, was improved reading comprehension due to the specific intervention programme or simply to the fact that readers

received attention in small groups or that they might have spent more time reading than the control group? To identify the aspects of the intervention that led to improved reading comprehension, future research should investigate the effect of other forms of reading intervention and other reading intervention programmes, as well as the same reading intervention programme offered by different facilitators/mediators. In future, two more similar L1 and L2 tests in terms of difficulty and topic should be used to determine the effect the reading intervention has on L1 and L2 reading abilities even more accurately.

In order to determine the generalisability of the findings of this study, the study needs to be replicated with a larger number of participants from a more heterogeneous group, including learners with an African language as their L1, learners from communities with a lower socio-economic status, and learners with a lower level of L1 literacy skills.⁶

5.3 Implications for L1 and L2 literacy development

Research such as that reported in this thesis is necessary for South African policy makers to make informed decisions about reading instruction and to address L1 and L2 literacy problems as well as the ever contentious issue of LoLT. In her statement on the ANA results for 2011, Angie Motshekga, Minister of Basic Education, said that: "In 2010, the Council of Education Ministers approved the recommendation that from 2012, the language chosen by the learner as a LoLT from Grade 4 shall be taught as a subject from Grade 1, and not from Grade 3 as is currently the case. From 2012, all learners whose LoLT will be English from Grade 4 onwards will be required to take English as a subject from Grade 1. What this means

⁶ Cummins' (1979, 1984) Interdependence and Threshold hypotheses (cf. section 2.3) lead to the prediction that learners with lower L1 literacy levels will not be able to transfer the reading skills that they acquire during L1 reading intervention to the domain of L2 reading.

is that the teaching of English will occur alongside home language instruction for those learners who choose English as a Language of Learning and Teaching in later grades."

It is not clear what exactly the teaching of L2 English "alongside home language" will entail. Will L2 English only be used for communicative purposes in order to start exposing learners to this L2 earlier on or will the teaching of L2 English include reading instruction as well? If the proposal is that literacy skills are to be developed in both languages (home language and L2 English) simultaneously, from grade 1 onwards, this does not bode well for learners' literacy development. The current study has shown that learners are able to transfer literacy skills that they acquire via L1 reading intervention to the domain of L2 reading but, according to Cummins' Interdependence and Threshold hypotheses, this will only be possible if learners have a sufficient level of L2 proficiency as well as well-developed L1 literacy skills. My concern is that instituting L2 instruction from grade 1 onwards, will decrease the already limited time available for L1 literacy teaching and, in this way, lead to learners who do not have improved L2 literacy skills in higher grades but who might, in addition, have even lower levels of L1 literacy than what the current educational system is producing. The study reported here does not claim to propose a solution for wide-spread low levels of literacy but it does provide an indication as to the value of reading intervention, something which can serve to alleviate literacy problems for learners in all grades.

I trust that, despite its limitations, the study reported in this thesis has made a contribution to our understanding of reading and reading instruction, especially in the multilingual South African context in which literacy rates are a cause for concern and language of education remains a topical issue. I hope that this study forms part of research which will one day (in the not too distant future) ensure that each and every child can receive the gift of reading.

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Appendix A
Example Lesson: Text (English original)

Giant rats haunt Cape Town

Adapted from *Cape Argus*, 5 May 2003

Cape Town has become the main breeding place for giant, infectious rats but the Unicity claims not to have the infrastructure or plans in place to control or get rid of them.

The problem was laid before the feet of the Unicity's health department but they seem to have failed dismally. Capetonians are upset at noticing more and more rats in populated areas. Council member, Saleem Mowzer, who heads merchant services let rip yesterday because Unicity's officials seem to be at logger heads about which department is responsible to deal with the rat infestation. Mowzer claims that Unicity can boast no interdepartmental cooperation and power struggles amongst officials rid them of objectivity and willingness to work together. Blame shifting for the rat problem seems to be the current norm and all departments seem to snub at responsibility. The greatest areas of rat infestation seem to be the less affluent and squatter camps. Unicity, however, have no long-term strategies in place to even try and relieve the problem.

The main cause for the infestation seems to be poor hygiene. Unless all the rubble and makeshift dump heaps in the city are cleared away, the rats will continue to breed at an alarming rate. They could very soon take over living areas. Rats thrive on rubbish! A holistic approach in which the rats and rubbish should be tackled might be the only working solution. The Cape Town mayor blames rubbish removals services for the problem and accuses them of not doing their job. However, rubbish removal does not exist in informal living areas. Neither does infrastructure such as sewerage and drainage pipes exist to get rid of excess water. Adding to this is a total lack of sanitation in these areas. Very few brick buildings exist let alone flushing toilets.

