The relationship between narrative skills and reading comprehension: when mainstream learners show signs of specific language impairment

by
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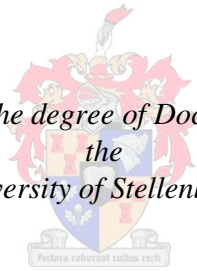

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ABSTRACT

The attainment of literacy is crucial for survival in a modern industrialised, knowledge-driven society. Children with poor language skills are at risk for academic failure because of the differences between oral language used in daily interactions and the language skills needed to succeed in a formal school environment. The impact of poorly developed oral language skills on the successful acquisition of reading skills, particularly reading comprehension, is often underestimated in the education of young learners in South Africa. Narrative skills form the bridge between oral language and literacy by providing experience in using the extended and decontextualized discourse units that children will encounter in written language. This study investigated the relationship between narrative skills and reading comprehension skills in young learners who are developing literacy. Specific linguistic markers of literacy in the narratives of a group of Grade 3 learners from communities with low socio-economic status were examined.

The main research questions this study attempted to answer were: "How do linguistic deficits of learners with poor reading comprehension and specific reading comprehension deficits manifest in their oral narratives?" and "Are there linguistic markers that decisively distinguish between learners with specific reading comprehension deficits and learners with general poor reading skills as compared to learners with normal reading comprehension?" In a quasi-experimental research design, the Grade 3 participants in this study were assigned to three groups: Readers who are competent at word level and comprehension (good reading comprehension group), readers who are competent at word level but poor at comprehension (specific comprehension disorder group) and readers who are poor at both word level and comprehension (poor reading comprehension group). Measurement protocols were used to assess the linguistic variables of interest, namely vocabulary, narrative micro- and macrostructure structure, cohesion, coherence and other aspects of oral language. The results of this study confirmed the relationships between language skills and reading comprehension. It was found that readers with general poor reading skills performed significantly poorer on a variety of linguistic measures than readers with good reading comprehension. The group identified as readers with specific reading comprehension disorders were, in general, not significantly different from the other two groups. This study therefore did not provide clear evidence that readers with specific reading comprehension disorders presented with linguistic markers that could differentiate them from the other groups. The clinical implications for speech-language therapists and educators with regards to assessment and intervention were highlighted.

OPSOMMING

Die behaling van geletterdheid is noodsaaklik om te oorleef in ‘n moderne, geïndustrialiseerde en kennisgedrewe samelewing. Kinders met swak taalvaardighede loop die risiko om akademies te faal weens die verskille tussen die orale taal wat alledaags gebruik word en die taalvaardighede wat vereis word om sukses in formele skoolomgewings te behaal. Die impak van swak orale taalvaardighede op die suksesvolle aanleer van leesvaardighede, spesifiek leesbegrip, word dikwels onderskat in die onderrig van jong Suid-Afrikaanse leerders. Narratiefvaardighede vorm die oorgang tussen orale taal en geletterdheid omdat narratiewe ondervinding verskaf in die gebruik van uitgebreide en gedekontekstualiseerde diskoerseenhede wat kinders in skryftaal teëkom. Hierdie studie het die verband tussen narratiefvaardighede en leesbegrip in jong kinders wat besig is om gelettedheid te ontwikkel, ondersoek. Spesifieke linguistiese merkers vir geletterdheid in die narratiewe van ‘n groep Graad 3 leerders van lae sosio-ekonomiese status, is ondersoek.

Die hoof navorsingsvrae van die studie was: “Hoe manifesteer die linguistiese gebreke van leerders met swak leesbegrip en spesifieke leesbegripsprobleme in hul orale narratiewe?” en “Is daar linguistiese merkers wat afdoende onderskei tussen leerders met spesifieke leesbegripsprobleme en leerders met algemene swak leesvaardighede?” In ‘n kwasi-eksperimentele ontwerp is die deelnemers aan hierdie studie toegeken aan drie groepe: Lesers wat bevoeg is op woordvlak en begripsvlak (groep met goeie leesbegrip), lesers wat bevoeg is op woordvlak, maar met swak begrip (groep met spesifieke leesbegripsprobleme) en lesers wat onbevoeg is op woordvlak en begripsvlak (groep met algemene swak leesvaardighede). Protokolle is gebruik om die linguistiese veranderlikes, naamlik woordeskat, narratief mikro- en makrostruktuur, kohesie, koherensie en ander aspekte van verbale taal, te meet. Die resultate van hierdie studie het die verband tussen taalvaardighede en leesbegrip bevestig. Daar is gevind dat lesers met algemene swak leesvaardighede, in vergelyking met lesers met goeie leesbegrip, beduidend swakker presteer het op verskeie linguistiese metings. Die groep wat geïdentifiseer is as lesers met spesifieke leesbegripsprobleme het, oor die algemeen, nie beduidend van die ander twee groepe verskil nie. Hierdie studie het dus nie duidelike bewyse gevind dat lesers met spesifieke leesbegripsprobleme linguistiese merkers vertoon het wat hulle van die ander twee groepe kon onderskei nie. Die kliniese implikasies vir spraak-taalterapeute en opvoeders met betrekking tot assessering en intervensie is toegelig.

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CHAPTER 1

1.1 INTRODUCTION

The attainment of literacy and the development of such literacy to ensure academic success are crucial for survival in a modern industrialised, knowledge-driven society. Poor literacy is a decisive barrier to the economic empowerment of many people in the developing world.

The UNESCO Education for All campaign (EFA) makes a forceful statement about the benefits of high quality education by affirming that good schooling is directly linked to improvement in individual worker productivity and national economic potential. Quality education leads to enhanced cognitive development of learners and fosters traits such as honesty, reliability, determination, leadership ability and willingness to work within the hierarchies of modern society. Non-cognitive skills such as creativity, originality and intolerance of injustice are additional benefits of good education that produce broader benefits for society in general. Good quality education is linked to aspects of individual behaviour such as healthy lifestyle, enhanced personal decision making and informed choices regarding risk behaviour. Improved levels of education and literacy, particularly in woman, are strongly related to lower incidences of HIV/AIDS as has been demonstrated in countries like Uganda (UNESCO, 2004:45). Considering such links between literacy, education and quality of life, the assurance of quality education is particularly pertinent in South Africa where infant mortality is exceptionally high (59 per 1000 live births) and where 40% of all deaths of infants under the age of five are directly AIDS-related (Lake and Marera, 2009:90).

In South Africa today a high percentage of learners make poor academic progress and leave school without the literacy skills they need to ensure economic survival. Despite being the most industrialised country in Africa, the literacy and numeracy achievements of South African children are among the worst in the world and even compare poorly to those of lesser developed African countries (Bloch, 2009:17). To succeed economically in the global community individuals have to possess high levels of information processing and literacy skills, and Stanovich (2000:391) aptly states that the “crisis” of low literacy levels has come

about because of rising *demands* for literacy – not because absolute levels of literacy are falling.

National performance in reading often reflects the effectiveness of a country's education system. Data from the 2006 Progress in International Reading Study (PIRLS) published in 2008 by the International Association for Evaluation of Educational Achievement (IEA) showed that South African learners obtained the lowest scores of 42 participating countries. Thirty thousand learners across all the provinces in South Africa took part in the study and were assessed in their home languages. Compared to the fixed international average scale score of 500, South African Grade 5 participants obtained an average scale score of 302 (SD 5.6). Participants in Morocco, the only other African country taking part in PIRLS 2006, obtained an average scale score of 323 (SD 5.9) (Howie Venter, Van Staden, Zimmerman, Long, Du Toit, Scherman and Archer, 2008:18).

Results for South African participants showed that only 13% of Grade 4 learners and 22% of Grade 5 learners reached the Low International Benchmark, whereas only 2% of Grade 5 learners reached the Advanced International Benchmark[1]. The Low International Benchmark describes the most basic level of reading skills and strategies, such as the ability to recognise, locate and reproduce information explicitly stated in texts. It is therefore of great concern that 50% of South African participants tested in Afrikaans and English and more than 80% of learners tested in African languages, have not attained the basic levels of reading skills and strategies[2] (Howie et al., 2008:27).

Low literacy levels of learners are already apparent in the foundation phase, i.e. in Grades 1-3 of primary school classes. Large-scale assessments in the Western Cape in 2004

[1] The international average of participants in the PIRLS 2006 reading achievement scale was set at 500. The range of performances of participants is represented by four benchmarks: The Advanced International Benchmark set at 625; the High International Benchmark set at 550; the Intermediate International Benchmark set at 475; and the Low International Benchmark set at 400. The purpose of the benchmarks was to provide qualitative descriptions of learners' performances on scales in relation to the reading comprehension questions that formed part of the assessments (Howie et al., 2008:25).

[2] The international median for participants that reached the low benchmark was 94%, whereas 98% of participants in the top performing country, the Russian Federation, reached this benchmark (Howie et al., 2008:25).

indicated that the majority of Grade 3 learners fail to pass standardised literacy tests at Grade 3 level. Assessment of the reading skills of 34 487 Grade 3 learners in 1 093 schools in 2004 showed that an average of only 39.5% of the learners passed the literacy test at Grade 3 level[3]. The assessments identified weak reading comprehension as the main problem in the poor literacy performance.

Children with poor language skills are at risk for academic failure because of the differences between oral language used in daily interactions and the language skills needed to succeed in a formal school environment. One of the main tasks facing young children in becoming literate is discovering the interrelationships between oral language and literacy. Narrative skills form the bridge between oral language and literacy by providing exposure to and experience in using the extended, decontextualized, cohesive discourse units that children will encounter in written texts. Within the field of speech-language therapy much attention has been devoted to problems in literacy development where there is a related pathology such as Specific Language Impairment (SLI)[4] (cf. Leonard, 1998:186). This study is interested in literacy development in a primary school population of mainstream learners who should not exhibit a prevalence of more than 7% of SLI (Leonard, 1998:3) – seeing that that is generally accepted as the highest estimate of SLI in child populations – but who in fact do exhibit a much higher prevalence of SLI symptoms than is to be expected.

It is well-documented that children from lower socio-economic backgrounds are at risk for literacy failure. Not only are children growing up in poverty exposed to conditions associated with poor nutrition and environmental risk factors, but sociolinguists and ethnographers have demonstrated that children with insufficient literacy experiences in

[3] Since assessments started in 2002, the WCED launched strategies to improve literacy and numeracy in the Western Cape. These included diagnostic testing, classroom support, special teaching and learning support materials, teacher training, special programmes by districts and schools, and family learning activities. These initiatives resulted in improvement in the pass rate for literacy to 47.7% in 2006 and 53.5% in 2008 (WCED, 2009a).

[4] Specific language impairment (SLI) is a significant impairment in the spoken language ability of children in the absence of identifiable causal factors or obvious accompanying factors such as neurological deficits, mental challenges, hearing disabilities, and emotional or behavioural problems (Leonard 1998: vi).

the home environment are at risk for academic failure (cf. Bernstein, 1971; Heath, 1986). Lower socio-economic status (SES) is associated with less child-directed speech, lower levels of maternal education and lack of exposure to the precursors for literacy, such as experience with storybook reading and literate language, which in turn correlate with poor reading outcomes (Hoff and Tian, 2005:276; Hoff, 2006:167). This study investigated the relation between narrative skills and reading comprehension skills in young learners who are developing literacy. Particularly, this involved an investigation of specific linguistic markers of literacy in the narratives of a group of Grade 3 learners from communities with low SES.

The study population comprised 102 Grade 3 learners from four schools in Stellenbosch who took part in the abovementioned 2004 WCED study. An analysis of their reading results showed that all the learners presented with normal reading at Grade 1 level, but that only 38% passed reading tests at Grade 3 level. While all the learners could read fluently at word recognition and decoding level as required by the Grade 1 tests, 62% failed at the Grade 3 level where the focus is on reading comprehension.

1.4 READING COMPREHENSION

The *simple view of reading*[5] (Gough and Tunmer, 1986:7) states that reading comprehension is made up of two components: word recognition and language comprehension. Learners who are competent at decoding levels of reading but have poor reading comprehension, i.e. specific comprehension deficits (SCD)[6], display general

[5] This view states firstly, that reading consists of two basic and distinct components, namely word recognition and linguistic comprehension; and secondly, that both of these components are necessary for reading, neither being sufficient in itself. There can be no reading comprehension without the ability to recognize or decode words, and similarly, there can be no reading comprehension if the reader lacks the linguistic comprehension to interpret what he or she has decoded. The word recognition or decoding component translates print into linguistic information, while the comprehension component involves the skills needed to determine the intended meaning of individual words, to interpret the syntactic structure of sentences, to gain meaning from sentence structures, and to construct meaningful discourse on the basis of syntactic meaning (Gough and Tunmer, 1986:7).

[6] SCD refers to readers who, despite accurate word reading abilities, display significant deficits in reading comprehension. Research estimates that as many as 5% to 10% of school children may display deficits in reading comprehension (Cf. Nation and Snowling, 1997:360; Nation, Clarke, Marshall and Durand, 2004:200).

language comprehension deficits and not comprehension impairment specific to reading (Snowling and Hulme, 2005:400; Catts, Adloff and Weismer, 2006:290).

Plaut, McClelland, Seidenberg and Patterson (1996) proposed a connectionist model of word recognition where reading development depends on the interaction between a phonological pathway (consisting of connections between phonological and orthographical representations) and a semantic pathway (consisting of connections between semantic representations, phonology and orthography). Learners with SCD develop efficient phonological pathways, enabling them to read at decoding level, but weaknesses in vocabulary and semantic skills constrain the development of their semantic pathways, causing comprehension problems.

Learners with SCD differ from learners with specific language impairment (SLI) in that they have normal or near normal phonological and expressive syntax skills and their language problems are often not severe enough to meet the diagnostic criteria for SLI. As a result of their subtle and less obvious language problems, and fluent reading at word level, they are often not identified by teachers in mainstream schools as having reading or language impairments (Nation et al., 2004:209; Catts et al., 2006:287). Children who have linguistic impairments including deficits in semantic representations have qualitatively different reading problems than dyslexic readers (Snowling and Hulme, 2005:400).

The process of reading comprehension is a dynamic and cognitively complex activity in which the reader is required to construct cohesive[7] and coherent[8] representations of the

[7] Cohesion is a semantic concept and refers to relations of meaning that occur within a text where the interpretation of an element in the text is dependent on that of another, in other words where one element presupposes the other (Halliday and Hasan, 1976:6). Any sentence element that requires the reader to go beyond the sentence for a referent is a cohesive device (Liles, 1985:132). The five types of cohesive devices or ties identified in systemic functional grammar are *reference, substitution, ellipsis, conjunction* and *lexical* items.

[8] A coherent mental representation allows the reader to access the information for later recall or retelling (Van den Broek, Kendeou, Kremer, Lynch, Butler, White, Lorch, 2005:109). Text must be perceived and represented in the reader's memory as a coherent structure and not as individual pieces of information. Coherence is not a property of text but seems to be the property of the mental representation or

text and to build a mental model to organize the information encountered, by means of lexical, syntactic and inference processes (Sanford and Garrod, 1994:701; Van den Broek et al., 2005:123). Reading comprehension occurs in the transaction between the reader and the text. From a psycholinguistic perspective[9] it can be stated that the goal of reading is to arrive at a mental representation of the text, and that reading comprehension is the result of the mental representations constructed by the reader.

Comprehension occurs as the reader builds a mental representation of the text message as a result of inferential[10] processes that take place during reading. Research has indicated that learners with SCD have particular problems with making inferences at word, sentence and text levels and fail to develop mental representations of what they read (Perfetti, Landi and Oakhill, 2005:231; Oakhill and Cain, 2007b:47; Yuill and Oakhill, 1991:73).

Another important aspect of comprehension is the activation of schema[11] knowledge. Schemas are hierarchically organized sets of information that enables readers, among other things, to make inferences.

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interpretation of the text. As such, coherence occurs in the mind of the reader (Sanford and Garrod, 1994:701).

[9] A psycholinguistic approach aims to study the relationship between language in its different forms and the mind by investigating the structures and processes that underlie a person's ability to speak and understand language (Stackhouse and Wells, 1997:7).

[10] The term "inference" refers to information that is not explicitly stated in the text but is activated during reading of the text, enabling the reader to establish coherence (Van den Broek, 1994:556). Categories of inferences that are needed to construct mental representations include cohesive inferences (anaphora and pronoun resolution), causal inferences, evaluative inferences (relating to the emotional outcome of events) and knowledge-based inferences (application of the reader's prior knowledge) (Bower-Crane and Snowling, 2005:192).

[11] A schema is an abstract, complex conceptual structure. It is a coherent representation of all or part of an existing or imagined reality (Duchan, 2004:381). Schema knowledge enables a person to construct mental models during reading and represent organization of the content facts, and the organizational patterns of the text, e.g. story grammar, that is independent from the content. Schemas enable skilled readers to activate background knowledge, to assimilate information coherently, to make inferences, and to monitor their own comprehension and they facilitate reconstruction of the text (Westby, 2005:162).

Schemas like story grammars[12] provide an organizational pattern that is structured in systematic ways that aid comprehension and inferencing. Nearly all the story grammars found in the narratives of Western cultures have the same content and structure. Since text comprehension involves the construction of an integrated and coherent representation of a text's meaning, one can predict that there will be a relationship between readers' ability to comprehend text and their ability to produce narratives that fit the conventionalised schemas.

1.5 READING COMPREHENSION AND ORAL LANGUAGE

Children with weak language skills (i.e. limited ability to use all of the available lexical, morphological and syntactic resources of a language at a level appropriate to their age), are at risk for academic failure. Differences between oral language used in daily interactions and the language skills needed to succeed in a formal school environment, account for a great part of such academic failure. One of the main tasks facing young children in developing literacy is discovering the interrelationships between oral language and literacy and developing understanding of a literate language[13] style.

Narrative skills form the bridge between oral language and literacy by providing exposure to and experience in using the extended, decontextualized, cohesive discourse units that children will encounter in written texts. Narrative structure arises from

[12] Story grammars provide an organizational pattern that is structured in systematic ways that aid comprehension. According to Stein and Glenn (1979) nearly all the story grammars found in the narratives of Western cultures have the same content and structure and occur in the following order: *Setting statement* (introducing the characters and describing the social, physical, or temporal context of the story); *Initiating event* (an occurrence, an activity of a character, the perception of an event, or changes in physiological state that trigger a response in characters); *Internal response*s (the emotional state of the character in response to the initiating event); *Internal plans* (indicating the characters' strategies for attaining their goals); *Attempts* (a series of actions intentionally carried out by the characters in an effort to achieve a plan); *Direct consequence*s (the success or failure of the character in achieving the goal); *Reactions* (the characters' feelings, thoughts, or actions in response to the consequences of attaining or not attaining a goal), (Cf. Stein and Glenn, 1979, Peterson and McCabe, 1991).

[13] Literate language used in textbooks and formal classrooms differs from oral conversation language in many ways. For example, literate language is decontextual, abstract and syntactically more complex. The vocabulary is more formal. Literate language is marked by certain complex language structures, such as embedding or figurative use of language, which occur naturally in written language and understanding of which is crucial for reading comprehension (Purcell-Gates, 2001:12; Westby, 2005:168).

understanding of conceptual relationships. Knowledge of schemas and the ability to structure narration according to the conventions of schemas in coherent and cohesive ways enable children to activate background knowledge, to assimilate information, to make inferences and to monitor their own comprehension. They also facilitate reconstruction during narrative production.

Research investigating text-processing skills of learners with comprehension deficits to date have focused mostly on reading accuracy and listening comprehension, assessing these skills by means of formal tests of reading ability e.g. The Neale Analysis of Reading Ability (Neale, 1997). There is very little research on learners who are adequate readers at sound, letter and word level, but experience problems at comprehension level, i.e. readers with SCD. The RAND Reading Study Group[14], an expert panel in reading research, described the present knowledge base on reading comprehension as "sketchy, unfocused, and inadequate as a basis for reform in reading comprehension instruction" (Snow, 2002:pxii). Very few studies have investigated the narration skills of children with SCD even though narratives could provide valuable information about the way that children construct mental representations of stories (cf. Cain, 2003; Nation et al., 2004). In reviewing published research outputs, no study investigating the narrative skills of learners with SCD in South Africa was found.

1.4 RESEARCH QUESTIONS, GOALS AND HYPOTHESES

1.4.1 Problem statement and focus

This study investigated the relation between oral language skills and reading skills in young learners who are developing literacy. Particularly, this involved an investigation of specific linguistic markers in the narratives of a group of Grade 3 learners from communities with low SES. A central hypothesis to be tested with an extensive set of data is that a clear relationship exists between development of certain aspects of language, specifically narrative production, and reading comprehension. It is

[14] The RAND Reading Study Group was commissioned by the United States of America Department of Education and consisted of a group of scholars in the field of reading comprehension. They produced *Reading for Understanding: Toward a Research and Development Program in Reading Comprehension* (Snow, 2002).

hypothesised that difficulties in the former (narrative production), signal equivalent difficulties in the latter (reading comprehension). It is the researcher's contention that the impact of poorly developed oral language skills on the successful acquisition of reading, particularly reading comprehension is underestimated, specifically in the education of young readers in South Africa.

The general question to be answered by this study is whether certain linguistic aspects in narratives – specifically those related to literate language features, cohesion, coherence and schema organisation – serve as markers for reading comprehension disorders. In order to answer the general question two specific questions were posed:

i) How do linguistic deficits of learners with poor reading comprehension and specific reading comprehension deficits manifest in their oral narratives?

ii) Are there linguistic markers that decisively distinguish between learners with specific reading comprehension deficits and learners with general poor reading as compared to learners with normal reading comprehension? If so, how are such linguistic markers identified?

In order to answer the two research questions the following set of aims has been articulated:

1.4.2 Aims of the study

The broad aims of the study were to investigate aspects of language and narrative skills of a group of Grade 3 learners from lower socio-economic backgrounds, and in particular, to explore the relationships between their language and narrative skills, on the one hand, and their reading comprehension abilities, on the other.

Specific aims related to the research questions given above were:

Aim 1: to compile reading comprehension profiles for participants based on their reading performances in the WCED assessments and the reading subtype model from

Catts Hogan and Fey (2003:159), and to examine the differences in aspects of reading comprehension between the three groups, namely readers who are competent readers at word level but poor at comprehension (SCD group), readers who are poor at both word level and comprehension (PC group), and readers who are competent at word level and comprehension (NC group);

Aim 2: to investigate the relationship between participants' phonemic awareness skills obtained through a phonemic awareness screening test and their reading skills;

Aim 3: to investigate the reciprocal relationship between participants' receptive vocabulary skills obtained through a formal vocabulary test and their reading comprehension skills;

Aim 4: to analyse narrative data obtained through story-retell narratives to determine the differences between the three groups for the following micro- and macrostructural variables:

- productivity (total number of words (TNW) and total number of T-units)
- lexical diversity (number of different words (NDW) and metaverbs - mental and linguistic verbs)
- syntactic complexity (number of words per T-unit, subordination, and noun phrase elaboration)
- macrostructural complexity (narrative level analyses)
- narrative cohesion (conjunction, referential cohesion and adequacy of cohesive ties)
- narrative coherence (causal event and causal link analyses);

Aim 5: to analyse the amount of information provided in participants' retell narratives (content information score, and landscape of consciousness (LOC) elements);

Aim 6: to analyse the disfluencies in participants' retell narratives (repetitions, incomplete utterances, and word and sentence revisions).

1.5 RESEARCH DESIGN

This study is an extension of the work undertaken by the researcher over the past 10 years related to developing literacy among mainstream learners from lower socio-economic backgrounds. A quasi-experimental research design was used in this study in order to test the abovementioned hypothesis and answer the research questions. Three groups of participants were formed on the basis of their reading comprehension and then compared on the basis of reading comprehension and other dependent variables to reveal the relationships which exist among the specified variables.

1.6 OUTLINE OF THESIS

The dissertation is structured in the following way. In chapters 2, 3 and 4 the literature review and theoretical framework that informed and shaped the study are presented. The key concepts and assumptions underpinning the study are discussed. Extensive research pertaining to the relationship between reading and language development exists but the literature on reading comprehension consists mainly of studies investigating reading comprehension instruction. In this study the relationship between SCD and oral language abilities are explored, specifically reading comprehension and narrative skills.

Chapter 5 documents the research design and procedures employed during the secondary data analyses. The data collection and data analysis procedures are described. The assigning of participants to subgroups to represent readers who are competent readers at word level but poor at comprehension (SCD group), readers who are poor at both word level and comprehension (PC group), and readers who are competent at word level and comprehension (NC group) on the basis of their reading comprehension levels are explained. Measurement protocols to assess the linguistic variables of interest (vocabulary, narrative micro- and macrostructure structure, cohesion, coherence and other aspects of expressive language) are described and justified.

In chapter 6 the results of analyses are described and illustrated using tables and graphs. The main trends in the data with reference to the hypotheses and research questions are

discussed. The main findings are interpreted and discussed. The analyses indicate the extent to which linguistic markers in narrative production could be found to distinguish between readers with normal reading comprehension skills and SCD. Also, the relationships between the various linguistic aspects and participants' reading levels are explored and discussed.

Chapter 7 provides conclusions based upon the findings of the study. The relevance of the study in the South African context is discussed. Recommendations regarding future research are made, specifically pertaining to investigations to determine whether the improvement of narrative skills of young readers would result in the improvement of their reading comprehension.

CHAPTER 2

LANGUAGE AND READING

2.1 INTRODUCTION

The focus of this study is on reading comprehension deficits that occur in young readers from disadvantaged backgrounds, and how these deficits manifest in the oral language production of such readers. This chapter aims to provide parts of the theoretical framework underpinning the study. *First*, processes in oral language and reading will be briefly explained to highlight the similarities and differences between them and to justify the contention that reading as a linguistic behaviour depends on adequate language development and the development of a literate language style.

Second, the broad concepts pertaining to reading, definitions of reading, models of reading, and the development of reading will be discussed. The literature reviewed will be discussed in terms of the models traditionally used to explain the development of reading and reading comprehension as well as recent models based on computer simulations. Sections 2.2, 2.3 and 2.4 aim to describe the broader theoretical constructs regarding the reading process to provide the background for sections 2.6 and 2.7 that will focus on the reading disabilities and the language and cognitive processes and components involved in reading comprehension.

Third, the broader socio-cultural context in which literacy and reading development takes place will be discussed in section 2.5 in order to provide information about the relevant socio-cultural variables which could have affected the language and literacy development of the study population.

In the section 2.5, definitions and classifications of reading disabilities will be provided based on differences in word recognition and comprehension, particularly referring to subtypes of reading disabilities and readers with specific comprehension deficits as opposed to readers with dyslexia. Research on the relationship between reading

disabilities and language disorders will be discussed to provide the rationale for the viewpoint that reading disability is a language-based disorder.

2.2 ORAL LANGUAGE AND READING

Although spoken and written language are interrelated and share many processes, there are also many important differences between them. In section 2.2 an overview of the similarities and differences between reading, literate language style and oral language will be provided.

Reading is a language-based skill that shares many of the processes and knowledge bases required by talking and listening. Snowling and Hulme (2005:397) state that reading is "parasitic on language" and that reading comprehension depends on all the domains of oral language: phonology (the rules governing the sequencing and distribution of speech sounds), morphology (rules governing words and inflections that convey meaning and have grammatical and pragmatic functions), syntax (rules governing how words are combined into larger meaningful units, e.g. sentences), semantics (rules governing the meaning of words and word combinations) and pragmatics (rules governing the use of language in context).

In a summary of the differences between reading and oral language Kamhi and Catts (2005a:23) state three main distinctions: *First*, comprehension of oral language involves analysis of the smaller phonological aspects of words by means of discrimination and identification processes, but these processes are automatic and occur unconsciously. Reading, on the other hand, requires explicit knowledge of the phonological aspects of speech to enable the reader to construct phoneme-grapheme correspondence rules. An adequate working knowledge of phonemes is a concomitant of basic oral language but deeply embedded in the subconscious layers of language. In contrast, learning to read requires explicit awareness of phonemes at a conscious metacognitive level (Adams, 1990:328).

The most obvious difference in form between speech and written language is that speech consists of phonemes while writing consists of graphemes[15] that do not always correspond with spoken sounds.

Second, the human perceptual system is biologically adapted to process oral, but not written, language. From an evolutionary perspective, reading is a new and arbitrary development for which specific biological adaptations do not yet exist.

Third, humans are biologically endowed to learn language and socialised by their communities to use oral language to communicate. Reading, on the other hand, can be described as a biologically secondary function because it is found only in certain cultures and communities; it does not develop without exposure to specific experiences and artefacts, and requires explicit and intensive training (Sénéchal, LeFevre, Smith-Chant and Colton, 2001:445). In short, although oral language and reading share the same underlying processes, reading is not a biologically innate skill and can only be acquired through explicit training.

There are considerable differences in the higher-order and contextual processes involved in written language comprehension, compared to the processing of oral language. Compared to the transient nature of speech, written language is relatively enduring and can record facts, ideas and information more permanently. Writing and reading are often individual activities and allow for the exploration of ideas in private and at leisure to clarify and expand thinking and ideas (Kamhi and Catts, 2005a:20). As a consequence, written language or a literate language style is more elaborated, abstract and complex compared to oral language.

A literate language style differs significantly from oral language in terms of vocabulary, syntax, reference conventions and pragmatic constraints. Comprehension of written texts requires readers to be familiar with the language used in textbooks and classrooms,

[15] Grapheme refers to any letter or letter sequence that represents a single phoneme, e.g. *th* and *igh* are two graphemes of the two phoneme word *thigh.*

namely decontextualised, abstract, syntactically more complex language with dense noun and propositional phrases, and more formal vocabulary than oral language (Kamhi and Catts, 2005a:20; Leseman and Van Tuijl, 2006:214; Westby, 2005:168).

Written language is abstract and decontextualised compared to oral language in the sense that there is no shared physical context between the reader and the writer of the text (Purcell-Gates, 2001:14). In order to make sense of the text, readers must form ideas from the words alone. They must therefore apply their reasoning and inferencing skills to construct mental representations from the words in the text to derive meaning from the text (McKeown and Beck, 2006:284). The complex syntax and formal vocabulary associated with literate language and written texts will be discussed in section 3.4.2.1 in the next chapter.

Academic language and school literacy discourse are loaded with information and require proficiency in a range of linguistic and metalinguistic knowledge, skills and strategies. The reader is also required to become familiar with different genres such as narrative, instructional, expository, and analytical texts, and the differences in the communicative content and goals associated with different genres (Hadley, 1998:133; Wallach, 2008:171). Literate language style features reflect the increasing oral-literacy transition as a result of the child's exposure to and experiences with books. Shared storybook reading, where parents and caregivers engage children in abstract reasoning about the content of the story, is one way to provide preschool children with valuable experiences with decontextualised written language (Van Kleeck and Van der Woude, 2003:71).

The specific language code associated with school literacy discourse has been described as *cognitive academic language proficiency* (CALP) as opposed to *basic interpersonal communicative skills* (BICS) (Cummins, 1984:137), *written language register* (Kaderavek and Sulzby, 2000:36), or *literate language style* (Westby, 1998:323). Cummins (1984:138) examined issues regarding the language proficiency needed for academic achievement in bilingual learners and distinguished between BICS and CALP as two different sets of language skills. BICS refers to early communication competence

needed to perform the functions of everyday communication in context-embedded routines. In contrast, CALP refers to the ability to use language as a tool in context-reduced settings such as academic contexts. Examples of context-reduced language are narratives, lectures and complex directives. According to Cummins' proposal language learners require 2 to 3 years' exposure to a new language to acquire BICS, but at least 5 to 7 years' exposure to acquire CALP. The implication is that second language learners, who are exposed to a language of instruction different from their mother tongue for the first time upon entering school, may only reach CALP at the end of their primary school years; Lemmer (1996:332) states that in South Africa written admissions tests measuring the language proficiency of second language learners often only assess surface elements of language such as basic vocabulary, whereas oral admission tests often only require verbal proficiency in context-embedded situations. Subsequent performance in content subjects then reveals that these learners struggle with more advanced, subject-specific vocabulary and the literate language demands of school discourse.

From a socio-cultural perspective, a literate language style is associated with what Bernstein (1971:152) described as the elaborated code used by middle class communities in contrast with the restricted code used by lower socio-economic communities (cf. Bernstein, 1971 for a review). According to Bernstein the ability to use and understand the elaborate code is crucial for academic success because of the similarities between this code and school-based discourse. The term *code* refers to a set of organizing principles behind the language employed by members of a social class; codes are functions of particular forms of relationships, or qualities of social structure (Bernstein, 1971:77). *Elaborated codes* provide a wide range of different ways to express ideas; they are more complex and therefore require more planning; they are appropriate in groups in which perspectives are not always shared, requiring speakers to express ideas and intentions explicitly. *Restricted codes* provide a narrower range of options and are therefore more predictable; they do not allow speakers to expand or elaborate on their ideas or intentions; they are appropriate in social groups with shared assumptions where there is less need to elaborate on what is meant.

Children socialised within middle-class contexts usually have access to both restricted and elaborative codes and can employ both codes depending on the demands of the communicative context. Users of the restricted code only are at a disadvantage in school because they are "limited to a restricted code" (Bernstein, 1971:136) and unfamiliar with the communicative requirements of the elaborate code. A feature of school literacy discourse is the interaction between reading and associated oral discourse, for instance, explanations provided by the teacher, verbal instructions about a reading task, discussions about previously read texts, group or individual assignments and oral presentations requiring the readers to consult a variety of texts and resources, including electronic texts (Leseman and Van Tuijl, 2006:214). (Issues pertaining to socio-cultural variables in language acquisition and the development of literate language and reading will be explored in greater detail in section 2.5 of this chapter.)

In summary, text is not speech written down or a simple derivative of oral language. Although spoken and written language share the same underlying processes, there are also considerable physical, situational and functional differences between them. Comprehension and production of written discourse require proficiency in a literate language style that differs considerably from oral discourse.

2.3 READING: A DEFINITION

The term *simple view of reading*, first proposed by Gough and Tunmer (1986:7) and to be discussed in detail in section 2.3.3, is used by most practioners and researchers to define reading. According to the *simple view of reading,* reading equals the product of decoding and comprehension, or R = D x C, where each variable ranges from 0 (nullity) to 1 (perfection). Comprehension, according to this definition, is not *reading* comprehension, but *linguistic* comprehension, that is, the process by which, given lexical (i.e. word) information, sentences and discourses are interpreted.

On this view, successful reading is the product of two components, namely word recognition and linguistic or listening comprehension. Word recognition refers to bottom-up identification of printed words whereas linguistic comprehension refers to the top-

down linguistic analyses of the semantic and syntactic relationships between the words to extract the text's meaning[16]. These two components of the *simple view* will be discussed in sections 2.3.1 and 2.3.2). Research has shown that these two aspects are dissociable and independent components of the reading process (cf. Gough and Tunmer, 1986:7; Aaron, Joshi and Williams, 1999:121; Catts, et al., 2006:279; Catts et al., 2003:151; Tunmer and Hoover, 1992:179). Results of studies investigating the effectiveness of bottom-up interventions, prediction of comprehension problems, and characteristics of readers with specific comprehension problems confirm that both components are necessary for successful reading (cf. Cutting and Scarborough, 2006 for a review of these studies).

2.3.1 Word recognition

Word recognition refers to decoding skills that translate print into a linguistic form by relating graphemes to phonemes. The two processes involved in word recognition are: i) the ability to decode written words and ii) the ability to decode words instantly and automatically (referred to as "sight-word reading").

In the *word recognition* stage of the development of reading comprehension, reading and speech share similar knowledge domains and processes, and McGregor (2004:302) states that at this stage "to read is to access the lexicon via print". The mental lexicon contains representations of the list of words of a language that a speaker has acquired and stored in memory. Included in each word's lexical entry is information about its phonological form (how it is pronounced), its lexical category (verb, noun, adverb, etc.), semantic information (what it refers to in the real world), and the syntactic environments in which it can be used (Shapiro, 1997:256). The mental lexicon contains information about the phonological and visual forms, as well as the meanings of words. Words previously stored in the mental lexicon are activated during speech or reading through perceptual analyses of their distinctive visual or auditory features. In speech the acoustic-phonetic features of a word activate a word's phonological representation in the lexicon. In reading

[16] Cf. section 2.4.1.1 for a discussion of bottom-up and top-down models of reading.

word meanings can be accessed in two ways: indirectly, through its phonological representation, or directly through its visual representation. Use of the visual representation route to the mental lexicon is known as direct, whole-word, or look-and-see approaches where the perceived visual configuration of a word is matched with its visual representation in the lexicon (Shapiro, 1997:260).

When accessing the mental lexicon by means of the phonological approach, readers use their knowledge of grapheme-phoneme correspondence rules to transform or "recode" visually perceived graphemes into matching phonemes. A word is recognised when the reader blends phonemes together in sequences corresponding to sequences in the lexicon in order to access the meaning of the word. This process is crucial in the development of successful reading and allows one to read words that one has never seen before in print. Reading by means of the phonological route and speech recognition is similar to speech recognition in that both access words in the mental lexicon through their phonological representations. Reading via the phonological route, in contrast with speech recognition, requires awareness of the phonological and phonemic structure of words at a conscious and metacognitive level (Adams, 1990:169; Kamhi and Catts, 2005b:39; McGregor, 2004:312).

2.3.2 Listening comprehension

Listening comprehension refers to the processes used to interpret words, sentences and discourse in oral language. A high correlation between listening comprehension and reading comprehension has been established by research studies (Tunmer and Hoover, 1992:179; Catts et al., 2006:279). Definitions and models of reading comprehension will be discussed in greater detail in section 2.4.

2.3.3 The simple view of reading

Although called "simple", the *simple view of reading* does not deny that reading is an extremely complex process, but rather suggests that these complexities can be grouped into two distinct components. The two components are combined in a multiplicative way, as opposed to an additive combination. The multiplicative notion states that the degree of

improvement in reading that is accomplished by improvement in any one of the two components is dependent on the level of skill in the other component (Tunmer and Hoover, 1992:179).

The two components are considered to be equally important, neither being sufficient in isolation to foster successful reading. Word recognition without the necessary linguistic skills to derive meaning from individual words and sentences to extract meaning from discourse, does still not constitute reading. Conversely, without word recognition, none of the linguistic processes involved in reading comprehension can take place.

The main objection by critics of the *simple view* is that this model fails to account for all the other variables involved in proficient reading, for example, vocabulary knowledge of the reader, general world knowledge possessed by the reader, the reader's motivation to read successfully, socio-cultural factors, working memory and speed of processing (Aaron, Joshi, Gooden and Bentum, 2008:69). Furthermore, the role of oral language and/or linguistic comprehension in reading comprehension has also not been confirmed by intervention studies. As yet, there is no conclusive evidence that an improvement in linguistic comprehension leads to improved reading and/or reading comprehension (Duke, Pressley and Hilden, 2004:508), while there is considerable evidence that training in phonemic awareness leads to improved word recognition and decoding (cf. Cutting and Scarborough, 2006 and Stanovich, 2000 for reviews). Despite these reservations, most researchers investigating reading components use the *simple view* as their theoretical point of departure.

2.4 THE READING PROCESS

Reading is a complex cognitive activity and complicated models and theories are required to explain how proficiency in the two main processes of reading, namely word recognition and text comprehension, develops, and how meaning is constructed by the reader. Successful reading requires a mental information-processing system that can transform print to speech and print to meaning. Models of reading aim to explain the successful acquisition of reading at word recognition and comprehension levels, to

account for reading disabilities, and to guide reading instruction and remediation. Theoretical models are derived from empirical data and reflect the orientation and perspectives of theorists and researchers and the disciplines represented by them. In the section 2.4.1, an overview of the traditional models of reading development and recent theoretical perspectives will be discussed.

2.4.1 Models of reading development

Traditionally, models of spoken and written language are divided by language and reading theorists into three general approaches: bottom-up, top-down and interactive[17]. In discussing the various models, it will be demonstrated how reading is viewed from different perspectives and how these models attempt to account for the development of reading as well as for reading disabilities.

2.4.1.1 Bottom-up and top-down models

Bottom-up models view spoken language and reading as a step-by-step process starting with the initial perceptual analysis of an auditory or visual stimulus. The initial input is then processed in progressively larger and more meaningful units. In other words, comprehension of a sentence starts with the processing of phonemes and working towards syllables, words and phrases until the sentence is understood by the reader. Proponents of the bottom-up model support the explicit teaching of phonics and grapheme-phoneme correspondences during the early stages of reading instruction (Adams, 1990:50; Snow and Juel, 2005:509). *Top-down models* emphasise the importance of scripts, schemas and inferences that allows the reader to make predictions and assumptions about the text. According to this approach, the reader relies less on perceptual information to construct meaning, but focuses instead on semantic and syntactic cues in the text. Proponents of this model hold that readers use semantic and syntactic cues to form hypotheses about the words that they will encounter and take in just enough visual information to test their hypotheses. In the words of Goodman (1967), reading is viewed as a "psycholinguistic guessing game". Proponents of the top-down

[17] Cf. Stanovich (2000) for comprehensive reviews of the literature, controversies and debates regarding reading models.

model support whole-language approaches to facilitate meaningful encounters with texts during reading instruction (Snow and Juel, 2005:508). For example, in the sentence *in autumn, many trees loose their …*, readers using the top-down approach will use their world knowledge and "guess" from the syntactic and semantic cues in the sentence that the last word will be *leaves*. Readers using the bottom-up approach will decode every word, including the last one, regardless of its predictability.

In summary, bottom-up and top-down models both emphasise serial or sequential processing. Many researchers have contended that these models are too simplistic to account for the complex interactions taking place between and within different reading processing levels. Models that allow for parallel and/or simultaneous processing are therefore seen to reflect the complexity of the reading process better (Kamhi and Catts, 2005a:13).

2.4.1.2 Stage models

Traditional bottom-up models of reading development usually propose stages of development in reading skills. According to *stage models,* the development of word recognition comprises the acquisition of an overlapping and reciprocal set of processes: phonological awareness, phonemic awareness, grapheme-phoneme connections, sight-word reading, decoding and fluency. Stage models, such as Ehri's model (cf. Ehri and McCormick, 1998 for a discussion of this model) are generally used to describe the complex changes during the development of fluent reading. Ehri's model consists of four stages of development in the acquisition of word recognition: Phase 1: the pre-alphabetic visual cue stage where children rely on graphic features to recognize words; Phase 2: the partial-alphabetic and phonetic cue stage, a transitional stage in which children begin to recognise words by processing grapheme-phoneme relationships; Phase 3: the full-alphabetical stage, in which children acquire the alphabetic principle and recode spellings into pronunciations according to grapheme-phoneme correspondences; and Phase 4: the consolidated alphabetic and orthographic stage, in which children are able to instantly analyse a word into orthographic units without phonological conversion (Ehri and McCormick, 1998:4).

Criticism levelled at stage models includes a lack of empirical evidence to support the actual stages and the transitions between them and lack of information about the mechanisms underpinning the changes in reading proficiency. Furthermore, the generalisations implicit in stage models obscure individual differences between readers (Kamhi and Catts, 2005b:37), as well as ecological and psychological variables contributing to reading acquisition and development (Aaron et al., 2008:68; Clay, 1998:236; Vellutino and Scanlon, 2002:297).

2.4.1.3 Self-teaching hypothesis

An important alternative view to stage models, namely the *self-teaching hypothesis*, was presented by Share (1999:96). He proposed that phonological recoding (i.e. grapheme-to-phoneme translation) is used as a self-teaching mechanism by young readers to acquire the orthographical representations necessary for fast and efficient word recognition. Familiar words that are well established in the mental lexicon are usually retrieved by means of orthographic strategies, while unfamiliar words and exception words have to be decoded by means of phonological recoding.

Self-teaching is applied when the child uses previous knowledge of spelling-to-sound correspondences to generate target pronunciations and then matches those pronunciations with known words in the lexicon. A few successful encounters with a word are sufficient to add that word to the child's orthographical lexicon. Share (1999:95) emphasised that adequate phonological decoding skills merely provide opportunities for self-teaching and do not guarantee self-teaching. Other factors, such as quantity and quality of exposure to print and vocabulary knowledge, will determine the extent to which self-teaching opportunities are exploited.

A growing body of empirical evidence has established the validity of the self-teaching hypothesis (cf. Cunnigham, Perry, Stanovich and Share, 2002 for a review of research on the self-teaching hypothesis; also Cunnigham, 2006; Philips and Torgesen, 2006). Results of these studies indicate that phonological processing is a necessary, but not sufficient,

condition for efficient word recognition, and that other cognitive factors may account for the residual variance not explained by phonological factors. An important aspect of the self-teaching hypothesis is that it acknowledges experiential learning in the Vygotskian sense, in other words, young readers' active engagement in their own learning processes.

2.4.1.4 Interactive models

Interactive models propose a combination of bottom-up and top-down routes where parallel or simultaneous processing occurs to construct meaning during and reading. Interactive models posit that activation of orthographical and phonological information has a reciprocal influence on each other resulting in a continuous interaction between orthographical and phonological representations during the word recognition process (Kamhi and Catts, 2005a:5).

2.4.1.5 Connectionist models

Connectionist models are interactive and parallel models for the processing of language and reading, and aim to account for the complex interactions during the reading processes (Plaut et al, 1996:56). Connectionist models are based on simulation experiments that apply neural-net learning algorithms to training sets of stimuli (Plaut et al., 1996:66). The reading process is mostly unconscious and our understanding of it is largely based on intuition. Simulations of the reading process allow researchers to dismantle the reading process in a way that intuition cannot and allow hypotheses regarding the representations and processes underlying reading to be tested. Seidenberg (2005:241) states several advantages of simulation models. These include that theoretical assumptions can be tested by reproducing specific behavioural phenomena; causal hypotheses about reading impairments and instructional practices can be tested; and connectionist models converge with evidence about neurobiological bases of reading.

Connectionist models view the lexicon as an interactive network of connections between different layers of processing where orthographic and phonological layers of units connect with each other, as well as with a semantic layer of units, to construct meaning. Seidenberg and McClelland (1989, as cited in Seidenberg, 2005:240) proposed a

connectionist model consisting of two types of representational units to explain word recognition. A set of input units codes orthographic units (graphemes), and a set of output units codes phonological units (the pronunciation of words). The input and output units are connected by a set of intermediate or hidden units. Seidenberg and McClelland's initial model did not deal with meaning although they acknowledged that a semantic process as well as phonological knowledge would be required to account for reading comprehension.

More recent connectionist models (Plaut et al., 1996:67; Seidenberg, 2005:241) propose a division of labour between a *phonological pathway* and a *semantic pathway*. The phonological pathway is responsible for mappings between phonological and orthographic representations, whereas the semantic pathway deals with mappings between semantic, phonological and orthographic representations. The pathways do not operate in parallel but interact by a division-of-labour between them to activate semantic units from both pathways simultaneously.

According to Plaut et al. (1996:98), beginner readers initially devote their cognitive resources establishing their phonological pathways. The phonological pathway plays the most important role during word recognition because it is responsible for translating a written word into its corresponding spoken form by mapping orthography onto phonology. The phonological pathway is therefore mainly involved in the reading of novel words. The semantic pathway is also involved in the word recognition stage of reading development because it enables beginner readers to decode exceptions and irregular words that cannot be read through the phonological route only (Nation, 2005:256; Snowling and Hulme, 2005:398).

The "triangle" model proposed by Plaut et al. (1996:58) depicts the connections between semantics, phonology and orthography and the pathways between them. Bishop and Snowling (2004, as cited in Snowling and Hulme, 2005:399) proposed an extended version of the triangle model by including grammar and discourse level processing as other sources of linguistic information involved in reading development (see figure 1).

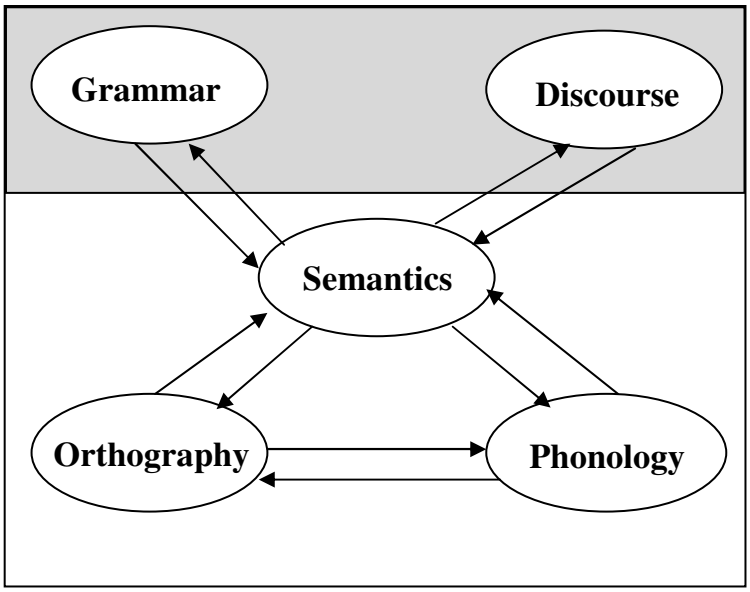


Figure 1 **An extended version of the triangle framework after Bishop and Snowling (2004, as cited in Snowling and Hulme 2005:399)**

By also incorporating discourse and grammar, the extended framework acknowledges the role of aspects such as syntactic awareness and contextual information already in the early stages of reading. Proponents of the self-teaching hypothesis have demonstrated that children use contextual knowledge in combination with decoding skills to establish new orthographic representations and to read novel words (Share, 1999:96). In contrast with stage models of reading, connectionist models acknowledge the involvement of higher-order linguistic functions already at the onset of reading development. One implication of this is that children with language impairments may have difficulties with word recognition despite having good phonological skills. Recognition of irregular and low-frequency words may, for instance, be particularly difficult for these children because of their limitations in vocabulary and syntactic-semantic skills.

2.4.1.6 Component models

The models discussed above ranged from models describing reading development in terms of sequences and stages and the acquisition of discrete skills, to complex, interactive models that account for the intricate interactions between the semantic and phonological pathways during reading. All the abovementioned models focused only on

the cognitive and linguistic aspects of reading. This section describes the theoretical perspectives pertaining to viewing reading in terms of component models, followed by a description of an expanded component model that incorporates a broader view of the domains and skills associated with reading than the abovementioned models.

Component models aim to describe a process in terms of the components comprising the process. Elements are identified as components when, according to Aaron et al. (1999: 121, 2008:68) they are identifiable, modular in nature, and independent from other elements. To comply with the independence criterion, a "double dissociation" must exist between two components. Syntax and comprehension, for instance, are considered two of the components of language in persons with aphasia because persons with Broca's aphasia have deficiencies in syntax but normal comprehension; whereas persons with Wernicke's aphasia have intact syntax but deficits in comprehension. It can therefore be concluded that syntax and comprehension are independent language components in persons with aphasia (Aaron et al., 1999:121).

Component models of reading, in contrast with discrepancy-based models, aim to identify the weak components underlying poor reading performance. That allows classification of poor readers into sub-groups on the basis of their strengths and weaknesses in independent reading-related skills so that intervention efforts can be focused on specific deficits (Aaron et al., 2008:81; Catts et al., 2003:152).

The *simple view of reading,* discussed in section 2.3.3, is an example of a component model, comprising two distinct components, word recognition and listening comprehension. The Component Model of Reading (CMR) proposed by Aaron et al. (2008:69) is based on Gough and Tunmer's *simple view of reading*, but acknowledges the multifaceted nature of the reading process by organising components constituting the reading process into three domains, namely cognitive, psychological and ecological. The CMR model is depicted in figure 2.

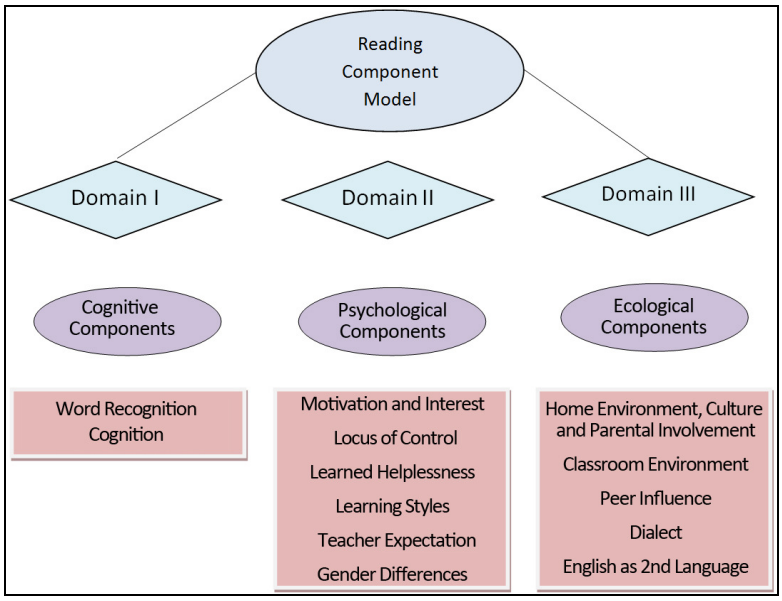


Figure 2 **The component model of reading (CMR) (Aaron et al., 2008:69)**

With the CMR model, Aaron et al. (2008:68) propose a paradigm shift from discrepancy models to reflect the complex nature of reading and to accommodate those environmental and psychological factors that have an effect on reading and literacy achievement. The cognitive domain comprises the two components incorporated in the *simple view of reading*, namely word recognition and listening comprehension. These two aspects can be classified as component skills because they are identifiable, independent from each other, and modular in nature (Aaron et al., 1999:124). The components in the environmental and psychological domains do not satisfy the requirements for classification as component skills to the same extent as the components in the cognitive domain. However, the value of the CMR model lies in its provision for environmental and psychological variables in reading, in contrast with traditional models of reading development and reading disabilities that tend to focus on the cognitive factors only.

2.5 SOCIO-CULTURAL CONTEXT AND READING

The CMR model discussed above reflects the importance of environmental, ecological and psychological variables in reading and provides for broader perspectives on literacy, reading, reading development and reading disabilities. According to Westby (2005:158), the definition of what it means to be literate in an industrialised and knowledge-driven

global economy has changed dramatically during the last century. More than basic literacy (reading along the lines) is required; to achieve academic success, readers are required to also possess critical literacy (reading between the lines) and dynamic literacy (reading across and beyond the lines).

Byrne (2005:109) states that a theory of learning to read must not only identify and describe the components of the reading process, but also determine the relative contributions of the learner and the environment to the process. The multi-cultural and multilingual context in South Africa requires researchers and clinicians to be acutely aware of the impact that socio-cultural and socio-economic variables may have on literacy development and education of children from different communities. The majority of the participants in this study came from lower socio-economic backgrounds. Variables pertaining to SES and literacy will therefore be discussed in considerable detail in an attempt to indicate the possible impact of environmental factors on their language and reading skills.

According to Barton (2007:4) the dominant definition of literacy in many societies is a school-based definition. From the educational perspective, literacy is often viewed as a set of skills and sub-skills that can be ordered in levels ranging from pre-reading skills to accomplished reading in skilled readers. In a critique of the discourse of individualism, Dudley-Marling (2004:483) states that the traditional Western emphasis on individualism leads to a view that academic success, and failure, is determined by individual effort and ability.

Educational research tends to overemphasize individual learning where reading is viewed as a psychological variable that can be assessed and measured. This can lead to a deficit perspective (Dudley-Marling, 2004:488) or "black box" view (Prinsloo and Stein, 2004:67), where the focus is on individual child attributes and where literacy is viewed as a neutral, cognitive, perceptual and individualised activity or set of skills to be acquired. Clay (1998:231) questioned the psychological reality of reading disability as a distinct clinical entity and argued that most studies investigating causal factors in reading

disability fail to take experiential and instructional limitations into account. Vellutino and Scanlon (2002:297), for instance, asserted that most reading disabilities are caused by limitations in early literacy experiences and/or inadequate instruction, and argued for a broader view of reading disability.

Seen from an ecological perspective, where literacy is viewed as the dynamic interaction between humans and their environment, school-based literacy is just one domain of literacy. A social constructivist perspective requires that researchers and educators assess the social context in which a child's identity as a poor or successful reader or learner is constructed (Reid and Valle, 2004:473), and places learning and learning failure in the context of human relationships and activity (Dudley-Marling, 2004:484). One influential model conceptualising children's development within a set of nested environments is Bronfenbrenner's ecological theory of child development (as cited in Weigel, Martin and Bennett, 2005:207). Barton (2007:30), however, contends that this model may be a too static model where different contexts and environments seem very fixed, instead of placing reading development in a more dynamic social context with a great deal of interaction between different elements and activities.

Emergent literacy models have challenged the validity of skills-based models of early literacy. These emergent literacy models – which propose that children acquire literacy skills not only through direct instruction but as a result of interaction with their environment where they are exposed to print and observe the functionality and uses of print – have challenged the validity of skills-based models of early literacy. Learning and literacy are cultural and historical activities because they are acquired through social interactions and represent how a specific cultural group or discourse community interprets the world and transmits information. Children are not only exposed to multiple forms of literacy including an assortment of digital literacies such as the Internet, social networks (e.g. Facebook), cell phones, text messaging, instant messaging and video games, but are also active participants in these practices. They may view school-based literacy practices and events as irrelevant and disconnected from their social environment (Considine, Horton and Moorman, 2009:473). Educators, on the other hand, may fail to

acknowledge, appreciate and utilise the rich and different literacy practices and skills that learners bring to the school environment[18].

The home and community is the first or primary discourse community into which a child is socialized. Gee (2001:723) describes children's primary discourse as the "ways with words" that is associated with their primary sense of self constructed in and through their socialisation within their family or primary socialising group. Children enter school with dispositions towards communication and learning and are in turn shaped by their experiences in the academic environment (Prinsloo and Stein, 2004:69). From socio-cognitive and socio-cultural perspectives, children's early everyday participation in and experiences with language and literacy practices in socially constructed practices (Rogoff, 1990:53) activate the internal mental processes that are the foundation of later reading and writing.

Researchers and educators are increasingly examining home literacy practices and events as major variables associated with children's later academic success. Children whose primary discourses are aligned with school discourse have advantages compared to children from backgrounds where there are mismatches between home literacy practices and events and school practices and events (Wasik and Hendrickson, 2004:155). Gee (2003:27) argues that inequalities in opportunities to learn must be taken into account in societies where there are major differences in social practices associated with language and literacy acquisition and situated learning experiences. Gee states that reading instruction that teaches children to decode print in such a way that they are still unable to comprehend "school-based language" in the content areas is pointless. He argues that unless all children are provided with equal opportunities to experience a variety of texts in specific sorts of ways, they will be disadvantaged because of a lack of equal opportunities to learn. Opportunities to learn must be taken into account when assessing reading in the South African context because there are still major inequalities and

[18] Cf. Barton (2007) for a social theory of literacy conceptualising the link between literacy practices and the social structures in which they are embedded, and Gee (2000) and Maybin (2000) for reviews of the so-called New Literacy Studies (NLS) conceptualising literacy as social and cultural practice, instead of in terms of decontextualised skills and competencies.

differences in the socio-cultural environments amongst learners. Furthermore, according to Willenberg (2004:192), the problem in South Africa is that the school literacy environments in many disadvantaged communities *resemble* the home literacy environments and fail to provide children with the opportunities to become proficient in academic and literate language.

There are major variations in literacy practices and events among families preparing their children for school through direct versus indirect versus unintentional teaching of literacy. These practices differ among and also within families of different cultures, educational levels and income levels. In sections 2.5.1, 2.5.2 and 2.5.3 variables influencing the acquisition of literacy will be discussed in terms of cultural differences, SES and home literacy environment.

2.5.1 Culture and literacy

In a society like South Africa with a rich diversity of cultural groups, considering the role of family, culture, beliefs and ethnicity in the literacy development of children is essential. Some researchers question the validity of cross-cultural comparisons of children's language and literacy abilities because ethnicity is often confounded by SES (Curenton and Justice, 2004:243). Because different cultures have different literacy experiences and expectations, literacy events and practices should be interpreted in relation to the larger socio-cultural patterns that they may exemplify or reflect (Heath, 1983:230). Children may come from environments that provide them with rich experience with many kinds of language use, but fall short in providing them with exposure to genres of oral and literate language that are aligned with the genres of academic language or discourse in formal school settings (Leseman and Van Tuijl, 2006:225).

Cultural differences are for instance reflected in text structures and story grammars[19] (cf. McCabe and Bliss, 2003 and Westby, 2002 for discussions of discourse organisation in oral and narrative texts from different cultural and language groups). Although all

[19] Cf. footnote 12 for the details of the content and order

cultures use a variety of text organisations, certain text structures tend to predominate in a culture. Cultural groups vary for instance in the emphasis placed upon the components of story structures and story grammars (Curenton and Justice, 2004:243; McCabe and Bliss, 2003:14).

In Western-based cultures story grammars emphasise goal-directed behaviour of the protagonists, and stories centre on the pursuit of goals and plans to overcome obstacles in order to reach goals. The emphasis on goal-directed behaviour may be a reflection of Western values such as individualism and achievement motivation where persons are expected to pursue their own goals (Westby, 2004:264). In contrast, according to Matsuyama (1983:667), more than 80% of Japanese folktales investigated did not have goals, attempts and consequences for characters and consisted mainly of initiating events and resolutions. Matsuyama (1983:668) ascribed Japanese folktale structure to the Buddhist notions of no desire and less emphasis on the individual and individual achievement. In a study comparing literate language features of lower SES preschoolers from different ethnic groups (Afro-American and Caucasian), Curenton and Justice (2004:244) concluded that socialisation practices seem to affect the narrative style of the two groups of children more than it does the microstructural properties of their narratives.

It is important to remember that cultural and ethnic groups are not homogonous and that there is considerable variation within cultures, as demonstrated by Heath (1983) describing the differences between literacy practices in working class and middle-class white communities in the same rural North American town.

2.5.2 Socio-economic status

The relationship between lower SES and academic success has been investigated extensively. Considerable evidence indicates that children growing up in lower SES environments are at greater risk than children from higher SES environments for poor development of language and literacy competencies and for school failure as a result of their lack of specific literacy skills.

Major socio-economic inequalities exist in South Africa. In 2007 2.7 million children lived in households that reported child hunger (Hall and Lake, 2009) and 68% of children lived in households with a per capita income below R350 (Meintjies and Hall, 2009). Results from the PIRLS study (Howie et al., 2008:32) indicated that only 20% of the Grade 4 South African learners taking part in the study had two parents who both worked full-time, compared to 36% internationally. Learners from South African households where parents were both employed achieved higher mean overall performances compared to learners from families where only one parent worked full-time, where parents worked less than full-time, or where they were unemployed.

Children growing up in poverty are at risk of academic failure, because of conditions associated with poor nutrition, poor medical care and environmental risk factors such as poor housing. Factors such as a lack of financial resources, family support, available time and their own educational limitations, have a negative impact on the ability of lower SES parents to provide the same language and literacy environments for their children as middle-class parents (Storch and Whitehurst, 2001:56; Vernon-Feagans, Hammer, Miccio, and Manlove 2002:193; Neuman 2006:30).

A large number of the aspects of early language experiences that determine the development of vocabulary, phonological awareness, syntax and literate language features vary as a function of SES. Lower SES is associated with less child-directed speech, lower levels of maternal education and lack of exposure to the precursors for literacy, such as experience with storybook reading and literate language (Hoff-Ginsberg, 1986:162; Hoff and Tian, 2005:272; Hoff, 2006:166).

Results from studies investigating the differences between social classes regarding literacy practices and exposure to experiences that facilitate the development of literacy skills reveal a stark contrast between social classes. Adams (1990:85), for instance, estimated that the a typical middle-class child in the USA enters first grade with 1 000 to 1 700 hours of one-on-one storybook reading time, compared to 25 hours in children from typical low-income families. A study by Hart and Risley (1995, in Hart and Risley,

2003) that observed children from three socio-economic levels from infancy to age 3 showed that children from low-income families enter kindergarten with a listening vocabulary of approximately 3 000 words compared to children from middle-income family who had listening vocabularies of approximately 20 000 words. By age 3, the recorded spoken vocabularies of the children from the professional families were larger than those of the parents in the welfare families. Between professional and welfare parents, there was a difference of almost 300 words spoken per hour. Extrapolating this verbal interaction to a year, a child in a professional family would hear 11 million words while a child in a welfare family would hear just 3 million. In South Africa, the results from the PIRLS study (Howie et al., 2008:32) indicated that 26% of Grade 4 and 5 learners' parents did not have a basic school exit qualification compared to 8% internationally. Grade 4 learners whose parents reported having tertiary level qualifications had average achievement scores of 378 (SD 14.2) compared to the average achievement scores of 218 (SD 4.1) of learners whose parents reported not having completed school.

Longitudinal studies have consistently shown that children who start school with delayed language seldom "catch up" and continue to fall even further behind (Johnson, Beitchman, Young, Escobar, Atkinson, Wilson, Brownlie, Douglas, Taback, Lam and Wang (1999:755). A large-scale longitudinal study by Tomblin, Zhang, Buckweiler and O'Brien (2003:1293) showed that 60% of preschoolers diagnosed with language impairments continued to show moderate levels of language impairment at both two and four years after initial diagnosis. A follow-up study by Klop and Tuomi (2007:64), performed in the same community as the population in this study, has shown that children who were diagnosed with language impairments in preschool, still exhibited language delays at the end of Grade 3 despite maturation and three years of formal academic training.

Research evidence indicates that maternal education is one of the major components of SES that predicts children's language experiences and language learning opportunities (e.g. Hoff and Tian, 2005:276; Hoff, 2006:167). A longitudinal study by Hoff (2006:164)

in which the vocabulary growth of 18–29 month old children (n=61) from high and middle socio-economic environments was investigated, identified mothers' speech as the source of SES-related differences in children's vocabulary growth. The high-SES mothers (mothers with college degrees) used more words, a greater variety of word types and longer utterances than middle-SES mothers (mothers with high school education), accounting for a statistically significant 5% of the variance in vocabulary growth of middle-SES infants. A large-scale epidemiological study by Catts Fey, Zhang, and Tomblin (2001:43) identified maternal education as a major variable predicting reading achievement of 604 preschool children in second grade. Dollaghan Campbell, Paradise, Feldman, Janosky, Pitcairn, and Kurs-Lasky (1999:1438) found that four measures of preschool children's language differed according to their mother's educational levels. Results from the abovementioned studies consistently show that the lower levels of maternal education associated with mothers from lower SES communities, correlate with lower levels of language skills in their children.

According to Neuman (2006:31) the "knowledge gap" that exists between children from high and low SES environments is what places the latter group at risk for academic failure. Children from low-income families often lack key experiences that facilitate conceptual knowledge development and background knowledge that are crucial for success in, for instance, later reading comprehension. Their reading comprehension is impaired by their limited world knowledge and their lack of vocabulary for conceptual knowledge in domains such as geography (Juel, 2006:412). Income enables parents to invest in their children's development through the provision of stimulating learning materials, enriching out-of-school experiences, and better early childhood care. Poverty and a daily struggle to survive may affect parents' emotional resources and their own well-being, which in turn are related to the quality of their interactions with their children and responsive parenting (Morrison, Connor and Bachman, 2006:381).

2.5.3 Home literacy environment

It is well documented that the early home literacy environment has a strong influence on children's language and literacy environment. A family's beliefs about literacy are

shaped by their own educational background and experiences and could significantly influence the literacy development of their children. Parents' own language and literacy skills can play a major role in the home literacy environment. Research studies have shown that high percentages of the variance in early reading skills, as well as the likelihood of reading disabilities, can be attributed to genetic factors (Olson and Gayan, 2002:91; Snowling, 2000:247). A recent study examining associations between early language development and later reading achievement in 7 179 twin pairs in Britain, found a significant overlap between genetic and environmental factors on the one hand and reading disabilities on the other (Harlaar, Hayiou-Thomas, Dale and Plomin, 2008:690). The researchers concluded that children from families with a history of reading disabilities are at a considerably higher risk for language and reading problems, than are children without such a history.

Some parents may view education and literacy development as being primarily the task of the school and therefore do not see themselves as active participants in their children's literacy and learning development. There are also differences in what parents view as important in literacy activities; some parents may focus on skills development while others may view literacy as a broader cultural activity. Shared storybook reading, the availability of print materials and the promoting of a positive attitude towards literacy and learning are examples of ways in which the home environment can facilitate early literacy development. Family beliefs about literacy affect the nature of the literacy interaction between adults and children, the materials available in the home and the literacy concepts and understanding that children develop (cf. Bus van Ijzendoorn and Pellegrini, 1995; Van Kleeck, 1992 for reviews of family literacy practices).

In South Africa, results from the PIRLS study (Howie et al., 2008:31) indicated that less than half of the parents of Grade 4 and 5 participants reported that they had engaged with their child in early home literacy activities prior to formal schooling. Fewer than 50% of learners reported having more than 10 books in their home, compared to 78% internationally. Participants with access to 51 to 100 books scored considerably higher on reading comprehension than participants with 10 or less books in the home.

2.5.3.1 Storybook reading

The benefits of shared storybook reading on the development of literacy skills in preschool children are well documented[20]. Shared reading, however, is not the cure for all reading problems, and its effects on reading achievement seem disappointingly modest. Two meta-analyses of the actual effect of early shared reading on reading achievement revealed that the amount of shared reading prior to formal schooling accounted for about 8% of the variance in reading achievement in the first grade (Scarborough and Dobrich, 1994:262; Bus et al., 1995:15).

According to Scarborough and Dobrich (1994:278), the positive outcomes on language and literacy usually ascribed to shared reading, may be due to components that coexist with shared reading, such as parental language skills, educational levels of parents, number of books in the home and the quality of language spoken in the home. It is therefore important to explore the interaction, activities and discourse associated with shared reading, and not only the frequency and amount of shared reading during the preschool years.

Shared reading is one way in which literate parents socialize their children into a literate discourse even before children start formal education and become literate themselves. Literate practices such as scaffolding[21] the interaction, promoting the abstract use of language and requiring the display of knowledge they have gained are fostered and facilitated during shared reading (Van Kleeck, 2004:185). In an overview of practices routinely used by middle-class parents during language and literacy events, Van Kleeck (2004:186-191) highlights five strategies used by these parents: the use of routines, such as bedtime storybook reading, gradually shifting the responsibility of the interaction to

[20] Cf. Whitehurst and Lonigan (1998), Van Kleeck and Van der Woude (2003) and Van Kleeck (2004) for comprehensive reviews of knowledge, skills and attitudes facilitated by shared reading.

[21] Scaffolding refers to the processes through which adults assist children in learning situations through joint participation. The adult typically structures an activity in a manageable and supported form to help the child reach the goals of the activity (Rogoff, 1990:94).

the child; operating in the child's zone of proximal development[22] (cf. Vygotsky, 1978); requesting verbal display of knowledge, and adjusting the proportion of information containing input already mastered versus new information.

From an ecological perspective, however, it is important to remember that the shared reading practices described above mainly reflect the literary discourse, culture and beliefs of one cultural group, namely Western-oriented middle-class parents. These practices are also congruent with the school discourse that children from this cultural group will encounter when they start their formal education.

Van Kleeck (2004:185) recommends a two pronged approach to provide children from cultures with different literacy discourses and practices with the skills to succeed academically. She states that until all schools can effectively accommodate children from all cultural and linguistic groups, the best solution is to help children to become "bicultural" in terms of literacy and literacy practices without devaluating or denigrating the values and beliefs held by their cultural group. Van Kleeck expresses the view that it is better to consciously attempt to socialise children into school discourse and literacy practices, with full awareness of cultural differences, than to deprive them of the opportunities to acquire the discourse, practices and skills needed to succeed in school.

The second prong of the approach advocated by Van Kleeck, as well as Farran, Aydogan, Kang and Lipsey (2006:264), is to actively seek to adapt current school practices to align them with the literacy practices of children from diverse cultural backgrounds, and to develop programmes and interventions aimed at bridging the gap between home and school, or, in the words of Gee (2003:27), to provide them with the necessary "opportunities to learn". A socio-culturally valid or facilitating approach requires active collaboration between communities, families and schools and entails developing interventions that respect the cultural values and practices of the community. Prinsloo and

[22]Child development proceeds through children's participation in activities slightly beyond their competence, their *zone of proximal development,* with the assistance of adults or more skilled peers (Vygotsky, 1978).

Stein (2004:82), reporting on the literacy practices observed in four preschool settings in urban townships in South Africa, state that "literacy discourses which work productively and sensitively with indigenous, local forms of knowledge, drawing on children's semiotic resources *in combination with* other forms of knowledge which are dominant and powerful, like academic and critical literacy, might be an important starting point" (authors' italics).

Several researchers have pointed out that it is in any case a false assumption that all schools and preschools actively promote literacy and shared reading (Van Kleeck, 2004:181; Whitehurst Zevenbergen, Crone, Schultz, Velting and Fischel, 1999:263). The PIRLS study (Howie et al., 2008:52), for instance indicated that the majority of schools taking part in the study (60%) did not have a school library. The study furthermore reported significantly higher reading achievement scores among learners from schools with the most books than among learners from schools with the least books.

2.5.3.2 Parent-child relationships

Van Kleeck (1992:4) highlights the cultural biases and assumptions often underpinning speech-language therapy intervention approaches and family-centred intervention programmes for parents of children with delayed language development (cf. van Kleeck, 1992). She argues that some of the cultural values guiding professional values are to a large extent culture-specific and may not reflect the values of other cultural and social groups. For instance, the high value placed on verbal and literate skills and individuality are the mainstays of Western middle-class communities, but are by no means important to all cultures.

Following Hall (1967; as cited in Van Kleeck, 1992:6), Van Kleeck distinguishes between "high-context cultures" and "low-context cultures". High-context cultures rely on physical context and nonverbal contextual clues to convey meaning; learning is accomplished mostly by observation, and teaching mostly by demonstration. Low-context cultures, in contrast, engage in frequent verbal interaction with children; teaching is

accomplished by step-by-step explanations; and children are encouraged to ask questions and to display their knowledge. Different adult-child interaction styles in different communities can affect aspects such as early vocabulary acquisition. In high-context cultures, children may exhibit what is termed by Bates, Bretherton and Snyder (1988, as cited in McGregor, 2004:302) *a social or expressive learning style,* resulting in vocabulary consisting of more formulaic phrases, words for social routines and a lower proportion of nominals. In contrast, children from low-context cultures, due to their exposure to different parent-child interaction patterns, may demonstrate a *referential or object-oriented learning style*, marked by a more productive knowledge of verbs and larger semantic lexicons at an earlier age than children exhibiting an expressive learning style.

Patterns of child-directed speech vary among cultures as a function of who is talking to the child, the reason for the interaction, the social context and the developmental level of the child (Schieffelin and Ochs, 1983:116). An adult in middle-class Western societies will typically assume the perspective of a young child in making semantically contingent responses to accommodate the child. The adult usually assumes the burden of understanding and takes care to adapt to the developmental level of the child by, for example, the use of simplified speech or "motherese" (Van Kleeck, 1992:7).

Cultural assumptions about intentionality vary considerably; in some societies children are regarded as intentional from birth, and adults will engage the preverbal infant in conversation and storybook reading by interpreting the infants' preverbal behaviour and expanding their utterances. Not all cultures, however, employ the same language socialising behaviours. Viewing young children as intentional and as conversational partners, expanding their utterances, asking leading questions, announcing events or activities for a child, and using a simplified lexicon and grammar are not universal verbal practices (Ochs, 1986:5).

In summary, there is considerable variation in the literacy practices in different cultural and socio-economic groups. In section 2.5, it was attempted to highlight some of the

variables pertaining to literacy and language development in lower socio-economic groups. The majority of participants in the present study are from previously disadvantaged and lower socio-economic environments. Based on the researcher's clinical experience in these communities and previous research findings, participants in this study were considered to be at greater risk than children from higher socio-economic environments for poor language and literacy development.

2.6 READING DISABILITIES

Not all children learn to read well and some children struggle with written language despite appropriate opportunities to learn and adequate instruction. Children with reading disabilities are a heterogeneous group and there is considerable variability in the nature and extent of their reading deficits as well as in the factors associated with these deficits. In section 2.4 different models of reading development and the processes underlying successful reading acquisition were discussed. The importance of environmental and ecological variables in reading and broader perspectives on literacy, reading, reading development and reading disabilities were discussed in section 2.5. In section 2.6 the terminology associated with reading disabilities will be described *first*; and *second* the definitions and classification of reading disabilities based on differences in word recognition and comprehension, particularly referring to readers with specific comprehension deficits as opposed readers with dyslexia. *Third*, research about the relationship between reading disabilities and language disorders will be described to provide the rationale for the viewpoint that reading disability is a language-based disorder.

2.6.1 Terminology

The term *congenital word blindness* was the first term employed to describe individuals with reading disabilities. Other terms currently used include *dyslexia, developmental dyslexia, specific reading disability, reading disability, learning disability, poor reader* and *language-learning disability*. The terms *disorder* and *impairment* are used interchangeably with *disability* (cf. Catts and Kamhi, 2005a; Aaron et al., 2008 for reviews of the use of these terms). In this dissertation the term *reading disability* (RD)

will be used to refer to children who have more difficulties than are usually encountered in learning to read. The terms *dyslexia* and *specific comprehension deficit* (SCD) will be used to refer to subtypes of reading disabilities. These terms are defined below.

2.6.2 Reading disability: Definitions

It has been evident for more than a century that some children struggle to learn to read despite adequate reading instruction[23]. Definitions of reading problems reflect the biases and theoretical points of departure of researchers, and Catts and Kamhi (2005a:50) state that it is impossible to have an unbiased historical perspective because researchers' biases influence the choice of literature reviewed as well as their interpretation of the literature[24]. Orton, a neurologist (1925, as cited in Catts and Kamhi, 2005a:52), and language specialists Johnson and Myklebust (1967, as cited in Catts and Kamhi, 2005a:53), are credited for the now widely accepted language-based perspective of reading problems. In the early 1970s, researchers began to support the notion that reading disabilities reflect limitations in language, rather than limitations in general cognitive abilities or visual perception. Over the last few decades considerable evidence has emerged supporting the role of language deficits as the basis of reading problems. The focus on language-based theories caused speech-language therapists to become increasingly involved in the intervention (identification, assessment, treatment and counseling) of persons with reading disabilities (Catts and Kamhi, 2005a:54).

Defining reading disability is a contentious issue, partly because of the different theoretical perspectives of the different disciplines interested in reading disabilities. The operational definition of reading disability used by researchers can have a significant impact on the validity of the research process, because such definition will influence the selection of participants and measuring instruments. Definitions also impact on intervention with children with reading disabilities, by influencing decisions about eligibility for inclusion in treatment programmes and specifying the nature and extent of

[23] Cf. Block and Pressley (2002) and Pressley (2006) for overviews of reading comprehension research in the United States of America.

[24] Cf. Catts and Kamhi (2005a) and Aaron et al. (2008) for reviews of the history of scholarly work on reading disabilities.

the aspects targeted for intervention. Catts and Kamhi (2005a:58) state that the one area of agreement between professionals from different orientations and theoretical perspectives is that the term *reading disabilities* should not refer to all persons who have problems in learning to read. As will be shown below, there are various subgroups of people who have problems to read.

Reading disability definitions can be grouped broadly into exclusionary and inclusionary definitions. An example of an exclusionary or discrepancy-based definition of dyslexia is that of the World Federation of Neurology (Critchley, 1970 as cited in Catts and Kamhi, 2005a:58):

> Dyslexia is a disorder manifested by difficulty learning to read despite conventional instruction, adequate intelligence, and socio-cultural opportunity. It is dependent upon cognitive disabilities which are frequently of constitutional origin

By stipulating exclusion criteria, discrepancy-based definitions strive to rule out a number of causal factors such as sensory, emotional, neurological and instructional factors. Among exclusionary factors, intelligence became the most important criterion in practice. A child could only be diagnosed as dyslexic if a significant discrepancy existed between his/her measured intelligence (IQ) and reading achievement, i.e. if the child demonstrated poor reading performance despite a normal or above average IQ. Recently, a growing number of researchers and professionals involved in reading have queried the validity and utility of IQ as an exclusionary factor (cf. Catts and Kamhi, 2005a; Aaron et al., 2008 for reviews).

In contrast to exclusionary definitions, which focus on certain possible causal factors, recent inclusionary definitions of reading disabilities tend to focus more on information pertaining to dyslexia by specifying the nature of the reading disabilities and the cognitive and other deficits associated with them. The definition of the International Dyslexia Association (IDA) is an example of an inclusionary definition:

> Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge (Lyon, Shaywitz and Shaywitz, 2003:1)

The IDA definition distinguishes between dyslexia and other learning disabilities and classifies the former as a specific type of learning disability on the basis of particular symptoms and causal factors. The definition also states that problems with word recognition and spelling occur as a result of deficits in phonological processing. Acknowledging that a phonological deficit is the core of dyslexia potentially allows for identification already during the emergent literacy phase, and more focused intervention procedures. The IDA definition, however, also includes exclusionary factors by ruling out ineffective classroom instruction and "other cognitive abilities" which ignore instructional differences and may again lead to IQ-based discrepancy approaches to assessment and intervention.

Another recent approach to the identification and diagnosis of children with reading disabilities is a process known as *response to intervention* (RTI) (cf. Aaron et al., 2008:81; Justice and Kaderavek, 2004:216). This model comprises of early screening of all children and enrolling children displaying reading difficulties in intervention programmes. Children who do not respond to classroom instruction and more intensive "second tier"[25] intervention in smaller groups, are then identified as having reading disabilities. The main benefit of this model is that it enables children to receive early intervention and assistance before they experience significant failure. The efficacy of the intervention programmes, however, remains a variable that is difficult to control in this model (Silliman, Wilkinson and Brea-Spahn, 2004:119).

[25] Kaderavek and Justice (2004:213) advocate a multi-tiered approach to emergent literacy intervention programmes implemented by teachers and speech-language therapists. Tier 1 instruction refers to whole-classroom instruction, while Tier 2 instruction refers to small-group or individual instruction to children who require additional learning opportunities.

2.6.3 Subtypes of reading disabilities

Experimental, developmental and neuropsychological research studies analysing the componential skill profiles of poor readers have found that they can be grouped into four subtypes (cf. Catts and Kamhi, 2005b; Aaron et al., 1999 for reviews). According to the s*imple view of reading*, reading comprehension is the product of word recognition and listening comprehension. On the basis of strengths and weaknesses in these two components, four distinct subtypes of reading disabilities have been identified.

Classifying poor readers into subtypes could lead to more efficient assessment and better identification of poor readers and to more effective and focused intervention (Aaron et al., 1999:130; Catts et al., 2003:161; Catts and Kamhi, 2005b:72; Leach, Scarborough and Rescorla, 2003:222). Based on their strengths and weaknesses in the two main components of reading the four subtypes include readers with problems in word recognition alone, problems in listening comprehension alone, problems in both areas, and problems in neither area. The four subtypes are depicted in figure 3 below, and will be briefly discussed in the following sub-sections.

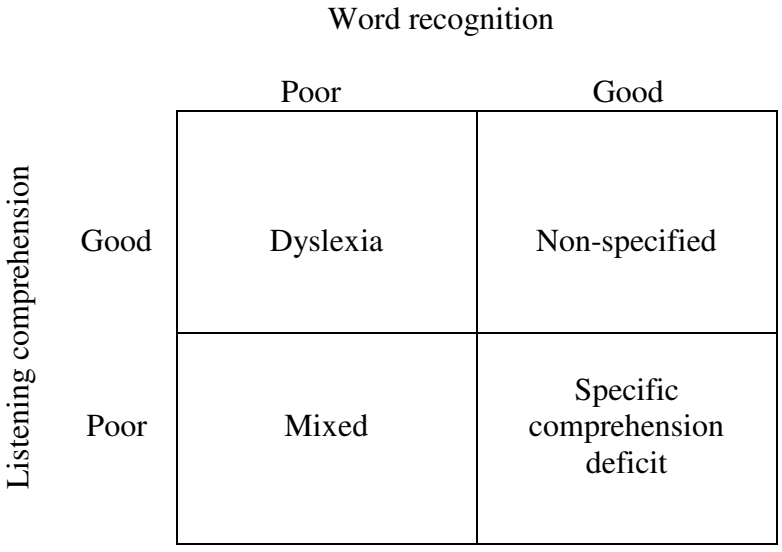


Figure 3 **Subtypes based on word recognition and listening comprehension (Catts and Kamhi, 2005b:74)**

2.6.3.1 Problems with word recognition only

Readers in this group have difficulties in learning to decode words phonologically and to develop a sight-word vocabulary. Consistent with the current definitions of dyslexia discussed above, they are classified as dyslexic readers. Their core deficit is in the phonological component of language and their reading proficiency is often unexpected in relation to their other cognitive abilities (Snowling and Hulme, 2005:400).

Reading problems at the word recognition level are often described in terms of the core-deficit hypothesis or the double-deficit hypothesis. Proponents of the core-deficit hypothesis propose that phonological processing skills underlie the development of word recognition. Phonological processes include phonological awareness (implicit awareness of the sound structure of words), phonological coding in lexical access (speed and accuracy in storing and retrieval of phonological representations), and phonological coding in working memory (retaining and retrieving phonological information for decoding and fluent reading of words). The core-deficit in children with reading problems is a specific impairment in the development of phonological awareness that interferes with discovery of the alphabetic principle (knowledge of grapheme-phoneme correspondences necessary for the fast and accurate mapping between graphemes and phonemes). A strong direct relationship between phonological awareness and reading has been found by many researchers (cf. Stanovich, 2000 and Muter, Hulme, Snowling and Stevenson, 2004), but Scarborough (2002:104) cautions that phonological awareness in kindergarten is actually a better predictor of future superior reading, than of future reading problems.