Education, training and infrastructure will be the only effective war against rats. Poisoning of rats might help but there's always the risk of children ingesting some of it, especially in informal living areas. Cape Town has rat catchers but they only capture rats in public areas such as shops and malls. Private persons, residences and residential areas have to make their own plans.

Rats usually live outside but in winter they nest in warmer inside areas. Inside the ceilings of houses seem to be the best place. The Norwegian rat is the largest species found in South Africa. They grow up to a meter long from the tips of their tails to their snouts. They enjoy living in drains and sewerage systems. One female can have up to 200 young ones per annum.

Another species found in South Africa is the Roof rat. They are much smaller than Norwegian rats but sexually mature at 8 weeks. One female can have up to 15 000 young per year.

Lastly, rats are dirty, germ infected vermin who'll eat anything possible. They spread diseases such as salmonella (which causes food poisoning) and carry fleas like taxis. If endangered or cornered, they will attack, their bites being toxic which could result in septicemia (toxic shock). This inevitably causes death. It was reported last year that a paraplegic man died from heart failure after having been severely bitten by rats. He did not realise that the creatures were feasting on his legs.

Appendix B
Example Lesson: Text (Afrikaans translation)

Reuse-rotte ry Kaapstad

Vertaal en aangepas uit *Cape Argus*, 5 Mei 2003

Kaapstad het die belangrikste broeigebied geword van reuse-, siektedraende rotte, maar het nie die infrastruktuur of planne in plek om hulle te beheer en of uit te roei nie.

Die probleem het vierkantig in die skoot van die Unistad se gesondheidsdepartement geval, maar hulle planne van werk nie. Inwoners van Kaapstad kla dat hulle meer en meer rotte opmerk.

Die grootste rotplae kom voor in die armer woonbuurtes en plakkersgebiede. Unistad het egter tot op hede geen langtermyn strategieë in plek om die probleem te probeer oplos nie.

Die grootste probleem met die rotplaag, is die stad se higiëne. Mits al die gemors nie uit die weg geruim word nie, sal die rotte aanhou broei en letterlik oorneem. Rotte floreer op gemors. 'n Holistiese benadering, waarin die rotte én die gemors getakel word, is al wat sal werk. Hoewel opvoeding en opleiding mense moet inlig oor hoe om beter higiëne toe te pas, is goeie infrastruktuur soos lopende water, spoeltoilette en gereelde vullisverwydering noodsaaklik om die probleem die hok te slaan. Vergiftiging van die rotte is ook 'n beheermaatreël, maar kinders kan niksvermoedend die gif inneem met dodelike gevolge. Kaapstad het rotvangers, maar hulle vang slegs rotte in publieke areas. Privaat huiseienaars moet hulle eie rotte beheer.

Rotte woon in die algemeen buite, maar soos die winter nader kruip, soek hulle warm, droë skuilings. Die lekkerste plek is 'n huis se dak.

Die Noorweegse rot is die grootste spesie wat ons in Suid-Afrika kry. Hulle kan tot 'n halwe meter lank word, van die punte van hulle sterte tot hulle snoete. Hulle woon die graagste in dreine. Een rotwyfie kan tot 200 kleintjies per jaar kry.

'n Tweede spesie wat ons hier kry, is die Dakrot. Hulle is kleiner as die Noorweegse rot, maar hulle is reeds seksueel ryp op 8 weke. Hulle kan 'n verbysterende 15 000 kleintjies per wyfie per jaar kry.

Verder is rotte vuil, besmette diere wat enigiets eet en orals kan wegkruip. Hulle dra siektes, versprei salmonella (die bakterie verantwoordelik vir voedselvergiftiging) en dra vlooië soos taxi's.

Indien vasgekeer, sal hulle byt en dit kan dodelik wees. Rotte wat mense lewendig opvreet, is nie altyd 'n wolhaarstorie nie. Vroeër die jaar is 'n paraplegiese man dood nadat rotte sy lewlose bene ernstig gevreet en hy toksiese skok opgedoen het. Toksiese skok is 'n toestand waarin die liggaam nie 'n infeksie kan beveg nie. Mens sterf dan gewoonlik aan hartversaking.

Ten slotte: Katte as troeteldiere en rotvangers is dalk nie 'n slegte idee nie. Maak net seker dat die kat gekastreer is. Hulle is ook bekend daarvoor om vinnig aan te teel.

Appendix C
Example Lesson: Words and Phrases

Words

Kaapstad
 infrastruktuur
 inwoners
 rotplae
 tot op hede
 rotplaag
 higiëne
 mits
 getakel
 vullisverwydering
 vergiftiging
 beheermaatreël
 niksvermoedend
 dodelike
 gevolge
 Noorweegse rot
 spesie
 snoete
 verbysterende
 besmette diere
 wolhaarstorie
 paraplegiese
 hartversaking

English translations

Cape Town
 infrastructure
 inhabitants
 rat infestations
 up until now
 rat infestation
 hygiene
 unless
 tackled
 rubbish removal
 poisoning
 control measure
 unsuspecting
 deadly
 consequences
 Norwegian rat
 species
 snouts
 perplexing
 infected animals
 rumour
 paraplegic
 heart failure

Phrases

vierkantig in die skoot geval
 toksiese skok opgedoen het
 salmonella
 (die bakterie verantwoordelik vir
 voedselvergiftiging)
 nie infeksie kan beveg nie
 privaat huiseienaars
 rotvangers publieke areas
 die probleem die hok te slaan
 holistiese benadering tot
 uit die weg geruim
 floreer op gemors
 belangrikste broeigebied
 reuse-, siektdraende rotte
 langtermyn strategieë in plek
 planne in plek

English translations

laid before the feet
 experienced toxic shock
 salmonella
 (the bacteria responsible for food poisoning)

 cannot fight infection
 private home owners
 rat catchers public areas
 solve the problem
 holistic approach to
 removed
 thrive on rubbish
 most important breeding area
 huge, disease carrying rats
 long term strategies in place
 plans in place

Appendix D
Example Lesson: Retention Test (Afrikaans)

Omkring die regte antwoord:

- | | | |
|--|---|---|
| 1. Kaapstad het beheer oor hulle rotprobleem verloor. | W | V |
| 2. Inwoners van Kaapstad merk nie op dat die rotte meer word nie. | W | V |
| 3. Die grootste rotplaag kom voor in die ryk woonbuurtes van Kaapstad. | W | V |
| 4. Daar is so baie rotte in Kaapstad omdat daar baie rommel en broeiplekke is. | W | V |
| 5. Die vergiftiging van rotte is die beste beheermaatreël. | W | V |



Beantwoord die volgende vrae. Volsinne is nie 'n vereiste nie.

1. Rotte woon gewoonlik buite. Wanneer wil hulle binne woon?

2. Watter soort rot is die grootste rot wat ons in Suid-Afrika aantref?

3. Hoe groot word bogenoemde rot?

4. Wat eet rotte?

5. Wanner sal 'n rot jou byt?

Skryf enige feit(e) wat jy uit hierdie leesstuk geleer het, neer.

Appendix E
Example Lesson: Retention Test (English translation)

Circle the correct answer:

- | | | | |
|----|--|----------|----------|
| 1. | Cape Town has lost control of its rat problem. | T | F |
| 2. | Inhabitants of Cape Town do not notice that the number of rats is increasing. | T | F |
| 3. | The biggest rat infestation occurs in the rich neighbourhoods of Cape Town. | T | F |
| 4. | There are so many rats in Cape Town because there is so much rubbish and there are so many breeding areas. | T | F |
| 5. | Poisoning rats is the best control measure. | T | F |

Answer the following questions. Full sentences are not required.

1. Rats usually live outside. When do they want to live inside?

2. Which type of rat is the biggest type that is found in South Africa?

3. How big can the above-mentioned rat grow?

4. What do rats eat?

5. When will a rat bite you?

Write down any fact(s) that you have learned from this reading.

Appendix F
Example Lesson: Comprehension Test (Afrikaans)

BEGRIP - JY MAG DIE LEESSTUK RAADPLEEG.

Begripsvlak (*verstaan feitlike inligting*)

1. Wat bedoel ons met: "vierkantig in die skoot geval"? (2)
2. Verduidelik waarom rotte in die winter binne huise se dakke sal woon. (2)
3. Wat word bedoel met: *die probleem moet hok geslaan word*? (2)
4. Verduidelik waarom daar so baie rotte in Kaapstad is. (2)
5. Waarom kan die rotvangers nie die rotprobleem oplos nie? (2)
6. Waarom is vergiftiging nie die beste manier om rotte uit te roei nie? (2)

Toepassingsvlak (*toepassing van aangeleerde inligting op 'n nuwe situasie*)

7. Kan jy aan twee ander oplossings dink vir die rotprobleem in Kaapstad? (4)

Analisevlak (*opbreek van inligting in dele en 'n begrip van die belangrikheid van elke onderdeel*)