The double-deficit hypothesis states that the ability to access and retrieve phonologically coded information from memory rapidly makes an independent contribution to word reading, beyond that of phonemic awareness and grapheme-phoneme knowledge. Assessment of rapid automatised naming (RAN) tasks that involve non-phonological processes, such as attention, visual recognition and speed of information processing, shows that reduced naming speed adds to the problems of struggling readers at decoding level. They are doubly handicapped by poor decoding skills (caused by reduced

phonological awareness) and poor sight-word recognition (caused by reduced ability to process information accurately and to rapidly store and retrieve orthographical sequences) (Catts, Fey, Zhang and Tomblin, 1999:356).

2.6.3.2 Problems with listening comprehension only

Readers with adequate or good word recognition skills but with poor listening comprehension are classified as readers with specific comprehension deficits (SCD) and have qualitatively different reading problems than dyslexic readers (Snowling and Hulme, 2005:400). Children with SCD develop efficient phonological pathways, enabling them to read at decoding level, but weaknesses in vocabulary and semantic skills constrain the development of their semantic pathways, resulting in problems with reading comprehension. They differ from learners with specific language impairment (SLI) because they have normal or near normal phonological and expressive syntax skills and their language problems are often not severe enough to meet the diagnostic criteria for SLI. As a result of their subtle and less obvious language problems, and their fluent reading at word level, they are often not identified by teachers in mainstream schools as having reading or language impairments (Nation et al., 2004:209; Catts et al., 2006:289). Their reading problems may actually only emerge later in their school career and remain undetected by themselves and educators (Leach et al., 2003:212).

2.6.3.3 Problems with both word recognition and listening comprehension

Readers with deficits in both components of reading have been classified as *garden-variety poor readers* (Stanovich, 2000:95), readers with *language-learning disabilities* (LLD) (Catts et al., 2003:155), or readers with *mixed reading disability* (Catts and Kamhi, 2005b:74). Children in this subgroup usually fail to meet the IQ-achievement discrepancy criterion for dyslexia and demonstrate specific problems in language comprehension (Aaron et al., 1999:121; Catts and Kamhi, 2005b:75). Readers in this group often present with more global cognitive deficits that affects both their verbal and nonverbal processing (Stanovich, 2000:98), or they may have normal nonverbal abilities but specific deficits in vocabulary, morphosyntax and text-level processing (Catts, 1993:36).

2.6.3.4 Non-specific reading problems

This subgroup comprises a few readers with reading comprehension problems not predicted by the simple view of reading because they present with adequate word recognition *and* listening comprehension (Catts and Kamhi, 2005b:74). Children in this subgroup have adequate word recognition and phonological skills and may perform satisfactorily on tests measuring listening comprehension. Their reading comprehension problems may reflect difficulties with syntactic and semantic processing, inference making and working memory that are not measured by the assessment procedures for listening comprehension. Their reading problems may also be associated with components of the psychological and ecological domains of the CMR model (Aaron et al., 2008; cf. Section 2.4.1.6) such as poor motivation, lack of interest, poor instruction and second language learning.

2.7 LANGUAGE-BASED DEFICITS AND READING DISABILITIES

One of the focus areas of this dissertation is the reading comprehension of the participants in this study and the possible relationships between their reading comprehension deficits and language deficits. Based on the evidence in the literature, the researcher's theoretical point of departure in investigating reading comprehension problems is that reading disabilities are best viewed as developmental language disorders. In a review of the literature on links between early language and later reading, Scarborough (2002:100) stated that virtually every study confirmed that early language impairments are associated with reading problems and continued language problems in older children (also see Catts et al., 1999, 2002; Storch and Whitehurst, 2002; Roth, Speece, Cooper, and De La Paz, 1996).

Most theories of reading acknowledge that accomplished and automatic reading consists of multiple skills that are learned and developed during childhood, at home and school. Five essential component skills of reading have been identified by The National Reading Panel report (NICHD, 2000) and *Preventing Reading Disabilities* edited by Snow, Burns and Griffin (1998) that became the foundation of federal legislation in the United States of America in Reading First as part of the No Child Left Behind Act of 2002. These five

component skills are the alphabetical principle, phonemic awareness, oral reading fluency, vocabulary, and comprehension. These skills are, however, not similar in scope and importance and follow different developmental trajectories during reading development. Paris (2005:187) argues that although overwhelming research identified the alphabetical principle, phonemic awareness, oral reading fluency, vocabulary, and comprehension skills as essential for successful reading acquisition, they cannot be regarded as similar in scope, importance and enduring individual differences. He argues for a reconceptualising of the developmental trajectories of reading skills because of the fundamental differences between these skills. The main differences between these skills is that the alphabetical principle, phonemic awareness and oral reading fluency are constrained skills that are learned relatively quickly, mastered entirely and cannot be considered enduring individual difference variables. Constrained skills are polarised at the ends of the continuum and develop from nonexistent to high or ceiling levels fairly quickly in early childhood resulting in data with variances that range from nil to large to nil during mastery. Because the variances and correlations are unstable longitudinally parametric statistics such as Pearson correlations and ANOVA's may be inappropriate. Vocabulary and comprehension, in contrast, are unconstrained skills that develop continuously and may vary in proficiency, resulting in normally distributed variables between people over time and stable differences (cf. Paris, 2005 for a review of the interpretation of research pertaining to the development of reading skills).

In sections 2.7.1 and 2.7.2 the literature pertaining to causal and predictive relationships between language impairment and reading disabilities will be reviewed by considering, *first*, phonological awareness, and, *second*, language disorders. In doing so, it is aimed to provide an overview of the causal links between developmental language disorders and reading disabilities established by previous research.

2.7.1 Phonological awareness

Research about the language skills underpinning successful acquisition of reading has focused mostly on the early stages of reading at word recognition level and on the strong correlations between phonological awareness skills and reading development. Paris

(2005:192) in a critical review of the literature has warned that methodological flaws in some studies may contribute to an overemphasis on phonological awareness skills because causal links are often inferred from correlational studies. However, causal links between phonological awareness skills and the development of word recognition have been established by well-documented research including longitudinal studies and intervention studies (cf. Bus and van Ijzendoorn, 1999; Catts et al., 1999, Catts, Fey, Tomblin and Zhang, 2002; Stanovich, 1992; Torgesen, Wagner and Rashotte, 1994; Vellutino and Scanlon, 2002).

Some researchers have expressed concern that an overemphasis on phonological awareness skills as the principal predictor of reading achievement, underestimates the role of other variables, specifically oral language skills (Speece, Roth, Cooper and De la Paz, 1999:168; Storch and Whitehurst, 2002:943). Despite these reservations, there is overwhelming research evidence for causal links between phonological processing deficits - that is, deficits in phonological awareness, phonological retrieval, phonological memory and phonological production - and reading disabilities.

2.7.2 Language disorders

Compared to phonological awareness research, fewer studies have examined the impact of early language skills on later reading comprehension. While there is overwhelming evidence from research that early language skills during the preschool years predict the development of later reading skills (cf. Scarborough 2002; Catts et al., 1999, 2002; Storch and Whitehurst, 2002; Roth et al., 1996), the exact nature and extent of these connections are still unclear (Paris, 2005:187). The development of reading is a dynamic process that relies on different language skills in different phases of reading acquisition. The reading outcomes of children with oral language problems depend on inter-individual differences in cognitive skills modified and influenced by ecological variables such as the quality of their early literacy experiences and formal instruction (Snowling and Hulme, 2005:406).

In their theoretical model for emergent literacy, Sénéchal et al. (2001:445) argue that oral language and metalinguistic skills should be viewed as constructs separate from literacy.

They propose that emergent literacy comprises children's procedural knowledge of written language (e.g., invented spelling) and conceptual knowledge of written language (e.g. knowledge of print convention). In their view, dynamic, specific and reciprocal relationships exist between procedural and conceptual knowledge on the one hand, and oral language and metalinguistic skills (e.g., phonological awareness) on the other, but that, for instance, interventions to improve children's emergent literacy skills should be limited to and target procedural and conceptual knowledge directly. In contrast, Purcell-Gates (2001:10) argues that oral language skills cannot be taken out of the construct of literacy because literacy concerns written *language*, and that reading and writing are essentially language activities.

Causal links and information about the normal range of variation in comprehension development are best established by longitudinal studies tracking the development of reading comprehension in children. Some relationships - for instance, those between syntactic and semantic abilities and reading comprehension - only become apparent during later elementary school years and various studies have established that different oral language skills play their most significant role at different points during the development of reading (cf. Speece et al., 1999; Storch and Whitehurst 2002; Cain and Oakhill, 2007b; Catts et al., 1999). According to Speece et al. (1999:168), understanding of developmental patterns is best determined using growth curve analyses in contrast with strictly linear approaches such as regression analyses.

One of the most comprehensive studies investigating the links between language skills and reading achievement was done by Catts et al. (1999) as part of a larger epidemiological study of developmental language impairments in 7 218 children (Tomblin, Records, Buchwalter, Zhang and O'Brien, 1997). In their longitudinal study they divided 604 children into good and poor readers on the basis of reading performance in second grade and compared the groups in terms of kindergarten language and phonological awareness abilities. Multiple regression analyses were performed to investigate the relative contributions of kindergarten measures to predict second grade reading skills across groups. Results showed that 70% of poor readers had histories of

early language impairment and that oral language and phonological awareness abilities each accounted for unique variance in second grade reading achievement. Large percentages of poor readers also performed at least one standard deviation below the means on tests of vocabulary (39%), grammar (56%), and narration (44%). In an attempt to ensure that the study population resembled the general population, the researchers did not exclude children on the basis of low IQ and they used weighted scores based on epidemiological data from the earlier study (Tomblin et al., 1997:1257).

A follow-up study using a subsample of the abovementioned cohort showed that when the children with histories of early language impairment reached Grade 4, 53% of them displayed reading comprehension problems, compared to only 5% of the normal language control group. The two factors related to reading outcomes in the group with early language impairment were severity of language impairment and improvement in language skills. The relationship between developing language skills and reading performance is demonstrated by the fact that improved language skills were associated with better reading outcomes (Catts and Hogan, 2003:233).

In their longitudinal study of 626 children from kindergarten through Grade 4, Storch and Whitehurst (2002:943) examined code-related language (e.g., print concepts and phonological awareness) and oral language (e.g., vocabulary) precursors to reading, and found that early oral language plays a lesser and indirect role during initial stages of reading development, but a strong, direct role in later reading comprehension development. The oral language measures in their study included tests of receptive and expressive vocabulary, a narrative retell task and a test of conceptual knowledge.

Recent analyses of the reading growth trajectories in the epidemiological cohort (n=7218) of Tomblin et al. (1997) measured the word recognition and reading comprehension skills of children with and without language impairments in second, fourth, eighth and tenth grade (Catts, Bridges, Little and Tomblin, 2008:1570). Results obtained from preschool

children with language impairments were consistent with the deficit model[26] of reading growth, demonstrating that they have significantly lower initial reading scores at Grade 2 level and then continue to follow a trajectory of parallel growth when compared to children without language impairment. In other words, according to the deficit model' children with early language impairments who start out as poor readers remain poor readers across the school grades and fail to catch up with their peers with normal language abilities. The implication of this finding is that early identification and intervention are crucial for the prevention of the long-term consequences of language disorders in preschool children.

Another way to establish causal links is through intervention research examining the ability or lack thereof, of intervention targeting the improvement of oral language skills and listening comprehension to improve reading comprehension. Some researchers (cf. Clay, 1998:88; Vellutino and Scanlon, 2002:297) argue that most reading problems are caused by limitations in early literacy experiences, inadequate instruction, and/or a lack of opportunities to learn (Gee, 2003:27) and question the emphasis on cognitive deficits as the primary cause of reading failure. Paris (2005:198) warns that an overemphasis on discrete cognitive skills as predictors for reading achievement may sprout from flawed research attributing causal effects to correlational data. This can lead educators to pay less attention to environmental factors such as home environment, the quality of parent-child interactions and school-based factors.

According to Cirrin and Gillam (2008:S132), narrative-teaching strategies is one area in which intervention procedures align well with the theoretical literature, even in the absence of research demonstrating the efficacy of these procedures to improve oral language skills and reading comprehension. They cite narrative schema theory (cf. Westby, 2005) and story grammar theory (cf. Stein and Glenn, 1979) as appropriate

[26] Other models of reading achievement growth trajectories include a delayed pattern of reading growth where children with language disabilities start out as poor readers, but catch up with their peers with normal language development due to accelerated growth in reading skills; or a cumulative trajectory model of achievement, where poor readers continue to fall further behind their peers with normal language development (Catts et al., 2008:1577).

theoretical bases informing intervention to improve understanding and production of oral and written language.

Several researchers have found that word recognition and comprehension are predicted by different aspects of underlying language abilities (cf. Catts et al., 2003:159; Storch and Whitehurst, 2002:943). This is contrary to widely held beliefs that the development of reading comprehension is a logical consequence of competence at word recognition and decoding levels.

In their overview of studies about the development of reading comprehension, Cain and Oakhill (2007c:68) state that even though children with SCD do not display a distinct profile of language abilities, it is evident that language comprehension problems are not modality specific. Studies investigating language comprehension problems in different clinical populations - such as children with autism spectrum disorders (Leekam, 2007:106), specific language disorders (Botting, 2007:96; Cain and Oakhill, 2007c:68), pragmatic language disorders (Bishop, 1997:192), attention-deficit and hyperactivity disorder (Lorch, Berthiaume, Milich and Van den Broek, 2007:147), neuro-developmental disorders (Barnes, Johnston and Dennis, 2007:210) and traumatic paediatric injury (Cook, Chapman and Gamino, 2007:238) - point to a common finding, namely that children who have problems understanding written text usually display similar problems in understanding spoken discourse. Individuals in the abovementioned populations were selected to rule out word recognition problems as the primary cause of their reading comprehension problems. One exception is children with hearing impairment, for whom problems at word recognition level seem to be the primary cause of their reading comprehension deficits (Kelly and Barac-Cikoja, 2007:244). In summary, it seems as if wide-ranging deficits in oral language comprehension are strongly associated with reading comprehension deficits, mainly because the processes required to construct meaningful representations are the same for written texts and oral discourse.

Apart from a need for research establishing causal links between early language skills and reading comprehension there is also a need for research demonstrating that improvement

of language skills leads to improved reading comprehension. In this regard, Duke et al. (2004:516) state that the simple view of reading as a theoretical construct will be strengthened by experimental research proving that interventions targeting listening comprehension actually lead to improved reading comprehension.

The current international emphasis on accountability and evidence-based practices require that clinicians and educators use intervention and training procedures that have proven effectiveness and efficacy. This is even more crucial in a developing country like South Africa where there is a shortage of professional services and educational resources and massive inequalities in the national education system due to past governmental policies.

The sobering reality is that there is little empirical evidence to demonstrate the efficacy and effectiveness of speech-language therapy interventions. A systematic review of peer-reviewed articles since 1985 by Cirrin and Gillam (2008) assessed the outcomes of language intervention practices for children from kindergarten to Grade 12. The review yielded 21 studies using experimental designs to measure the outcomes of language intervention practices and revealed little research evidence supporting the efficacy of these intervention practices. No studies that focused on literacy interventions were included in the review. The authors concluded from their review that clinicians can have a moderate degree of confidence in techniques targeting the improvement of phonological awareness in school-age children. However, a review of the 16 studies that targeted syntax and morphology, pragmatics and discourse, semantics and vocabulary, and language processing, respectively, yielded less favourable results. The review revealed that no clear evidence of the efficacy of specific interventions in these areas could be found.

There are several possible reasons for the lack of empirical evidence for the influence of early language skills on later reading comprehension. Analyses of the relationships between oral language skills and reading comprehension based on longitudinal and concurrent assessments of reading and oral language are often compromised by

methodological issues, such as the selection of the language variables that were investigated, the sampling procedures employed and the variation in outcome measures to assess reading achievement (Catts et al., 1999:354; Paris, 2005:192).

Many studies investigated only a few isolated aspects of language and few studies assessed the same oral language domains. Speece et al. (1999:185) noted the need to view reading achievement from a multivariate perspective because the relative importance of a variable can only be determined if it is compared against other variables. Related to this issue is the use of control variables in research. According to Oakhill and Cain (2007a:5), studies examining the correlations between language skills and reading comprehension often relegate language variables to the status of control variables, thereby excluding examination of their independent contribution to comprehension and reading.

Another confounding factor is the reciprocal relationship between language and reading, e.g. the *Matthew effect*[27] (Stanovich, 1986), which makes it difficult to establish causal links between the components of reading comprehension and the oral language skills of the reader. Most studies examined the language problems in children who had reading problems for several years, making it difficult to determine to what extent the observed language problems were the cause or the consequence of their reading problem (Catts and Kamhi, 2005c:97).

The *measurement* of reading outcomes is another factor that may account for the lack of agreement between researchers and inconclusive empirical evidence about the links between reading comprehension and language variables. According to Cutting and Scarborough (2006:281), reading comprehension tests and procedures are created by different authors, whose conception of reading may be quite different and not always explicitly stated. Different tests may tap different sets of cognitive processes and

[27] Stanovich (1986) coined the term *Matthew effects* to describe the negative consequences associated with reading failure and the fact that early achievement facilitates faster rates of later achievement. The term refers to a Biblical passage in the Gospel according to Matthew that comments on how *the rich get richer* and *the poor get poorer*. Stanovich hypothesised that the Matthew effect is caused by the reciprocal relationship between reading and cognitive development.

component skills, and results may be influenced by particular skills that can influence comprehension. Cain and Oakhill (2006a:700) cite vocabulary as an example of a potential confounding skill when assessing comprehension, because word knowledge may influence scores on reading comprehension and obscure the effects of other comprehension variables under investigation. They also emphasise the "hidden processing demands" in various tests and assessment as confounding variables, for instance tasks that require verbal responses in children with expressive language deficits. Task format - for instance, open-ended questions vs. cloze tasks - or miscue analyses may tap into different sets of component skills and require different levels of comprehension (see Cain and Oakhill, 2006a for a review of reading assessment procedures).

The majority of studies also focused on the differences between readers with good comprehension and readers with poor comprehension or differences between children with and without language disorders. While these studies enable researchers to establish group differences, less information is gained about the normal range of variation across the continuum of skills in oral language and reading. The causal links between specific oral language skills and reading are often *inferred* in studies investigating the differences between groups and not on directly observed causal links (Speece et al., 1999:168; Storch and Whitehurst, 2002:936; Paris, 2005:191; Cain and Oakhill, 2007c:56).

Another problem in establishing causal links between oral language differences and reading skill differences is the heterogeneity of language skills displayed by children with reading comprehension disorders. As a group, most children with SCD display weaknesses in the language skills that underpin reading comprehension, but there is ample evidence of individual differences and different language skills profiles among them (Cain and Oakhill, 2007c:69; Nation et al., 2004:210; Scott, 2009:185). Some children with SCD display problems in core language skills, such as vocabulary, and others more text-level deficits, such as the making of inferences (Johnston, Barnes and Desrochers, 2008:130). Furthermore, not all children with SLI have poor reading comprehension (Bishop, 1997:183; Ehri and Snowling, 2004:450).

In summary, considerable research evidence demonstrated strong associations between language deficits and reading disabilities, even if the exact nature of these links is unclear. It seems clear, however, that language comprehension problems are not modality specific; children who experiences problems understanding written language usually experience similar problems understanding spoken discourse. Furthermore, there are obvious causal links between early language problems and reading disabilities, but also strong evidence that language problems may be a consequence of reading disability. This reciprocal relationship implies that all children with reading disabilities will demonstrate some form of language disorders.

2.8 SUMMARY

The focus of this study is on reading comprehension deficits that occur in young readers from disadvantaged backgrounds, and on how these deficits manifest in their oral language production. This chapter aimed to provide parts of the theoretical framework underpinning the study. The relationship between oral language and reading was discussed and it was argued that, although spoken and written language share many similar processes, reading is a biologically secondary skill that is only acquired through explicit training. Using the *simple view of reading* as the theoretical point of departure, word recognition and listening comprehension were discussed as obligatory components of reading that interact to enable the reader to access meaning via phonological or semantic pathways.

Following Gee (2001) and Aaron et al. (2008), arguments were presented for a broader view of literacy and reading disability which includes, apart from cognitive components, also psychological and ecological components of the reading process. The socio-cultural and socio-economic variables that are associated with poor school-based literacy were discussed. It was argued that lack of opportunities to learn and differences in home literacy environment have to be taken into account when investigating reading disabilities in children from lower socio-economic environments. Current definitions of reading disabilities and the classification of subtypes of reading disabilities based on *the simple view of reading* were discussed. This classification will be used to compare subgroups of

participants in this study based on their language and reading scores. Last, research about the relationships between language and reading development was discussed. Recent research that indicate causal links between language disorders and reading disabilities was discussed to justify the researcher's contention that language deficits are a major cause of reading disabilities.

In the next chapter, the language and cognitive skills for reading comprehension will be discussed. The role of text variables in reading comprehension will be explained to provide information about the language and cognitive processes required to construct mental models from texts. Processes in oral language and reading will be discussed in terms of the variables that were investigated in this study to determine the relationships between participants' reading performances and these variables.

CHAPTER 3

LANGUAGE AND COGNITIVE SKILLS FOR READING COMPREHENSION

3.1 INTRODUCTION

The goal of reading is the comprehension of written texts. Certain cognitive and linguistic abilities underpin reading comprehension, including a literate style of language, schema knowledge and metacognitive processing. These abilities vary considerably between readers (inter-individual differences) and may even vary within the same reader (intra-individual differences) when he or she is confronted with different types of texts and reading activities (Snow, 2002:22). Although the larger socio-cultural and historical background, or the ecological domain of the component model of reading (CMR) (Aaron et al., 2008:69), has to be taken into account when assessing reading comprehension and planning intervention, variability in individual reader characteristics should also be considered.

Most of the current theories and understanding of reading comprehension stem from studies that have investigated differences in the abilities of individual readers. The RAND Reading Study Group (Snow, 2002:83) identified seven critical components that directly or indirectly influence language and reading comprehension and account for the variability in the reading achievement of individual children. These components comprise the cognitive and psychological domains of the CMR model (Aaron et al., 2008:69) and include: i) vocabulary and linguistic knowledge, including oral language skills and an awareness of linguistic structures; ii) non-linguistic abilities and processes such as attention, inferencing, reasoning and critical analysis; iii) engagement and motivation; iv) understanding of the purposes and goals of reading; v) discourse knowledge; vi) domain knowledge; and vii) cognitive and metacognitive strategy development (also see Snow, 2002:19-28 for a review of the research on variability in reading comprehension).

This study investigated the oral narrative production of Grade 3 participants with and without reading comprehension deficits. It was hypothesised *first*, that the participants

with poor reading comprehension in the study population lacked proficiency in the higher-order language skills and literate language style associated with reading comprehension, and *second*, that they did not have the necessary schema knowledge and inferencing skills to aid them in the comprehension of narrative and expository texts.

In this chapter, reading comprehension will be defined and a brief overview of current theoretical concepts pertaining to the nature of and the processes involved in reading comprehension will be defined. Next, the role of text variables in reading comprehension will be discussed to provide information about the different levels of text representations involved in reading comprehension. This information provides the background for the section 3.4, which will discuss the language and cognitive processes and components required to construct mental models from texts. These processes will also be discussed in terms of the variables that were investigated in the study to determine the relationships between participants' reading performances and these variables.

3.2 READING COMPREHENSION

The goal of reading and listening is comprehension. It enables the reader to acquire information, to experience fictional worlds, to communicate and to achieve academic success. Comprehension is not a single construct but a set of empirical phenomena that is not very well formulated or easily defined (Duke, 2005:93). It is a set of processes that can only be observed or assessed indirectly, by measuring the outcomes such as the reader's ability to answer questions about the text, or to paraphrase what has been read. In the this section current definitions of reading comprehension are provided, followed by current models of reading comprehension development in section 3.2.1.

The RAND Reading Study Group (Snow, 2002:11) defines reading comprehension as "the process of simultaneously extracting and constructing meaning through involvement with written language". It consists of three elements: the reader, the text, and the activity or purpose for reading. These three elements are interrelated and occur within a larger socio-cultural context, or ecological domain (Aaron et al., 2008:69), that mediates the readers' experiences just as the readers' experiences in turn influence the context.

According to Kintsch and Rawson (2005:209), the term *comprehension* refers to a set of empirical phenomena that, at best, is ill-defined and difficult to describe. There is, however, ample evidence that readers who are skilled comprehenders use different strategies than less-skilled comprehenders (cf. Pressley, 2006 for a review), and that children with SLI display difficulties in the comprehension of oral language at all levels (cf. Bishop, 1997 for a review).

Oral language comprehension skills are the foundation of reading comprehension; to understand written text, the reader must understand spoken language. Although a strong correlation exists between reading comprehension and oral language (Catts et al., 1999:352, 2006:289), this link only becomes apparent during later stages of reading development (Leach et al., 2003:211; Nation et al., 2004:210: Pressley, 2006:80). In beginner readers, the correlation between oral language comprehension and word recognition is generally weak compared to the correlations between, for instance, phonological skills and word recognition (Sénéchal et al., 2001:450).

Consistent with the *simple view of reading* (Gough and Tunmer, 1986:7), this implies that language or listening comprehension plays a lesser role in decoding and word recognition and that is possible for readers with poor listening comprehension skills to become fluent at word recognition level. However, as discussed in section 2.4 in the previous chapter, recent research about the self-teaching hypothesis and connectionist models clearly indicate that higher-order language functions are already involved at word recognition levels by means of the semantic pathway. The implication of the early involvement of semantic skills for word recognition is that poor listening comprehension and language disorders are already compromising the initial stages of reading acquisition.

During later stages of reading development where comprehension becomes the focus of reading, the relationship between oral language comprehension and reading comprehension is clearly indicated, and readers with SCD experience reading comprehension problems even if they are competent readers at word recognition level.

Although there are strong positive correlations between good early word recognition skills and good later reading comprehension skills, it cannot be assumed that competence in word recognition will ensure good reading comprehension (Leach et al., 2003:212; Nation et al., 2004:210).

3.2.1 Theories of reading comprehension

The main theories about reading comprehension emerged from the evidence that skilled readers use certain cognitive strategies when reading. Early theories proposed that skilled readers construct representations of the ideas coded in the text. Researchers who proposed such theories include Mandler (1984) and Stein and Glenn (1979) who stated that attending to story grammar elements enhances readers' comprehension. Schema theorists, such as Anderson and Pearson (1984, as cited in Pressley, 2006:302), found that comprehension and memory of what is read improve when readers are: i) encouraged to activate text schemas through activation of prior knowledge; ii) making predictions and inferences; and iii) asking themselves questions about the reasons for relations in the text.

Reader-response theory, proposed originally by Rosenblatt in 1938, added a new dimension to comprehension from the cognitive psychology domain. According to this theory, comprehension occurs as a result of a transaction between a reader and the text. The transaction may vary from reader to reader depending on his or her prior knowledge and perspectives, in response to texts that may affect different readers differently (cf. Pressley, 2006:300-308 for a review of early theories).

Evidence from recent neuroscience research and eye-tracking studies indicate that reading, like other complex cognitive functions, can be described as an interactive constructivist process (Strauss, Goodman and Paulson, 2009:026). On this view, reading is not a bottom-up, information-processing activity but a top-down, prediction-memory process to construct meaning from incoming information. In contrast to studies citing neuroscientific evidence that phonological processing deficits are the core component of reading disability (cf. Shaywitz, Shaywitz, Blachman, Pugh, Fulbright, Skudlarski, Mencl, Constable, Holahan, Marchione, Fletcher, Lyon and Gore, 2004:926; Shaywitz,

Mody and Shaywitz, 2006:278), constructivist theories focus on neuroscientific evidence about the prediction-confirmation propensity of the brain in the construction of meaning. They propose that higher brain cortical structures select incoming information from subcortical structures to confirm or disconfirm predictions activated from prior knowledge stored in memory. In other words, constructivist theorists argue that recent neuroscience research confirms Goodman's early theory that reading is a "psycholinguistic guessing game" (in Smith and Goodman, 2008:61; Strauss et al., 2009:026).

All models of reading comprehension acknowledge that comprehension involves more than recognising and understanding individual words. In order to make sense of texts, readers must construct mental representations to organise and interpret the information encountered. Successful reading requires the integration of grapho-phonemic, syntactic and semantic-pragmatic cues represented in texts, and integration of the information gleaned from these cues with prior knowledge (Gillam and Carlile, 1997:39).

Evidence from studies of reading development demonstrates that the ability to learn to read is determined primarily by the status of a child's phonological representations (cf. Adams, 1990 and Stanovich, 2000 for reviews). Reading comprehension, on the other hand, involves more than the identification of letters and words in text. In the words of Goodman, reading is making sense of print (Smith and Goodman, 2008:61). In order to assign meaning to texts, readers use their previous knowledge about language and the world and their specific knowledge about different text structures and genres. Comprehending a text requires the interaction of several component processes to enable readers to integrate written information with their background knowledge and experience, and to transform the meaning in the text into meaning in the mind (Kintsch and Kintsch, 2005:74). Readers also rely on their reasoning abilities to make inferences and analogies and on their metacognitive abilities to facilitate the reading process. In other words, comprehension implies the construction of coherent and cohesive representation of the concepts and ideas conveyed by the text in the reader's mind in a mental model (Rapp,

Van den Broek, McMaster, Kendeou and Espin 2007:292; Kendeou, Van den Broek, White and Lynch, 2007:92; Kintsch and Kintsch, 2005:73).

As a theoretical construct, comprehension resembles perception in that both can be described as "spontaneous constraint satisfaction processes" (Kintsch and Rawson, 2005:209). This means that readers use their background knowledge to interpret textual concepts and constraints in a logical and rational way without deliberate problem- solving at a cognitive level. As in perception, deliberate problemsolving is not required to understand language or to construct meaning during reading. Analytical and conscious reasoning processes are only used when the reader becomes aware of a breakdown in comprehension.

Although comprehension can be described in terms of components and sub-skills it is influenced by many variables inherent to the text, e.g. the type and topic of the text and the purpose of reading (Duke, 2005:93), and the reader, e.g. cognitive processes, motivation and engagement (Guthrie and Wigfield, 2005:189). The multi-faceted nature of comprehension has implications for assessment of comprehension, comprehension instruction and the remediation of reading comprehension problems, and presents many challenges for theorists, researchers and educators trying to identify the best way to help struggling readers.[28]

Two important theoretical issues have emerged from recent literature on the development of reading comprehension. First, it is clear that language comprehension problems are not modality specific; as discussed in section 2.7, children who experience problems understanding written language usually experience similar problems understanding spoken discourse (cf. Oakhill and Cain, 2007b). Second, reading comprehension develops independently from word recognition (cf. Catts et al., 1999; Catts et al., 2008; Kendeou et al., 2007; Storch and Whitehurst, 2002). These two issues were discussed in section 2.7, the section on the relationship between reading disabilities and language-based deficits.

[28] Cf. e.g. Pearson and Hamm (2005) for a review of reading comprehension assessment practices.

In summary, all texts are not the same. Different types of text require different processes and strategies to comprehend the various types of representations, ideas and connections contained in the text. In section 3.3, the relationship between text features and reading comprehension will be examined in order to highlight the cognitive and linguistic demands on the reader to construct mental representations at different text levels.

3.3 TEXT VARIABLES AND READING COMPREHENSION

Written texts are not inherently difficult or easy, but they become difficult or easy at the interface of readers because particular features of texts are difficult for particular readers engaged in particular activities (Snow, 2002:94). As will be described in greater detail in section 3.4, understanding of narrative and expository texts requires different types of cognitive and metacognitive processes and conceptual knowledge. Narrative texts, for instance, centre on goal-directed behaviour and motivations of protagonists, whereas expository texts express a variety of logical relationships (Westby, 2005:164).

Comprehension of written texts requires readers to be familiar with the language used in textbooks and classrooms, namely decontextualized, abstract, syntactically more complex language, with more formal vocabulary than is generally found in oral language (Westby, 2005:168). The reader is also required to become familiar with different genres such as narrative texts, instructional texts, expository texts, and analytical texts, and the differences in the communicative intent and purpose associated with different genres (Hadley, 1998:133). Certain domain-specific texts such as mathematics, science and history texts are marked by specific technical jargon and terminology. There are also certain assumptions about how texts should be interpreted and appreciated, for example, viewing texts as authoritative accounts from the perspectives of experts.

Text representation can be described in terms of five different levels: i) the surface code (vocabulary and syntax); ii) the propositional text base (explicit meaning of the content); iii) the mental or situation model (deeper referential content); iv) pragmatic communication; and v) discourse structure and genre (Graesser, Mills, and Zwaan, 1997:167; Snow, 2002:94). In the following sub-sections, each of the abovementioned

text levels and components will be briefly described. In doing so, the inherent demands of the text and the role of each component and level in providing the reader with the necessary knowledge and information to construct a representation of the text, will be discussed. Next, the cognitive processes and procedures employed by the reader in order to extract meaning from the text through processes aimed at constructing mental representations and making inferences, will be discussed.

3.3.1 The surface code (vocabulary and syntax)

The surface code consists of the exact wording and syntax of the written text. Processing of the surface code involves the perceptual processes to decode the graphic symbols in the text, as well as word recognition and syntactic parsing. The surface code is normally only retained in working memory for a short period, in contrast with the subsequent levels of representation that are retained much longer (Graesser, et al., 1997:167; Radvansky, 2005:478). Readers rely on their structural knowledge to interpret morphological and syntactic cues presented in texts, particularly to decode novel words during word recognition. Structural cues include word order, grammatical morphemes and function words, for instance, relative pronouns and conjunctions (Kamhi and Catts, 2005a:10). Processing of texts at the surface code level and the role of vocabulary knowledge and syntactic abilities of readers in text processing will be discussed in section 3.4.2.1.

3.3.2 The text base (explicit meaning of the content)

The text base is a propositional code that preserves the arguments (nouns, pronouns, embedded propositions) and the predicates (main verbs, adjectives, connectives) but not the exact wording and syntax. A proposition is an idea unit that consists of a predicate and its arguments (Graesser et al., 1997:168). Arguments may be concepts or other propositions that can be classified in terms of their semantic roles. Readers use lexical knowledge of predicates and their inherent arguments contained in their long-term memories to construct propositions from texts (Kamhi and Catts, 2005a:11; Kintsch, 1994:726). The text base does not include more subtle details about verb tense and aspect and deictic references (*there*, *here, then, this, that*) (Snow, 2002:97). The text base does

however contain the meaning of the explicit propositions, such as story statements or idea units, which retain the meaning of the propositions, including a small number of inferences needed to connect the propositions to establish local coherence (Graesser et al., 1997:178).

The micro- and macrostructures of a text together form the text base. The microstructure refers to the local structure of the text, in other words, the complex network of text propositions or idea units that provide the proposition-by-proposition information to establish local coherence. To comprehend longer texts, however, the reader must go beyond the microstructure and also consider the macrostructure of the text. The macrostructure represents the global organisation of the text that contains; for instance, cues about the relative importance of portions of the text. Propositions in the macrostructure are hierarchically ordered to represent broad themes or the gist of the text and provide the reader with cues about the intention of the writer and purpose of the text (Kintsch, 1994:726; Westby, 2005:163). Processing of texts at the text base level will be discussed in section 3.4.2.2.

An important text feature that affects comprehension at text base level is coherence at micro- and macrostructural levels. Coherence at micro level is maintained by explicit explanations and linguistic markers such as connectives between propositions, so that fewer inferences are required by readers. Coherence markers at macrostructural level, such as topic headings and introductory statements, again require less inferencing from readers and generally make the text easier to understand (Kintsch and Kintsch, 2005:85). The role of coherence in the construction of text representations will be discussed in section 3.4.2.5.

3.3.3 The situation model

The situation model constitutes the deeper referential content of the text containing the characters, setting, states, actions and events. The content of the situation model can be explicitly stated by elements in the text or less explicitly stated, requiring the reader to make more inferences during reading. In contrast with the text base, the mental model

constructed by readers depends to a much larger extent on their goals for reading and on their prior knowledge (Kintsch and Kintsch, 2005:84).

Readers construct mental models of the situation models during reading by making inferences and through interactions between the explicit text and their prior knowledge. The situation model dominates processing and memory retrieval of texts because it remains available in memory longer after reading than the surface code and propositional text base (Graesser et al., 1997:167; Radvansky, 2005:478).

3.3.4 Discourse structure and genre

Discourse structure is the text organisation that connects the elements of a text in a coherent way to convey the content to the reader. Discourse structure includes the text genre, the distinction between given and inferred information in the discourse context, the main message of the text, the topic structure, the pragmatic or communicative intent and the function of the speech act (Snow, 2002:99). Genres are general text categories such as narrative, expository, persuasive and descriptive texts, e.g. literary novels, science textbooks, graphic novels and instruction manuals. The different skills required to comprehend and interpret different text genres, will be discussed in section 3.4.2.5. As stated previously, to succeed in school, children have to be exposed to a variety of text genres and learn the different skills required to comprehend and interpret different text genres.

To understand discourse the reader must nost only construct representations based on the structural, propositional and situational information in the text, but must also relate these representations to one another (Kamhi and Catts, 2005a:12). Scripts and schemas are prototype forms of discourse that provide structures that specify general or expected arrangements of information. The role of schemas in the construction of mental models will be discussed in section 3.4.2.6.

Not all researchers agree that comprehension is schema-driven. Kintsch (1994:732), for instance, states that schema-driven, top-down processes to explain text comprehension

fail to account for how schemas are initially constructed, and are in general too inflexible to adapt to new contexts. He proposed a construction-integration (CI) model that is, in contrast with schema models, a bottom-up process, unguided by the larger discourse content or implementation of comprehension strategies. Two sources of information are involved in this model: i) the individual and his perceptions, goals, beliefs, concepts and emotions; and ii) a given perceptual situation such as printed words in text. During the construction phase, knowledge from the reader's long-term memory is activated by the information from the text. This is followed by the integration phase where the activated ideas are integrated in the reader's working memory. The CI model is implemented in instruction practices such as meaningful talk about texts, guided comprehension facilitated by a teacher or during group discussions where the group jointly constructs meaning to improve readers' text comprehension (McKeown, Beck and Blake, 2009:223).

According to the CI model, readers' prior knowledge and the text base they construct during reading are represented as associative networks of concepts and propositions. The propositional idea units in the text must be connected with the reader's prior knowledge, goals for reading and experience. The more the reader knows about the text domain, the easier a coherent mental representation will be constructed for comprehension (cf. Kintsch, 1994:729-735). A study investigating the validity of this model, however, indicated that the role of prior knowledge in text comprehension is different for beginner, intermediate and advanced readers. Beginner readers tend to focus more on the surface features of the text, whereas advanced readers are more inclined and able to process texts at a deeper semantic level (Caillies, Denhiére and Kintsch, 2002:284).

In contrast with the CI model, Graesser (1997:183) proposed a constructionist model emphasising the role of comprehension strategies. These strategies focus on the building of explanations and coherent representations that address readers' goals for comprehension. Three assumptions underpin the constructionist model:

i) a *reader goal assumption* stating that readers employ strategies that serve their goals for comprehension,

ii) a *coherence assumption* stating that readers attempt to construct meaning representations that are coherent at local and global levels of text structure, and

iii) an *explanation assumption* stating that readers attempt to generate explanations for why events and actions in texts occur.

According to the constructionist model, the coherence and explanation strategies determine the reader's selection of content to focus on as well as the inferences that are generated.

A recent study by McKeown et al. (2009:233), however, indicated that intervention aimed at instruction of comprehension strategies (e.g., summarising and question generation to guide readers' access to the text during reading) did not prove superior to instruction that focused their attention on *content* through general meaning-based questions about texts. They concluded that the content approach required readers to focus on meaning directly, instead of indirectly, by focusing on their strategies for comprehension. Focusing on strategies may also increase the cognitive demands on readers during reading in addition to their efforts to make meaning. McKeown et al. argued that making connections between ideas is the most important factor in the construction of meaning and text comprehension. Instruction that focuses on the content and building meaning during reading is therefore more likely to aid readers to construct mental representations than is strategy instruction.

3.3.5 Pragmatic communication

This level refers to the exchange and interaction between the reader and the writer, or the narrator and the listener. The pragmatic context influences and determines the way in which the writer or narrator phrases the text to convey the content aimed at a specific target audience. At this level, the reader must have an understanding of the goals and purposes of the text and of the writer's intentions (Snow, 2002:95).

3.4 LANGUAGE AND COGNITIVE PROCESSES UNDERLYING TEXT COMPREHENSION

A substantial body of research has identified three distinct predictors of reading comprehension in young children: the ability to understand story structure, the ability to make inferences, and the ability to monitor comprehension (Graesser et al., 1997:181; Oakhill and Cain, 2007a:7). According to Kintsch and Kintsch (2005:85), there are two central issues to consider when difficulties with text comprehension are investigated: *first*, the mental representations that the reader must construct during reading, and *second*, the inferences that are required to construct mental representations that support deep understanding of texts.

In sections 3.4.1 and 3.4.2, the linguistic and cognitive processing during reading comprehension at the surface, propositional text base and situation model levels, will be discussed. Theoretical perspectives pertaining to these processes and their contribution to text comprehension will be examined. Section 3.4.2.6 will focus on schema theory, particularly the role of story schemas during the construction of mental models, and proposes how deficits in schema knowledge and understanding play a role in reading comprehension problems.

3.4.1 Metacognition and text comprehension

Metacognitive abilities are crucial for text comprehension, and many children with reading disabilities exhibit deficits in metacognition (Westby, 2005:166; Wallach, 2008:130; Yuill and Oakhill, 1991:41). Readers' metacognitive abilities or lack thereof can influence their reading comprehension in two ways: good comprehenders use metacognitive strategies *first*, good comprehenders use metacognitive strategies to monitor their own comprehension, and *second*, to recognise and interpret metacognitive processes portrayed in the text, as for instance, in decoding the goals and plans of characters. These two aspects will be discussed in this section.

Comprehension of texts in order to learn requires metacognitive and metalinguistic abilities. According to Van Kleeck (1994) metalinguistic development occurs in two

major stages. In the first stage, during the preschool years, children become aware that language is used to convey meaning, while during the next phase, between the ages of 7 and 11 years, they become aware that language is also an object in its own right. During the latter phase children recognise that language is an arbitrary conventional code and that it is systematic. The metalinguistic awareness that language is an arbitrary code forms the basis for the development of other skills such as understanding of figurative language (metaphors and idioms), ambiguity, irony, synonyms and humour. Phonological and syntactic awareness, and aspects of reading and writing, such as print referencing and editing, stem from this awareness that language is systematic. *Metacognition* refers to "insights one can have regarding internal mental actions or cognitive processes" (Van Kleeck, 1994:56), whereas "metalinguistic skill, or language awareness, refers to the ability to reflect consciously on the nature and properties of language" (Van Kleeck, 1994:53)[29].

Several aspects of metacognition are crucial for text comprehension and for the development of reading comprehension strategies such as self-evaluation, self-management, strategic reading and comprehension monitoring. Metacognitive skills enable readers to consciously access their own cognitive operations, to evaluate the outcome of these operations, and to adjust and plan their cognitive processes when needed. Several studies have indicated that poor comprehenders exhibit less evidence of metacognitive awareness and strategic behaviour than do good comprehenders. They are less inclined to apply self-questioning and self-monitoring, to correct errors during reading and to detect anomalies in their understanding (Yuill and Oakhill, 1991:41).