8. Wat is die twee dinge wat gelyktydig aangespreek moet word om die rotprobleem op te los? (2)
9. Wat was die belangrikste rede waarom daar so baie Dakrotte is? (2)

Sintesevlak (*samevoeging van idees om iets nuut te vorm*)

10. Wat sal gebeur as die rotte nie onder beheer gebring word nie? (2)

Evalueringvlak (*'n waardebepaling op grond van kriteria*)

11. Kan dit regtig gebeur dat rotte mense lewendig opvreet? Gee ten minste twee redes vir jou antwoord. (3)

TOTAAL 25

SOEK SO VINNIG MOONTLIK EEN WOORD UIT DIE LEESSTUK VIR:

hulpbronne soos: geboue, paaie, water, mense, dienste	
mense wat in 'n dorp of stad woon	
'n plan van aksie	
as jy van niks vermoed nie	
groeï goed en baie vinnig	
bakterieë wat voedselvergiftiging veroorsaak	
toestand waar die liggaam nie 'n infeksie kan beveg nie	

Appendix G
Example Lesson: Comprehension Test (English translation)

COMPREHENSION QUESTIONS - YOU MAY CONSULT THE READING.

Comprehension level (understand factual information)

1. What do we mean with "laid squarely at the feet of"? (2)
2. Explain why rats will live inside the roofs of houses in the winter. (2)
3. What is meant with: *die probleem moet hok geslaan word* (idiomatic expression for "solving a problem")? (2)
4. Explain why there are so many rats in Cape Town. (2)
5. Why can the rat catchers not solve the problem? (2)
6. Why is poisoning not the best way to exterminate rats? (2)

Application level (application of learnt information to new situations)

7. Can you think of two other solutions to the rat problem in Cape Town? (4)

Analysis level (breaking information down into components and understanding the importance of each component)

8. What are the two problems that must be addressed simultaneously in order to solve the rat problem? (2)
9. What is the most important reason why there are so many roof rats? (2)

Synthesis level (combining ideas to form something new)

10. What will happen of the rats are not brought under control? (2)

Evaluation level (a value assessment on the basis of criteria)

11. Can it really happen that rats eat people alive? Provide at least two reasons for your answer. (3)

TOTAL 25

AS QUICKLY AS POSSIBLE FIND ONE WORD IN THE READING FOR:

resources such as: buildings, roads, water, people, services	
people who live in a town or city	
a plan of action	
when you do not suspect anything	
grow well and very fast	
bacteria that cause food poisoning	
condition in which the body cannot fight an infection	

Appendix H Language Background Questionnaire

Deelnemernommer: _____

Alle inligting op hierdie vraelys sal as streng vertroulik hanteer word

A. Persoonlike inligting

Van: _____

Voornaam: _____

Telefoonnommer: _____

Adres: _____

E-pos: _____

Geslag: Manlik ____ Vroulik ____

Geboortedatum: _____

Geboorteplek: Stad _____ Land _____

Indien jy nie in Suid-Afrika gebore is nie, hoe lank bly al hier? _____

B. Eerstetaal (Moedertaal)

Wat is jou eerstetaal? _____

Wat is die eerstetaal van jou ma?: _____ pa?: _____

Watter taal(e) het jy as jong kind by die huis gepraat? _____

C. Skoolopleiding en Taalgebruik

In watter taal het jy jou skoolopleiding ontvang?

Laerskool _____

Hoërskool _____

Watter taal(e) gebruik jy:

By die huis	
In sosiale situasies	
By die skool	

D. Tweedetaal: Engels

Hoe lank is jy reeds blootgestel aan Engels? _____

Vir hoe lank ontvang jy al onderrig in Engels as tweedetaal? _____

Ongeveer hoeveel ure per week gebruik jy Engels buite die klaskamer? _____

Ongeveer hoeveel ure per week is jy blootgestel aan Engels buite die klaskamer? _____

Maak jy gebruik van enige ander hulpmiddele om Engels aan te leer (bv. handboeke, opvoedkundige videos of bandopnames, televisie, ekstra klasse)? Indien wel, spesifiseer asseblief:

Beoordeel asseblief jou taalvaardighede in Engels asook in alle ander tale wat jy ken

(bv. Xhosa, Frans, Duits) ***buiten*** jou moedertaal:

(Gebruik die volgende afkortings: S=swak ; G= gemiddeld; V= gevorderd; BM=byna moedertaalstandaard.)

	Afrikaans	Engels	_____	_____	_____
Lees					
Skryf					
Praat					
Luister					
Algemene Taalvaardigheid					

Baie dankie vir jou tyd!

Appendix I Text for L1 Afrikaans reading test

Selkletsdiens bied nou wiskundelesse

From *Die Burger* 6 June 2009

Spreek die woord MXit en **menige** ouer kry so 'n warm gevoel onder die kraag en verbied onmiddellik hul kinders om hul selfone te gebruik.

Dié kletskamer gaan egter binnekort gebruik word om leerders meer van wiskunde te leer en hoe om wiskunde-probleme op te los. Die MXit-kletskamer gaan van volgende week by twee Wes-Kaapse skole ingespan word om vir eers net gr.10-leerders te leer om oplossings te vind. Dié skole is die Kaapse Akademie vir Wiskunde, Wetenskap en Tegnologie in Tokai en die Hoërskool Wittebome in Wynberg.

'n Opgewonde mnr. Greg van Schalkwyk, hoof van die Kaapse Akademie, het gesê die innovasie en gebruik van tegnologie gaan net help dat sy leerders se punte verbeter. Van Schalkwyk het gesê dit is 'n feit dat **feitlik** alle tieners MXit gebruik. "By my skool MXit meer as 99% van die leerders."

Hy het gesê deur dié diens kan hul wiskunde-onderwyser, mnr. Jerome Meyer, vir hulle smiddae ná skool, saans of selfs deur die dag take van sy skootrekenaar SMS. Leerders kan dus reg deur die dag gehelp word. Leerders sal gemiddeld 15 vrae kry waardeur hulle moet werk. "Deur middel van die tegnologie wat op die fone gelaai word, kan ons sien hoe hulle die probleem aanpak, wat die **struikelblokke** is en wat die oplossings is," het hy gesê. "Die volgende oggend kan mnr. Meyer vir hulle wys waar hulle gefouteer het en ook hoe hulle gevaar het."

Van Schalkwyk het bygevoeg dat terwyl leerders met hul take op MXit besig is, hulle nie ander kletskamers kan binnegaan nie en dat hierdie diens vir hulle heeltemal **gratis** is. Hulle hoef nie vir ekstra klasse te betaal nie. Leerders wat nie selfone het nie of wie se selfone nie kan MXit nie, sal soos die onderwysers selfone kry om aan die projek deel te neem.

Van Schalkwyk, Meyer en twee onderwysers aan die Hoërskool Wittebome is die enigste onderwysers in die Wes-Kaap wat opgelei is om aan hierdie projek te werk. Die projek, wat Imfundo Yami Imfundo Yethu genoem word, is 'n gesamentlike program van die nasionale departement van onderwys, Nokia Suid-Afrika, die MXit-groep en 'n maatskappy in Finland wat die wiskunde-sagteware ontwerp het.

Appendix J
L1 Afrikaans reading test

Vraag 1 (Retensie)

BEANTWOORD HIERDIE VRAE **SONDER OM DIE LEESSTUK TE RAADPLEEG.**

Omkring slegs die regte simbool.

1. Vir watter graad gaan daar Wiskunde-lesse op Mixit aangebied word?

- a. graad 10
- b. graad 11
- c. graad 8
- d. graad 8-12

2. Hoeveel tieners gebruik MXit?

- a. meer as die helfte
- b. feitlik alle tieners
- c. minder as die helfte
- d. baie

3. Hoeveel gaan die leerders vir die diens betaal?

- a. niks
- b. R 99 per kwartaal
- c. R 600 per kwartaal
- d. net 'n eenmalige bedrag van R100 om aan te sluit

4. Wat gaan die leerders doen wat nie selfone het nie?

- a. buite speel
- b. op die rekenaar werk
- c. hulle gaan verniet selfone kry
- d. die onderwyser leen sy selfoon vir hulle

5. Watter twee voordele hou die Wiskunde lesse op Mxit in?

- a. dis lekker en moeilike werk word behandel
- b. hulle kry minder huiswerk en take
- c. dis gratis en hulle kan nie in ander kletskamers ingaan nie
- d. dit is goedkoop en hulle kry beter punte

TOTAAL 10

Vraag 2 (Begrip)

BEANTWOORD HIERDIE VRAE STRENG VOLGENS DIE INSTRUKSIES.

JY MAG DIE TEKS RAADPLEEG.

Beantwoord alle vrae in **een saaklike volsin**, tensy anders gevra word.