A *reading comprehension strategy* is defined by Graesser (2007:6) as "a cognitive or behavioural action that is enacted under particular contextual conditions, with the goal of improving some aspect of comprehension". Reading strategies such as understanding the purpose of reading, identifying and focusing on the main ideas in a text rather than identifying and focusing on insignificant details, comprehension monitoring and

[29] Cf. Van Kleeck (1994) for detailed analyses of the nature and development of these processes.

employing corrective action when comprehension breaks down are metacognitive behaviours crucial for successful reading comprehension. According to Graesser (2007:4), poor readers often do not know that their comprehension is inadequate and consequently fail to employ deliberate cognitive strategies to facilitate deeper understanding. They also tend to strive only for shallow understanding, e.g. understanding of content words and sentences, whereas deep comprehension requires the making of inferences, linking together of idea units to construct coherent representations at local and global levels, critically assessing the claims made by the text, and understanding the goals of the authors.

Inadequate metacognition skills of poor comprehenders also have a negative impact on their abilities to activate schema knowledge and to construct text representations and mental models. For instance, to make, inferences about characters' plans, goals and intentions in narratives, readers or listeners rely on their own metacognitive understanding of planning and awareness of mental states, motivations, intentions and goals (Oakhill and Cain, 2007a:27). Good comprehenders employ cognitive strategies to construct inferences from similar prior experiences retrieved from their long-term memory. They will also reread a text when a breakdown in comprehension is detected for information about causal antecedents to explain why actions and events in the text occur (Yuill and Oakhill, 1991:150; Graesser, 2007:4).

Children with pragmatic-semantic language disorders, such as children with autistic spectrum disorders, usually struggle with reading comprehension because of their inability to draw inferences from the text and failure to monitor their own comprehension (Botting, 2007:86; Snowling and Hulme, 2005:410).

3.4.2 Levels of text processing

Text comprehension processing takes place at three levels during reading: i) processing of the surface code to decode the word and sentence meanings of the text, ii) processing at propositional text base level to determine meaning at micro- and macrostructural levels, and iii) processing at situation model level to form mental models. Successful

comprehension of a text implied that the reader, through the processes of construction and integration (cf. the CI model (Kintsch, 1994) discussed in section 3.3.4), integrated representations from all these levels without implementing intentional strategies (Graesser, 2007:4).

Rapp et al. (2007:291) state that reading comprehension is usually measured by means of product-based assessments such as question-based tasks and recall after reading. These assessment procedures reflect what the reader has derived from reading the text and are administered *after* reading has taken place. They argue that the processes taking place *during* reading reflect the cognitive activities underpinning reading comprehension that takes place during reading. To address the needs of readers struggling with comprehension, the focus of assessment and intervention should therefore be on the cognitive processes that underlie comprehension at the different levels of text comprehension. One approach to analyse readers' cognitive processes during reading is reading miscue analyses[30]. This approach analyses readers' retellings of texts that they have read and examines discrepancies between the text and the retelling to provide information on their cue interpretation.

Comprehension at each level of text representation and the potential impact of limitations in readers' cognitive and linguistic skills at each level of processing will be discussed in the following sub-sections. In doing so, the problems readers with poor comprehension may encounter at different levels of text processing will be highlighted.

3.4.2.1 Processing at surface code level

At the most basic level of text comprehension, the reader must form mental representations of the propositions or idea units of the text. Perceptual and conceptual processing at the linguistic level comprises word recognition, that is, the decoding of graphemes, accessing the mental lexicon to form meaning representations at word level, and parsing to interpret word meaning in the syntactic context. Comprehension at this level focuses on content facts and does not imply comprehension of the superordinate

[30] Cf. Gillam and Carlile, 1997 and Strauss et al., 2009 for discussions of miscue analyses.

organisation of the text. Reading comprehension can, however, already be severely compromised by limitations in readers' cognitive and linguistic skills at this level of text processing. Westby (2005:164) provides the following description of content ideas typically expressed in written texts[31]:

i) *Physical states*: statements about ongoing states in the physical or social world (e.g. the dove sits in the tree);

ii) *Physical events:* statements about changes in the physical or social world (e.g. the ant fell in the water);

iii) *Internal states*: statements describing ongoing mental or emotional states of characters (e.g. the ant was afraid);

iv) *Internal events*: statements referring to metacognitive or thought processes (e.g. the ant decided to help his friend);

v) *Goals:* statements referring to attempts to attain future states/events (e.g. the man wanted to shoot the dove);

vi) *Style*: statements that modify actions or states (e.g. the man screamed loudly).

Certain cognitive operations such as attention and fluency play important roles during processing at the surface level. To comprehend texts, readers must be able to pay attention to and concentrate on the material being read. Fluency in word recognition reflects the reader's ability to decode words without effort and to read words with appropriate pacing and phrasing. Readers who are fluent at word recognition level can allocate more attention to comprehension because they need to focus less on the visual or phonological decoding processes[32].

In the following sub-section, the role of vocabulary knowledge and syntactic abilities in text processing at the surface level will be discussed. In doing so, these two aspects as important variables to explain the reading comprehension problems of the participants in this study, will be highlighted.

[31] The examples are from the model narrative used in this study. Cf. Appendix 7 for the full narrative elicitation protocol.

[32] Cf. Snow, 2002 for reviews of the research pertaining to fluency and attention in relation to reading comprehension.

a) Vocabulary

The previous chapter presented research evidence to demonstrate the links between readers' vocabulary skills and their levels of reading proficiency, to demonstrate that poor vocabulary is associated with socio-cultural and socio-economic factors, and to show the differences between vocabulary skills associated with oral discourse as opposed to the more formal and decontextualised vocabulary associated with academic and literate discourse.

Poor vocabulary knowledge and poor lexical development, in other words, a limited mental lexicon, will compromise text processing at the surface code level. A poorly developed mental lexicon will constrain a reader's ability to read via the phonological route, in other words, to construct phonological representations of words by transforming visually perceived graphemes into matching phonemes (McGregor, 2004:312; Shapiro, 1997:260). As described before, readers rely mainly on their phonological pathways to recognise novel and exception words (Plaut et al., 1996:67; Seidenberg, 2005:241). Word recognition by means of the visual route involves the mental lexicon and will be affected by limitations of the mental lexicon because sight-word reading requires the reader to match a word's visual configuration with its visual representation in the mental lexicon. Children with adequate vocabularies have more fine-grained and better organised phonological representations in their mental lexicons, which could facilitate the development of visual recognition skills and account for their abilities to read exception words successfully (Ricketts, Nation and Bishop, 2007:236).

The self-teaching hypothesis (Share, 1999:96) also provides evidence for the links between exception word reading and vocabulary. When confronted with novel and exception words, readers with larger vocabularies can draw on their vocabulary knowledge to assist them in decoding, because they can match partially decoded words with known words in their lexicons (Ricketts et al., 2007:253).

Although vocabulary knowledge correlates highly with reading proficiency, reading comprehension involves more than accessing the meanings of individual words in the

text. Several studies have demonstrated that children can have poor reading comprehension even when vocabulary skills are controlled for. Evidence from these studies indicates that limited vocabulary knowledge does not always impair comprehension and that adequate vocabulary development does not ensure good comprehension (cf. Oakhill and Cain, 2007b for a review).

A formal test of receptive vocabulary (Afrikaanse Reseptiewe Woordeskattoets; Buitendag, 1994) was used to investigate the vocabulary skills of the participants in this study. The lexical diversity of their narratives was investigated by measuring the number of different words produced, as well as two categories of word-level semantic knowledge, namely metaverbs (metalinguistic and metacognitive verbs) and conjunctives. It was hypothesised that participants with poor reading comprehension would display limited vocabulary and lexical skills compared to participants with normal reading comprehension.

b) Syntax

The processing of sentences with complex syntax at the surface code level may be problematic for readers with language disabilities. Research has shown that poor readers have some unique problems with syntax that set them apart from their age- and decoding-matched peers (Scott, 2004a:354)[33]. Syntax has been viewed as a core deficit in children with SLI (Leonard, 1998:213; Nippold, Mansfield, Billow and Tomblin, 2009:242) and these children are also at high risk for reading impairment (Catts et al., 2006:284). Although research has consistently shown that children with early language impairment are likely to have problems with reading comprehension later (cf. Catts et al., 2001:46; Scott 2009:186; Nippold et al., 2009:246), the contribution of early syntactic problems to later reading impairment is less clear. There is also a lack of intervention research to examine the effects of syntactic training on later reading development, and to establish causal relationships between syntax and reading problems (Scott, 2004a:351; Duke et al., 2004:516).

[33] Cf. Cain and Oakhill (2007a) and Scott (2004a, 2004b, 2009) for analyses of the links between syntactic skills and processes and reading comprehension problems.

There are considerable linguistic differences in the syntax typically associated with written texts and oral language. Written language is usually marked by more complex syntactic structures than spoken language. Furthermore, spoken language provides prosodic cues such as intonation, stress and pauses, which help the listener to understand the message. The absence of these cues in written language makes sentence parsing more complex for the reader (Kamhi and Catts, 2005a:19; Scott, 2004a:347). According to Scott (2004a:341, 342), there are three main factors that contribute to syntactic complexity:

i) certain features of the nouns and verbs and the relationships between them, which influences the difficulty or ease with which sentences can be processed, e.g., reversible passives (*the man was chased by the dog*) are more difficult to process than non-reversible passives (*the ball was kicked by the girl*);
ii) the number and type of syntactic operations in a sentence, usually reflected by sentence length; and
iii) the type of syntactic operation, e.g., it is more difficult to process a sentence where the subordinate adverbial clause precedes the main clause (*although he was scared, he did not run away*).

Complex syntax in written texts and literate language often conveys semantic relationships such as causality that cannot adequately be expressed in simple sentences (Scott, 1988b:59; Nippold et al., 2009:242). Syntax in written texts is often transformed and more embedded through the use of constructions such as dependent clauses, adjective and adverbial clauses, appositives, nominalisations and attributive adjectives. The ability to understand complex syntax is therefore a crucial aspect of reading comprehension. The surface level of sentence comprehension in reading involves the processing of different kinds of information: for example, sentences can be processed on the basis of morphosyntactic markers and word order, separate from meaning. Sentences can also be understood by processing the meaning of individual words and groups of words (Scott, 2004a:344).

Perera (1984 in Scott, 2004a:348) stated that readers find sentences difficult to parse and comprehend when they contain:

i) structures that are difficult to predict because they occur less often in language, are acquired late, or are found almost exclusively in written language, for instance sentences that contain concealed negatives, e.g. *Scaly anteaters are rarely found in the wild*;

ii) structures that are difficult to segment because they contain words or phrases that are difficult to assign to grammatical constituents, for example, ambiguous sentences, e.g. *Racing cars can be dangerous*; and/or

iii) structures that tax working memory because the reader has to keep a word or phrase in short term memory long enough to perform the constituent analysis, for instance ellipses with long distances between the ellipses and its referent, e.g. *Peter invited Sarah and her parents to the dance to celebrate his recent promotion but [ ] was in the end unable to go*[34].

Two key markers of complex syntactic development are increasing sentence length and clausal density (Nippold et al., 2009:247). Transformations at clause and lexical levels occur more frequently in written texts than in oral language, and in oral expository discourse than in oral conversational discourse, supporting the view that more complex language is driven by more complex cognitive processes (Purcell-Gates, 2001:12; Snow, 2002:41; Nippold, Hesketh, Duthie and Mansfield, 2005b:1057; Nippold et al., 2009:242).

To examine group differences in the participants in this study, three aspects of syntactic complexity in their narratives were investigated, namely sentence length, elaboration of noun phrases and the use of subordination, discussed in section 4.2.3. It was hypothesised

[34] Cf. Scott, 2009:186; Nippold et al., 2009:242 and Perera, 1984 in Scott, 2004a:348 for more examples of syntactic structures in written texts that are difficult to understand; also examples of "garden path sentences" by Pinker, 1994:210-212.

that these aspects would differentiate readers with good comprehension from those with poor comprehension.

3.4.2.2 Processing at text base level

The micro- and macrostructures of a text together form the text base. The microstructure refers to the local structure of the text, in other words, the complex network of text propositions or idea units that form the proposition-by-proposition information. The macrostructure is that part of the text through which the reader reconstructs meaning by making inferences about propositions and the relationships between propositions, by interpreting the coherence relations between propositions, usually indicated by cohesion markers such as anaphora and conjunctions, and integrating this information with their world knowledge (Rapp et al., 2007:292).

World knowledge includes knowledge about specific content domains such as academic subject knowledge about e.g. history; procedural knowledge, e.g. knowledge on how to play rugby; and knowledge about scripts, e.g. birthday parties[35]. World knowledge also includes knowledge about interpersonal aspects such as human needs, motivations, traits, emotions, behaviour, values and relationships (Kamhi and Catts, 2005a:12; Wallach, 2008:186).

Activation of prior knowledge during reading is crucial for comprehension at text base level. To construct meaning at text base level, the reader must have adequate world knowledge and be able to organise the content facts or propositions in a schema. A content schema represents an organisational structure of text elements that is independent from the specific content of the text, e.g. a content schema for a birthday party will facilitate understanding of a written or oral text about a birthday party (Westby, 2005:160; Duchan, 2004:381). Readers from environments that did not foster them with adequate world and domain knowledge will therefore struggle to construct content schemas. The relationships between content facts are not always explicitly stated and

[35] A script can be viewed as a specific type of event schema containing stereotypical knowledge structures for common routines (Westby, 2005:159). A script for a birthday party will typically include actions such as receiving birthday presents, eating and drinking, playing party games, etc.

must be inferred by the reader. Westby (2005:164) describes the following types of relationships that can exist between content facts to form a content schema:

i) Reason: relationships that refer to the reasons that relate goals to actions and events, e.g. *the ant bit the man to save the dove*;

ii) Initiate: relationships that link states, events and actions to goals, e.g. *the man lifted the gun* (action) *because he wanted to shoot the dove* (goal);

iii) Consequence: states, events and actions can lead to other states and events by causally driven links, e.g. *the ant fell in the water* (action)*/ he is wet* (physical state);

iv) Property: descriptive relations that link the attributes of characters or objects to other characters or objects, e.g. *the dress was very expensive, it is dark* green; and

v) Support: relations that link general statement ideas that make assertions, e.g. *whales are not fish; they are mammals because they are warm-blooded and fish are not*.

In summary, the micro- and macrostructures together form the text base. The microstructure is organised in higher-order semantic units to form the global text structure or macrostructure. Propositions in the macrostructure are hierarchically ordered to represent broad themes or the gist of the text that is derived from the microstructure. If the macrostructure is not explicit in the text – and it is often not – it must be inferred by readers by using their world knowledge and schema knowledge.

3.4.2.3 Construction of mental models

To process the meaning of a text the reader must go beyond the text to construct a mental model of the schemas represented by the text. Graesser et al. (1997:179) state that as a general underlying principle, readers strive to achieve the most global level of understanding that can be attained given the text composition, the reader's knowledge base, and the reader's goals for reading. Text processing models posit that the reader's mental processes during reading focus on the development of coherence through organisation of the meaningful elements in the text. Readers process new elements in

terms of how they relate to information already given and their own prior knowledge (McKeown et al., 2009:220).

The text base contains the meaning of the propositions explicitly stated in the text as well as the inferences required to form a connection between the propositions. In-depth understanding of the text requires more than processing the information explicitly presented in the text; it also requires the reader to establish structural coherence and linguistic cohesion (Cain, 2003:337; Peterson and McCabe, 1991:30; Rapp et al., 2007:292). Successful reading comprehension requires local cohesion and global coherence, in other words, cohesion within and coherence between the levels of the representations in the mental model. Local cohesion refers to the connection between an incoming proposition and a previous proposition. Global coherence, on the other hand, is achieved if an incoming proposition can be linked to the text macrostructure, to information no longer available in the working memory, or to the reader's prior conceptual knowledge (Graesser et al., 1997:178).

To construct mental models, readers must activate and retrieve relevant prior knowledge about the ideas expressed in the text and integrate it with the new information encountered. Readers without adequate world knowledge and domain knowledge will find it difficult to arrive at deeper understanding of texts. Cultural values, beliefs, experiences and the themes and organisational text structures associated with different cultures have an impact on a reader's construction of mental models. Readers will find it more difficult to construct mental models from text macrostructures that do not resemble texts, themes and schemas representative of their own cultural and environmental discourse (Westby, 2005:171). Poor comprehenders and language-impaired children have problems with the integration of stories as a whole and tend to give picture-by-picture accounts as if they are describing a series of unrelated events rather than constructing an integrated sequence of events (Yuill and Oakhill, 1991:165; Hayward, Gillam and Lien, 2007:243).

Interestingly, some studies investigating interactions between texts, the construction of mental models and readers' prior knowledge report results that seem to be counterintuitive. As expected, readers with little prior knowledge about the topics of the text obtained higher comprehension scores on texts with high coherence. Readers with a high amount of prior topic knowledge, however, scored better on less coherent texts, because the coherence gaps forced them to draw more inferences, construct richer elaborations and to compensate for the coherence gaps by allocating more processing resources to the construction of the mental model (Kintsch and Kintsch, 2005:81; Snow, 2002:107). These findings seem to concur with the results of the study by Peskin and Astington (2004:265) that demonstrated that a shared storybook reading intervention requiring young children to construct their own inferences resulted in better metacognitive understanding. It would therefore seem that active metacognitive engagement of readers in constructing mental models and drawing inferences results in deeper understanding of texts, even of texts that are inherently less coherent.

3.4.2.4 Construction of mental models and inferencing

To construct mental models that go beyond the information explicitly provided in the text, readers are required to make inferences and derive at the meaning of the text as a whole (Rapp et al., 2007:294). Problems with constructing inferences have consistently been found to differentiate between readers with good comprehension and those with poor comprehension (Oakhill and Cain, 2007b:47; Perfetti et al., 2005:231; Westby, 2005:160; Yuill and Oakhill, 1991:73). Van den Broek et al. (2005:123) found that children's ability to infer relations at the preschool level strongly predicts their later reading comprehension over and above other literacy skills such as vocabulary, and alphabet and word knowledge.

According to Graesser et al. (1997:182), readers encode three sets of inferences, namely inferences addressing the readers' comprehension goals; inferences that explain why events, states and action occur; and inferences that establish local and global coherence in the mental models. Coherence therefore reflects the meaningful connections that the reader is able to establish between elements of the text and prior knowledge. Two types

of inferences have been found to be particularly important to establish cohesion and coherence in narratives, namely *referential* inferences that enable readers to keep track of objects, characters and events in a text (Yuill and Oakhill, 1991:176), and *causal* inferences that enable readers to establish how different events and facts depend on or cause one another (Yuill and Oakhill, 1991:175). Causal and referential inferences will be discussed in greater detail in section 3.4.2.5.

Three possibilities are proposed to account for the deficits in inference-making abilities of poor comprehenders: first, their general world knowledge deficits restrict their abilities to make inferences; second, they may be unaware that inferences are necessary, and third; their processing limitations may hamper their ability to access relevant world and schema knowledge and use inferences to integrate it with text information (Westby, 2005:160; Yuill and Oakhill, 1991:74). Oakhill and Cain (2007b:64) suggest that the causal link between comprehension and inference-making may relate to the reader's standard for coherence that determines the extent to which the reader will read for comprehension, make inferences and monitor his or her comprehension. This corresponds with the notion of coherence gaps and the event indexing model proposed by Zwaan, Langston and Graesser (1995), discussed in section 3.4.2.5. Poor comprehenders may have poor understanding of the purposes and goals of reading and may focus on individual words during reading instead of striving for coherent text representations and detecting gaps in their own comprehension.

3.4.2.5 Cohesion and coherence

As mentioned above, text comprehension requires more than the processing of the information explicitly presented in the text; it also requires the reader to establish structural coherence and linguistic cohesion (Cain, 2003:337; Peterson and McCabe, 1991:30). Successful reading comprehension requires local cohesion and global coherence, in other words, cohesion within and coherence between the levels of the representations in the mental model. Local cohesion refers to the connection between an incoming proposition and a previous proposition. Global coherence, on the other hand, is achieved if an incoming proposition can be linked to the text macrostructure, to

information no longer available in the working memory, or to the reader's prior conceptual knowledge (Graesser et al., 1997:178).

Cohesion and coherence describe different aspects of organisation within a narrative text. Cohesion refers to the semantic relations between different sentences and clauses in the text, and is established by linguistic devices, such as cohesive ties that can be grouped into anaphora and conjunctions (Halliday and Hasan, 1976:8). Cohesive devices tie a text together at the local level by indicating the semantic relations between propositions, for instance indicating whether propositions are temporally or causally related (Cain, 2003:338; Peterson and McCabe, 1991:30). The surface code contains cues to help the reader to monitor coherence and conceptual continuity, and to establish local cohesion. Verb tense, aspect and temporal connectives, such as *before* and *after*, provide cues for temporal continuity. Setting statements provide information about spatiality and protagonists e.g. *once upon a time there was a king who lived in a castle,* whereas causal connectives, e.g. *because* and *so that*, provide cues about causality and intentionality (Graesser et al., 1997:180; Peterson and McCabe, 1991:34).

To establish global coherence, the reader has to construct mental models of the text macrostructure or event structure, in other words, the relationships between events. Coherence therefore concerns the meaningful organisation of narrative events, for instance, the sequencing of events in temporal or causal frameworks (Cain, 2003:336; Peterson and McCabe, 1991:32).

According to Zwaan et al.'s (1995) *event indexing model,* the reader continually monitors comprehension along five conceptual dimensions: *spatial, temporal, causal, intentional* and *protagonist*. A coherence gap is detected when the reader becomes aware of discontinuity between incoming statements and previous statements along the abovementioned dimensions. This model concurs with the constructionist model (Graesser, Mills and Zwaan, 1997:182; Graesser, 2007:11) discussed in section 3.3.4, stating that good readers actively employ strategies to construct coherence at local and

global text levels. The coherence of the text and the reader's perception thereof are therefore crucial for comprehension and self-monitoring of comprehension.

To test the hypothesis that children with reading comprehension problems will have distinctive problems in selecting appropriate conjunctions, Cain, Patson and Andrews (2005:890) investigated the comprehension of conjunctions in two groups of 7 to 9 year old children who were matched for word reading ability and vocabulary knowledge, but who differed in reading comprehension skills. Results indicated that both groups had more correct responses for additive and adversative conjunctions than causal and temporal terms, but that the poor comprehenders displayed significantly more problems using all types of conjunctions. The poor comprehension of conjunctions in children with SCD seems to indicate problems with understanding of the semantic relations between events in written texts and narratives.

Children with poor reading comprehension make more errors when answering questions that require understanding of anaphoric references and are generally poor at the use of cohesive devices[36] (Cain and Oakhill, 2007c:48; Yuill and Oakhill, 1991:87). Cohesive repairs reflect children's understanding of the importance to monitor listeners' comprehension and require organisational strategies not normally found in conversation (Purcell and Liles, 1992:359). In this study, participants' narratives were investigated for two aspects of cohesion, namely the use of conjunctions and the adequacy of the cohesive ties[37] (percentage of complete, incomplete and erroneous ties per narrative) displayed in

[36] An element is identified as a cohesive marker if its meaning cannot be adequately interpreted by the listener without searching outside the statement for the completed meaning. An element is not a cohesive marker if the information referred to can be recovered within the statement. For example, in *the man washed <u>his</u> car*, the possessive *<u>his</u>* is not a cohesive element, because the information about who the car belongs to is recoverable within the sentence context. By contrast, in the statement *then the ant bit <u>his</u> leg,* the possessive *<u>his</u>* refers to a character previously mentioned in the story context (but not in the statement) and is therefore a cohesive device (Liles, 1985).

[37] Cohesive ties can be classified as: i) complete, when the information referred to by the cohesive marker is easily found and understood with no ambiguity, e.g. *once there was an ant / <u>he</u> walked to the dam because <u>he</u> was thirsty*; ii) incomplete, when the information referred to by the cohesive marker is not provided in the text, but has to be recovered outside the text by inferring the meaning from the story context, e.g. *the dove plucked the leaf / <u>he</u> crawled onto the leaf*); and, iii) erroneous, when the listener is guided to ambiguous or incorrect information, such as omission of an article, e.g. [ ] *man wanted to shoot the bird*.

their retell narratives (see section 4.4.1.2 for a discussion of cohesive markers and ties). The purpose was to establish whether there is a relationship between participants' performance in reading comprehension and their use of cohesive devices in narrative production. Based on evidence in the literature, it was hypothesised that the poor comprehenders would display problems with pronominal referencing and that they would produce fewer complete ties and conjunctions in their narratives.

As stated above, successful reading comprehension requires the reader to identify and decode words and syntactic structures, and then derive meaning from individual sentences. Poor comprehenders and children with language impairments have problems with the integration of stories as a whole and tend to give picture-by picture accounts as if they are describing a series of unrelated events rather than constructing an integrated sequence of events (Yuill and Oakhill, 1991:156, Hayward et al., 2007:243). Mere understanding of the words and sentences is not sufficient for reading comprehension. The reader is also required to identify and comprehend the relations between the various components of the text and between the text and the reader's world knowledge. Texts must be perceived and represented in the reader's memory as a coherent structure and not as individual pieces of information. A coherent mental representation allows the reader to access the information for later recall or retelling (Van den Broek et al., 2005:109). Coherence is not a property of text but seems to be the property of the mental representation or interpretation of the text. In other words, as stated by Sanford and Garrod (1994:701), coherence occurs in the mind of the reader.

Texts consist of chains of causally and temporally connected events, states and actions (Kemper, 1986:12; Trabasso and Sperry, 1985:601). Causal relations are important components of the structure of narratives because narratives typically describe how events and actions cause changes in the states of objects and persons in the text. The causal structure of a text can be described in terms of a *causal chain* of connected events, actions and states. A causal chain maintains the causal flow of the text and is a crucial aspect for the coherence of the narrative (Van den Broek et al., 2005:122).

3.4.2.6 Construction of mental models and schema knowledge

As stated before, the construction-integration model of Kintsch (1994:732) questions the validity of schema-driven top-down models to account for discourse comprehension. Kintsch's model proposes that the construction of propositional networks is a selective bottom-up process largely unguided by the discourse context.

The focus of this study, however, is on the narrative production of the participants. To construct mental models of narrative texts, readers must be able to activate and use schema knowledge. It will be argued that the participants' knowledge of schemas and competency in the construction of narrative schemas are linked to their competence in comprehension of narrative texts. In this section, the general nature of schemas, the role of schema knowledge in text comprehension, and variables pertaining to schema knowledge in different text genres, such as story grammars and expository text grammars, will be described.

A schema is an abstract, complex, ever-changing structure that is a coherent representation of an existing or imagined reality (Duchan, 2004:381). Schemas are hierarchically organised sets of information that describe generalised knowledge about a text, events, scenes, objects or classes of objects, in other words, the regularities upon which the world is built (Mandler, 1984:3).

The role of schemas in text comprehension has been widely studied (cf. Stein and Glenn, 1979). Anderson (1994, in Westby, 2005:160) describes a variety of functions of schemas in relation to text comprehension:

i) Schemas provide a scaffold for the assimilation of text information by providing slots for the new information to fit into;

ii) they facilitate selective allocation of attention to the more important information contained in the text, assisting the reader in the processes of summarising and editing;

iii) they allow orderly searches of memory and facilitate the reconstruction and recall of information because readers can use schema knowledge to hypothesise about missing information; and

iv) they facilitate comprehension monitoring because readers can use schema knowledge to detect discrepancies and anomalies in their own understanding of the text.

Schema knowledge plays a major role in readers' abilities to make inferences about implicit information in narrative texts, particularly when interpreting characters' goals, plans and intentions. The pervasive deficits in inferencing displayed by poor comprehenders, particularly when required to provide answers about the text that requires inferencing, may be related to their lack of appropriate schema knowledge and difficulties to access and integrate relevant schema knowledge during reading (Oakhill and Cain, 2007b:50, Westby, 2005:162).

The ultimate goal of education, the development of knowledge, is obtained through the acquisition of new schemas (Westby, 2005:161). Activation of prior schema knowledge forms the basis of narrative comprehension, while comprehension, in turn, provides a means for the construction or acquisition of new schemas. According to the Piagetian notion, the mind has a propensity to organise itself, but, whereas structures in the environment can be perceived, true understanding of schemas comes mainly through experiential learning (Byrne, 2005:109). It is through experiential learning that schemas become mental models that can be used in the acquisition of new information through the metacognitive processes of selection and abstraction, and interpretation and integration (Mandler, 1984:x).

Each type of discourse or text has its own macrostructure that specifies the organisation of information within the text (Hadley, 1998:133; Wallach, 2008:192). Children are required to master connected discourse across several genres such as conversational, narrative and expository discourse in the spoken and written language domains of the

academic curriculum[38]. Activities in the language subjects require comprehension and production of narrative texts whereas the content subjects, such as history, and aspects of mathematics require proficiency in expository discourse. In the South African Revised National Curriculum, the focus of reading in the foundation phase (Grades R to 3) is mainly on narrative texts. The intermediate phase (Grades 4 to 6) and the secondary phase (Grades 7 to 12) require proficiency in expository as well as narrative texts.

The comprehension and production of narrative and expository discourse demands different types of cognitive strategies or modes of thought: narratives deal with human or human-like intentions, actions and the consequences thereof, whereas expository discourse deals with the logical-scientific or paradigmatic processes pertaining to causes, formal connections and the processes to verify and test for empirical proof (Bruner, 1986:17; Gillam, Fargo and Robertson, 2009:83).

Narrative texts generally require understanding of causal event chains and story schemas, whereas expository texts require understanding of text functions and text organization in terms of logical relationships, factual information and abstract ideas. The inferences required for comprehension of narrative texts are often pragmatic in nature and stem from own experience and world knowledge. In contrast, expository texts require logical-deductive inferences based on the facts in the text (Gillam et al., 2009:83). Comprehension of narrative texts therefore rely more on top-down processing that allows the reader to make predictions and assumptions about the text, whereas comprehension of expository texts rely more on bottom-up processing (Westby, 2005:163).

In a summary of the research pertaining to the interaction between content and structure knowledge, Wallach (2008:174) states how readers' use of their structural knowledge of texts, whether narrative or expository, is especially important when the content is

[38] According to Wallach (2008:193) children require the following knowledge and skills when faced with expository discourse: the ability to i) compare and contrast events and ideas; ii) describe and summarize; ii) think and report on how and why events occurred; iii) list facts, dates and achievements; iv) manage cause-effect and problem-solution texts; v) present their own opinions and interpretations; and vi) persuade others in oral and written presentations. (Cf. Westby, 2005 for a discussion of the differences between narrative and expository texts with regards to text grammars and schema content).

moderately or very unfamiliar. They can then use their knowledge of and the cues provided by the text structure to create meaningful mental representations to facilitate comprehension. It follows that text comprehension will be severely compromised if both content knowledge and structural knowledge are limited, or if a text is poorly written and fails to provide the reader with explicit cues for organisation.

A story grammar is one example of a story schema. Story grammars provide an organizational pattern that is structured in systematic ways that aid comprehension. The predictability of the typical story grammar format aids the reader in the construction of mental models. In contrast to story grammar and narrative texts, which usually follow a predictive pattern and where the purpose is often to entertain, expository texts are designed to present factual information. Expository texts usually present novel ideas and facts and it is therefore more difficult for readers to use their prior content schema knowledge to construct mental models. They are required to process individual facts before they can organise them into content schemas.

Although less predictable and conventional than story grammars, certain text grammar rules direct the placement and sequence of information in expository texts. Structural organisation in expository text grammars includes text structures to convey, for instance, procedural, persuasion, comparison-contrast, cause-effect, problem-solution, description, enumeration, or temporal order information (Wallach, 2008:190; Westby, 1994:192, 2005:163). Descriptive expository text structures are for instance signalled by words such as *for example*; sequential expository text structures present information in chronologically or numerically ordered format, often signalled by terms such as *first* and *previously*; whereas comparative expository text structures can be signalled by words such as *in contrast* and *conversely* (Gillam et al., 2009:83).

In this study, structural level analyses of participants' narratives were performed to determine the developmental levels of their narratives. Narrative analyses also investigated the participants' abilities to produce narratives that contained episodes and goal-attempt-outcome structures and to indicate understanding of narrative schemas,

understanding of psychological causality, perspective taking, meta-awareness of the ability to plan, and the need to justify plans and actions. Based on evidence from previous studies, it was hypothesised that participants with poor reading comprehension would display problems with these aspects of narrative production.

3.5 SUMMARY

The goal of reading is the full comprehension of written texts. Certain cognitive and linguistic abilities and processes underpin reading comprehension. These abilities vary considerably between readers and may even vary within the same reader when he or she is confronted with different types of texts and reading activities in different kinds of contexts.

This chapter aimed to provide an overview of the current theoretical concepts pertaining to the nature of and processes involved in reading comprehension. All models of reading comprehension acknowledge that comprehension involves more than recognising and understanding individual words. In order to make sense of texts, readers must construct mental representations to organise and interpret the information encountered. The text variables involved in the construction of mental models and discussed the language and cognitive processes involved in readers' construction of mental models of texts, were discussed.

In the next chapter micro- and macrostructural aspects of narrative production will be discussed in terms of the relevance of these aspects to literate language style, schema knowledge and text comprehension. The frameworks for analysis of participants' narratives to make comparisons between the groups will also be discussed.

CHAPTER 4

NARRATIVES AND READING COMPREHENSION

4.1 INTRODUCTION

Discourse is the main linguistic medium through which academic information is disseminated and acquired. Discourse knowledge has been identified by the RAND study group (Snow, 2002:83) as one of seven critical components that directly or indirectly influence language and reading comprehension and account for the variability in the reading achievement of individual children. Narratives serve as a bridge between oral and literate language and the mastery of the more abstract and complex texts encountered in the classroom context (Hadley, 1998:132, Wallach, 2008:171). Numerous studies have demonstrated the value of children's narratives to predict academic success and reading skills (e.g. Botting, 2002:3; Gillam, Peña and Miller, 1999:34; Feagans and Short, 1984:1734; Kaderavek and Justice, 2004:221; Milosky, 1987:329; Paul, Hernandez, Taylor and Johnson, 1996:1296; Roth, 2000:15).

According to Oakhill and Cain (2007a:26), reading comprehension has its roots in the comprehension of narrative discourse that develops simultaneously with other early language skills prior to formal reading instruction. The ability to tell a story links oral language skills and literacy, because it requires children to plan and produce de-contextualised and cohesive narratives. Narratives are defined as a form of discourse initiated and controlled by a person, organised in a predictive, cohesive, rule-governed way, and representing causal and temporal patterns of relating information (Owens, 1999:223). As such, narratives provide an accurate index of cognitive, semantic and social abilities (Liles, 1993:869). Narratives are increasingly considered by researchers and clinicians to be an ecologically valid way to investigate communicative competence (Botting, 2002:3) and to be more valid, sensitive and less biased than norm-referenced assessment tools (Norbury and Bishop, 2003:310; Justice et al., 2006:178).

Traditional diagnostic measures used by speech-language therapists are usually more focused on the identification of children with specific language impairments (SLI), i.e. disordered language. As stated before, there are only a few standardised tests, such as the *Afrikaanse Reseptiewe Woordeskattoets (ARW)* (Buitendag, 1994) and the *Test of Oral Language Production (TOLP)* (Vorster, 1980), available in South Africa for use with Afikaans speaking children. A number of formal tests, such as the *Reynell Development Language Scales* and the *The Test of Auditory Comprehension of Language Revised (TACL-R)*, have been translated into Afrikaans. Other tests, such as the *Peabody Picture Vocabulary Test (PPVT)*, have been adapted for use in the English speaking South African population (see Penn 1998:261) for a review). There are, however, reservations among South African speech-language therapists about the validity and reliability of these adapted and translated tests. It is generally felt that tests that were standardised on American and British populations, fail to take the diversity and complexity of the experiential, cultural and socio-economic circumstances of South African learners into account (Penn, 1998:260). To overcome this problem, speech-language therapists often employ informal qualitative assessment procedures, such as analysing language samples obtained through childrens' narratives to assess their language development.

Narrative analysis is an effective and valid clinical and research tool because oral narratives provide a rich source of data about a child's language use in a naturalistic context (Botting, 2002:3). Furthermore, oral narratives allow clinicians to analyse multiple linguistic features, such as microstructural aspects, e.g. lexical diversity, and macrostructural elements, e.g. story grammar, using a relatively short language sample (Heilmann, Miller, Nockerts and Dunaway:2010:154). Narrative analysis therefore represents a cost-effective tool for researchers and clinicians.

Depending on the goals of the examiner, narratives are usually analysed at two levels, namely microstructure and macrostructure. Microstructural analyses focus on the internal linguistic structures used in the construction of the narrative, such as noun phrases and conjunctions. Macrostructural analyses, by contrast, focus on higher-order hierarchical organisation such as episodic structure and story grammar components (Owens,

2004:213; Heilmann et al., 2010:155). Microstructure and macrostructure variables therefore represent two distinct areas underlying narrative competence (Liles et al., 1995:38). The variables investigated in this study were grouped into these two broad categories, namely microstructure and macrostructure.

The main aim of this study was to examine the relationships between aspects of narrative production of the participants, on the one hand, and their reading comprehension levels on the other. In this study participants' narratives elicited through a story retell format were analysed for the different variables of narrative production associated with reading comprehension. In doing so it was attempted to generate insights into the participants' deficits in narrative production as one of the underlying sources of their poor reading performances. To elucidate the abovementioned theoretical perspectives, this chapter describes aspects of narrative production at micro- and macrostructural levels in terms of their relevance to literate language style, schema knowledge and text comprehension. Each concept will be briefly explained. Together, these aspects comprised the frameworks for analysis used in this study that allowed me to make comparisons between the groups' reading comprehension scores and their narrative production.

4.2 NARRATIVE MICROSTRUCTURE

A number of studies have demonstrated the use of microstructural analyses of narratives to measure linguistic competence in children (Justice et al., 2006:184; Heilmann et al., 2010:155) and to identify children with SLI (e.g. Feagans and Short, 1985:1731; Liles et al., 1995:423; Kaderavek and Sulzby, 2000:46; Scott and Windsor, 2000:326). There are, however, several challenges in using norms and criteria obtained from published research. Methodological differences between studies pertaining to, for example, sample size, age of participants, procedures for narrative elicitation, participant selection criteria and variables investigated make it difficult to compare and interpret results. The development of the Index of Narrative Microstructure (INMIS) by Justice et al. (2006) using the Test of Narrative Language (TNL) developed by Gillam and Pearson (2004) was one attempt to provide a standardised instrument for the microstructural analysis of narratives for clinical use.

The abovementioned study of Justice et al. (2006), in which the INMIS was used, demonstrated through factorial analyses that microstructural variables can be grouped into two moderately related factors: productivity (measures of word output, lexical diversity, and T-unit[39] output) and complexity (measures of syntactic organisation) in typically developing children (Justice et al., 2006:184). This study also demonstrated that performance on narrative microstructure increases with age but peaks at the age of 10 years. The researchers hypothesised that older children have a reduced interest in producing elaborated narratives and that their more restricted performances reflect aspects associated with testing, skills and motivation. Furthermore, data indicated that the participants' performances on microstructural criteria were not distributed normally among age or grade levels, but were skewed towards the lower values. The authors hypothesised that the variability in the data and the clustering of the data toward the lower end of the distribution could be artefacts of using language sampling instead of more controlled methods of data collection, such as formal language tests. They concluded that the lack of normal distribution of microstructural elements do not preclude their use for normative and criterion-referenced purposes, but recommended that these distributional irregularities are investigated in future research studies (Justice et al., 2006:186).

4.2.1 Productivity

Productivity refers to the amount of language produced in response to a task and is generally interpreted as measure of general language proficiency, volubility and developmental processes associated with increased maturation and language proficiency (Puranik et al., 2008:108; Scott and Windsor, 2000:325; DeThorne et al., 2005:638; Watkins, Kelly, Harbers and Hollis 1995:38). Measures of productivity in narratives can be used to distinguish between language impaired children and children with normal

[39] A T-unit (terminal unit) comprises a main clause with all its concomitant subordinate clauses and phrases (Owens, 2004:190). Simple sentences, e.g. *The children played outside,* and complex sentences with embedded clauses e.g. *Whatever she told you was true* comprise one T-unit. A compound sentence where two or more clauses are conjoined, e.g. *The children played outside while their mother made supper,* comprises two T-units

language development. The narratives of language impaired children are often shorter, contain less complex sentences, have fewer content ideas (Roth, 1986:27; 2000:20), and generally resemble the narratives of younger children (Scott and Windsor, 2000:326; Puranik et al., 2008:108).

Two measures, namely total number of words (TNW) and total number of T-units, were used determine if, in this study, participants with normal reading comprehension (NC) differed from participants with specific reading comprehension (SCD) and poor comprehension (PC) in terms of the amount of language they produced in their narratives.

4.2.1.1 Total Number of Words (TNW) and total number of T-units

TNW and total number of T-units provide a general measure of productivity in response to a stimulus and increase steadily with age. Language-impaired children tend to produce fewer words and fewer T-units than children with normal language development, because their oral narratives are in general shorter and less complex (Roth, 1986:27; 2000:20; Scott and Windsor, 2000:325). The same was found in studies examining the differences in productivity in written language of children with and without language impairments (see Puranik et al., 2008:108 for a review).

4.2.2 Lexical diversity

The lexical diversity in the narratives of the three groups of participants in this study was determined by examining the number of different words (NDW) produced in each narrative, and two categories of word-level semantic knowledge associated with literate vocabulary, namely *metaverbs* (metacognitive and metalinguistic verbs) and *conjunctives*.

4.2.2.1 Number of Different Words

Lexical diversity in narratives can be measured by counting the number of different words (NDW) produced in each narrative. A recent study by Heilmann et al. (2010:160) showed a unique relationship between NDW and narrative macrostructural skills in typically developing children. Research indicates that NDW is a more reliable measure

than Type-Token-Ratio (TTR)[40] to distinguish between children with normal language development and children with language impairments, mainly because of the effect of sample size on TTR (cf. Scott and Windsor, 2000:326 and Watkins et al., 1995:1354). NDW reflects a child's expressive vocabulary size and semantic proficiency (Watkins et al., 1995:1353) and correlates with standardised vocabulary measures[41] (Ukrainetz and Blomquist, 2002:71). The validity of the ARW to measure vocabulary in speakers of non-Standard Afrikaans was questioned by Southwood and Van Dulm (2009:6); see section 5.7.1 for a discussion. NDW represents a measure of expressive vocabulary that may be less culture-sensitive than standardised tests, such as the ARW, and therefore more appropriate to assess lexical diversity in children from different socio-economic and cultural backgrounds.

Low levels of NDW in a language sample may reflect stereotypical verbal utterances, poor vocabulary and word retrieval problems (Owens, 2004:182). NDW is strongly correlated with maturation, and some studies indicated that NDW distinguishes language-impaired children from children with normal language (Klee, 1992:31; Watkins, et al., 1995:1353). Other studies, however, did not find that NDW, when corrected for sample size, distinguished between children with and without SLI (Greenhalgh and Strong, 2001:122; Scott and Windsor, 2000:334). In using NDW as a diagnostic, the effects of sample size should be borne in mind. The shorter narratives typically produced by children with SLI may result in higher NDWs due to the repetition of prepositions, articles and auxiliaries (Greenhalgh and Strong, 2001:120). Higher NDW scores of children with normal language development, on the other hand, may merely reflect the fact that they produce more words in samples controlled for utterance size than do children with SLI (Klee, 1992:39).

[40] Type-Token-Ratio (TTR) is the ratio of the number of different words to the total number of words in a language sample (Owens, 2004:181)

[41] A standardised test, the Afrikaans Reseptiewe Woordeskattoets (ARW) (Buitendag, 1994), was used in this study to assess the participants' receptive vocabulary

4.2.2.2 Metaverbs

The ability to produce a cohesive and coherent narrative not only requires mental representations of the story elements in the narrator, but also requires the narrator to form mental representations of the listener's mental state and knowledge (Curenton and Justice, 2004:241;). The ability to attribute mental states to the self and others is referred to as *theory of mind*. Discourse development is linked to the development of theory of mind because it requires mastery of skills such as intention-reading, perspective-taking, and repair strategies in instances of communicative breakdown (Lorusso et al., 2007:39; Tomasello 2003:278). In a review of research about language and theory of mind, Miller (2006:152) concluded that children with language impairments may be at risk for problems with theory of mind, particularly when they also display pragmatic disorders. Poor theory of mind development may, on the other hand, constrain a child's language and communicative development.

The nature and frequency of metaverbs (metalinguistic and metacognitive verbs) in the participants' narratives were examined, because the use of these verb forms by the participants were taken as evidence of their awareness of others' states of minds and indications of their cognitive processes to interpret intentionality. The use of metaverbs in narrative production reflects awareness of the goals and intentions of characters and contributes to the comprehension and construction of coherent narrative schemas and mental representations (Greenhalgh and Strong, 2001:116; Westby, 2005:165). In a study comparing the narratives of children with and without language impairments, Bishop and Donlan (2005:39) found that the use of metaverbs correlated with the use of complex syntax, and that failure to use metaverbs predicted poor recall of narrative information. The use of landscape of consciousness verbs also reflects a literate language style that forms a crucial aspect of decontexualised school-based discourse (Curenton and Justice, 2004:249: Heilmann et al., 2010:156).

Metalinguistic verbs refer to the various acts of speaking using linguistic verbs such as *said, called, told* and *asked*. Later forms of metalinguistic verbs include verbs such as *argue, predict* and *imply*; again as with later forms of metacognitive verbs, probably as a

result of exposure to more advanced literate language in academic discourse, content subjects and written texts (Nippold, Ward-Lonergan and Fanning, 2005:127).

Metacognitive verbs refer to the acts of thinking and indicate the user's awareness of characters' mental states, motivations, intentions and goals (Nippold et al., 2005a:127). The presence of these verbs in narratives is therefore an indication of the processes of subjectification[42], presupposition and multiple perspectives associated with landscapes of consciousness (Bruner, 1986:25), false belief-understanding and theory of mind (Lorusso et al., 2007:44).

The earlier forms of metacognitive verbs in children's language include verbs such as *thought, remembered, decided,* and *knew*. Later forms of metacognitive verbs such as *assume, hypothesise*, and *infer,* develop during adolescence, usually as a result of exposure to the more advanced forms of these verbs in books and the academic curriculum, and continue to develop during adulthood (Nippold, et al., 2005a:133). According to Nippold (1988:33) a large percentage of adults never masters these advanced verb forms, particularly if they had limited educational experiences.

The representation of others' states of minds is encoded in the use of metacognitive verbs as well as the syntax of complementation that these verbs allow, e.g.

(1) ***Ben believes*** *in the Easter bunny*

The mental state verb, *believes*, denotes a proposition that encodes the content of Ben's mind (De Villiers and Pyers, 2002:1038). According to Tomasello (2003:253), sentence complements dealing with expressions of knowledge and belief, such as *he thinks that* .., are not understood by children before the age of 4 years. Children acquire sentence complements with metalinguistic verbs (e.g. *say, tell*) earlier than metacognitive verbs dealing with mental states (e.g. *think, know*).

[42] Subjectification is used by Bruner (1986:25) to describe the depiction of reality through the consciousness of characters in a story

4.2.3 Syntactic complexity

The ability to produce and understand complex language is closely associated with reading comprehension and academic success. Scott (2009:184) claims that the role of syntactic complexity to successful acquisition of reading comprehension has been overlooked by models that focus on domain-specific comprehension strategies at text level. Research indicates that there is a positive correlation between knowledge and awareness of complex syntactic structures, both for comprehension and production, and reading performance. Children with poor reading display difficulties with syntax in reading as well as in writing skills compared to age-matched and decoding-matched peers (Puranik et al., 2008:108; Scott, 2004a:354, 356).

Reading requires learners to use structural and conceptual linguistic knowledge to initially decode simple syntactic texts, and later to extract meaning from complex and less familiar syntactic constructions in written texts (Nippold et al., 2009:242). Knowledge of the syntactic rules governing the order and combination of words enables children to produce well-formed sentences and to comprehend complex literate language. Poor readers produce less complex sentences, display more syntactic errors, and experience problems understanding complex sentences (Scott, 2004a:354; Westby, 2005:162)[43].

There are considerable linguistic differences in the syntax typically associated with written texts and that typically associated with oral language. Written texts are decontextualised and marked by more advanced and precise vocabulary and by formal syntax conveying temporal and causal event chains (Curenton and Justice, 2004:241). Complex syntax in written texts and literate language often conveys semantic relationships, such as causality, that cannot be expressed adequately in simple sentences (Scott and Stokes, 1995:312). Syntax in written texts is often transformed and more embedded through the use of constructions such as, dependent clauses, adjectival and adverbial clauses, appositives, nominalisations and attributive adjectives. In contrast with

[43] For a review of the differences in written language produced by children with typical and atypical language development, cf. Puranik et al. (2008).

oral sentences, written sentences are often left-branching, that is, the sentence starts with an adverbial or other type of modifier clause before the subject is encountered, e.g.

(2) ***in order for bears to keep warm in winter****, they have to sleep in holes under the ground*

Written language often contains complex Boolean expressions (*or*, *and*, *not, if-then)* as in:

(3) *travelling to town she could take the bus* ***or*** *the train*

These complex sentence structures add to readers' working memory load as they keep track of the different options during reading (Snow, 2002:96). Two key markers of complex syntactic development are increasing sentence length and clausal density (Scott and Stokes, 1995:310; Nippold et al., 2005b:1049). Transformations at clause and lexical levels occur more frequently in written texts than in oral language, and more in oral expository discourse than in oral conversational discourse (Purcell-Gates, 2001:12). One of the reasons why syntactically complex sentences pose problems to young or struggling readers is that such readers need to hold the partially-coded information in their working memory before encountering the main proposition in the sentence. The ability to comprehend complex sentences is therefore linked to verbal working memory for both spoken and written modalities (Scott, 2009:188).

Several studies have demonstrated that children with reading and listening comprehension problems display poor syntactic awareness skills (cf. Bowey, 1986; Cain and Oakhill, 2007a; Nation and Snowling, 2000). Results indicate that poor comprehenders' weak syntactic awareness skills reflect their general language processing problems. Poor syntactic awareness skills have a negative impact on readers' text integration and comprehension monitoring. Limited syntactic awareness also constrains the development of word recognition because readers use sentence contexts to decode unfamiliar or irregular words (Cain and Oakhill, 2007c:44: Nation and Snowling, 2000:229).

The correlation between the production and comprehension of complex syntax is, however, not straightforward. The heterogeneity of language skills displayed by children with language disorders makes it difficult to establish clear causal links between oral language differences and reading skill differences. The ability to produce complex sentences is not always and accurate predictor of comprehension and vice versa. Children may be able to use particular syntactic structures in discourse, but experience comprehension problems when they encounter the same structures in decontextualised written texts (Scott, 2009:188)[44].

In this study four syntactic aspects of narratives which are commonly used as measures of syntactic complexity, namely i) number of words per T-unit, ii) number of subordinate clauses, iii) the subordination index, and iv) number of elaborate noun phrases (ENPs), were investigated. The last two aspects are also associated with a literate language style (Curenton and Justice, 2004: 241; Greenhalgh and Strong, 2001:121; Westby, 2005:168). In the following sub-sections a brief description of these aspects and the rationale for selecting them to measure the syntactic complexity of the narratives produced by the participants in the present study, will be provided.

4.2.3.1 Number of words per T-unit

Sentence length is one of the key markers of syntactic development (Nippold et al., 2005b:1049; Scott and Stokes, 1995:310) and is more realiable than mean length of utterance (MLU) to the linguistic developments displayed by children older than 5 years, such as phrasal embedding and using a variety of subordinate clauses (Owens, 2004:191). A slow but steady increase in length takes place in both spoken and written sentences throughout the school years[45]. Longer T-units usually reflect a higher level of syntactic complexity because words are added through expansions at phrase and clause levels (Scott and Windsor, 2000:326) and serves as a diagnostic to distinguish between children with and without language impairment (Klee, 1992:39).

[44] Cf. Cain and Oakhill (2007a) and Scott (2004a, 2009) for discussions of the links between syntactic skills and processes and reading comprehension problems.

[45] Cf. Scott (1988a:55-57) and Puranik et al. (2008:108) for reviews of sentence length data for spoken and written discourse

4.2.3.2 Subordination index

The use of subordination is often associated with exposure to a literate language style, because subordination occurs more frequently in written language than in oral language (Greenhalgh and Strong, 2001:121; Scott and Stokes, 1995; Westby, 2005:168) and more frequently in expository discourse than narrative discourse (cf. Nippold et al., 2005b:1050; Scott, 2004b:129). The use of subordinate clauses[46] in narratives allows the narrator to convey semantic relationships more clearly, concisely and coherently.

Clausal density, defined as the average number of main and subordinate clauses in a sentence, is considered to be a marker of later syntactic development (Scott, 1998a:58). Clausal density distinguishes the narratives of school-age children from those of preschoolers (Owens, 2004:206) and also distinguishes between the narratives of children with and without language impairment (Merritt and Liles, 1987:545). Clausal density or the subordination index is calculated by adding up the total number of independent and dependent clauses and dividing them by the total number of T-units in a language sample (Nippold et al., 2005b:1049). Subordination is an indication of increasing syntactic complexity through the processes of embedding and conjoining (cf. Scott, 1988a, 1988b for reviews). Research has reported a gradual improvement in children's understanding and use of subordinating conjunctions as they mature.

The three main types of clause subordination are nominal, adverbial and relative, accounting for 90% of all subordination structures in the language of 9-year old children (Gummersall and Strong, 1999:154). A nominal clause is a noun-like expression that can serve as the subject of the sentence (Nippold et al., 2005b:1061), e.g.

(4) ***whatever she told you****, was true*

or as the object of the sentence e.g.

(5) *he will buy* ***what he wants***

---

[46] A subordinate clause is either joined some other clause by means of a subordinate conjunction, e.g. *I want the dog* ***that I saw yesterday***, or embedded within another clause to fulfil a grammatical function, e.g. ***The toy that you want*** *is on sale.*

Adverbial clauses function like adverbs in that they usually modify the verb. They fill specific adverbial slots in clauses (Scott, 1988b:49) and provide background and orientating information by indicating temporal, causal and conditional relations between clauses (Tomasello, 2003:258) e.g.

(6) ***after I read the book,*** *I went to bed*

Relative clauses form part of a noun phrase argument; they follow the noun and modify either through embedding (centre or right) or by placing focus on the noun through the use of the relative pronoun). Relative clauses are used with noun phrase arguments, and serve to modify the noun by providing information that is linked to the noun by means of a realative pronoun (Scott, 1988b:49) to help identify referents. Tomasello (2003:254) states that children of all ages experience problems interpreting centre-embedded relative clauses, in other words, relative clauses that modify the subject. For example, children find it harder to interpret

(7) ***the cat which the dog chased*** *ran away*

than

(8) *the dog chased* ***the cat which ran away***

One explanation for the difficulty experienced in interpreting centre-embeddings is that children find it hard to keep track of different characters and their activities[47].

4.2.3.3 Elaborated noun phrases (ENPs)

ENPs occur more in written than in spoken language. The elaboration of noun phrases in narrative production is regarded as a reliable indicator of literate language style because ENPs facilitate the exactness and descriptiveness of narratives (Pellegrini, 1985:91; Westby, 2005:169) and serves as a useful diagnostic to differentiate between children with and without SLI (Greenhalgh and Strong, 2001:120).

According to Owens (2004:200) elaboration initially occurs in isolation, then moves to the object position in a sentence, and then to the subject position. Most typically-

[47] Cf. Tomasello (2003:253-256) for a discussion of other hypotheses.

developing five year old children use only one modifier with each noun. Elaboration of noun phrases continues to develop till late childhood and adolescence. Elaborations, such as modifiers preceding the noun, e.g.

(9) ***the two small*** *cats*

or qualifiers (such as prepositional phrases) following the noun, e.g.

(10) *the cat* ***in the tree***

and relative clauses, e.g.

(11) *the boy* ***who is naughty***

describe and add information about the nouns or pronouns (Greenhalgh and Strong, 2001:116). One of the functions of ENPs in narratives is therefore to aid the listener in building mental representations of the story's characters and objects.

Following Greenhalgh and Strong (2001:125), ENPs, for the purposes of this study, were defined as noun phrases that have more than two modifiers preceding the noun (e.g. ***the two small*** *cats*) or have qualifiers such as prepositional phrases or relative clauses following the noun. A study by Eisenberg et al. (2008:155) examining the development of noun phrase elaboration in the spoken narratives of 5, 8 and 11 year-old children, found that complex premodification, i.e. the use of multiple modifiers, and postmodification increased steadily as a function of age in their study population. They concluded from the data obtained from a randomly selected population (n=40 per age group) that complex premodification (two or more descriptive elements before the noun) and postmodification (e.g. prepositional phrases and clauses) do not typically occur in the narratives of 5 or 8 year-old children and that these structures, generally, only emerge at age 11. An interesting finding from this study was that single picture fantasy context elicited more noun phrase elaborations than a realistic picture sequence context. The researchers hypothesised that descriptive language may be more readily elicited when less pictorial context is provided.

4.3 NARRATIVE MACROSTRUCTURE

It was aimed in this study to investigate the macrostructural differences in the narratives of the different groups comprising the study population. Macrostructural analyses focus on children's language skills at the level of connected discourse and reflect their abilities to relate concepts beyond the utterance level (Heilmann et al., 2010:154). Several studies (e.g. Botting, 2002:3; Gillam et al., 1999:34; Feagans and Short, 1984:1734; Kaderavek and Justice, 2004:221; Milosky, 1987:329; Paul et al, 1996:1296; Roth, 2000:15) found a positive relationship between children's reading comprehension and narrative abilities. A review of scientific research by Snow et al. (1998:107,110), cited story recall in preschool children as one of the strongest predictors of later reading ability. Other studies found that narrative ability is one of the best predictors of academic success for children with language impairments (Bishop and Edmundson, 1987:169; Oakhill and Cain, 2007a:26).

According to Heilmann et al. (2010:155) the methods employed by researchers and clinicians for macrostructural analyses can be divided into two broad categories. The focus of studies in the first category is on the inclusion or exclusion of story grammar components (e.g. Boudreau and Hedberg, 1999). Children who produce narratives that contain most of the story grammar elements and more advanced story grammar components such as internal plans are considered to display good narrative organisational skills.

Studies in the second major category include, in addition to quantifiable aspects such as story grammar elements, also global and holistic judgements to rate the overall quality of narratives (e.g. McFadden and Gillam, 1996; Pearson, 2002). In the second group of macrostructural analyses, the inclusion of qualitative elements such as maintaining a clear flow of information, interesting word choices, elaboration and appropriateness, are used to judge the quality of a narrative production. McFadden and Gillam (1996:53) found that holistic measures capture important qualitative elements such as clarity, charm and subtlety and were more sensitive in distinguishing between children with and without language impairments. A disadvantage of these measures is that they are more subjective

than story grammar coding and could result in lower levels of interjudge reliability (Heilmann et al., 2010:155).

There are presently several formal narrative assessment instruments, such as the *Renfrew Bus Story* (Renfrew, 1997), the *Test of Narrative Language* (TNL) (Gillam and Pearson, 2004) and the *Edmonton Narrative Norms Instrument* (ENNI) (Schneider, Dubé and Hayward, 2004) to assess narrative and discourse abilities. The *Renfrew Bus Story* only provides information about the amount of story information and sentence length in children's narrative production. The story and scoring format do not specifically measure macrostructural elements, such as story grammar, and was therefore unsuitable for the purposes of this study. At the time of data collection for this study, the *TNL* and *ENNI* were not commercially available in South Africa.

Another measure that is widely used for narrative research is the wordless picture book *Frog where are you?* (Mayer, 1969). Berman and Slobin (1994) reported a series of cross-linguistic and developmental studies that used the *Frog* wordless book to elicit narratives from children in the United States of America, Turkey, Germany, Israel and Spain. Berman and Slobin (1994:22) acknowledged that this particular story is a product of Western culture and part of the experiential background of children through experiences with storybooks, films and television. The researcher's clinical experience in the communities from which the study population was drawn has taught her to be wary of cultural and socio-economic assumptions underlying certain assessment instruments and procedures. The TNL, for instance, comprise content about a visit to McDonalds, aliens from a spaceship landing in a park, and a dragon hoarding a treasure; while the *Frog* story portrays animals and landscapes that may be unfamiliar to many South African children. It can be argued that children with less exposure to storybooks and children's television programmes may be unfamiliar with the abovementioned scripts and story genres and therefore less able to draw on their background knowledge to make inferences and interpret novel stories.

In this study a wordless colour picture sequence based on a South African published book was used. See section 5.5.3.1 for a discussion of the narrative elicitation material and procedures.

One of the main focuses of this study was to determine if the reading comprehension differences displayed by the NC, PC and NC groups could be linked to their narrative structural development. Knowledge of narrative structures and schemas enables a person to construct mental models during reading by accessing the organizational patterns of the text that is independent from the content. Narrative schema knowledge also provides the conceptual basis of abstract-to-concrete transformation of information and enables skilled readers to activate background knowledge, to assimilate information coherently, to make inferences, and to recall and reconstruct the text (Mandler, 1984:95; Duchan, 2004:381; Perfetti et al., 2005:231; Perfetti, 2007:363). Another aspect of narrative schema knowledge closely related to reading comprehension is awareness of characters' goals, intentions, plans and feelings (Trabasso and Nickels, 1992:250).

A story grammar is one example of a narrative schema. Story grammars propose that all stories have a setting and episode system to provide a structured and systematic organisational pattern (Trabasso and Nickels, 1992:250). The predictability of the typical story grammar format aids the reader in comprehension and the construction of mental models. Characters in stories are usually confronted with problems that they wish to solve. Their motivations, goals and actions are causally linked to their responses to these problems, resulting in consequences linked to the success of their problem solving actions (Peterson and McCabe, 1983:212; Stein, 1982:331).

The story grammar model has been proven to be valid representation of how persons organise story information to encode, understand and retrieve stories (Trabasso and Rodkin, 1994:86; Schneider, Hayward and Dubé, 2006:225). This model has been applied in research investigating narratives from children with and without language impairments using various elicitation methods such as story stem completion and retell of orally presented stories (Merritt and Liles, 1987:547). The focus in examining the

macrostructural complexity of the narratives obtained from participants in this study was on two aspects of narrative schema organisation, namely structural complexity and inclusion of goal-attempt-outcome structures. The purpose of the analyses was to determine whether the three groups in this study population differed in terms of the structural complexity of their narratives.

4.3.1 Structural complexity of narratives

The ability to produce well-formed episodes in narratives indicates understanding of narrative schemas, understanding of psychological causality, perspective-taking, meta-awareness of the ability to plan, and the need to justify plans and actions (Westby, 2005:165; Trabasso and Nickels, 1992:250; Trabasso and Rodkin, 1994:87). The model story provided a narrative schema in the form of complete episodes, in other words, structures containing the obligatory story grammar elements. According to Peterson and McCabe (1983:213), episodic structure serves as a standard for our expectations of the plot of a typical Western-based narrative schema. In their seminal study, they concluded that episodic analysis captures the cognitive components of human actions and causality better than, for instance, high-point analysis or dependence analysis. They also identified the weaknesses of episodic analysis, namely that it does not capture personal evaluation of experience, that it neglects the syntactic complexity of narratives, and that it fails to capture the overall causal coherence of a narrative (Peterson and McCabe, 1983:184).

Following Westby (2005:180), structural level analyses were conducted to categorise the participants' narratives into either sequences or episodes based on the inclusion of propositions denoting goal-directed behaviour of characters in the narratives. The Westby (2005:181) binary decision tree was used to determine the structural complexity of the narratives (see Appendix 10). The purpose of this procedure was to determine participants' developmental levels of narrative structure by establishing whether they could provide complete episodes in their retell narratives, as opposed to abbreviated

episodes or sequences. Children's narratives follow a developmental sequence and the structural complexity of their narratives increases with age in predictable manners[48].

Children start telling fictional narratives between the ages of 2 and 3 years, which are generally without clear story lines, plots and cause-effect relationships. Temporal event sequences emerge between the ages of 3 and 5 years followed by the inclusion of causal chains between the ages 5 to 7 years. In general, well-formed narratives consisting of plots and resolutions only become evident after the age of 8 years and continue to develop during adolescence (Trabasso and Nickels, 1992:256).

It should be borne in mind that these developmental norms are mainly based on children who have American English as their mother tongue. It is well documented that differences in language learning experiences and expectations between different socio-cultural groups have an impact not only on narrative development, but also on the narratives associated with different socio-cultural groups[49]. To the researcher's knowledge, no research exists in South Africa about narrative development in children from different language and cultural groups.

In the following sub-sections the differences between the levels of narrative structural development will be described and discussed in terms of the variables that are of interest in this study.

4.3.1.1 Sequences

Preschool children and children with less developed narrative schemas tend to tell stories in a series of descriptions or actions that can be classified, ranging from least to most complex, as *descriptive*, *action* or *reactive* sequences (cf. Applebee, 1987; Botvin and Smith, 1977; Peterson and McCabe, 1983 and Westby, 2005 for discussions of the structural properties of sequences). Evidence from these studies can be summarised as

[48] Cf. Applebee (1978); Stein and Glenn (1979); Peterson and McCabe (1983) for detailed analyses of patterns of narrative development in children.
[49] Cf. Heath (1986); Berman and Slobin (1994); McCabe and Peterson (1991); McCabe and Bliss, (2003) for discussions of social class and cultural differences in discourse patterns and narrative development.

follows: Descriptive sequences describe characters, the environment, and habitual actions in largely unconnected sentences without chronological or causal relationships, e.g

(12) *This is a story about my cat. My cat is black. He likes to sleep in the sun. His name is Sebastian. I love to play with my cat.*

Action sequences focus on the behaviour of characters and list series of actions that are chronologically rather than causally related, e.g.

(13) *We went to the beach for my birthday. My friends gave me presents. We played in the sand and built a castle. We also swam and played beach football. Then we all had ice-cream and went home.*

Reaction sequences focus on changes in the narrative environment and describe causally related events in a set of changes that cause other changes, but without planning involved, e.g.

(14) *A girl and a boy went for a walk in the forest. Then they saw a dragon in a cave. And the dragon had a treasure. And the dragon blew fire clouds. Then the children ran home.*

Peterson and McCabe (1983:107) noted that narratives of all age groups contain reactive sequences and that these structures may be viewed as alternatives to episodes, and not necessarily as less complex forerunners of narrative structures.

Sequences are therefore series of statements and may or may not be causally related. The main difference between sequences and episodes is that causality in episodes is expressed in planning and goal-directed behaviour of characters, in other words, the narrator's awareness of the perspectives and intentionality of characters and the ability to express this knowledge in a coherent way. Sequences, on the other hand, contain no evidence of awareness of goal-directed behaviour. In the following sub-sections, the differences between abbreviated episodes, incomplete episodes and complete episodes are discussed, based on the work of Stein and Glenn (1979) and Petersen and McCabe (1983).

4.3.1.2 Abbreviated and incomplete episodes

Abbreviated and incomplete episodes represent more advanced levels of narrative production than sequences and indicate some awareness of planning and goal-directed behaviour. In abbreviated episodes the narrator describes the actions of a character and the consequences of these actions, but the listener must infer the goals and planning involved in the actions. The narrator does not clearly display his or her metacognitive awareness of the character's perspectives and intentionality, i.e. the need to justify the actions of characters, or the need to convey these aspects to the listener. Abbreviated episodes in narratives contain implicit goals and denote the purposeful behaviour of characters but lack evidence of premeditated planning by the characters in the episode. If the characters' goals are not explicitly stated, but can be inferred, episodes are regarded as abbreviated episodes. In this study the following components were required to classify a narrative component as an abbreviated episode: i) motives in terms of an initiating event (IE); ii) actions (A) from which goals can be inferred, and, ii) a consequence (C) that achieves or fails to achieve the character's goal, e.g.

(15) *The man saw the dove in the tree* (IE). *He lifted the gun* (A) (goal can be inferred). *The ant bit him on the leg* (A). *He ran away* (C).

In incomplete episodes, the narrator fails to provide a conclusion to the episode, in other words, displaying a lack of awareness of the effects and consequences of actions and attempts. If the goal (G) is explicitly stated and then followed by actions and attempts but without consequence (the latter in terms of attaining or not attaining the goal), the episode can be regarded as incomplete, e.g.

(16) *The man saw the bird in the tree* (IE). *He wanted to shoot the bird* (G). *He aimed at the bird* (A). *The ant saw the man* (A).

Consequences (C) describe characters' success or failure at attaining his goals, as well as changes in the sequence of events resulting from characters' actions, e.g.

(17) *The ant fell in the water* (IE). *The dove wanted to save his friend* (G). *He threw a leaf in the water* (A). *The ant got onto the leaf* ***and was saved*** (C).

Emotional reactions (R) as a result of the character's actions are also regarded as consequences, e.g.

(18) *The ant was thirsty* (IE). *He fell in the water* (A). ***He was very scared*** (R)

4.3.1.3 Complete episodes

Complete episodes are the dominant structure in the narratives of children older than 6 years (Peterson and McCabe, 1983:102). An episode schema consists of problems faced by a character, his plans, goals and actions to overcome or solve the problem, and the consequences of these actions in terms of the success or failure in attaining the goal. A narrative structure is coded as an episode if it contains a *motive* of a character, followed by *goal-directed behaviour*, and resulted in a *consequence* related to the attainment of the goal. If goals were explicitly stated and there is clear evidence of awareness of planning and intentional behaviour in the form of attempts to achieve the goal, followed by a consequence, the episode is regarded as a complete episode. Motives, goal-directed behaviour and consequences will each be discussed below.

Motives are initiating events that cause the character to respond with purposeful goal-directed behaviour and include the following:

i) Natural occurrences: changes in the physical environment that are not caused by an animate being or the characters' actions, e.g. ***it was a very hot day****, the ant became thirsty*;

ii) Attempts: an action by a character that initiates a response in another character, e.g. ***the ant fell in the water****, the bird wanted to save him;*

iii) Internal events: perception of an internal or external event, or changes in internal states such as pain or hunger, e.g. ***the ant was thirsty****, he went to the dam to drink water;*

iv) Verbalisation**:** an initiating event expressed in dialogue form, e.g. ***the ant said: "I must help my friend"****, he bit the man on the leg*.

The inclusion of motives and initiating events as precursors to goal and planning statements denotes the narrator's awareness of cause-effect relationships and of characters' perspectives and intentionality in narratives. The narrator is also aware that these aspects must be shared with the listener to provide the listener with the necessary background knowledge to understand the narrative.

Goal-directed behaviour describes planned and/or intentional actions and attempts by the protagonist to attain a goal (Trabasso and Nickels, 1992:250). Goal-directed behaviour is indicated by internal plans (IP), responses expressing the character's desires, intentions and goals (G), and actions or attempts (A) to attain his goals in the following ways:

i) Internal plans describe the character's strategy for attaining his goal, e.g. *the ant was thirsty* (IE). *He decided to go to the dam to drink water* (IP)*;*
ii) Internal responses describes the character's desires or intentions, e.g. *so he wanted to save his friend;*
iii) Attempts describe the character's overt actions to attain the goal, e.g. *the man wanted to shoot the bird* (G), *he aimed the gun at the dove* (A).

The model narrative used in this study comprised four well-delineated goal-attempt-outcome (GAO) structures (see Appendix 7). Participants' narratives were analysed to determine how many of these they included in their retellings. A GAO structure comprised a clearly stated goal, followed by an action or attempt to reach the goal, followed by an outcome or consequence of the action related to the goal. The average age of participants was 9 years 4 months at the time of the study and it was expected, based on developmental patterns reported in the literature (cf. Applebee, 1978; Stein and Glenn, 1979; Peterson and McCabe, 1983; Trabasso and Nickels, 1992), that they would be able to produce more advanced narratives comprising episodes and GOA structures rather than sequences.

Narratives containing many GAO structures tend to be more organised and cohesive than narratives with fewer GAOs (Trabasso and Nickels, 1992:251; Flory et al., 2006:854). GAO structures represent the essential elements of episodic structure, form important idea-units in narratives, and are better understood, remembered and recalled than other narrative elements. Narrative recall depends on the number of causal connections the reader or listener can make, and goals generally have the highest number of causal connections (Peterson and McCabe, 1983:189; Stein, 1982:331; Mandler, 1984:65; Van den Broek et al., 2005:122). The extent to which recall of elements focuses on core events and causal connections also indicates the extent of deeper understanding of texts and narratives (Kendeou et al., 2007:96). The inclusion of characters' goal-directed behaviour indicates awareness of landscape of consciousness elements, such as intentionality and perspective-taking, and the need to convey these aspects to the listener to justify and motivate actions and consequences of actions (Trabasso and Nickels, 1992:252; Westby, 2005:180). Mature and skilled narrators are able to produce even more advanced episodic structures, such as interactive and complex episodes, where the goals and actions of more than one character work towards a goal and influence the other character (Stein and Glenn, 1979:70; Peterson and McCabe, 1983:97), e.g.

(19) *The man saw the dove in the tree* (IE). *He wanted to shoot the dove* (G). *He aimed the gun* (A). *The ant saw this and wanted to help his friend* (G). *The ant bit the man on his leg* (A). *He screamed and ran away* (C).

In summary, certain aspects of narrative comprehension and production are associated with reading comprehension and the ability to extract meaning from texts and school-based discourse. These aspects include understanding of narrative schemas and story structure, perspective-taking and understanding of psychological causality. Structural analyses of participants' narratives were performed to determine the levels of structural development in the three groups and the participants' abilities to produce narratives that contained complete episodes and goal-attempt-outcome structures,

4.4 COHESION AND COHERENCE IN NARRATIVES

In section 4.4.1 narrative cohesion, and particularly the role of conjunctions and referential cohesion, will be discussed.

4.4.1 Cohesion

4.4.1.1 Conjunctions

Conjunctions in the participants' narratives were examined to determine the nature and extent of their use of conjunctions in constructing cohesive narratives. This section will briefly describe the semantic and pragmatic functions of conjunctions in narratives; the development of conjunctions in child language and narratives; and finally the role of conjunctions in reading comprehension.

Conjunctions[50] are used in narrative discourse as cohesive devices to connect phrases, clauses and sentences; to organise narratives; to clarify event and object relationships in the narratives; to signal semantic relations between sentences; and to make meanings explicit (Pellegrini, 1985:92; Scott, 1984:426). Oral and written narratives have a high density of conjunctions in comparison to other types of texts or conversational discourse (Peterson and McCabe, 1991:45). The use of conjunctions in oral narratives aid listeners in construction of meaning and mental models (Greenhalgh and Strong, 2001:116); help them to reduce the processing load (Cain, Patson and Andrews, 2005:878); and enables a narrator to convey concepts across individual utterances (Heilmann et al., 2010:156). Formal written texts often contain later developing conjunctions such as *consequently*, *in conclusion*, *furthermore* and *similarly*, that are seldom used in spoken language. The function of these more advanced conjunctions is to link ideas across sentences, often in constructing or elaborating arguments, or in persuasive writing (Nippold et al., 2005a:127).

[50] Cf. Halliday and Hasan's (1976) seminal work about cohesion in English and the role of conjunctions in cohesion; and Peterson and McCabe (1991) for reviews of children's age-related use of conjunctions and the relationships they express

Conjunctions also serve a pragmatic function by expressing relations between speech acts, such as the use of *and* as a stalling technique to indicate that the speaker is not ready yet to hand over his or her speaking turn. The connectives *and, so* and *but* are often used at the pragmatic intersections between speech acts, while *because* and *then* are rarely used with such function[51]. The conjunctions *and*, *then* and *and then* are often excluded from the analyses of conjunction use in narratives because children often use these structures as discourse markers rather than conjunctions between propositions (Greenhalgh and Strong, 2001:125).

The sequence of conjunction acquisition is stable across languages. Additive conjunctions such as *and* are acquired first, followed by conjunctions expressing temporal, causal and adversative conjunctions such as *before*, *because*, and *but* (cf. Scott, 1984 for a discussion of these and other developmental patterns). The conjunction *and* is very versatile and has been described as an all-purpose connective used by even older children with a full repertoire of conjunctions at their disposal, to indicate cohesion between sentences rather than semantic relationships (Peterson and McCabe, 1987:380). Cain, K. et al. (2005:884) found that although children use temporal and causal conjunctions correctly from the age of 5, their comprehension of these terms may still be incomplete at the age of 10, particularly when faced with different options for selecting the correct response in a cloze task.

Conjunctions usually indicate the following semantic functions (Pellegrini, 1985:87; Peterson and McCabe, 1991:33):

i) Additive conjunctions such as *and* signal the co-occurrence of independent events;

ii) Temporal conjunctions such as *when*, *while* and *after* in subordinate clauses provide the listener with information about the sequential ordering of narrative events;

[51] Cf. Peterson and McCabe (1991) for a review of connectives as pragmatic markers

iii) Causal conjunctions such as *because* and *so that* provide information about the goals and intentions of protagonists and motivations and physical reasons for events;

iv) Adversative conjunctions, such as *so*, *but* and *however* signal opposition (in which one clause negates the other), or exception (in which one clause qualifies the other).

Conjunctions mark the semantic relationships between different propositions in oral and written discourse and facilitate comprehension and the construction of coherence relations between sentences. Greenhalgh and Strong (2001:120) found that the use of conjunctions in retell narratives of 7 to 9 year old children differentiated children with language disorders from children with normal language development. Appropriate use of causal conjunctions in oral narratives is associated with narratives that have coherent and causally integrated event structures (Cain, K. et al, 2005:890; Heilmann et al., 2010:156). According to Hudson and Shapiro (1991:125), children's use of conjunctions is strongly influenced by narrative topic and genre. Similar to what Cain et al. (2005:884) found for children's use of temporal and causal conjunctions in oral language, Hudson and Shapiro (1991:125) found that children use more advanced conjunctions in narrative structures that they have mastered.

4.4.1.2 Referential cohesion

As discussed in section 3.4.2.4, successful reading comprehension requires local cohesion and global coherence, in other words, cohesion within and coherence between the levels of the representations in the mental model. Referential cohesion refers to relations of meaning that occurs within a text where the interpretation of an element in the narrative is dependent on that of another, in other words where one element presupposes the other (cf. Halliday and Hasan's (1976) seminal text on cohesion in English). Referential cohesion allows the narrator to maintain references to characters and objects across utterances by using appropriate noun phrases and pronouns (Heilmann, 2010:156). An element is identified as a cohesive marker or tie if its meaning cannot be adequately interpreted by the listener resulting in the listener having to search search outside the

statement for the meaning. Any sentence element that requires the listener to go beyond the sentence for a referent is a cohesive tie (Liles, 1985:132).

The five types of cohesive devices or ties described by Halliday and Hasan (1976:4) are *reference, substitution, ellipsis, conjunction* and *lexical* items. When reference, substitution and ellipsis ties are used, the speaker relies on syntactic resources to convey meaning. In the comprehension or production of narratives, they must therefore pay attention to the syntactic structures in the narratives, apart from the story structure. Due to the lack of normative data on the development of cohesion markers in language, researchers and clinicians usually rely on descriptive analyses of cohesion for diagnostic purposes. According to Owens (2004:227), mature story grammar develops prior to mature use of cohesive devices and it is therefore possible to produce good episodic structures without good cohesion.

Cohesive adequacy, first described by Liles (1985:124), refers to the degree of success in using cohesive ties to connect narrative elements to facilitate comprehension in the reader or listener, first described by Liles (1985:124). Cohesive ties are classified as *complete* when the information referred to by the cohesive marker is easily found and understood with no ambiguity (e.g. *once there was an ant* / ***he*** *walked to the dam because* ***he*** *was thirsty); incomplete* when the information referred to by the cohesive marker is not provided in the text, but has to be recovered outside the text by inferring the meaning from the story context (e.g. *the dove plucked the leaf* / ***he*** *crawled onto the leaf*); and, *erroneous* when the listener is guided to ambiguous or incorrect information.

A number of studies investigating cohesive adequacy in narratives have found that when compared with children with normal language abilities, children with SLI use fewer cohesive ties, fewer complete cohesive ties, and more incomplete or erroneous ties (Liles, 1985:130, 1993:880; Merritt and Liles, 1987:423; Paul et al., 1996:1300; Strong and Shaver, 1991:107; Finestack, Fey and Catts 2006:245). They are also less successful in repairing cohesive breakdowns (Purcell and Liles, 1992:359).

The errors in cohesion displayed by children with SLI in narrative production may reflect their problems with the management of information. They tend to include irrelevant and redundant information, exclude critical and necessary elements, use unclear and ambiguous references, and confuse the sequencing and marking of new and old information with articles and pronouns (Owens, 2004:147). Problems managing the flow of information may reflect a lack of metalinguistic and metacognitive skills pertaining to intention-reading and perspective-taking associated with landscapes of consciousness (Bruner, 1986:25), false belief-understanding and theory of mind (Tomasello, 2003:278).

In the present study, the use of pronominal referencing[52] in narratives by the children with different reading comprehension profiles was investigated. Pronominal referencing has been identified by some studies as the cohesive element in narratives that most consistently appears to differentiate children with SLI from their peers (Liles, 1985:130; Liles et al, 1995:423; Norbury and Bishop, 2003:307) and to distinguish between children with and without reading comprehension problems (Feagans and Short, 1984:1734). In contrast, studies by Van der Lely (1997:240) and Finestack et al.[53] (2006:245) found that these measures were not sensitive enough to differentiate school-age children with typical language development from those with language impairment. Southwood (2007:185), in a study investigating SLI in Afrikaans speaking children, also found that pronominal referencing did not differentiate between children with normal language development and children with SLI.

[52] Referencing normally follows a set of rules: When a new character is first introduced the referring expression contains an indefinite determiner *a* or *an*; when the character is reintroduced a definite determiner *the, that* or *this* plus the noun is used; when reference to a character already introduced is maintained, use of a pronoun or a definite determiner plus noun is appropriate (Graesser et al., 1997:177); Norbury and Bishop, 2003:297; Van der Lely, 1997:232). Wigglesworth (1997) investigated the development of referencing in narratives in different age groups and found that although all age groups use a variety of strategies to maintain reference, preferential strategies were observed within each group. Anaphoric referencing was most common in adults and older children. Adults used mainly pronouns or determiner plus noun to maintain reference, and nominals when switching reference. 4 year old children used a thematic subject strategy, i.e. choosing one character as the thematic subject and then refer to that character with pronouns throughout the narrative. 10 year olds used both thematic and anaphoric referencing.

[53] Finestack et al.[53] (2006:245) investigated frequency and adequacy of pronominal referencing in an epidemiologically based sample (n=569)

It should be noted that factors, such as elicitation techniques, the nature of the story prompts, and differences in task demands, e.g. retell versus wordless picture books, may influence the narrators' notions about characters and therefore their referencing strategies. Aspects, such as familiarity with the story content and longer stories, may result in more task engagement and therefore more cohesive narratives. Referencing will also be influenced by the active or passive nature of the secondary characters in relation to the main character, the frequency of appearance of characters, and whether the main character is established as such by for instance appearing on the front and first pages (Wigglesworth, 1997:281,282).

Referencing may also be influenced by assumptions about shared knowledge. Younger children often introduce characters with a pronoun because they assume that the listener share their knowledge and perspectives about the story (Wigglesworth, 1997:281). To control for the influence of shared knowledge on referencing, researchers usually make use of a naïve listener, supposedly unfamiliar with the content, during narrative elicitation (e.g. Liles, 1985:124; 1993:873; Hadley, 1998:134; Gazella and Stockman, 2003:65; Schneider and Dubé, 2005:55). The researcher's clinical experience in lower socio-economic communities alerted her to the fact that children from these communities often lack experience in the retelling of shared information. They seem unfamiliar with tasks that require them to retell information for the purpose of displaying their knowledge to adult listeners. This may be the result of different environmental and cultural discourse styles and less exposure to adult-child interactions where the child assumes a narrator role.

4.4.2 Coherence

As discussed in section 3.4.2.3, readers have to construct mental models of the macrostructure or event structure of texts to establish global coherence. Coherence concerns the meaningful organisation of narrative events, for instance, the sequencing of events in temporal or causal frameworks. Episodic analysis of a narrative provides information about the schematic structure and goal-directed behaviour of the characters, but may not reflect causal connectedness (Peterson and McCabe, 1983:212; Low and

Durkin, 1998:212). It is possible for a narrative to contain the necessary elements of story grammar to form an episode, but to still lack coherence, because of poor causal connectedness, e.g.

(20) *The ant is walking* (Setting). *The ant fell in the water* (IE) *The dove sat in the tree* (Setting). *The ant was afraid* (R). *The dove wanted to save him* (G). *The ant floated on the leaf* (A). *The ant is happy* (R/C)

The above episode consists of action, goal and internal reaction statements, but lacks coherence because the causal connections between the story elements are not clearly stated.

In contrast with episodic analysis that focuses on the structural hierarchy of a text, and the narrator's awareness of intentionality and cognitive processes of protagonists, causal event analysis focuses on the explicit and implicit propositions necessary to connect the causes and consequences of events expressed in the text (Trabasso and Nickels, 1992:251; Kemper, 1986:12). According to Gutierrez-Clellan and Iglesias (1992:364), omission of story grammar elements and deviation from the prescribed order of story events often reflect cultural variation in narratives, rather than lack of knowledge about story grammar. They found that causal sequence analysis was a helpful tool to reveal development patterns and changes in the narratives of Spanish speaking children ages 4, 6 and 8 years. Older children, for instance, included more cohesive causal events and less unrelated propositions than younger children in their sample. The length of the causal chain and the reduction of unrelated statements were proposed as valid parameters to assess the development of causal coherence in narratives (Gutierrez-Clellan and Iglesias, 1992:368).