- 1. Wat word bedoel met die volgende: "'n warm gevoel onder die kraag"? (par.1) (2)
- 2. Wat is die doel van die Wiskunde-projek? (par.4) (1)

3. Kan jy aan nog 2 voorbeelde dink hoe Mixit ingespan kan word om leerders se skoolpunte te verbeter? (2)
4. Om Wiskunde op Mixit te onderrig hou baie voordele in. Noem 3 voordele volgens die teks. (2)
5. Wat is jou mening oor die Wiskunde-projek? Sal dit regtig suksesvol kan wees? Staaf jou antwoord met ten minste 2 voorbeelde uit die teks. (3)

TOTAAL 10

Vraag 3 (Woordeskat)

1. Haal een woord uit die leesstuk aan wat dieselfde beteken as: *'n nuwe uitvinding*.
2. Gee 'n sinoniem (een woord met min of meer dieselfde betekenis) vir:
 - 2.1 gratis
 - 2.2 menige
3. Verduidelik wat die volgende beteken: (Jy kan 'n sin maak, of die woord verduidelik.)
 - 3.1 feitlik
 - 3.2 struikelblok

TOTAAL 10

Appendix K
Text for L2 English reading test

Spitting to Survive
by Liana Mahoney

Spit keeps our mouths moist and softens our food when we chew. Without spit in our mouths, we would have a hard time talking. We would find it even harder to swallow. But for some animals, spit works better after it has left the mouth. Some animals are **experts** at surviving because they are expert spitters.

Llamas are animals often found in petting zoos and farms. These animals seem to like their personal space. A llama that feels threatened or **annoyed** will spit slimy gobs at you to get you to leave it alone. Sometimes llamas even spit on each other to steal food! This trick usually works, because llama spit includes food from the llama's stomach, and it can be quite smelly. When a llama spits on another animal, the animal usually loses its **appetite** and walks away, leaving its food behind.

The archer fish is a very skilled spitter. This fish is like a submarine with a loaded weapon. It takes aim and spits jets of water at insects and other small creatures to knock them into the water. Then it gulps them down quickly. To create such a forceful stream of water, an archer fish closes its gills, and uses its tongue to form a tube in its mouth. Then the fish sticks its snout out of the water and aims. Aim! Launch! Lunch!

Spitting cobras are also known for their expert aim. These snakes spray poisonous venom from their fangs to protect themselves. Scientists believe that these snakes actually aim for the eyes! When the cobra's venom gets into the eyes of an animal, the venom causes terrible pain, and even blindness. This gives the snake plenty of time to get away. Spitting is considered to be **rude** behaviour in people. But for some animals, spitting can be a smart way to get lunch – or a clever way to avoid becoming lunch!

Retrieved from http://www.jlawrance.com/Spitting_to_Survive.doc November 2010.

Appendix L
L2 English reading test

Question 1 (Retention)

ANSWER THESE QUESTIONS **WITHOUT REFERRING TO THE TEXT.**
Simply circle the correct answer.

1. Where do we usually find llamas?

- a. In a nature reserve
- b. In a zoo and on farms
- c. In mountains
- d. In the wild

2. What do llamas seem to like?

- a. Their personal space
- b. Food
- c. Humans to play with
- d. Other animals

3. Which animal creates a forceful stream of water to capture insects?

- a. humans
- b. archer fish
- c. spitting cobras
- d. llamas

4. If the venom of a cobra gets into the eyes of an animal, it causes:

- a. bleeding and blindness
- b. terrible scars
- c. pain and blindness
- d. itching and pain

5. What is the author's purpose for writing this passage?

- a. to tell funny stories about animals
- b. to teach the reader how animals survive
- c. to express opinions about animals
- d. to show how animals are different

TOTAL 10

Question 2 (Comprehension)

ANSWER THESE QUESTIONS STRICTLY ACCORDING TO THE INSTRUCTIONS.
YOU MAY REFER TO THE TEXT.

Answer all questions in **one concise full sentence**, unless you are asked to do otherwise.

- 1. List any two ways spit helps humans. (2)
- 2. Name two reasons a llama might choose to spit. (2)

- 3.1 With what does the author compare the archer fish? (1)
- 3.2 Is this comparison successful? Give a reason for your answer. (1)
4. How does a spitting cobra use its spit to protect itself? (2)
5. What is the difference between animals and humans with regard to spitting? (2)

TOTAL: 10

Question 3 (Vocabulary)

1. Quote one word from the passage that has more or less the same meaning as: *poison*.
2. Give an antonym (one word with the opposite meaning) for the following word in the passage: *rude*.
3. Explain, either in a sentence or in your own words, the meaning of the following words:
- 3.1 experts
- 3.2 annoyed
- 3.3 appetite