According to Kemper's taxonomy (cf. Kemper, 1986, 1988), narratives are underpinned by event chains consisting of causally and temporally ordered actions, physical states and mental states. The three basic types of events, *actions*, *physical states* and *mental states*, are causally linked by *motivations*, *enablements*, *initiations* and *resultants* to form event

chains. In addition to the three categories of narrative events specified by Kemper, Gutierrez-Clellan and Iglesias (1992:365) also added *goals* as a fourth category. According to the taxonomy, the causal chain is violated when an action is followed by another action, or a physical state by another physical state. That does not imply that all event chains underlying texts need to consist of a simple linear string of actions and states (Kemper, 1988:149), but rather that the focus of analysis is on the explicitly stated links between causes and consequences of events in the text, in other words, local coherence. Links that are not explicitly stated must be inferred to repair the causal chain (Kemper, 1983:400).

As discussed in section 3.4.2.4, readers have to make inferences and that go beyond the information explicitly provided in the text to construct mental models (Rapp et al., 2007). Problems with constructing inferences have consistently been found to differentiate between readers with good comprehension and poor comprehenders (Oakhill and Cain, 2007b:64; Westby, 2005:160; Yuill and Oakhill, 1991:73). Van den Broek et al. (2005:125) found that children's ability to infer relations at the preschool level strongly predicts their later reading comprehension over and above other literacy skills such as vocabulary, alphabet and word knowledge. To determine the ability of participants in the current study to produce coherent narratives, their use of causal links to establish causal connectivity between adjacent propositions was examined. Causal relations were determined using Kemper's taxonomy of causal events (Kemper 1986, 1988), as adapted by Gutierrez-Clellan and Iglesias (1992). It was hypothesised that participants with poor reading comprehension would produce less coherent narratives and particularly, fewer causal links than participants with good comprehension.

Following Gutierrez-Clellan and Iglesias (1992:366) the Kemper taxonomy was used to code participants' propositions as narrative events and to determine the causal links between adjacent propositions (see Appendix 13). The links were then analysed in terms of their relatedness to the story structure. Events were regarded as related when they were temporally or causally interconnected and relevant to the story theme. In contrast, unrelated events were statements without temporal or causal links with other propositions

which did not contribute to the development of the narrative. Causal chains usually open with the setting statement and/or the introduction of the protagonist, and usually end with the attainment of the goal or direct consequences of failure to attain the goal. A proposition was regarded as unrelated if it fell outside the causal chain, in other words, propositions without temporal or causal connections with adjacent propositions, e.g.

(21) *the ant was afraid* (proposition A)
the dove dropped a leaf (proposition B).

Following Low and Durkin (1998:212), temporal relatedness between two adjacent propositions were determined according to Trabasso and Sperry's (1985:601) criteria for successiveness or coexistence. Temporal links between propositions do not denote or imply causality. Successiveness occurs when two adjacent propositions merely follow each other without a causal link between them, e.g.

(22) *the dove sat in the tree* (proposition A)
he flew away (proposition B)

Coexistence occurs when two adjacent propositions happen at the same time, e.g.

(23) *the man wears brown shoes* (proposition A)
and he has a gun (proposition B)

Links between adjacent propositions that did fulfil the criteria for temporal or causal connectivity, were coded as unrelated propositions, e.g.

(24) *the ant was afraid* (proposition A)
the dove plucked a leaf (proposition B)

In summary, Kemper's taxonomy was used to investigate three aspects of coherence in participants' narratives: the type and frequency of narrative events (physical states, mental states, actions, and goals), the frequency and nature of links (resultant, initiation, enablement, motivation) between events, and the relatedness of the events to the story structure (temporally or causally related or unrelated). The importance of awareness and understanding of causality in the construction of mental representations, and therefore

comprehension of texts was discussed in section 3.4.2.4. The purpose of examining indicators of causality in participants' narratives was to determine if their performance in reading comprehension could be linked to their use of causal links to establish coherence in their narratives.

4.5 CONTENT

Language impaired children generally produce shorter and less complex narratives than children with typical language development (Roth, 1986:26; Scott and Windsor, 2000:326). They tend to provide less information in oral narratives in response to picture sequence stimuli (Boudreau and Hedberg, 1999:256), wordless picture books (Cragg and Nation, 2006:67), and during story generation tasks (Pearce, 2006:121). A study, comparing the oral and written narratives of 10 year old children with and without reading comprehension problems, found that the poor comprehension group included fewer of the stimulus story's main ideas and that they obtained lower content scores in both narrative genres (Cragg and Nation, 2006:67). In contrast, studies that used gist recall paradigms to examine children's ability to remember the propositional content of a story, rather than the actual linguistic forms, revealed few differences between children with and without language impairments (Roth, 1986:23). Norbury and Bishop (2003:307) found that the number of content propositions in the narratives about a wordless picture book did not differentiate different clinical populations from children without language impairment.

In summary, the narratives in this study were analysed to determine the number of relevant items of information that the participants included in the retelling of the story. It was expected that narratives from participants, who focused mainly on descriptions of observable content, would yield lower information content scores than narratives containing inferences about events and characters and causal connections between propositions. Participants' narratives was analysed for the amount of relevant content they included, the nature of the content in terms of different categories of information, and the presence of landscape of consciousness indicators in the content (see Appendix 14).

4.6 FLUENCY

Fluent speech production requires the efficient integration of all the subcomponents of spoken language in a fast and accurate way. It is therefore not surprising that a variety of speech disruptions, in the absence of a stuttering disorder[54], occur in everybody's speech. Many normally developing children between the ages of 2 and 5 years pass through periods of speech disfluency consisting of repetitions, revisions, prolongations and pauses. Increases in speech disruptions during early childhood are associated with the demands of language acquisition, delays in speech-motor control skills and interpersonal stress factors in the child's environment (Guitar, 2006:144). Speech disruptions, in other words, reflect the cognitive processes underlying speech and language production.

Speech disruptions often occur during the developmental stages of language when production and processing capacities are still limited and undergoing rapid changes (Guo, Tomblin and Samelson, 2008:723) and may reflect difficulty in integrating emerging complex grammatical structures with fluent speech production (Rispoli and Hadley, 2001:1142). In the absence of a stuttering disorder, children's speech disruptions therefore reflect their speech-motor and linguistic vulnerability during the acquisition of complex language.

According to the model of language formulation and speech production proposed by Levelt (1989, in Kolk and Postma, 1997:185; Ratner 1997:100 and Guo et al., 2008:722) the generation of speech involves three processing stages, namely, conceptualisation, formulation and articulation. Levelt' model[55] proposes that during the *conceptual* stage, the speaker constructs a non-linguistic, preverbal representation to convey a communicative intention. During the *formulation* phase, grammatical and phonological encoding takes place. Grammatical encoding involves the construction of a syntactic frame or surface structure through transformation of the preverbal message into linguistic

[54] The World Health Organization (1977: 202) defines stuttering as "disorders in the rhythm of speech, in which the individual knows exactly what he wishes to say, but at the time is unable to say it because of an involuntary, repetitive prolongation or cessation of a sound. Cf. Guitar (2006) for discussions of normal disfluency and stuttering

[55] Cf. Kolk and Postma (1997:183-189) for discussion of Levelt's model and its relevance to self-monitoring during speech production

structures. Processes include selecting words from the lexicon and assigning syntactic roles to the words, e.g. subject, object, and elaboration of the syntactic structure, e.g. noun or verb phrases. Lemmas, that is, the semantic properties of words combined with their syntactic specifications, drive grammatical encoding. Retrieval of a noun from the lexicon results in the construction of a noun phrase while retrieving a verb results in the construction of an appropriate verb phrase. Lemmas contain no phonological information and specification of the phonological information to permit articulation rests with lexemes. In the last stage of speech processing, the *articulatory* plan is constructed and implemented. Execution of the articulatory plan results in overt speech production.

Disruptions occurring within any of the stages will result in the disruption of fluent speech production. Speech disruptions that are considered "normal" disfluencies such as whole-word and phrase repetitions, filled pauses, interjections and revisions (Guitar, 2006:144), may occur as a result of problems at the level of grammatical encoding in Levelt's model. Atypical disfluencies associated with fluency disorders, such as stuttering, include part-word repetitions, sound or word prolongations and tense silent pauses. These atypical disfluencies may be a result of problems in the phonological encoding of the utterance (cf. Ratner, 1997 and Kolk and Postma, 1997 for discussions of Levelt's model and stuttering).

Speech disruptions may vary according to aspects, such as the demand of the language task, the topic, the listener and the length of the utterance (Milosky, 1987:339; Rispoli and Hadley, 2001:1142; McCabe and Bliss, 2003:97; Owens, 2004:174). Different discourse types impose different demands on children's language systems. More speech disruptions occur during narratives than conversational discourse (MacLachlan and Chapman, 1988:7) or expository discourse (Hadley, 1998:138). These findings suggest that narrative production, in general, seems to be cognitively and linguistically more demanding than conversation.

Narrative retelling, because of the syntactic and information restraints placed on the narrator, may place greater demands on lexical retrieval and sentence planning systems

than other forms of narratives. Milosky (1987:331) states that the complexity of narrative production may result in trade-offs in performance quality and that some other aspects of the task, such as fluency, may deteriorate. Speech disruptions in narratives may be a result of such trade-offs, particularly in young children who are still in the process of acquiring language.

Van Dyk (2000:23) found significant increases in speech disfluencies in the narratives of Grade 3 children after a language intervention programme, compared to their narratives before the intervention. The children, from the same community as the present study's population, took part in a six week intervention programme focused on the improvement of vocabulary, syntax and narrative skills. After the intervention the participants produced narratives with more complex narrative microstructural elements, but also significantly more repetitions and word and sentence revisions. Of interest is the fact that the intervention programme specifically targeted awareness of the correctness of syntax and morphology in utterances. Evaluation of the correctness of language in their own utterances therefore required processes of self-monitoring and self-evaluation. The relationship between self-monitoring and revisions (Rispoli, 2003:821) will be discussed later in this section.

From the above, it seems logical that children with SLI will, because of their lexical and syntactic deficits, will produce more disfluencies during speech than their age-matched peers. A study by Guo et al. (2008: 735) found that children with SLI produced more silent pauses than their age-matched, but not language-matched, peers. This finding is interpreted as a confirmation of the relationship between language ability and speech disruptions and suggests that speech disruptions reflect the underlying syntactic and lexical immaturity of children with SLI. Guo et al. (2008:732) interpret the relationship between speech disruptions and language ability by means of a representation account. On this account, the representation and processing of lexical and syntactic knowledge are mutually dependent and both processes form part of the same neural network.

Several studies, however, have failed to demonstrate differences in speech disruptions between children with and without language impairments (cf. MacLachlan and Chapman, 1988; Scott and Windsor, 2000:334). According to Guo et al. (2008) methodological issues such as the non-inclusion of silent pauses in the data and differences in measurement may account for these findings (cf. Guo et al., 2008 for a discussion).

The excessive use of maze behaviours in speech (i.e. false starts, silent pauses, fillers, repetitions and revisions), in the absence of a stuttering disorder, indicates linguistic vulnerability and may signal word-finding problems and difficulties with formulation of utterances (Dollaghan and Campbell, 1992:56). Rispoli (2003:819), in an analysis of speech disruption phenomena, classified speech disruptions as stalls (e.g. *I want..**I want** to go home*), revisions (e.g. *I want to **have** ..drink milk*), or incomplete utterances (e.g. *and then we went to the beach and we …*).

Stalls include sentence disruptions that add no additional phonological, lexical or grammatical content to the sentence, silent pauses, fillers such as, "uhm", and repetitions of words and phrases. According to Rispoli (2003:820), stalls seem to occur more often during earlier stages of grammatical development and decrease as children become more competent in sentence formulation, whereas revisions are associated with periods of emerging grammatical complexity in children. Stalls are prospective strategies that occur before an utterance is completely articulated and reflect momentarily slow-downs in the flow of information as a result of difficulties in the formulation of syntactic representations or retrieval of lexical items. According to Guo et al. (2008:733), silent pauses in the narrative production of children with SLI reflect their problems with the activation of linguistic elements during sentence formulation. The occurrence of more silent pauses in the speech of children with SLI than in the speech of their age-matched peers may indicate that SLI children need more time to activate linguistic elements during the formulation of sentences.

Revisions, on the other hand, reflect changes in the choice of lexical or morphosyntactic items. Revisions are retrospective and occur when the sentence plan has already been

produced, but does not match the speaker's intention. Incomplete utterances, where the sentence is abandoned before completion, may indicate that formulation of the thought or content was not completed, or may form part of revision strategies (Rispoli, 2003:819). Revisions indicate self-monitoring processes and reflect the availability of alternative grammatical or morphosyntactic options available to the speaker (Rispoli, 2003:819). The findings by Van Dyk (2000:23) that participants in a language intervention programme that enhanced their self-monitoring processes produced more revisions after the programme seem to confirm Rispoli's theory.

In summary, the findings of previous studies indicate that there is a relationship between language ability and speech disruptions. Speech disruptions may indicate lexical and syntactic deficits in children and may be associated with increased levels of self-monitoring during periods of syntactic development. In this study speech disruptions in participants' narratives were analysed and classified as repetitions, incomplete utterances, word revisions and sentence revisions.

4.7 SUMMARY

The main aim of this study was to examine the relationships between aspects of narrative production of the participants and their reading comprehension levels. In this study participants' narratives elicited through a story retell format were analysed for the different variables of narrative production associated with reading comprehension. This chapter described aspects of narrative production at micro- and macrostructural levels in terms of their relevance to literate language style, schema knowledge and text comprehension. Brief explanations of each concept and the frameworks for analysis used to make comparisons between the groups, were provided.

The next chapter will present the research questions, aims, and research design and data collection procedures for the study.

CHAPTER 5

METHODOLOGY

5.1 RESEARCH DESIGN

This chapter gives the aims, research design and data collection procedures for the study. A research design is a structure within which selected variables are controlled, manipulated and measured in order to test hypotheses and to answer research questions (Hegde, 1987:135). A comparative descriptive research design was implemented. Three groups of participants were formed on the basis of one independent variable, namely reading comprehension. The three groups were compared on the basis of reading comprehension and other dependent variables to reveal the relationships which exist among the specified variables. Systematic probability sampling was used by the WCED to select the participants (cf. section 5.2.1) for the Grade 3 literacy assessments. The WCED data and the results from the linguistic variables were analysed using both quantitative and qualitative methods (cf. section 5.9).

This study is an extension of the work undertaken by the researcher over the past 10 years related to developing literacy among mainstream learners from lower socio-economic backgrounds. This study is a continuation of a project that started in 2004, *Correlation between precursors to literacy and reading skills in Grade 3 (N04/08/138)*, with the researcher as the principal investigator. The first part of the project comprised a longitudinal study to investigate whether preschool language impairments demonstrated in a variety of linguistic variables, were still evident three years later. The results of the linguistic analyses of Grade 3 learners were compared with similar data from when these learners were preschoolers. The preschool data came from the clinical records of Stellenbosch University's Division of Speech-Language and Hearing Therapy student training programmes in the four target schools. Results from this follow-up cohort study verified the persistence of preschool language impairments in Grade 3 children. The children at the end of Grade 3 still displayed language delays despite maturation and three years of formal academic training (Klop and Tuomi, 2007:64).

This study reports the second phase of the project that comprised more in-depth linguistic analyses of the data collected when the participants were in Grade 3 to test the hypothesis and to answer the research questions set out in section 1.4.

5.2 PARTICIPANTS

5.2.1 Participant selection

Predetermined criteria were used in deciding on processes for including and excluding participants. Those who met the inclusion criteria were allocated into three groups, namely readers with normal reading comprehension (NC), readers with specific reading comprehension deficits (SCD) and readers with poor reading comprehension (PC).

In 2004 the WCED assessed the literacy and numeracy skills of 34 487 Grade 3 learners in 1 093 schools. In the WCED project, 40 learners per school were randomly selected through systematic probability sampling from all the Grade 3 learners in all the schools in the Western Cape. In smaller schools with less than 40 learners in Grade 3, the sample sizes were adjusted according to the number of learners in Grade 3. The WCED project assessed 140 children in the four primary schools selected for this study; 27 learners in School D, 39 learners in School P, 39 learners in School W, and 35 learners in School I. Permission for this study was obtained from the WCED Directorate of Research Services (cf. Appendix 3) and the literacy assessment data from the learners in the four target schools were made available to the researcher.

This study therefore made use of a small convenience sample drawn from the larger WCED project. Homogeneity of the participants was a major consideration in the selection of the study population. The four target schools were selected because they were all in the same school district, viz. the Cape Winelands Educational Region, and part of the same community. Through involvement in the speech-language student training programmes in these schools over the past 10 years, it was clear to the researcher that many children from this community have poor language and literacy skills.

5.2.1.1 Exclusion and inclusion criteria

Three sets of criteria determined which learners from the WCED sample would be excluded from this study, namely hearing status, mother tongue and age. To be included in the sample, learners had to pass otoscopic examinations and pure tone hearing screening at 20 dB levels at 500, 1000, 2000 and 4000 Hz (Stach, 1998). A GSI 38 screening audiometer was used for the hearing screening. Seven participants who failed the first screening and otoscopic evaluations were referred to the local hospital for wax removal and re-assessed three weeks later. No participant failed the second hearing screening.

Learners who were not Afrikaans home language speakers were excluded to control for the potentially negative effect of second language learning on reading comprehension abilities. The predominant language of the community where the schools were situated is a regional variety of non-standard Afrikaans. The language medium of instruction in all four schools was Afrikaans. Learners who were isiXhosa home language speakers (n=5) and English home language speakers (n=2) were excluded from the study.

South African learners start their formal schooling in the year in which they will turn seven. The typical learner in Grade 3 in October, when the assessments were done, was therefore expected not to be older than 118 months. Learners who were older than 118 months in Grade 3 usually had started school later or had repeated one or more years due to academic failure. These learners were excluded to control for the possible effects of cognitive or other kinds of impairments and developmental delays on reading comprehension. Thirty-one learners in the WCED sample whose ages ranged from 120 to 129 months were therefore excluded.

In summary, all Grade 3 learners from the WCED sample (n=140) who complied with the selection criteria, were included in this study (n=102). They had normal hearing, were non-standard Afrikaans speakers from largely monolingual homes, from four Afrikaans-medium schools in the same community in the Cape Winelands Educational Region, and 118 months or younger.

5.2.2 Description of participants

The study group comprised 61 female and 41 male participants. They were all from the so-called Coloured population group and all spoke the non-standard Afrikaans typical of their community.

5.2.2.1 Socio-economic status

Since 2007, the WCED funds schools according to poverty rankings in their surrounding communities, based on the National Norms and Standards for School Funding (NNSF). Schools are assigned a poverty rating in one of five quintiles, according to three poverty indicators, namely income levels, unemployment rates and educational levels of the community (WCED, 2009b; Hall and Giese, 2009:37). On a continuum which represents the three indicators in scalar proportion, quintile 1 schools are usually situated in the most poverty-stricken areas and quintile 5 schools in the most affluent areas. Parents of learners in quintile 1 to 3 schools are exempt from paying school fees (WCED, 2009b:4). Participants in this study all attended schools classified as quintile 2 and 3 schools, in other words, schools in the lower socio-economic status communities that are exempt from school fees.

5.2.3 Participant groups

The results of the study sample's literacy assessments were made available to the researcher by the WCED Directorate of Research Services in August 2006. This set of data comprised all 140 children in the four primary schools selected for assessment by the WCED. For the present study, 38 children were excluded because they did not comply with the inclusion criteria specified in section 5.2.1.1. An analysis of the WCED literacy results of the 102 participants in the present study showed that all of them passed at Grade 1 reading level, but that only 38% passed reading tests at Grade 3 level, in other words obtained a score of 50% or more at Grade 3 level. While all the learners passed the WCED criteria for reading proficiency at word recognition and decoding level as

required by the Grade 1 tests, 62% failed at the Grade 3 level where the focus is on reading comprehension[56].

Based on the WCED assessment results, participants were assigned to three groups: learners with normal reading comprehension (NC), learners with poor reading comprehension (PC), and readers with specific reading comprehension problems (SCD). According to Cain and Oakhill (2007c:42), it is important to match groups for word recognition abilities when differences in reading comprehension are investigated. Group allocations were based on the following criteria: Participants were assigned to the NC group (n=38) if they obtained scores of 50% or more at Grade 1, 2 and 3 levels; to the PC group (n=18) if they passed at Grade 1 levels, but obtained scores of below 50% at Grade 2 and 3 levels; and to the SCD group (n=46) if they obtained scores of 50% or more at Grade 1 and 2 levels, but below 50% at Grade 3 level. Participants' reading performances according to which group allocation was made, are summarised in the following table:

Table 5.1 Reading scores - summary of means and standard deviations per group for reading at Grade 1, 2 and 3 levels, with standard deviations in parentheses

Reading levels	**Groups**		
	NC (n=38)	**PC (n=18)**	**SCD (n=46)**
Grade 1 (maximum score 10)	9.6 (0.6)	8.8 (1.1)	9.3 (0.8)
Grade 2 (maximum score 16)	13.5 (1.8)	4.9 (1.9)	11.5 (2.3)
Grade 3 (maximum score 12)	7.7 (1.5)	1.4 (1.1)	3.0 (1.6)

As shown in the table 5.1, the scores of all the groups were similar at Grade 1 level. The SCD group resembled the NC group at Grade 1 and 2 levels, but at Grade 3 level they performed similar to the PC group. Detailed analyses of the differences between the three groups are reported in Chapter 6.

[56] Cf. Appendices 1 and 2 for information about the WCED assessment framework and examples of the assessments.

5.3 WCED GRADE 3 LITERACY AND NUMERACY ASSESSMENT TESTS

5.3.1 Description of the WCED assessment protocol[57]

The Revised National Curriculum Statement (RNCS) states that the primary focus of the Foundation Phase (Grades 1-3) is to ensure that all learners learn to read, and to achieve this 40% of teaching time in this phase is allocated to literacy (DoE, 2002). A "balanced approach" to literacy development is emphasised, starting with emergent literacy skills, involving the reading of "real books", writing for real purposes, and attention to phonics (DoE, 2002:23).

The WCED literacy testing of Grade 3 learners comprised assessments at Grade 1, 2 and 3 levels of reading skills (see Appendix 1 for examples of the literacy exercises that were provided to the researcher by the WCED Directorate of Research Services). The assessments are based on the standards set out in the WCED Benchmarks for Literacy and Numeracy and the National Curriculum Statement (NCS) (WCED, 2008). Learners were considered to be proficient at Grade 3 reading level if they obtained a score of 50% at this level, in other words if they scored 6 or more out of 12.

In the following sub-sections the assessment protocols at each Grade level will be briefly discussed (see Appendix 2 for a framework providing a summary of test items, scores, learning outcomes and assessment standards according to the RNCS, DoE, 2002).

5.3.1.1 Grade 1 level assessment

The Grade 1 level of the protocol comprised the reading of single words with visual cues provided. Learners were provided with a choice of four pictures to match a given word. In terms of the learning outcomes stated in the RNCS (2002), this level assessed learning outcome 3 (LO3), *reading and viewing* skills. In terms of the RNCS assessment standards, learners' ability to read single words, to use visual cues to make meaning, and to use their knowledge of phonics and sight words was assessed. Learners were

[57] To ensure the validity of the WCED assessment protocols, only sample items from the tests are released to schools or other persons (Cf. WCED, 2010 for examples of Grade 3 and 6 numeracy and literacy test examplars).

considered to have proficiency at Grade 1 reading level if they obtained a score of 50% at this level, in other words if they scored 5 or more out of 10.

5.3.1.2 Grade 2 level assessment

The Grade 2 level of the assessment protocol comprised two sections, namely reading single sentences with visual cues and reading single sentences without visual cues. The first section, reading single sentences with visual cues, assessed learners' skills in LO3 *(reading and viewing)*, i.e. learners' ability to read unfamiliar texts; and LO6 *(language structure and use)*, i.e. working with sentences. The assessment standards required knowledge and use of sounds, words and grammar to create and interpret texts. Learners were provided with short sentences with a missing word, a visual cue in the form of a picture, and a choice of four words to complete the sentence. A possible score of 8 could be obtained.

The second section of the test, reading single sentences without visual cues, assessed LO3 and LO6 skills. The assessment standards require the use of word recognition strategies to read unfamiliar texts and to work with texts. Learners are provided with short sentences with a missing word, no visual cues and a choice of four words to complete a sentence. Learners are considered to have proficiency at Grade 2 reading level if they obtain a score of at least 50% at this level, in other words if they score 8 or more out of 16.

5.3.1.3 Grade 3 level assessment

Grade 3 level of the assessment protocol comprised two sections: Comprehension based on a mind map text, and comprehension based on an extended passage. The learning outcomes assessed were LO3 and LO5 *(thinking and reasoning).* The mind map contained visual cues in the form of pictures. According to the assessment standards for LO3 and LO5, learners were required to use word recognition strategies to read unfamiliar texts and process information in different ways, as well as to choose selected information from a text. A possible score of 7 could be obtained.

The extended passage comprised a paragraph in narrative style. According to the assessment standards for LO3 and LO5 learners were required to read unfamiliar texts and process information in different ways, choosing selected information from a text and summarising of texts. A possible score of 7 could be obtained.

5.4 ETHICAL CONSIDERATIONS

The study was approved by the WCED (see Appendix 3) and received ethical clearance from Research Committee C, Stellenbosch University (see Appendix 4). Written consent was obtained from participants' parents or guardians and verbal assent was obtained from participants (see Appendix 5). Parents and participants were informed that participation was voluntary and that they could withdraw from the study at any stage of the process. To ensure confidentiality and anonymity, participants and schools were given codes and their identities are not revealed in the dissertation.

The four school principals were informed about the study and gave their consent. After completion of the data analyses, the results of the study were discussed with them. They will be provided with copies of this dissertation if requested. The initial results of the data analyses were provided to and discussed with the WCED Director of Research.

5.5 DATA COLLECTION PROCEDURES

The names of the 140 learners who were selected from the four schools to take part in the WCED Grade 3 literacy and numeracy assessment tests were obtained from the WCED research directorate. As explained above, 102 learners from the WCED cohort (n=140), met all the selection criteria to become participants in this study. The data collection took place over a period of three weeks at the four schools. The researcher was assisted by two qualified speech-language therapists each with more than 6 years of clinical experience. Participants were assessed individually in quiet rooms made available by the schools.

5.5.1 Assessment of receptive vocabulary

A formal test, the Afrikaans Reseptiewe Woordeskattoets (ARW) (Buitendag, 1994), provided a standardised measure to assess receptive vocabulary skills. The ARW was developed and standardised in South Africa for use in Afrikaans speaking populations[58].

5.5.2 Phonemic awareness assessment

A phonemic awareness screening protocol (see Appendix 6) was used to assess participants' phonemic awareness. The main purpose was to determine if there were differences in phonemic awareness skills between the three groups. As discussed in section 2.3, most studies of reading development indicate that learning to read is determined primarily by the status of a child's phonological representations (cf. Adams, 1990; Stanovich, 2000; Schuele and Boudreau, 2008, for reviews). Reading via the phonological route requires explicit awareness of the phonological and phonemic structure of words at conscious and metacognitive levels (Adams, 1990:169; Kamhi and Catts, 2005a:9; McGregor, 2004:312). The awareness of onset-rime is particularly important to promote initial decoding by facilitating the use of orthographic analogies during early reading development (Muter et al., 2004:666) and plays a role in self-teaching to acquire the orthographical representations necessary for fast and efficient word recognition (Share, 1999:96).

[58] It should be noted that the validity of the ARW in speakers of non-standard Afrikaans has been questioned by Southwood and Van Dulm (2009:6) because the test was normed and standardised on white standard Afrikaans speaking children in a specific geographical region (Buitendag, 1994:42). Southwood and Van Dulm anticipated that the adapted, dialect-neutral translation of the Diagnostic Evaluation of Language Variation (DELV) (Seymour, Roeper and De Villiers, 2005) would yield a more accurate and representative picture of the language abilities of 49 mainstream learners in the same community as the population of this study. However, they found that only 13% of the children presented with typical language development when measured with the adapted DELV (Southwood and Van Dulm, 2009:10). In contrast with the ARW, the semantic domain of the DELV assesses not only vocabulary knowledge, but semantic processing and organisation, in other words, more in-depth semantic skills. Although it was anticipated that the participants would perform better on the DELV assessments than the ARW, results revealed that only 62% of the participants in Southwood and Van Dulm's study presented with normal language abilities in this domain. Thus, although the validity of both the ARW and the DELV has been questioned on sensible grounds, results from the studies by Klop and Tuomi (2007) and Southwood and Van Dulm (2009) indicated that a significant number of children in the community from which participants were drawn, may indeed present with atypical language development.

The phonological awareness protocol, routinely used by the researcher as a screening tool to identify pre-school children with poor phonological awareness skills, consists of three subsections assessing phonological segmentation skills (see Appendix 6). Only one subtest was used during the study, consisting of five items assessing onset-rime awareness. It is acknowledged that the reliability and validity of this screening tool have not been established. According to Schuele and Boudreau (2008:6) phonemic awareness, such as the manipulation of isolated sounds, represent more advanced phonological awareness skills than, for instance, segmentation of words in syllables. Children are usually expected to have mastered these skills during the early stages of Grade 1. Furthermore, once children start to read, their phonemic awareness skills usually improve as a result of their developing decoding abilities that enhance their awareness of the discrete units in speech. Due to this reciprocal relationship between early reading and phonemic awareness, the use of phonemic awareness assessments during the later school years in the diagnosis of reading impairment has been questioned by some researchers (see Torgesen Al Otaiba and Grek, 2005:131). The researcher hypothesised that the Grade 3 participants in this study would be able to perform this task easily because they could already read and were exposed to phonemic awareness skills as part of the foundation phase curriculum.

5.5.3 Narrative assessments

A story retell procedure (see Appendix 7) to elicit narratives was chosen because retold stories result in longer, more detailed and grammatically more complex language samples than personal narratives or story generation tasks (Merritt and Liles, 1987:547; McCabe and Rollins, 1994:47; Gazella and Stockman, 2003:62; Schneider and Dubé, 2005:57; Hayward et al., 2007:237; Puranik et al, 2008:109). The process of retelling involves more than just repetition of the stimulus narrative. Retelling requires the narrator to reconstruct and reinterpret the story (Nelson, 2010:395). Retelling can reveal how children modify and assimilate the story's vocabulary and language structures, as well as the content of the story (Gillam and Carlisle, 1997:31). A story-retell format, in contrast with story generation or personal narratives, offers the researcher control over aspects such as narrative length, complexity and content and allows for error analyses and

assessment of comprehension (Liles, 1993:877, 878; Hadley, 1998:136). All the subjects are presented with the same story and the retold narratives can therefore be compared to the model narrative and across subjects in a more valid and reliable way to increase interjudge agreement and therefore the reliability of the results (Liles, 1993:879; Gazella and Stockman, 2003:62). A further reason for the choice of a retell narrative procedure is the resemblance between this task and classroom activities. Teachers often expect children to display their understanding by retelling information that was previously presented to them.

To elicit a retell narrative, a story (Die Duif en die Mier *(The Dove and the Ant),* Smallman and Nestling, 1993), was told to the children with the aid of 8 laminated colour pictures from the original storybook (see Appendix 7). The story is a fable, representing the typical fable format, consisting of an orientation followed by two episodes and closing with a moral. Episodes in fables typically consist of complications followed by resolutions (Martin, 1983:10). The original text was adapted to include more complex syntactic structures, such as subordination and elaborated noun phrases. Multimodal input, in other words, audio combined with visual information, offers more support and information to the listener for the processing and reconstruction of the narrative (Gazella and Stockman, 2003:69). Also, such input usually results in longer and more complex narratives (Schneider and Dubé, 2005:58). The use of picture sequences to provide contextual support for the retelling is an attempt to reduce the role of memory and processing demands in order to obtain more representative language samples from participants (Stenning and Michel, 1985:262).

To control for the possible influence of the assumption of shared knowledge on retelling, researchers usually make use of a naïve listener, supposedly unfamiliar with the content, during narrative elicitation (Liles, 1985:124; 1993:873; Hadley, 1998:134; Gazella and Stockman, 2003:65; Schneider and Dubé, 2005:55). In this study, participants retold their narratives to a second researcher who was not present during the first presentation of the story.

5.6 NARRATIVES ANALYSES

The variables investigated in this study were grouped in two broad categories, namely microstructure and macrostructure. Microstructure and macrostructure variables represent two distinct elements of structure underlying narrative competence (Liles et al., 1995:38). Microstructural analyses focus on the internal linguistic elements used in the construction of the narrative, such as noun phrases and conjunctions. Macrostructural analyses, by contrast, focus on higher-order hierarchical elements of organisation such as episodic structure and story grammar components (Owens, 2004:213; Heilmann et al., 2010:155). All the protocols used in the different analyses are included in the appendices of the dissertation and are referred to by number in the remainder of this chapter.

5.6.1 Reliability and validity

This study made use of secondary data obtained from the WCED literacy assessments. A major limitation of secondary data analyses is that the researcher cannot control for data collection errors and is constrained by the original study's aims and objectives (Mouton, 2001:165; Castle, 2003:289). The WCED literacy assessment protocols are regarded as highly sensitive material. To ensure the scientific integrity and valididity of the assessments no information regarding the test items are made available to schools or researchers. The only available information regarding these assessments are examples of Grade 3 and 6 literacy and numeracy tests on the WCED's web site (cf. WCED 2010 and Appendix 1). The fact that the researcher had no control over the WCED sampling and assessment procedures, or the reliability and validity of the results of these assessments, is therefore a methodological constraint of this study. Despite these contraints the researcher felt that it was important to use the results of the official assessments developed and used by the WCED rather than other standardised reading assessments e.g. the *Neale analysis of Reading Ability – Revised* (Neale, 1997).

All the measures employed in this study to elicit and analyse narratives were selected on the basis of principles established in prior research. Protocols were adapted from existing formats and modified to suit the goals and aims of this study.

All analyses were performed by speech-language therapists experienced in narrative analysis, according to specified criteria (cf. Appendices 8-14). All analyses were separately coded and verified by different research assistents (two coders per analysis) to establish interjudge agreement. Interjudge reliability figures are reported for each measure in the following sections. As a rule, all disagreements after the second coding were discussed and resolved so that 100% agreement was obtained for the final analyses. The allocation of participants to the NC, PC and SCD groups took place after the results of the ARW, phonemic awareness test and narrative data were analysed. All persons involved in the coding and analyses were therefore blind to the participants' reading proficiency and reading group status.

5.6.2 Transcription

The narrative samples were audio-recorded using two Panasonic PF-US395 IC recorders. Recordings were transcribed by the graduate speech-language therapist research assistants. Following this, a third speech-language therapist research assistant listened to all the recordings a second time to verify the accuracy and completeness of the transcriptions. The percentage of agreement between the third and first transcribers was 97%. Disagreements were discussed and consensus decisions were reached so that 100% agreement was attained for transcriptions.

To prune and segment the narrative data into T-units, the protocols used in the Test for Oral Language Production (Vorster, 1980:26-29) were followed. T-unit segmentation is commonly used to parse spoken and written narratives into reliable units (Justice et al., 2006:181). See Appendix 8 for details of the pruning and segmentation processes. After pruning and segmentation into T-units, the microstructural variables were analysed.

For the analysis of the cohesion and coherence variables, the narrative transcriptions were coded into propositions. Following Mandler (1984:62), a proposition was defined as an idea-unit consisting of a predicate and a relatively small number of arguments. In contrast with the T-unit as the unit of analysis used in the microstructural analyses, propositions

could be sentences or clauses expressing ideas. Codas were included in the cohesion analyses.

5.6.3 Microstructural analyses

The linguistic variables selected for the microstructural analyses of the narratives will be briefly described in the following sub-sections. Also see section 4.2 for detailed discussions of these measures, and Appendix 9 for protocols and information regarding coding conventions for microstructural analyses.

5.6.3.1 Productivity

Two measures, namely total number of words (TNW) and total number of T-units, were used to examine quantity, i.e. how much language the participants produced in their narratives.

5.6.3.2 Lexical diversity

Two measures of lexical diversity were investigated, namely the number of different words (NDW) and the number of metaverbs (metalinguistic and metacognitive verbs). The NDW reflects a child's expressive vocabulary size and semantic proficiency while the use of metaverbs reflects awareness of others' states of minds and the cognitive processes used to interpret intentionality.

Previous studies indicated that NDW is a more reliable measure than Type-Token-Ratio (TTR) to distinguish between children with normal language development and children with SLI, mainly because of the effect of sample size on TTR (cf. Scott and Windsor, 2000:326; Watkins et al., 1995:1354). There are quantitative data in the form of age norms for NDW and number of T-units (e.g. Klee, 1992:31; Owens, 2004:192). However, the wide variability across children and confounding variables such as language sample size and method of elicitation raise questions about the validity and reliability of normative data pertaining to these two measures (cf. section 4.2.2.1). In this study, NDW and the number of T-units were therefore used to compare the different groups and not as normative measures.

5.6.3.3 Syntactic complexity

Four measures of syntactic complexity were investigated, namely the number of words per T-unit, the number of subordinate clauses, the subordination index, and the number of elaborate noun phrases (ENPs).

Sentence length is one of the key markers of syntactic development (Nippold et al., 2005b:1049; Scott and Stokes, 1995:310). The number of words per T-unit is regarded as more sensitive than MLU to the linguistic development displayed by children older than 5 years. Linguistic development is evident in mastery of structures, such as phrasal embedding and insertion of a variety of subordinate clauses (Owens, 2004:191). The number of words per T-unit was determined by dividing the TNW by the number of T-units.

The number of subordinate clauses per narrative and the subordination index in participants' narratives were determined. Clausal density or the subordination index was obtained by adding up the total number of independent (main) and dependent (subordinate) clauses and dividing them by the total number of T-units in each narrative (Scott, 1988a:58; Nippold et al., 2005b:1053).

Following Greenhalgh and Strong (2001:125), ENPs were defined as noun phrases that had more than two modifiers preceding the noun (e.g. ***the two small*** *cats*) or had qualifiers such as prepositional phrases (e.g. *the cat* ***in the tree***) or relative clauses (e.g. *the boy* ***who is naughty***) following the noun.

The microstructure of the narratives was analysed by the graduate speech-language therapist research assistants. Following this, a third speech-language therapist research assistant coded all the narratives a second time to verify the accuracy and completeness of the analyses. The percentage of agreement between the third and first analyses was 96%. Disagreements were discussed and consensus decisions were reached so that 100% agreement was attained for the analyses.

5.6.4 Macrostructure

The linguistic variables selected for the macrostructural analysis of the narratives will be briefly described in the following sub-sections. Also see section 4.3 for detailed discussions of these and other measures that can be used to analyse macrostructure. See Appendices 10-13 for protocols and information regarding the coding conventions used for macrostructural analyses in this study.

5.6.4.1 Structural complexity

The model story provided a narrative schema in the form of complete episodes, in other words, structures containing the obligatory story grammar elements and four explicitly stated goal-attempt-outcome structures. An adaptation of the Westby (2005:181) binary decision tree was used to determine the structural complexity of participants' narratives (see Appendix 10). Structural level analyses categorise the participants' narratives into sequences, abbreviated episodes or complete episodes based on the inclusion of propositions denoting goal-directed behaviour of characters in the participants' narratives. In this study, the total number of sequences (Seq), total number of abbreviated (Abbr) and complete episodes (Compl) in the narratives produced by each participant were determined. Sequences combined *descriptive*, *action* or *reactive* sequences. (See Appendix 10 for protocols and information regarding coding conventions for analyses of structural complexity)

5.6.4.2 Cohesion

Two aspects of narrative cohesion, namely conjunction and referencing, were examined (cf. section 4.4.1 for discussions of these aspects of cohesion). Analyses of conjunctions focused on the types and frequency of conjunctions used in the narratives. Following Greenhalgh and Strong (2001:125) and Eisenberg et al. (2008:147), the conjunctions *and*, *then* and *and then* were excluded from the analyses of conjunction use in the participants' narratives because children often use these structures as discourse markers rather than conjunctions which link propositions. (See Appendix 11 for protocol and information regarding coding conventions for analysis of conjunctions.)

Referencing was examined by investigating the frequency of referencing and the adequacy of participants' use of cohesive ties (percentage of complete, incomplete and erroneous ties per narrative). Cohesive adequacy was determined according to the definitions and guidelines in Liles (1985:124). (See Appendix 12 for protocols and information regarding coding conventions for analyses of referencing.)

5.6.4.3 Coherence

Narrative coherence was determined according to Kemper's taxonomy of causal events (Kemper 1986, 1988) as adapted by Gutierrez-Clellan and Iglesias (1992). Three aspects of coherence in participants' narratives were examined, namely, the type and frequency of narrative proposition categories (physical states, mental states, actions, goals), the frequency and nature of causal links (resultant, initiation, enablement, motivation) between events, and the relatedness of the events to the story structure (temporally or causally related or unrelated). Also see section 4.4.2 for a discussion of coherence and measures to examine this aspect in narratives.

Following Gutierrez-Clellan and Iglesias (1992:366), the Kemper taxonomy was used to code participants' propositions as narrative events and to determine the causal links between adjacent propositions. The links were then analysed in terms of their relatedness to the story structure. Events were regarded as related when they were temporally or causally interconnected and relevant to the story theme. In contrast, unrelated events are statements without temporal or causal links with other propositions and which do not contribute to the development of the narrative. Causal chains usually open with the setting statement and/or the introduction of the protagonist, and usually end with the attainment of the goal or direct consequences of failure to attain the goal (see section 4.4.2 and Appendix 13 for examples of causal analysis).

Following Low and Durkin (1998:212), temporal relatedness between two adjacent propositions was determined according to the criteria for successiveness or coexistence (Trabasso and Sperry, 1985:601). Successiveness occurs when two adjacent propositions merely follow each other, e.g. *the dove sat in the tree* (A) *he flew away* (B), without a

causal link between them. Coexistence occurs when two adjacent propositions happen at the same time; e.g. *the man wears brown shoes* (A) *and he has a gun* (B). A proposition was regarded as unrelated if it fell outside the causal chain, in other words, if it was a proposition without temporal or causal connections with adjacent propositions (e.g. *the ant was afraid* (proposition A), *the dove drops a leaf* (proposition B). (See section 4.4.2 for examples and Appendix 13 for protocols and information regarding coding conventions for causal analyses).

The microstructure of the narratives was analysed by the graduate speech-language therapist research assistants. Following this, a third speech-language therapist research assistant coded all the narratives a second time to verify the accuracy and completeness of the analyses. The percentage of agreement between the third and first analyses was as follows: structural complexity 93%, cohesion 96% and coherence 93%. Disagreements were discussed and consensus decisions were reached so that 100% agreement was attained for analyses.

5.7 CONTENT

A checklist was made containing relevant items of information that the participants could recall from the model narrative. Following Pearce (2006), items were grouped in the following categories: characters, objects, places, description of characters, events or actions with different characters as agents, the goals, desires and thoughts of different agents, the feelings of different agents, the plans or goals of different agents, and the dialogue of different agents. It was the aim of the study to find out if there were group differences in the number of content items recalled by participants and also to determine whether items in certain categories were better recalled.

Following Westby (2005:169), participants' narrative content was also coded for landscape of consciousness elements. Landscapes of consciousness, as opposed to landscapes of action in narratives were described in section 4.2.2.2. Combined scores in the categories the *goals and thoughts of different agents,* the *feelings of different agents,* and the *dialogue of different agents* were interpreted as indicators of landscape of

consciousness (LOC). These elements included adjectives and adverbs denoting emotions, and propositions referring to internal states of characters e.g. their being *afraid, glad, angry*; propositions referring to internal plans, intentions, cognitions and/or goals that serve to initiate actions of characters, e.g. in ***wanted*** *to drink water,* ***had to*** *make a plan,* ***wanted*** *to help his friend*; and propositions containing dialogue between characters, e.g. *the ant said: "****I must help my friend****"*. (See Appendix 14 for protocols and information regarding coding conventions for content analyses). The content analyses were done by two graduate speech-language therapist research assistants according to the coding checklist in Appendix 14. The percentage of agreement between the two analysers was 99%. Disagreements were discussed and consensus decisions were reached so that 100% agreement was attained for analyses.

5.8 FLUENCY

Fluent speech production requires the efficient integration of all the subcomponents of spoken language in a fast and accurate way, and speech disruptions may indicate lexical and syntactic deficits in children (also see section 4.6). As part of the transcription process, described in section 5.8.2, narratives were analysed for the following speech disruptions: sentence structure corrections (S), choice of word corrections (W), repetitions (R), incomplete utterances (I), and non-word insertions (Non). All unintelligible utterances were discarded. These speech disruptions were coded as fluency indicators and excluded from the other analyses. (See Appendix 8 for protocols and information regarding coding conventions for fluency analyses).

5.9 DATA ANALYSES

Clinicians usually consider a minimum of 50 utterances as a representative language sample for analytical purposes (Crystal, Fletcher and Garman, 1976:87; Gazella and Stockman, 2003:69). Narrative samples obtained from participants did not comply with this criterion, therefore interpretation and comparison to e.g. age and developmental norms reported in the literature (cf. Klee, 1992; Owens, 2004:190) were done with caution. Comparisons between groups and individuals who participated in the study could be made because all participants were presented with the same stimulus input and

sampling procedures. Participants' performances on the different narrative measures were compared with the model narrative that served as the elicitation stimulus. The purpose was not to regard the model narrative as a "gold standard" or norm, but to enable the researcher to examine the extent to which the mental models that they formed of the model narrative influenced the micro- and macrostructural properties of their retell narratives.

Data analyses included one-way ANOVAs to examine differences between groups. Values to consider significant group differences were set with p-values equal to or less than 0.05. Although data was not normally distributed, results were verified using non-parametric bootstrap analyses. The bootstrapping procedure is distribution-independent and provides an indirect method to assess the properties of the distribution underlying the sample and the parameters of interest that are derived from this distribution. This procedure allows the researcher to make inferences from data without making strong distributional assumptions about the data or the particular statistic being calculated (Haukoos and Lewis, 2005:360). A 5% significance level ($p<0.05$) was used as guideline for determining significant effects of variables for bootstrap analyses. The letters (e.g. ^{a}) in figures denote significant differences on a 5% ($p<0.05$) level. Similar letters denote no significant difference between scores, whereas different letters indicate that significant differences occurred. For example, ^{a} and ^{b} denoted statistically significant differences, but ^{a} and ^{ab} indicate no significant difference. Bonferroni corrections were applied to correct for multiple testing.

5.10 SUMMARY

This chapter presented the aims, research design and data collection procedures for the study. The main aim of this study was to examine the relationships between aspects of the participants' narratives and their reading comprehension levels. This chapter provided a brief explanation of each aspect of narrative production at micro- and macrostructural levels and the frameworks used for analysis of these aspects to make comparisons between the groups. The next chapter will present the results of the data collection and the discussion thereof in terms of the research questions and hypothesis of the study.

CHAPTER 6

RESULTS AND DISCUSSION

6.1 INTRODUCTION

This chapter presents and discusses the results for the different analyses performed in the study. The analyses were designed to assist in answering the specific research questions articulated in section 1.4 and the aims stated in section 1.4.2. These analyses examine the differences between the groups (NC, PC and SCD) identified for the purposes of this study, with respect to various measures. The broad aims of the study were to investigate aspects of language and narrative skills of a group of Grade 3 learners from lower socio-economic backgrounds, and in particular, to explore the relationships between their language and narrative skills, on the one hand, and their reading comprehension abilities, on the other.

The presentation and discussion of the results will be structured around the aims of the study that lead from the main research questions. Conclusions regarding the two main questions, *"How do the linguistic deficits of learners with poor and specific reading comprehension deficits manifest in their oral narrative production?"* and *"Are there linguistic markers that decisively distinguish between learners with specific reading comprehension deficits and learners with general poor reading as compared to learners with normal reading comprehension? If so, how are such linguistic markers identified*?*"* will be drawn in the final chapter of the dissertation.

Data are first reported in each section in terms of average scores for variables and descriptive statistics for all the participants (n=102) to examine performance of the whole group for the variables of interest. Second, group differences are reported for one-way ANOVA analyses where values are considered significant if group differences showed *p* values equal or less than 0.05. Bonferroni corrections were applied to correct for multiple testing. Group differences were verified by nonparametric bootstrap analyses at 95% confidence intervals. As stated in section 5.9, 5% significance level ($p<0.05$) was used as guideline for determining significant effects of variables for bootstrap analyses. The

letters (e.g. [a]) in figures denote significant differences on a 5% ($p<0.05$) level. Similar letters denote no significant difference between scores, whereas different letters indicate that significant differences occurred. For example, [a] and [b] denoted statistically significant differences, but [a] and [ab] indicate no significant difference. Each set of variables will also, where applicable, be compared to the model narrative that served as the elicitation stimulus.

First, analyses of participants' reading scores at the different grade levels (based on the WCED assessments) will be presented, followed by the results of phonemic awareness screening test and the the receptive vocabulary test. The findings of these analyses will be used to present and discuss the different reading profiles displayed by the participants. Thereafter the results from the narrative analyses will be presented.

6.2 READING PROFICIENCY AT THE DIFFERENT GRADE LEVELS

Aim 1: To compile reading comprehension profiles for participants based on their reading performances in the WCED assessments and the reading subtype model from Catts Hogan and Fey (2003:159), and to examine the differences in aspects of reading comprehension between the three groups, NC, PC and SCD groups

In order to accomplish this aim, the reading performances of the participants were investigated. Each participant was allocated to one of three groups (NC, PC or SCD; see below) and it was hypothesised that bootstrap analyses would indicate that the groups present with different reading profiles, specifically that the SCD group would present with a different profile compared to the other groups. The analyses were performed to investigate the validity of the assumption that there were significant differences between the three groups in terms of their reading proficiency at the three grade levels.

Participants were allocated to the NC, PC and SCD groups on the basis of their reading scores on the WCED assessments. The WCED criterion for passing was set at 50% correct responses at each level. recall that participants were assigned to the NC group (n=38) if they obtained scores of 50% or more at Grade 1, 2 and 3 levels; to the PC group

(n=18) if they passed at Grade 1 levels, but obtained scores of below 50% at Grade 2 and 3 levels; and to the SCD group (n=46) if they obtained scores of 50% or more at Grade 1 and 2 levels, but below 50% at Grade 3 level. Refer to table 5.1 (section 5.3.3) for a summary of mean results per group.

6.2.1 Grade 1 level reading results

The WCED Grade 1 level assessment task comprised reading of single words with visual cues provided (see Appendix 1 for examples). The assessments took place at the end of participants' Grade 3 school-year and it was anticipated that they would all pass this level, except for readers presenting with severe word recognition and decoding problems. All participants passed, in other words, they obtained scores of 50% and higher. The group average score was 9.3 (SD 0.8), with a range of 6 to 10 out of a possible 10. However, when considering the scores of the individual groups instead of all the participants combined, the bootstrap analyses, depicted in figure 6.1, indicated differences between the three groups.

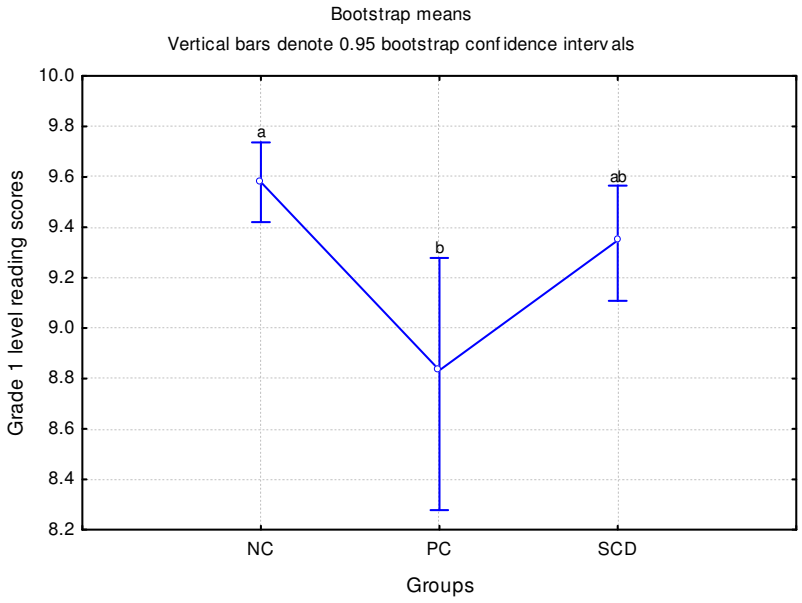


Figure 6.1 Means per group for reading scores at Grade 1 level

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

The differences between the groups were significant between the NC group (those who obtained reading scores of 50% or higher at all three grade levels) and PC group (those who obtained reading scores of 50% or higher at Grade 1 level but not at Grade 2 and 3 levels), but not between the SCD group (those who obtained reading scores of 50% or higher at Grade 1 and 2 but not at Grade 3 level) and the other two groups.

Although all the participants passed the assessments at Grade 1 level, it is clear that the NC group demonstrated the least individual variance and the PC group the most, and that the NC group was significantly better at decoding and sight word reading than the PC group. So even though all participants passed the single-word reading test, those who could pass the reading comprehension tests (participants in the NC group) were better at reading words in isolation than were those who failed the reading comprehension tests (participants in the PC group). Participants in the SCD group did not differ significantly from the PC or NC groups in terms of reading at decoding level, in other words, they were not significantly better than the readers with general poor reading at this level.

6.2.2 Grade 2 reading results

This assessment comprised reading of single sentences with and without visual cues provided (see Appendix 1 for examples). Although participants in the NC and SCD groups passed the Grade 2 tests, in other words, they obtained scores of 50% and higher the bootstrap analyses, depicted in figure 6.2, indicated significant differences between these two groups.

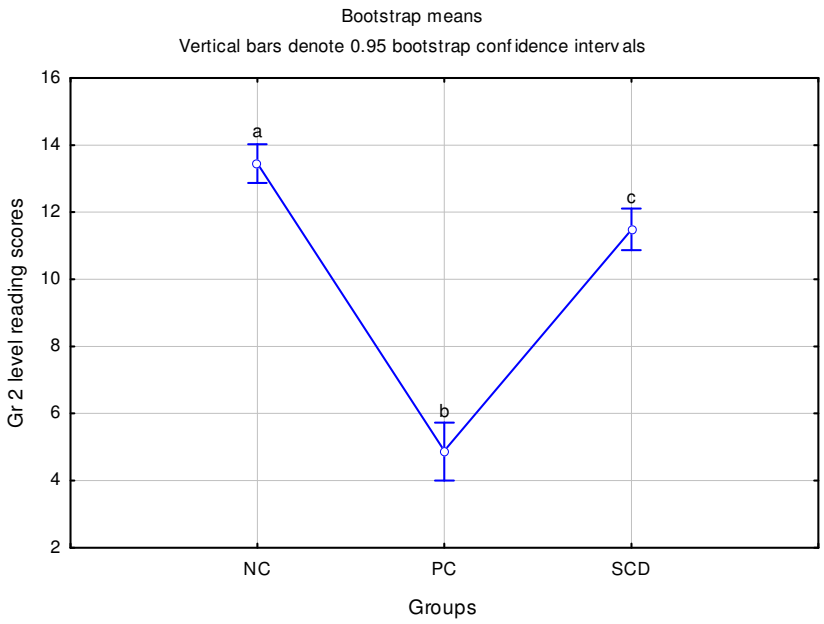


Figure 6.2 Means per group for reading scores at Grade 2 level

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

Reading scores at this level (together with that at Grade 3 level) was used to allocate participants to the three different groups. It was therefore expected that PC scores would be significantly lower than those of the other groups at this level. The significant difference between the NC and SCD groups was an unexpected finding. Although the SCD participants, like the NC participants, obtained pass scores at this level, it is clear that they were significantly poorer than the NC group at reading at sentence level. This finding indicates that they were less proficient in using their word recognition strategies and knowledge of syntax to read and interpret sentences compared to the NC group. This finding concurs with those of Nation and Snowling (1998:98) that children with SCD have weaker word recognition skills than their peers with normal reading comprehension.

6.2.3 Grade 3 reading results

Assessment at this level comprised reading comprehension based on a mind map text, and comprehension based on an extended passage (see Appendix 1 for examples). The tasks required participants to use their word recognition skills to read unfamiliar narrative and expository texts and to select information from the texts. Reading scores at this level

formed part of the criteria to assign participants to the different groups and differences were therefore expected. Bootstrap analyses depicted in figure 6.3 confirmed significant differences between the groups.

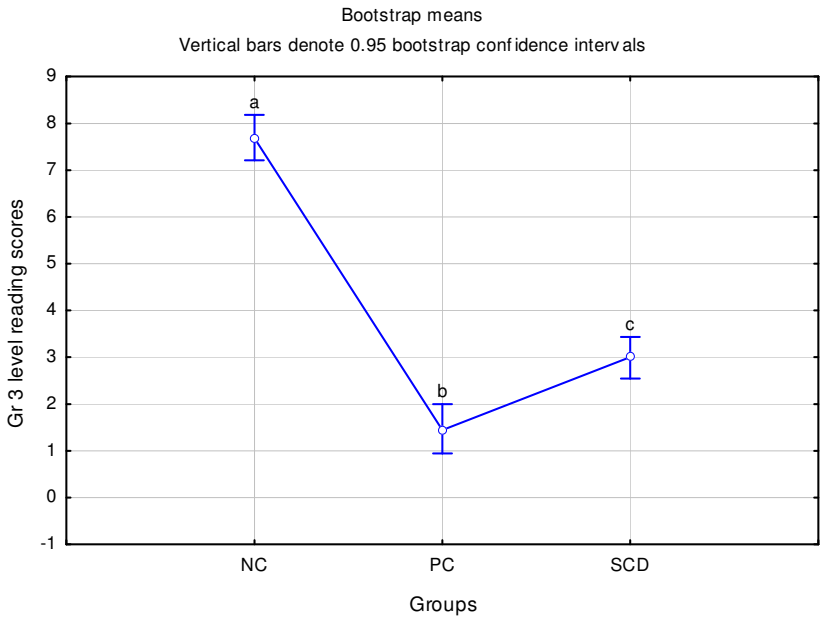


Figure 6.3 Means per group for reading scores at Grade 3 level

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

The results depicted in figure 6.3 clearly show the differences in reading comprehension between the three groups. A noteworthy finding was that although the SCD group also failed to obtain pass scores at Grade 3 level, their performances were still significantly better than those of the PC group.

6.2.4 Summary: Participants' reading proficiency at the different grade levels

The mean reading scores of the three groups at all three levels are depicted in figure 6.4 to demonstrate the differences between the groups and their reading proficiency profiles at the different grade levels.

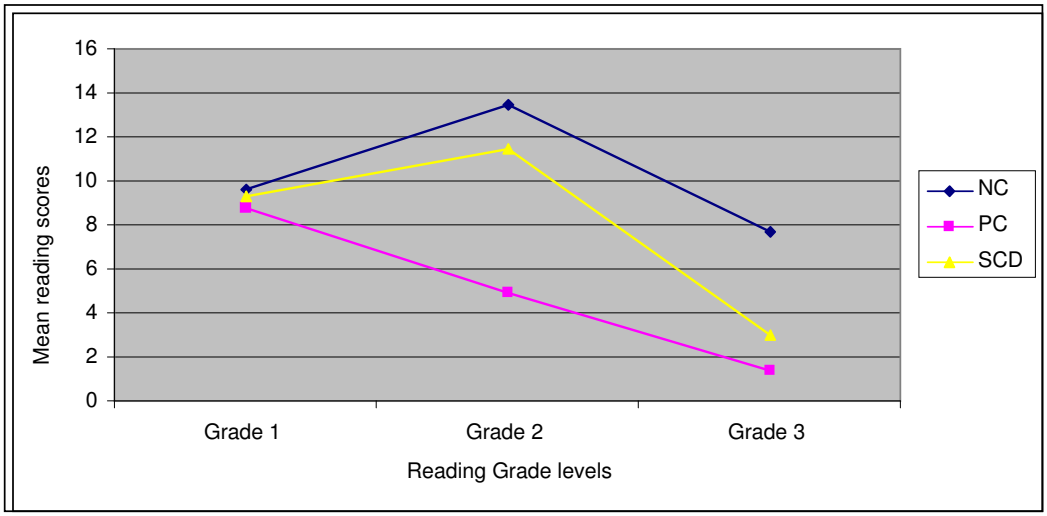


Figure 6.4 Means per group for reading scores at grade levels

Taken together, the abovementioned results confirm the findings Catts et al. (2003:159) and Cain and Oakhill (2006b:692) that readers with SCD form a distinct group and that their reading problems are qualitatively different from readers with general poor reading abilities. The SCD participants in this study are not distinguishable from other readers in terms of their ability to read single words, but read single sentences and paragraphs significantly better than readers with poor comprehension (the PC group) yet significantly worse than readers with good comprehension (the NC group).

6.3 PHONEMIC AWARENESS

Aim 2: To investigate the relationship between participants' phonemic awareness skills obtained through a phonemic awareness screening test and their reading skills;

The phonemic awareness abilities of participants were assessed by an informal screening test consisting of five items. Scores obtained by all participants ranged from 0-5 out of a possible score of 5, with an average score of 4.1 (SD 1.6). The nine participants who scored 0 on this measure were distributed among the three groups. Bootstrap analyses depicted in figure 6.5 indicated no significant differences between the groups.

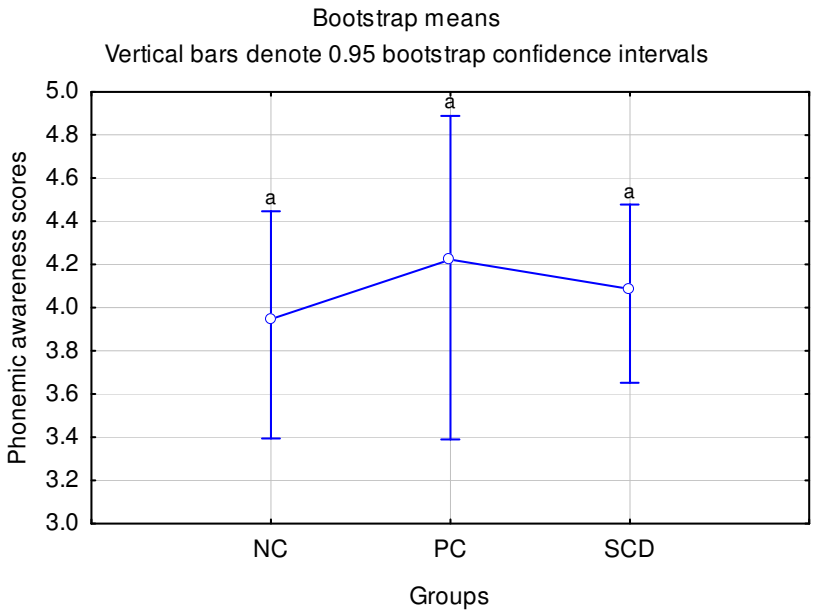


Figure 6.5 **Means per group for phonemic awareness scores**
[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

The finding that most participants performed well in the phonemic awareness test corresponds with their performances at Grade 1 reading levels. Extensive research studies have established causal links between phonological awareness skills and word-reading (cf. Catts et al, 1999, 2002; Torgesen et al., 1994, 2005; Vellutino and Scanlon, 2002). In terms of the reading subtype model (cf. Catts and Kamhi, 2005b; Aaron et al., 1999; see section 2.6.3), the subtype *readers with problems in word recognition alone* describes readers with good comprehension skills, but poor phonological awareness and decoding skills. Based on the results of their reading and phonemic awareness assessments, none of the individual participants or the three groups in this study fit the profile of this subtype.

In summary, the results of the reading assessments and the phonemic awareness screening test indicated that the SCD group presented with a different profile than the NC and the PC groups. SCD participants seem to resemble the subtype *readers with problems in reading comprehension only.* They performed adequately at Grade 1 and 2 reading levels, and demonstrated good phonemic awareness skills. Their performances at Grade 3 level resembled that of the PC group, but were significantly higher. The results indicated

that their reading deficits manifested mainly at Grade 3 level, where the reading tasks focused on text comprehension. The finding that, though passing, they performed significantly poorer at Grade 2 level than did the NC group may indicate that their comprehension deficits already started to surface at sentence reading level. Although they passed the reading assessments at Grade 2 level, they performed at a significantly poorer level than the NC group.

Participants in the PC group resembled the subtype *readers with problems in both word recognition and reading comprehension.* Although they passed the WCED tests at Grade 1 level, they performed poorer than the other two groups. Their performances at Grade 2 and 3 levels indicated problems with reading at sentence and discourse levels.

It should be noted that although the NC group passed all three levels of reading assessment their individual reading scores at Grade 3 level clustered around the lower rather than the higher end of the possible range of pass scores. As depicted in figure 6.6, no participant obtained full marks, and 11 participants (29%) in the NC group achieved only the minimum pass rate of 50% (6 correct responses out of 12).

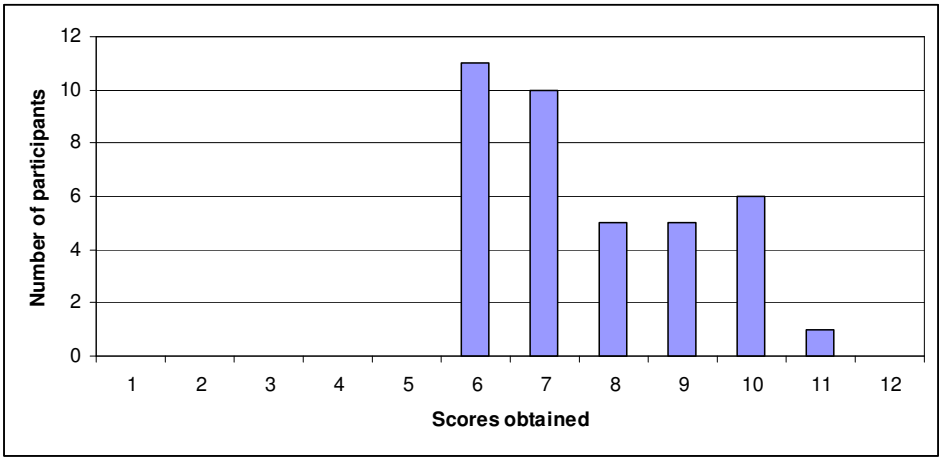


Figure 6.6 Grade 3 reading level scores of NC participants (n=38)

In terms of the research question, the abovementioned results indicate that participants in the PC and SCD groups resembled two of the subtypes in the Catts et al. (2003) classification model. The SCD group presented with a distinct profile: indistinguishable

from the other two groups in terms of phonemic awareness and single-word reading, but better than the PC group and worse than the NC group in terms of single-sentence and paragraph reading.

6.4 RECEPTIVE VOCABULARY

Aim 3: To investigate the reciprocal relationship between participants' receptive vocabulary skills obtained through a formal vocabulary test and their reading comprehension skills;

In order to fulfil this aim, participants were assessed with the ARW. Based on research evidence reported in chapter 3, it was assumed that the NC group would have higher vocabulary scores than the other two groups. Results for ARW scores are usually reported as raw scores, standard scores (SS) and language age (LA) scores. Raw scores are converted to standard scores and language age scores. According to the test format, a standard score of one standard deviation below the average (-1Z) can be interpreted as clinically significant (Buitendag, 1994:27). Thirty-two of the 102 participants obtained standard scores below 50, which corresponds to three standard deviations below the average (-3Z). The norm tables do not provide individual standard score equivalents for scores below 50, and individual standard score equivalents could therefore not be calculated for these 32 participants who scored below 50. Only 10 participants had standard scores of more than 85, in other words, within the normal developmental range of 100 (SD 15).

Language age scores indicate that 93 participants (91%) of participants scored below their chronological age levels for receptive vocabulary (see table 6.1). The average language age score for all the participants combined was 77 (SD 13.3) months, compared to an average chronological age of 113 (SD 3.3) months. Although participants in the NC group presented with higher average language age scores (81 months, SD 14.1) than did the other two groups, their average language age scores were still considerably lower than their chronological age levels.

Table 6.1 **Summary of means and standard deviations per group for chronological age (CA) and language age (LA) scores for the receptive vocabulary test (ARW), with standard deviations in parentheses**

Variable	Group		
	NC (n=38)	**PC (n=18)**	**SCD (n=46)**
CA in months	113 (3.4)[a]	112 (3.8)[a]	113 (3.1)[a]
LA in months	81 (14.1)[a]	70 (7.4)[b]	76 (13.5)[ab]

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

Language age scores of more than 6 months below chronological age indicates a moderate delay and a language age score of more than 12 months below chronological age indicates a severe delay (Buitendag, 1994:26). Results showed that of the 93 participants with language age scores below their chronological age levels, 4 could be classified as moderately delayed, while the other 89 participants (87%) could be classified as severely delayed. According to the criteria for SLI as specified by Stark and Tallal (1981) and Leonard (1998:vi), the majority of the participants could be classified as SLI on the basis of their receptive language age skills. The distribution of language age scores achieved by participants in the different groups is depicted in figure 6.7.

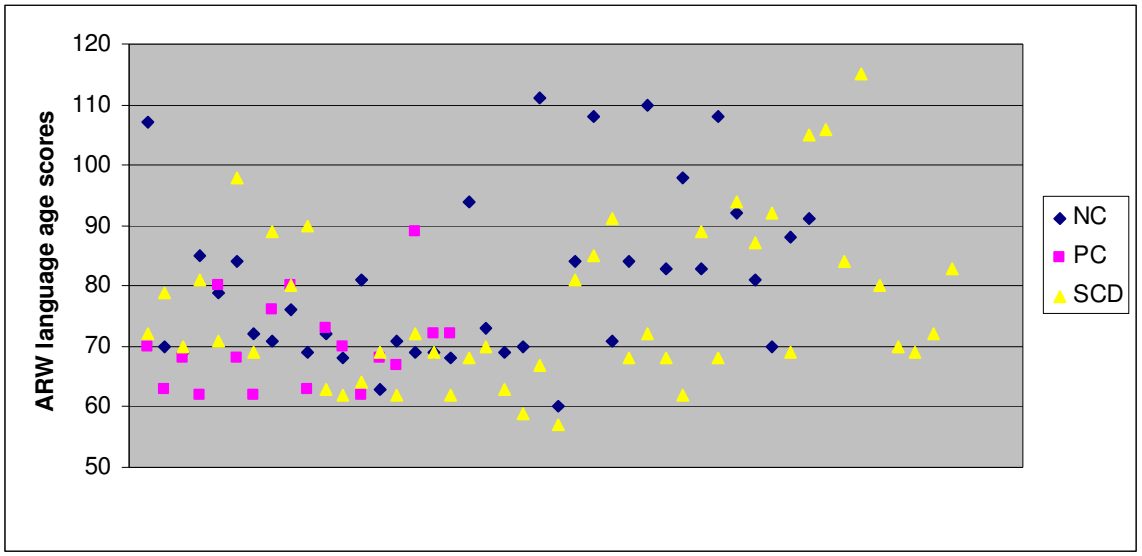


Figure 6.7 **ARW language age (months) scores of participants in the NC, PC and SCD groups.**

The data from the ARW concur with those of Klop and Tuomi (2007:62) from a study in the same community as the current study population. They found that all participants (n=25) presented with below-average ARW scores when first assessed at the age of 6 years 5 months to 6 years 9 months. When participants were retested three years later, at the end of Grade 3, their ARW language age scores were still significantly below their chronological age. Other language variables, such as measures of syntactic complexity that formed part of the longitudinal assessments, confirmed the prevalence and persistence of this cohort's language impairments over time[59].

Although bootstrap analyses indicated no significant differences between the groups for chronological age, there were significant differences between the NC and PC groups for language age scores, but not between the SCD group and the other two groups (see table 6.1). In other words, although age-matched, there were considerable differences between participants in the PC and NC groups in terms of their receptive vocabulary as measured by the ARW.

In summary, the majority of participants scored so far below their chronological age levels for receptive vocabulary that they can be classified as severely language impaired according to the ARW norms (Buitendag, 1994:26) or as specifically language-impaired according to current definitions of SLI (Leonard, 1998:vi). The PC group, in particular, performed on average more than three years below their chronological age. The results of the current study and those of Klop and Tuomi (2007) and Southwood and Van Dulm (2009) all seem to indicate poor levels of vocabulary skills in mainstream children from this community. As discussed in section 3.4.2.1, poor vocabulary and lexical knowledge reflect limitations of the mental lexicon and compromise text processing at surface code level. Poor vocabulary knowledge has a negative impact on word recognition via the phonological as well as the visual routes (Nation and Snowling, 1998:99), and compromises readers' ability to self-teach (Share, 1999:96) and to read novel and exception words (Ricketts et al., 2007:250). Even when they have normal word

[59] Cf. section 5.6.1 for a discussion of the validity of the ARW in communities who are speakers of non-standard Afrikaans.

recognition skills, poor vocabulary knowledge will constrain readers' abilities to read words that require support from semantic representations, thereby compromising their comprehension of texts at surface level (Nation and Snowling, 1998:99; and Cain and Oakhill, 2006b:693). The finding that the PC group, although achieving pass scores at word recognition level, performed significantly weaker than the other two groups, at word recognition level is interpreted as evidence of the negative impact of their limited vocabulary on their word recognition skills.

6.5 NARRATIVES

Aim 4: To analyse narrative data obtained through story-retell narratives to determine the differences between the three groups for the micro- and macrostructural variables specified in section 1.4.2

In order to accomplish the above aim, elements of micro- and macrostructure of participants' retell narratives were analysed. Narratives were further analysed in terms of coherence and cohesiveness, the amount of content they provided in comparison with the model narrative, and in terms of the participants' fluency in the retellings. These particular aspects, as discussed in sections 4.2, 4.3, 4.4 and 4.6, were identified as being related to reading and reading comprehension. It was hypothesised that participants in the PC and SCD groups would perform poorer than those in the NC group on all of the narrative measures.

6.5.1 Narrative microstructure

In order to determine the differences between the three groups, microstructural qualities of participants' narratives were examined.

6.5.1.1 Productivity

Are there differences between the three groups in terms of productivity of their retell narratives?

To answer the above question, total number of words (TNW) and total number of T-units were measured to determine if the groups differed in terms of the amount of language

they produced in their retell narratives and to compare their retell narratives with the model narrative.

There was considerable variation in length between the narratives produced by the individual participants in response to the model narrative, both in terms of TNW and total number of T-units. After pruning, participants' narratives contained an average of 149 words per narrative (SD 41.7), with narratives ranging from 50 to 250 words. They produced on average 20 T-units (SD 5.3), ranging from 6 to 34 T-units per narrative. The model narrative contained 310 words and 32 T-units. It is therefore clear that most participants produced narratives that were considerably shorter than the model narrative.

Descriptive statistics for the two measures of productivity, namely TNW and total number of T-units, are presented in table 6.2. For both TNW and total number of T-units, bootstrap analyses confirmed significant differences between NC and PC groups, but not between the SCD group and the other two groups.

Table 6.2 Productivity – summary of means and standard deviations per group for total number of words (TNW) and total number of T-units (Tot T-units) compared to the model narrative, with standard deviations in parentheses

Variable	Groups			
	Model narrative	**NC (n=38)**	**PC (n=18)**	**SCD (n=46)**
TNW	310	159 (39.7)[a]	127 (24.7)[b]	149 (45.9)[ab]
Tot T-units	32	20.3 (4.9)[a]	17 (4.0)[b]	19.7 (5.9)[ab]

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

In summary, the results of the productivity measures indicated that all participants produced considerably fewer words and T-units than the model provided in the elicitation stimulus. The PC group, in particular, produced shorter narratives than the other two groups; they produced fewer T-units and fewer words than the other groups although these differences were not statistically significant between the PC and SCD groups. Evidence from previous studies, e.g. Roth (1986:27; 2000:20), Scott and Windsor,

(2000:333) and Puranik et al. (2008:108), indicated that children with language impairments, in general, produce shorter narratives than their age-matched peers, although Fey, Catts, Proctor-Williams, Tomblin and Zhang (2004:1314) found productivity measures to be less sensitive than, for instance, measures of syntactic complexity in distinguishing between clinical groups.

6.5.1.2 Lexical diversity

Are there differences between the three groups in terms of the lexical diversity of their retell narratives?

Two measures of lexical diversity in the retell narratives of the three groups, namely number of different words (NDW) and metaverbs, were examined. NDW reflects a child's expressive vocabulary size and semantic proficiency whereas the use of metaverbs reflects awareness of others' states of minds and the cognitive processes to interpret intentionality.

On average, participants produced 62 different words (SD 14), with a range of 23 to 99 different words per narrative compared to the 131 different words in the model narrative. The results were interpreted as evidence of limited lexical diversity in the narrative production of all participants. This finding converges with those of the ARW results reported earlier (see section 6.4).

Mental and linguistic verbs were grouped together as metaverbs. Participants included on average 4 tokens of metaverbs per narrative (SD 2), with a range of 0 to 9 metaverbs. All participants, except for one, produce at least one metaverb. Analyses revealed that 89% of the metaverbs produced were linguistic verbs and 11% mental verbs. Linguistic verbs consisted mainly of *skreeu/geskreeu* 'shout/shouted' and *sê/gesê* 'say/said'. Other metalinguistic verbs that were used by participants included *dank* 'thank', *roep* 'call' and *vra* 'ask'. Mental verbs consisted almost exclusively of one form, namely *dink/gedink* 'think/thought'. Three participants used *weet/geweet* 'know/knew' and two participants used *besluit* 'decide' in their narratives. The model narrative, however, contained only 8

metaverbs in total, 7 instances of three linguistic verbs, namely *roep* 'call', *sê* 'says' and *skreeu* 'shout' and 1 instance of a mental verb, namely *besluit* 'decide'. It is therefore possible that the limited variety of metaverbs in the model narrative (4 types in total) constrained participants' use of metaverbs in the retell narratives.

Descriptive statistics for NDW and metaverbs for the different groups are presented in table 6.4. As discussed in section 4.2.2.1, the considerable differences in the length of participants' narratives in terms of TNW and total number of T-units may compromise the validity of NDW as a measure of lexical diversity, and rather reflect differences in narrative length. To correct for the differences in the length of the narratives, metaverbs were calculated as percentages by dividing the total number of metaverbs by the total number of T-units.

Table 6.3 Lexical diversity - summary of means and standard deviations per group for total number of different words (NDW), total number of metaverbs (Total Met) and % metaverbs per narrative (%Met), with standard deviations in parentheses

Variable	Group			
	Model narrative	**NC (n=38)**	**PC (n=18)**	**SCD (n=46)**
NDW	131	66 (13.5)[a]	56 (11.5)[b]	61 (15.4)[ab]
Total Met	8	4.5 (1.8)[a]	3.3 (1.6)[b]	3.9 (2.2)[ab]
% Met	25	22 (7.7)[a]	19 (8.2)[a]	20 (9.4)[a]

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

Bootstrap analyses indicated only significant differences between the NC and PC groups for NDW. This finding converges with those of the ARW results reported earlier, in other words, significant differences were found between the NC and PC groups for both measures of vocabulary, namely the ARW and NDW. The NC group produced more metaverbs in total (Total Met) than the PC and SCD groups. However, when metaverbs were calculated as proportions by dividing the number of metaverbs by the number of T-units and expressing them as percentages (%Met) in order to correct for differences in the length of narratives, bootstrap analyses indicated no differences between the groups.

In summary, in terms of lexical diversity, the NC group produced a greater number of different words than did the PC group, but not more metaverbs when corrections for differences in the length of narratives were made. NDW has been found to distinguish between children with and without language impairment (Klee, 1992:31; Watkins et al., 1995:1353). The PC group's performance on this measure may signify SLI in this group. Participants' limited use of metaverbs and the lack of observed differences between the groups may be ascribed to limited occurrence of these elements in the model narrative stimulus. Results from another measure of landscape of consciousness elements, namely a contents measure, will be discussed in section 6.6. The PC group's significantly lower levels of lexical diversity combined with their poor ARW results are interpreted as indicative of poor expressive and receptive vocabulary typical of children with SLI. A recent study by Heilmann et al. (2010) employed hierarchical regression analyses to investigate the relationships between micro- and macrostructural measures in the narratives of typically developing 5-7 year children. Their results indicated that unique relationships exist between narrative macrostructure and lexical diversity and vocabulary. They conclude from their findings that young children, before they are proficient in using complex syntax, often rely on their vocabulary skills to organise their narratives (Heilmann et al., 2010:161). The finding in this study, reported in section 6.6, that participants in the PC group produced narratives that were structurally less complex than those of the other two groups, seem to indicate that their limitations in vocabulary and lexical diversity also impacted on their ability to produce complex narratives.

6.5.1.3 Syntactic complexity

Are there differences between the three groups in terms of the syntactic complexity of their retell narratives?

As discussed in section 4.2.3, the ability to produce and understand complex language is closely associated with reading comprehension. Four aspects of syntactic complexity, namely syntactic length (number of words per T-unit), subordination (number of subordinate clauses), clausal density (subordination index) and noun phrase elaboration (ENP) – both total number of ENPs and percentage of ENPs per narrative - were examined. The subordination index was calculated by adding up the total number of

independent and dependent clauses and dividing them by the total number of T-units. To correct for differences in the length of narratives, ENPs were calculated as proportions by dividing the number of ENPs by the number of T-units and expressing them as percentages (%ENP). Data from the different syntactic measures will first be reported and discussed in terms of participants' performances as a group, and then in terms of differences between the groups. The group results are depicted in table 6.4.

a) Number of words per T-unit

The average sentence length of the model narrative was 10 words per T-unit. Participants produced sentences that ranged in length from 4 to 12 words per T-unit, with an average of 7 words per T-unit (SD 1). Longer T-units are usually an indication of higher levels of syntactic complexity because they contain more words due to expansions at phrase and clause levels (Scott and Windsor, 2000:326). Nippold et al. (2005b:1049) and Klee (1992:36) found a slow increase in length of T-units as children mature and Loban (1976, as cited in Nippold et al. 2005b:1049) reported an average of 7.62 words per T-unit in conversational samples of Grade 3 children. Compared to the model narrative used as the elicitation stimulus, participants produced shorter and less complex T-units, but their average T-unit length compared well to that reported by Loban (1976 as cited in Nippold et al. 2005b:1049) for children at their grade level. Bootstrap analyses indicated no significant differences between the groups for words per T-unit.

b) Subordination and clausal density

The model narrative contained 16 subordinate clauses resulting in a subordination index of 1.5. Participants produced an average of 2 (SD1.9) subordinate clauses (range 0-9), and 22% produced no subordinate clauses at all. Typical examples of subordinate clauses produced by the participants include:

(1) *eendag was daar 'n mier* ***wat dors was***
'once there was an ant which was thirsty'

(2) *die duif red die mier* ***wat in die water geval het***
'the dove saved the ant which fell in the water'

Participants' subordination indexes revealed an average clausal density of 0.1 clauses per T-unit (SD 0.1). Scott (1988a:59) analysed longitudinal data collected by Loban (1976 as cited in Nippold et al. 2005b:1049) from conversational discourse of 211 children and found that the mean subordination index for Grade 3 children was 1.22, which is considerably higher than that of the participants in this study.

No significant differences between the groups were found when performing bootstrap analyses for number of subordinate clauses or subordination index. The distribution of participants' mean subordination index scores is depicted in figure 6.9.

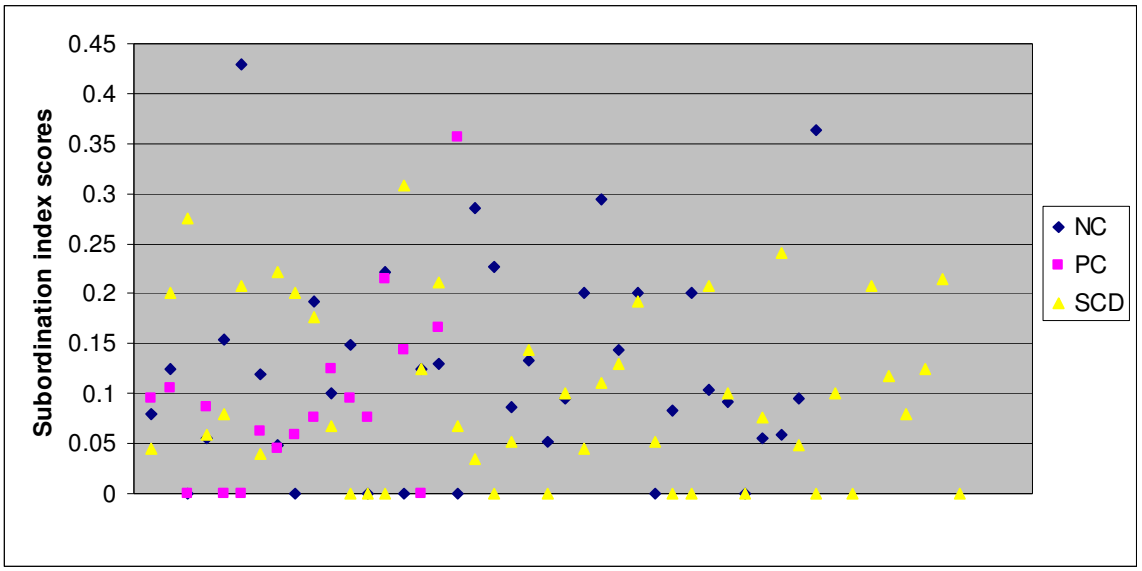


Figure 6.8 Mean subordination index scores of participants in the NC, PC and SCD groups.

Clausal density usually serves as a marker for later syntactic development and distinguishes school-age children from preschoolers (Owens, 2004: 206) and children with language impairment from those without such impairment (Merritt and Liles, 1987:545). Participants' use of subordination and clausal density was extremely limited compared to the model narrative and in terms of the norms provided by Scott (1988a:59). Their narratives, in terms of subordination and clausal density, resembled those of much younger or language-impaired children.

c) Noun phrase elaboration

Children with language impairments often display poor noun phrase elaboration (Owens, 2004:200; Scott and Windsor, 2000:334; Greenhalgh and Strong, 2001:120). The model narrative contained a total of 15 ENPs: 1 complex premodification (*'n groot groen blaar* 'a big green leaf') and 14 examples of postmodification (4 relative clauses and 10 prepositional phrases).