TOTAL: 10

Appendix M
Individual results on L1 and L2 reading tests

Table M1. L1 Afrikaans pre-test results: Experimental group

L1 Afr PRE-test (E-group)					
Participant	W.P.M.	RET.	COMP	VOCAB	TOTAL
#		10	10	10	30
E1	124	10	4	4	18
E2	118	6	4	0	10
E3	80	8	6	4	18
E4	108	10	4	2	16
E5	81	8	4	0	12
E6	144	10	5	4	19
E7	81	4	4	8	16
E8	181	6	8	4	18
E9	172	8	2	4	14
E10	115	8	4	4	16
E11	132	8	7	2	17
E12	138	6	1	1	8
E13	245	8	8	10	26
E14	191	8	6	4	18
E15	129	8	6	4	18
E16	148	10	6	8	24
E17	92	8	3	4	15
E18	143	10	2	4	16
E19	140	10	0	1	11
E20	119	6	4	1	11
E21	114	10	4	4	18
E22	164	8	6	4	18
E23	131	6	1	1	8
E24	191	6	3	1	10
E25	95	8	2	4	14
E26	96	6	0	4	10
E27	182	8	0	0	8

Table M2. L1 Afrikaans Pre-test results: Control group

L1 Afr PRE-test (C-group)					
Participant	W.P.M.	RET.	COMP	VOCAB	TOTAL
#		10	10	10	30
C1	143	8	2	9	19
C2	87	4	2	4	10
C3	154	6	6	6	18
C4	162	10	5	1	16
C5	181	8	2	1	11
C6	90	8	5	6	19
C7	118	10	5	1	16
C8	113	10	7	1	18
C9	132	10	3	1	14
C10	133	8	7	1	16
C11	154	6	7	4	17
C12	156	6	2	0	8
C13	108	10	6	10	26
C14	103	8	6	4	18
C15	143	8	4	6	18
C16	169	8	10	6	24
C17	134	6	5	4	15
C18	181	8	7	1	16
C19	123	8	2	1	11
C20	111	6	4	1	11
C21	135	10	4	6	20
C22	133	6	8	4	18
C23	137	4	3	1	8
C24	95	4	5	1	10
C25	204	6	4	4	14
C26	127	8	1	1	10
C27	60	4	2	1	7

Table M3. L1 Afrikaans Post-test results: Experimental group

L1 Afr POST-test (E-group)					
Participant	W.P.M.	RET.	COMP	VOCAB	TOTAL
#		10	10	10	30
E1	201	10	6	1	17
E2	200	6	8	6	20
E3	248	6	7	6	19
E4	191	8	8	6	22
E5	125	8	6	4	18
E6	320	10	5	6	21
E7	240	4	5	8	17
E8	377	6	10	6	22
E9	254	6	9	4	19
E10	215	8	7	4	19
E11	254	8	7	4	19
E12	278	6	7	8	21
E13	377	10	10	10	30
E14	316	6	7	6	19
E15	189	6	10	6	22
E16	377	6	10	8	24
E17	147	8	7	6	21
E18	265	10	6	6	22
E19	143	10	6	4	20
E20	178	8	5	4	17
E21	223	8	8	8	24
E22	240	8	6	6	20
E23	94	6	8	2	16
E24	260	8	5	4	17
E25	274	6	8	4	18
E26	149	6	7	6	19
E27	316	8	4	6	18

Table M4. L1 Afrikaans Post-test results: Control group

L1 Afr POST-test (C-group)					
Participant	W.P.M.	RET.	COMP	VOCAB	TOTAL
#		10	10	10	30
C1	252	8	5	8	21
C2	133	8	5	8	21
C3	250	8	2	4	14
C4	218	8	5	2	15
C5	196	8	2	4	14
C6	165	8	3	4	15
C7	175	8	7	4	19
C8	171	8	6	4	18
C9	153	10	7	4	21
C10	180	8	6	4	18
C11	248	6	7	7	20
C12	216	8	5	3	16
C13	113	10	8	8	26
C14	121	10	4	4	18
C15	171	8	7	6	21
C16	240	10	8	4	22
C17	210	8	5	8	21
C18	190	8	3	4	15
C19	317	8	2	6	16
C20	143	8	2	4	14
C21	201	8	3	4	15
C22	184	10	4	4	18
C23	167	4	2	4	10
C24	238	10	4	4	18
C25	184	10	3	4	17
C26	160	8	3	4	15
C27	161	8	3	4	15

Table M5. L2 English Pre-test: Experimental group

L2 Eng PRE-test (E-group)					
Participant	W.P.M.	RET.	COMP	VOCAB	TOTAL
#		10	10	10	30
E1	152	10	3.6	6	19.6
E2	87	1	3.6	1	5.6
E3	56	8	6.2	1	15.2
E4	105	8	6	8	22
E5	60	4	1	0	5
E6	148	6	7	4	17
E7	71	4	4	6.2	14.2
E8	145	10	6.2	8	24.2
E9	159	10	5	6	21
E10	142	8	3.8	1	12.8
E11	141	10	3.8	1	14.8
E12	147	6	5	6	17
E13	183	10	7.5	6	23.5
E14	200	10	8.8	8	26.8
E15	95	10	6.2	4	20.2
E16	111	10	5	4	19
E17	68	8	7.5	6	21.5
E18	105	8	6.2	4	18.2
E19	98	4	5	6	15
E20	112	10	5	4	19
E21	113	6	7.5	1	14.5
E22	136	8	5	4	17
E23	68	8	2.5	1	11.5
E24	153	6	6.2	6	18.2
E25	105	10	5	4	19
E26	77	10	2.5	6	18.5
E27	124	10	3.6	6	19.6

Table M6. L2 English Pre-test: Control group

L2 Eng PRE-test (C-group)					
Participant	W.P.M.	RET.	COMP	VOCAB	TOTAL
#		10	10	10	30
C1	114	1	5	6	12
C2	174	8	2.5	1	11.5
C3	166	4	7.5	6	17.5
C4	131	10	7.5	4	21.5
C5	72	0	2.5	4	6.5
C6	112	8	5	4	17
C7	131	8	2.5	1	11.5
C8	105	8	7.5	8	23.5
C9	105	10	7.5	4	21.5
C10	141	8	2.5	1	11.5
C11	153	10	5	10	25
C12	131	10	5	1	16
C13	118	10	6.2	4	20.2
C14	99	8	6.2	10	24.2
C15	141	10	8	4	22
C16	159	10	8.8	1	19.8
C17	143	10	6.2	8	24.2
C18	145	8	5	4	17
C19	118	10	5	1	16
C20	107	10	2.5	6	18.5
C21	145	4	5	6	15
C22	112	8	5	4	17
C23	129	6	3.8	1	10.8
C24	94	8	6.2	6	20.2
C25	168	7	8	4	19
C26	131	8	7.5	6	21.5
C27	81	6	2.5	0	8.5

Table M7. L2 English Post-test: Experimental group

L2 Eng POST-test (E-group)					
Participant	W.P.M.	RET.	COMP	VOCAB	TOTAL
#		10	10	10	30
E1	211	10	9	7	26
E2	244	10	10	6	26
E3	185	10	8	4	22
E4	266	8	10	9	27
E5	85	8	4	0	12
E6	243	10	9	10	29
E7	108	6	5	2	13
E8	320	10	10	8	28
E9	215	8	9	10	27
E10	227	8	5	8	21
E11	259	10	10	8	28
E12	260	4	8	8	20
E13	320	8	10	10	28
E14	320	8	10	10	28
E15	145	8	10	8	26
E16	298	10	10	6	26
E17	137	10	10	8	28
E18	201	8	8	6	22
E19	138	10	10	4	24
E20	159	8	4	7	19
E21	220	10	9	10	29
E22	222	8	9	3	20
E23	70	10	5	4	19
E24	320	8	8	6	22
E25	242	8	9	10	27
E26	320	10	6	8	24
E27	224	8	7	8	23

Table M8. L2 English Post-test: Control group

L2 Eng POST-test (C-group)					
Participant	W.P.M.	RET.	COMP	VOCAB	TOTAL
#		10	10	10	30
C1	251	8	5	1	14
C2	159	10	3	8	21
C3	168	10	7	2	19
C4	193	8	5	4	17
C5	153	8	2	8	18
C6	190	6	5	4	15
C7	169	10	6	4	20
C8	154	10	9	6	25
C9	148	10	7	8	25
C10	148	10	8	8	26
C11	244	10	8	10	28
C12	153	10	8	6	24
C13	108	8	9	8	25
C14	153	6	5	10	21
C15	171	10	8	8	26
C16	227	8	5	2	15
C17	227	10	10	10	30
C18	183	10	7	6	23
C19	312	8	8	8	24
C20	81	6	7	6	19
C21	173	10	7	8	25
C22	137	10	8	10	28
C23	157	8	7	8	23
C24	154	10	3	6	19
C25	116	8	8	10	26
C26	165	8	7	8	23
C27	152	8	6	2	16