Participants produced on average only 2 ENPs per narrative (SD 1.2). Further analysis of the ENPs revealed that participants produced qualifiers rather than modifiers to elaborate their noun phrases. Only 9% of participants produced any form of complex noun premodification, and they all used the structure included in the model narrative, namely

(3) ***'n groot groen*** *blaar* 'a big green leaf'

wheras 82% produced at least one noun qualifier, e.g.

(4) *die duif* ***in die boom*** 'the dove in the tree'
(5) *die mier* ***wat in die water geval het*** 'the ant which fell in the water'

However, as discussed in section 4.2.3.3, complex noun phrase elaboration often emerges only at age 11 in the narratives of children with normal language development (Eisenberg et al., 2008:155). If participants, as indicated by their ARW language age scores, functioned at a much lower language age level, it would have been unrealistic to expect complex ENPs in their narratives. The lack of complex premodification (more than two modifiers) in the model narrative could also have failed to provide sufficient examples and thereby constrained participants' use of modifiers in their retellings.

The differences between the groups for the measures of syntactic complexity are reported in table 6.4. The data clearly shows that participants' narratives were syntactically less complex than the model narrative provided. Bootstrap analyses indicated no significant

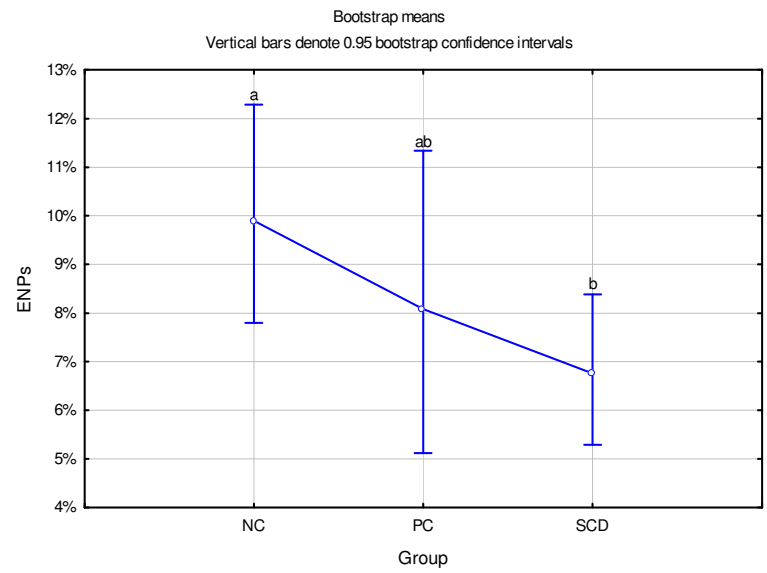
differences between the groups for words per T-unit, number of subordinate clauses or subordination index.

Table 6.4 **Syntactic complexity - summary of means and standard deviations per group for words per T-unit, number of subordinate clauses (SUB), subordination index (SUB index), number of elaborated noun phrases (ENPs) and percentage of elaborated noun phrases (%ENP) compared to the model narrative, with standard deviations in parentheses.**

Variable	Group			
	Model narrative	**NC (n=38)**	**PC (n=18)**	**SCD (n=46)**
Words/T-unit	10	7.9 (0.2)[a]	7.5 (0.3)[a]	7.6 (0.2)[a]
SUB	16	3 (2.1)[a]	2 (1.1)[a]	2 (1.9)[a]
SUB index	1.5	0.1 (0.1)[a]	0.1 (0.1)[a]	0.1 (0.1)[a]
ENPs	14	2 (1.2)[a]	1 (1.1)[ab]	1 (1.1)[b]
%ENP	43	10 (7)[a]	8 (7)[ab]	7 (6)[b]

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

As shown in table 6.4, bootstrap analyses revealed significant differences between the NC and SCD groups for number of ENPs and %ENP, but not between the PC group and the other two other groups. As can be seen in figure 6.10, while the SCD group's range of % ENPs overlap completely with that of the PC group, the average percentage of ENPs used by the SCD group is lower than that of the PC group. This is an unexpected finding, as thus far the general pattern has been that the SCD group fares worse than the NC group but still better than the PC group.



[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

Figure 6. 9 Syntactic complexity - means per group for %ENP per narrative

In summary, only noun phrase elaboration was found to differentiate between groups regarding syntactic complexity. All participants displayed limited levels of syntactic complexity despite the fact that retell narratives, compared to conversational analyses, usually result in more complex syntax (Liles, 1993:872). Participants' narratives contained very few subordinations, low clausal density and limited noun phrase elaboration. Of interest is that the SCD group demonstrated even lower levels of noun phrase elaboration than the other two groups. Research demonstrating the strong links between syntactic awareness, syntactic knowledge and reading comprehension was discussed in section 4.2.3. Recall that spoken language forms the foundation of reading and literacy. As such, the poor syntactic skills displayed by the participants are reason for concern.

In terms of narrative microstructure, participants in the PC group performed significantly poorer than the other groups with regards to productivity and lexical diversity measures. All three groups perform equally poor on syntactic complexity measures, but the SCD

group displayed significantly lower levels of noun phrase elaboration than their NC and PC peers.

6.5.2 Narrative macrostructure

In order to determine the differences between the three groups, macrostructural qualities of participants' narratives were examined. Several studies have found a positive relationship between narrative abilities and reading comprehension (e.g. Feagans and Applebaum, 1986; Westby, 2005; Cain, 2003; Cain and Oakhill, 2007c) and it was therefore assumed that PC and SCD participants would produce narratives that are less complex than the NC group.

The Westby (2005:181) binary *decision tree* was used to determine the structural complexity of participants' narratives. Structural level analyses categorised the participants' narratives into sequences, abbreviated episodes or complete episodes based on the inclusion of propositions denoting goal-directed behaviour of characters in their narratives. The total number of sequences (Seq), and total number of abbreviated (Abbr) and complete (Compl) episodes in the narratives produced by each participant were determined. Sequences combined *descriptive*, *action* or *reactive* sequences.

The model narrative comprised four complete episodes with four explicitly stated goal-attempt-outcome structures. Analyses of structural levels revealed that 46% of all participants produced sequences in their narratives, e.g.

(6)	*die mier het gekom*	'the ant came
	toe sien hy die voëltjie daar	then he saw the bird there
	toe loop hy en loop hy	then he walked and walked
	toe val hy in die water	then he fell in the water
	toe sê hy: "help my, help my"	then he said, "help me, help me"

(Reaction sequence; Participant PL 6)

Forty-eight percent of all participants produced abbreviated episodes, in other words, structures containing no explicit goal-directed behaviour, e.g.

(7) *toe val hy in die dam in* 'then he fell in the dam
toe sien die duif vir hom then the dove saw him
die duif pluk 'n blaar van die boom af the dove plucked a leaf from the tree
hy gooi dit op die water he threw it on the water
die mier klim vinnig op die blaar the ant climbed quickly onto the leaf'

(Abbreviated episode; participant PL 1)

Only 58% of all participants produced at least one complete episode, in other words, structures containing explicit goal-directed behaviour, e.g.

(8) *eendag was daar 'n mier* 'once there was an ant
hy was dors he was thirsty
toe wil hy by die dam gaan water drink then he wanted to drink water by the dam
toe buk hy laag af om te wil drink then he crouched low to drink water
toe val hy in die water then he fell in the water'

(Complete episode; participant IV 14)

Table 6.5 provides a summary of the results of the bootstrapping analyses for the structural level analyses of the narratives of the different groups.

Table 6.5 Macrostructural complexity - summary of means and standard deviations per group for total number of sequences, abbreviated episodes (Abbr), and complete episodes (Compl), with standard deviations in parentheses

Variable	Group		
	NC (n=38)	**PC (n=18)**	**SCD (n=46)**
Sequences	0.5 (0.8)[a]	0.8 (1.0)[a]	0.9 (1.2)[a]
Abbr/Inc	0.4 (0.5)[a]	0.8 (0.7)[b]	0.5 (0.8)[ab]
Compl	1.3 (1.2)[a]	0.4 (0.6)[b]	0.9 (1.1)[ab]

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

Bootstrap analyses indicated no significant differences between groups for the total number of sequences, but significant differences between NC and PC groups for total number of abbreviated (Abbr) and complete (Compl) episodes. The PC group produced significantly more abbreviated and incomplete episodes and significantly less complete episodes than the NC group. Recall that a narrative structure is coded as an episode if it contains a *motive* of a character, followed by *goal-directed behaviour*, and resulted in a *consequence* related to the attainment of the goal and that the inclusion of these elements denotes the narrator's awareness of cause-effect relationships and of characters' perspectives and intentionality in narratives. Complete episodes are therefore structurally more complex than abbreviated and incomplete episodes.

Figure 6.11 shows the percentages of participants in the different groups who included sequences, abbreviated episodes and complete episodes in their narratives. More participants in the NC group produced complete episodes than participants in the PC and SCD groups, although it should be noted that 26% of NC participants also produced no complete episodes. The group profiles in figure 6.11 indicate that the NC group produce more structures with goal-attempt-outcome structures (GAOs) and the PC group more structures without GAOs. The SCD group's narratives included equal percentages of sequences, abbreviated episodes and complete episodes.

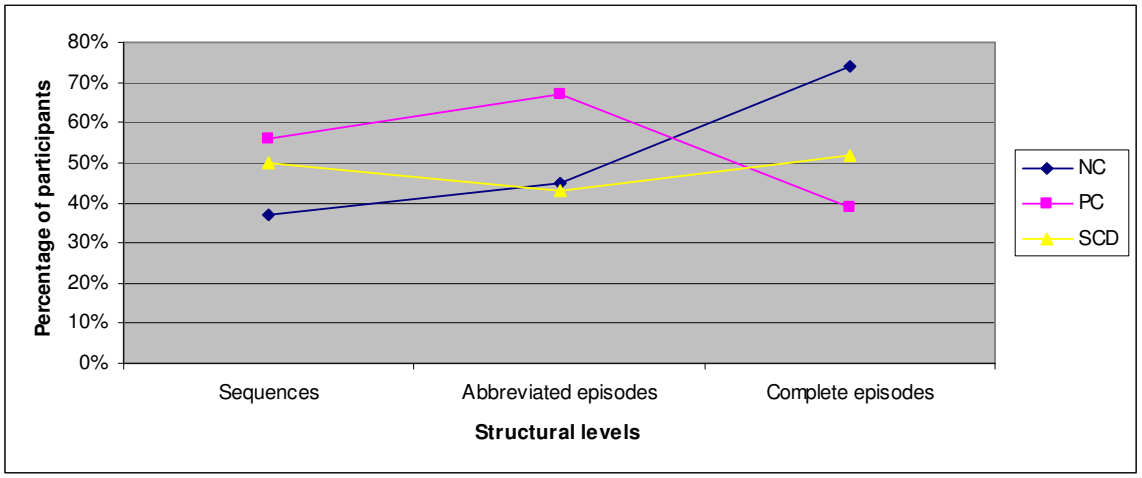


Figure 6.10 Macrostructure - percentage of participants in the NC, PC and SCD groups who included sequences, abbreviated episodes and complete episodes in their narratives.

In summary, macrostructural analyses revealed that all participants included sequences (no goal-attempt-outcome structures), abbreviated episodes (no explicitly stated goals) and complete episodes (goal-attempt-outcome structures) in their narratives. The average age of participants was 9 years 4 months at the time of the study and it was expected, based on developmental patterns reported in the literature (cf. Applebee, 1978; Stein and Glenn, 1979; Peterson and McCabe, 1991; Trabasso and Nickels, 1992), that they would be able to produce more narratives comprising complete episodes and GAO structures than sequences. According to Peterson and McCabe (1991:102) and Westby (2005:173), for example, children older than 8 years usually produce well-formed narratives containing complete episodes.

The model narrative contained four episodes with explicitly stated goal-attempt-outcome structures. The picture sequences also guided the temporal sequencing of retellings by providing a visual schema. It should be noted that Peterson and McCabe (1991:107) reported that reactive sequences, i.e. sequences that describe causally related events but without planning involved, are found in the narratives of all age groups. They stated that reactive sequences are used, even by adults, and they do not necessarily represent primitive precursors to episodes.

The NC group produced the most complex macrostructures and most of them included at least one complete episode. The differences in structural complexity between the SCD and other groups were not significant, but it is clear from figure 6.11 that they presented with a different profile than the PC and NC groups. As shown in table 6.5, the PC group's narratives included significantly less goal-attempt-outcome structures than the NC group and can therefore be considered to be less complex at macrostructural level. The inability to convey character' goals and intentions demonstrates deficits in metacognitive theory of mind and awareness of the attributes and feelings of other people (Trabasso and Nickels, 1992:250; Nelson, 2010:391). Several studies have shown that children with language impairments demonstrate awareness of story grammar elements, but that their narratives are structurally less complex and that they include fewer episodes than children with normal language development (cf. Westby 2005; Merrit and Liles,

1987; Roth and Spekman, 1991). The PC group's narratives therefore resembled those of language impaired children or much younger children.

6.5.2.1 Cohesion

Are there differences between the three groups in terms of the cohesion of their narrative production?

In order to answer the above question, two aspects of narrative cohesion were examined, namely *conjunction* and *referencing*. Analyses of conjunctions focused on the types and frequency of conjunctions used in the narratives. Referencing was examined by investigating the frequency of pronominal referencing and adequacy of participants' use of cohesive ties (percentage of complete, incomplete and erroneous ties per narrative). Based on previous studies discussed in section 4.4, it was anticipated that the PC group would perform more poorly than the other groups on cohesion measures.

a) Conjunction

Are there differences between the three groups in terms of the use of conjunctions in their retell narratives?

Conjunctions are cohesive devices that connect phrases, clauses and sentences. Only 41 of the 102 participants produced any form of conjunction in their narratives, in other words 60% of participants used no conjunctives. Analyses revealed that 86% of the total number of conjunctives used by participants was causal and 14% adversative. The distribution of causal structures was as follows: *want* 'because' 66%, *omdat* 'because' 24%, *sodat* 'so that' 3%, and *nou*[60] 'so' 7%. An analysis of adversative conjunctives revealed that participants used *maar* 'but' 80%, *dan* 'then' 10%, and *anders* 'otherwise' 10%. No temporal conjunctions other than *toe* 'then' and *en toe* 'and then' were used. The model narrative contained 10 instances of two conjunctions, both of them causal conjunctions, namely *want* 'because' and *daarom* 'therefore'.

[60] E.g. *jy het my gehelp, nou help ek weer vir jou* 'you helped me, so I helped you' (Participant W3).

The differences in the groups' use of conjunctives are reported in table 6.6. To correct for the differences in the length of the narratives, conjunctives were first calculated as proportions by dividing the total number of conjunctives by the total number of T-units and then expressed as percentages.

Table 6.6 Narrative cohesion - summary of means and standard deviations per group for total number of conjunctions (Conj), and percentage of conjunctions per narrative (%Conj) compared to the model narrative, with standard deviations in parentheses

Variable		Group		
	Model narrative	**NC (n=38)**	**PC (n=18)**	**SCD (n=46)**
Total Conj	10	1 (0.2)[a]	0.2 (0.3)[b]	0.7 (0.2)[ab]
% Conj	31	5 (5)[a]	1 (2)[b]	3 (5)[ab]

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

Bootstrap analyses revealed significant differences between the NC and PC groups for conjunctives, both in terms of total number of conjunctives produced, and when calculated as percentages per narrative (%Conj). Compared to the model narrative, all participants produced very few conjunctions other than *and*, *then* and *and then* that were excluded from the analyses (see section 4.1.1.1 for the reason for this exclusion). Only four participants in the PC group included any conjunctives other than the forms excluded from analyses.

In summary, all participants displayed limited levels of conjunctive use despite the fact that retell narratives, compared to conversational analyses, usually results in more complex syntax (Liles, 1993:872). The use of picture sequences to elicit narratives also usually result in more cohesive narratives because of the structural support provided by the related sets of pictures (Stenning and Michel, 1985:262; Cain, 2003:338). The findings of the current study, namely that the PC group made significantly less use of conjunctions than the NC group, correspond with those of Cain et al. (2005:888) who found that children with poor reading comprehension experience significantly more problems using all types of conjunctions than children with normal reading comprehension. Previous studies have also shown that the use of conjunctions in retell

narratives differentiated children with language disorders from children with normal language development (Greenhalgh and Strong, 2001:120).

b) Referencing

Are there differences between the three groups in terms of the use of referencing and the adequacy of cohesive ties in their retell narratives?

In order to answer this question, frequency of referencing and the adequacy of the cohesive ties (percentage of complete, incomplete and erroneous ties per narrative) used by participants in the different groups were investigated. The purpose was to determine if the participants' performance in reading comprehension could be linked to their use of cohesive devices in narrative production.

Participants produced on average 24 references per narrative (SD 6.5), within a range of 8 to 44 references (see appendix 12 for a participant example). The differences in referencing per group are shown in table 6.7. Data include the total number of references produced by participants per group and the adequacy of their cohesive ties in terms of percentages of complete, incomplete, erroneous and unrelated ties per narrative. The different forms of ties were calculated as proportions and expressed as percentages to correct for differences in the length of narratives.

Table 6.7 Narrative cohesion - summary of means and standard deviations per group for total number of references (Tot ref), percentages of complete ties per narrative (%Compl ties), percentages of incomplete ties per narrative (%Incompl ties), percentages of erroneous ties per narrative (%Err ties), and percentages of unrelated propositions per narrative (%Unrel), with standard deviations in parentheses

Variable	Group		
	NC (n=38)	**PC (n=18)**	**SCD (n=46)**
Tot Ref	25.2 (6.1)[a]	20.7 (3.5)[b]	24.3 (7.4)[a]
%Compl ties	90.9 (7.3)[a]	86.8 (8.5)[a]	87.2 (8.8)[a]
%Incompl ties	7.1 (5.6)[a]	10.6 (7.4)[a]	9.4 (7.9)[a]
% Err ties	3.0 (4.5)[a]	4.0 (3.7)[a]	4.7 (7.0)[a]

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

Bootstrap analyses indicated significant differences between the NC and SCD groups on the one hand and the PC group on the other for total number of references. There were no significant differences between groups for percentages of complete ties per narrative, incomplete ties and erroneous ties. Although the NC group produced more references than the PC group, there were no significant differences between the groups in terms of cohesive adequacy. The higher frequency of references in the narratives of the NC group may be ascribed to the fact that their narratives were significantly longer than those of the PC group.

These findings correspond with those of Van der Lely (1997:240) and Finestack et al. (2006:245) that children with normal language development and non-specific language impairments use more pronominal references than children with SLI, but that the adequacy of their use of references is not a sensitive measure to differentiate between different groups of children with language impairments.

6.5.2.2 Coherence

Kemper's taxonomy was used to investigate three aspects of coherence in participants' narratives: the type and frequency of narrative events (physical states, mental states, actions, goals), the frequency and nature of links (resultant, initiation, enablement, motivation) between events, and the relatedness of the events to the story structure (temporally or causally related or unrelated). It was hypothesised that participants with poor reading comprehension would produce fewer causal links and more unrelated statements than participants with good comprehension.

Are there differences between the three groups in terms of the use of causal links in their retell narratives?

Participants produced an average of 18 propositions per narrative (SD 4.8). Following Kemper's taxonomy (Kemper 1986, 1988) as adapted by Gutierrez-Clellan and Iglesias (1992), propositions were coded as physical states, mental states, actions and goals. Analyses of propositions in terms of the different narrative event categories showed that while all participants produced action propositions, 8% produced no physical state

propositions, 2% produced no mental state propositions, and 58% produced no goal propositions. The average number of propositions in the different categories in participants' narratives and the number of propositions in the different categories in the model narrative are shown in figure 6.12.

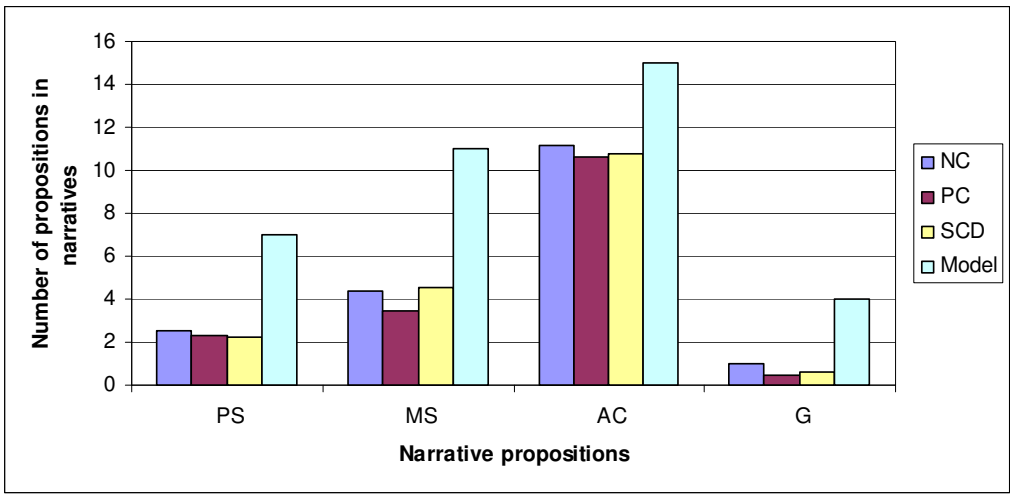


Figure 6.11 Narrative coherence – average number of physical states (PS), mental states (MS), actions (A) and goals (G) in the narratives produced by participants and in the model narrative

As shown in figure 6.12, all three groups produced on average fewer propositions than the model narrative, mainly because they produced shorter narratives compared to the model narrative. The model narrative contained considerably more mental states and goals than those produced by the participants. The overall pattern of occurrence of narrative events was similar for all three groups and corresponded well to the findings of Gutierrez-Clellan and Iglesias (1992:367). They found that all the children in their study produced more actions than physical states, mental states, or goals, in that order.

The causal event analyses revealed that participants produced on average only 5 causal links per narrative (SD 2.6), compared to the 14 causal links in the model narrative. Twenty-seven percent of participants produced unrelated propositions (range 1 to 6), in other words, adjacent propositions with no temporal or causal links between them. The

following is a translated example of such an unrelated propositions in a participant's narrative:

(9) *the man saw the bird / the ant saw the man*

To correct for the differences in the length of the narratives produced by participants the number of causal and unrelated links were again calculated as percentages of the total number of propositions per narrative.

Table 6.8 Narrative Coherence - summary of means and standard deviations per group for percentages of causal links per narrative (%Caus links) and percentage of unrelated propositions per narrative (%Unrel), with standard deviations in parentheses

Variable		Group		
	Model narrative	**NC (n=38)**	**PC (n=18)**	**SCD (n=46)**
%Caus	38	29.7 (8.3)[b]	23.5 (8.5)[a]	22.7 (10.6)[a]
%Unrel	0	2.4 (5.4)[a]	3.2 (8.0)[a]	4.2 (9.1)[a]

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

Bootstrap analyses revealed significant differences between the NC group on the one hand, and the PC and SCD groups on the other for the percentage of causal links per narrative. No significant differences between the groups for the percentage of unrelated propositions per narrative were found. The finding that the NC group produced narratives with more causal connectivity concurs with those of previous research that younger children (e.g. Martin, 1983:33; Gutierrez-Clellan and Iglesias, 1992:368) and children with language impairment produce proportionally fewer causal links that children with typical language development (e.g. Hayward et al., 2007:242).

In figure 6.12 the distribution and frequency of the different types of causal links in participants' narratives and the model narrative are shown. As shown in the figure, all three groups produced on average fewer causal links than was contained in the model narrative, therefore, compared to the model narrative they produced less coherent narratives. Although there was no resultant causation links in the model narrative, some of the participants included this type of causal link in their narratives, e.g.

(10) *he fell in the water / he was wet*
(actions *result* in physical states)

The groups displayed similar distribution patterns, except for the markedly higher frequency of motivation causation (MOT) links for the NC group. Examples of such links are:

(11) *the ant was thirsty / he went to the dam to drink water*
(mental states motivate actions)

(12) *he wanted to save his friend / he threw a leaf into the water*
(goals motivate actions)

According to the Kemper taxonomy, motivation causation links mental states and goals with actions, and older children were found to use increasingly more motivation causation than other types of causal links (Kemper, 1984 as cited in Gutierrez-Clellan and Iglesias, 1992:364). The higher frequency of motivation causation links therefore corresponds with the finding, reported earlier in section 6.5.2, that the NC group produce more structures with GAOs.

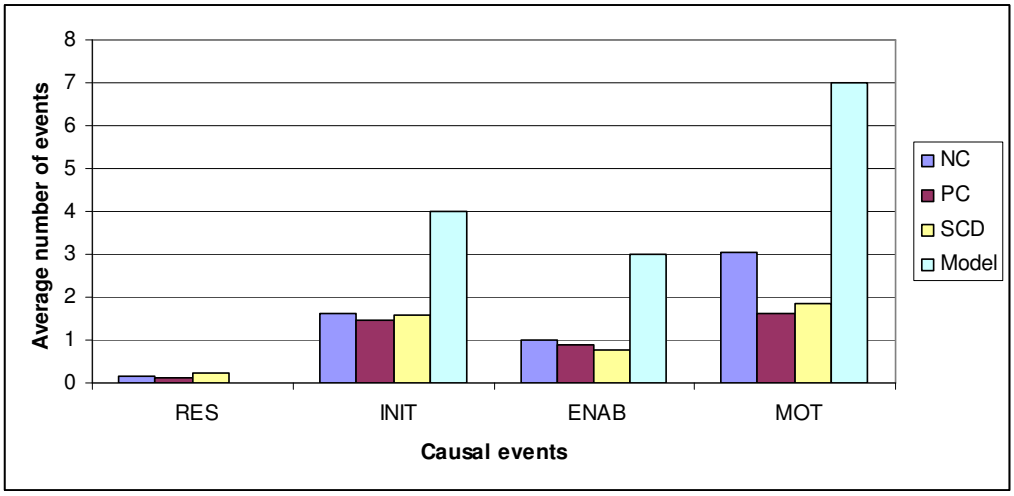


Figure 6.12 Narrative coherence – average number of causal events in terms of resultant causation (RES), initiation causation (INIT), enablement causation (ENAB) and motivation causation (MOT) in the narratives produced by participants and the model narrative

In summary, the NC group produced significantly more causal links in their narratives than the other two groups, making their narratives more coherent than those of the other two groups. All participants included unrelated propositions in their narratives, but no differences between the groups were found for this measure.

6.6 CONTENT

Aim 5: To analyse the amount of information provided in participants' retell narratives (content information score, and landscape of consciousness (LOC) elements)

In order to accomplish the above aim, a content checklist was compiled based on the information provided in the model narrative. Items were grouped in the following categories: characters, objects, places, description of characters, events or actions with different characters as agents, goals, desires and thoughts of different agents; feelings of different agents; plans or goals of different agents; and dialogue of different agents (see Appendix 14). It was anticipated that narratives of participants who focused mainly on descriptions of observable content would yield lower content scores than narratives containing inferences about events, characters and causal connections between propositions. Following Westby (2005:169), participants' narrative content was also coded for landscape of consciousness elements. Combined scores in the categories *goals and thoughts of different agents; feelings of different agents;* and *dialogue* were interpreted as indicators of landscape of consciousness.

Based on research from previous studies, discussed in section 4.5, it was anticipated that the PC group would have lower content scores than the other groups. The results of participants' scores on the content checklist are reported in table 6.9. Participants in general obtained low total scores; on average they included less than half of the possible content items in the model narrative in their retellings. Their total scores for items recalled ranged from 12 to 41, with an average of 25 (SD 6). To assess indicators of landscape of consciousness, scores in the categories *goals/thoughts, feelings* and *dialogue*

were combined. Participants obtained average scores of 6 out of a possible total score of 20 (SD 2.4) within a range 0 to 12 for the landscape of consciousness items.

Table 6.9 Narrative content - summary of means and standard deviations for content scores for all participants, with standard deviations in parentheses

Content category and highest possible score	Average score and SD for all participants (n=102)
Characters /3	3 (0.2)
Object /6	4 (1.2)
Place /7	3 (1.1)
Feelings /5	1 (0.7)
Goals/thoughts /8	2 (1.4)
Time /2	1 (0.5)
Actions /18	7 (2.1)
Description objects /5	1 (1)
Description actions /6	1 (0.9)
Dialogue /7	2 (1.4)
Total /67	25 (5.9)

Participants' scores were particularly low, compared to the model narrative, in the item categories *feelings* (propositions referring to internal states of characters), *goals/thoughts* (propositions referring to internal plans, intentions, cognitions and/or goals that serve to initiate actions of characters), *actions* (propositions containing verbs to describe actions of characters), *description objects* (propositions containing adjectives to describe objects), *description action*s (propositions containing adverbs to describe actions), and *dialogue* (propositions containing dialogue uttered by characters). See Appendix 14 for examples.

The differences in content scores per group are reported in table 6.10. The landscape of consciousness scores were calculated as percentages of the total number of content items per narrative to correct for the differences in the length of the narratives produced by participants.

Table 6.10 Narrative content - summary of means and standard deviations per group for total content scores per narrative and percentage of landscape of consciousness (%LOC), with standard deviations in parentheses

Variable	Group		
	NC (n=38)	**PC (n=18)**	**SCD (n=46)**
Total score out of 67	27 (6.3)[a]	23 (4.4)[b]	25 (5.9)[ab]
%LOC scores	26 (1.2)[a]	25 (1.8)[a]	24 (1.1)[a]

[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

Bootstrap analyses revealed significant differences between the NC and PC groups for the percentage of total content items per narrative. No significant between-group differences were found for the percentage of landscape of consciousness indicators per narrative.

In summary, the content of participants' narratives was investigated to determine the amount of relevant content they included, the nature of the content in terms of different categories of information, and the presence of landscape of consciousness indicators in the content. These findings concur with those of other researches who found that children with SLI tend to provide less information than their typically developing peers in oral narratives in response to picture sequence stimuli (Boudreau and Hedberg, 1999:256) and wordless picture books (Cragg and Nation, 2006:67), and during story generation tasks (Pearce, 2006:121). A study comparing the oral and written narratives of 10 year old children with and without reading comprehension problems found that the poor comprehension group included fewer of the stimulus story's main ideas and that they obtained lower content scores in both narrative genres (Cragg and Nation, 2006:67).

FLUENCY

Aim 6: To analyse the disfluencies in participants' retell narratives.

To accomplish the aim, participants' narratives were analysed for repetitions, incomplete utterances, and word and sentence revisions. Recall that, according to Rispoli' (2003) analysis of speech disruption phenomena discussed in section 4.6, speech disruptions can

be classified as *stalls* (disruptions as a result of problems at sentence production level), or *revisions* (disruptions involving changes in sentence production as a result of self-monitoring causing replacement of words and producing of morphosyntactic alternatives). *Incomplete* utterances, where the sentence is abandoned before completion, may indicate that formulation of the thought or content was not completed, or may form part of revision strategies. Following to Rispoli's (2003) classification system, repetitions were classified as *stalls*, whereas incomplete utterances and word and sentence revisions were classified as *revisions*. Disfluencies occurred in 52% of participants' narratives. Examples of such disfluencies included:

(13) ***toe het hy****...hy wou water drink* **then he did**…he wanted to drink water
(sentence revision)

(14) *hy* ***is*** *...was dors* **he is**…was thirsty
(word revision)

(15) ***hy wou****…hy wou swem* **he wanted to**… he wanted to swim
(repetition)

(16) ***toe val die geweer op die****…* **the gun fell on the**….
toe hardloop hy weg then he ran away
(incomplete utterance)

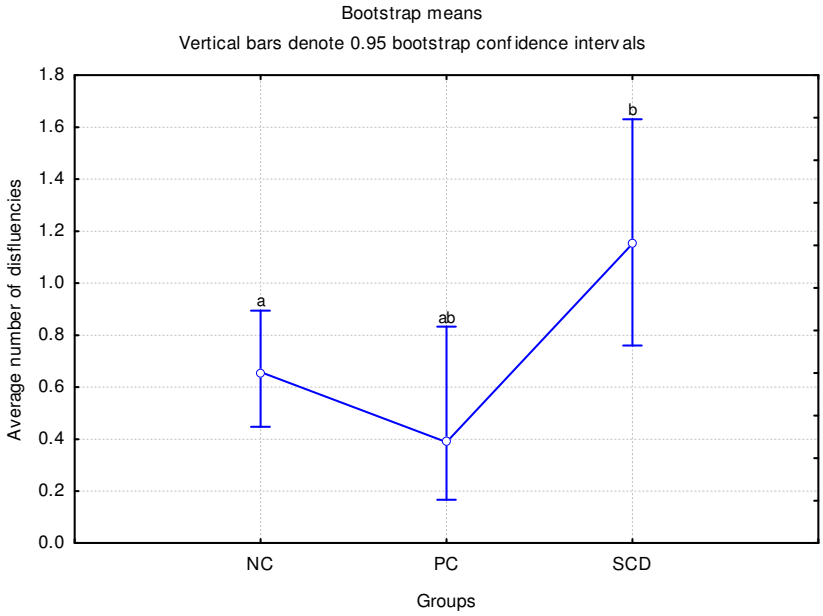
Analyses of the frequency of the types of disfluencies displayed in the narratives are provided in table 6.11.

Table 6.11 Fluency – proportion of repetitions, incomplete utterances, word and sentence revisions in the total number of disfluencies (n=87) in participants' narratives

Type of disfluency		**% of total disfluencies**
Rispoli classification	**Classification in this study**	
Stalls	Repetitions	22
Revisions	Incomplete utterances	39
	Word revisions	31
	Sentence revisions	8

As shown in table 6.11 the majority (78%) of disfluencies in participants' narratives can be classified as revisions, in other words, disruptions involving changes in sentence production causing replacement of words and production of morphosyntactic alternatives. Rispoli (2003:820) states that revisions occur as a result of self-monitoring and are associated with periods of emerging grammatical complexity in children. Incomplete utterances, where the sentence is abandoned before completion, may indicate that formulation of the thought or content was not completed, or may be part of revision strategies.

As depicted in figure 6.14, bootstrap analyses revealed significant differences between the NC and SCD groups for the average number of disfluencies per group. It was an unexpected finding that the SCD group's narratives contained more disfluencies than the other two groups.



[a, b] and [c] each denotes statistically significant differences between groups on a 5% level ($p<0.05$); [ab] denotes no statistical significance between groups for bootstrap analyses. Bonferroni corrections were applied to correct for multiple testing.

Figure 6.13 Fluency - summary of means and standard deviations per group for average number of disfluencies per narrative

The SCD group produced 11 repetitions, 21 incomplete sentences, 15 word and 2 sentence revisions. One possible explanation for this group's higher levels of disfluency,

based on the research cited in section 4.6, may be that the SCD group presents with specific problems in the formulation of syntactic representations or retrieval of lexical items. The finding, reported in section 6.5.1.3, that they performed significantly lower than the NC group on noun phrase elaboration may be further evidence of this.

6.7 SUMMARY

Research discussed in chapter 4 demonstrated clear evidence of a strong relationship between children's reading comprehension and their oral narrative abilities. Children with poor comprehension, in general, display poor expressive language abilities compared to children with good reading comprehension. Their narratives are usually shorter and contained less content ideas. They struggle to present integrated event structures during oral narrative production and produce less coherent narratives. Their narratives lack cohesion because of limited use of causal connectives and causal links. The PC group performed poorer then the NC group in most of the variables measured in this study. They differed significantly from the NC group in terms of receptive vocabulary, measures of productivity, lexical diversity and macrostructural complexity. Their narratives were less cohesive and coherent than those of the NC group and they recalled fewer of the content items. Based on these findings, they can therefore be classified as children with SLI. According to the Catts et al. (2003) model, they resemble the subtype *readers with problems in both word recognition and reading comprehension.*

The SCD group, for all the measures except ENPs and fluency, did not differ statistically significantly from the other two groups. They performed, in general, better than the PC group and more poorly than the NC group on most measures. The NC group performed consistently better than the other groups on most of the measures. However, their performances in particularly the receptive vocabulary test and the microstructural aspects of the narratives indicate that their language skills may also be poorer than expected of children their age.

The two main questions (see section 1.4) of this dissertation are *"How do the linguistic deficits of learners with poor and specific reading comprehension deficits manifest in*

their oral narratives?" and *"Are there linguistic markers that decisively distinguish between learners with specific reading comprehension deficits and learners with general poor reading as compared to learners with normal reading comprehension? If so, how are such linguistic markers identified*?*"* Conclusions regarding these two questions will be drawn in the final chapter of the dissertation.

CHAPTER 7

CONCLUSIONS, CLINICAL IMPLICATIONS AND CRITICAL REFLECTIONS

7.1 INTRODUCTION

The language measures used in this study, apart from a formal vocabulary test and a phonemic awareness screening test, focused on language skills at production level. The aim was to determine if analyses of participants' narrative abilities could be linked with the reading skills they displayed at the different levels of text processing. The study attempted to identify linguistic markers that could provide insight into the language problems of the SCD group and the PC group that differentiate them from the NC group.

In the section 7.2, the performances of the different groups on the reading and language measures will first be summarized to highlight the differences between the groups. Following that, the implications of participants' performances on the different measures for reading comprehension will be discussed. Conclusions will then be drawn regarding the clinical implications of the results. Finally, the findings will be critically evaluated and recommendations with regards to clinical practice and future research will be made.

7.5 GROUP DIFFERENCES: MAJOR FINDINGS

Profiles based on participants' reading performances in the WCED assessments were compiled to examine the differences in aspects of reading and reading comprehension between the three groups. The groups were matched for socio-economic status, chronological age, and reading at Grade 1 level, in other words for word recognition abilities. All participants were non-standard Afrikaans home language speakers attending schools where Afrikaans was the language medium of instruction. They all passed the Grade 1 reading assessments according to the WCED criteria. The WCED results showed that 64 of the participants failed at Grade 3 level, in other words, at the level that focused on the assessment of comprehension of extended passages. In this study the learners who failed the assessments at Grade 3 level were divided into two groups, namely the PC

group (n=18) who also failed the Grade 2 level assessments, and the SCD group (n=46) who passed at Grade 2 level, and only failed at Grade 3 level. The purpose of the subdivision of participants into these two groups was to investigate the hypothesis that they represent different subtypes according to the subtype model from Catts et al. (2003:159).

7.2.1 Participants in the NC group

Participants were allocated to the NC group on the basis of their reading scores. In terms of the *simple view* (Gough and Tunmer, 1986), their reading scores indicated that they were competent in both components of the reading process, namely word recognition as well as reading comprehension. Their performances in all the language measures employed in this study were consistently better than those of the other two groups. They produced oral narratives that were longer and more complex at microstructural levels. In terms of macrostructure, their narratives contained more episodes and goal-attempt-outcome structures, indicated better understanding of narrative schemas, causality, perspective taking and meta-awareness of goal-directed behaviour than those of participants in the other two groups. Their ability to produce more coherent and structurally complex narratives than the other groups, indicate that they are better at inferencing than participants in the other two groups. These findings are interpreted as confirmation of the strong links between oral language abilities and reading proficiency, as discussed in previous chapters. Oakhill and Cain (2007a:7) reported that the three aspects that most consistently differentiate between readers with good and poor reading comprehension are answering inferential questions, self-monitoring of comprehension, and understanding of story structure. The narrative macrostructural analyses suggest that NC participants were indeed better at inferencing and understanding of story structure than the other participants. Compared to the other groups, their narratives contained significantly more causal links and goal statements. This finding indicates that they were able to make inferences to maintain coherence within the narratives they produced.

However, although the NC group performed significantly better than the other groups on most of the measures, there is reason to be concerned about their reading abilities and

language skills in general. Their reading abilities were measured at the end of the foundation phase of the school curriculum. According to the Revised National Curriculum Statement (RNCS) the primary focus of the Foundation Phase (Grades 1-3) is to ensure that all learners learn to read, and as such 40% of teaching time in this phase is allocated to literacy (DoE, 2002). Although the NC participants passed all three grade levels of the reading assessments, 29% achieved only the minimum criteria of 50% at Grade 3 level and no participant obtained full marks. Their poor performance on the formal receptive vocabulary test, the ARW, is a particular cause for concern. Their average language age score for the ARW was nearly three years below their average chronological age and indicative of a severe language disorder according to the test norms (Buitendag, 1994:26). Despite questions about the validity of the ARW as a language measure in this population, the extent of their underperformance in this test is reason for concern.

Qualitative analyses of their performances on the narrative measures also revealed that their language abilities were generally poorer than expected. Their retell narratives were longer, and more complex in terms of lexical diversity, syntax and macrostructure than those of the other two groups, but still poorer than generally expected of nine-year old, typically developing children. The relatively poor quality of their narratives in terms of lexical and syntactic complexity is a particular reason for concern. Previous research studies have shown that retell narratives with visual support usually result in the most complex and representative narratives samples (cf. Stenning and Michel, 1985:262; Merritt and Liles, 1987:547; McCabe and Rollins, 1994:47; Gazella and Stockman, 2003:62; Schneider and Dubé, 2005:57; Hayward et al., 2007:237; Puranik et al., 2008:109). Despite the contextual support provided by the elicitation procedures, the NC group's narratives were marked by limited use of noun phrase elaboration, conjunction and subordination. In terms of macrostructure, their narratives were structurally more complex than those of the other groups, but 26% still produced no complete episodes. Previous research has shown that children older than 8 years usually produce well-formed narratives containing complete episodes (cf. Applebee, 1978; Stein and Glenn, 1979; Peterson and McCabe, 1983; Trabasso and Nickels, 1992:265). Furthermore, despite the

fact that the NC group produced longer narratives than the other groups, their content scores indicated that they included, on average, less than half of the possible content of the model narrative.

7.2.2 Participants in the PC group

The PC group obtained significantly lower reading scores at all three grade levels. It was anticipated that the PC group's Grade 2 and 3 scores would be significantly lower than the NC group because of the criteria used for group allocation. The Grade 1 assessment task, namely reading single words with visual cues, required learners to use their phonic and word recognition skills to decode new or unfamiliar words in context. An unexpected finding was that participants in the PC group, although they passed at Grade 1 level, obtained significantly lower scores than the other groups. This finding is interpreted as evidence that the PC participants were also less proficient at the word recognition level than the other groups. In terms of the *simple view* (Gough and Tunmer, 1986), they seem to experience problems with both components of the reading process, namely word recognition as well as reading comprehension. According to the subtype model of Catts et al. (2003:159), they can therefore be classified as readers with *mixed reading deficits*.

The PC group's performances on the phonemic awareness screening test were similar to those of the NC and SCD groups. It is therefore unlikely that their word recognition performances could be ascribed to poor phonological awareness skills. Their relatively good phonological awareness skills in combination with their poor reading comprehension skills therefore rule out the classification of dyslexia according to the Catts et al. (2003) subtype model.

Children with mixed reading deficits usually display general language impairments (Catts and Kamhi, 2005b:74). Results reported in the previous chapter indicated that they performed consistently poorer than the other two groups on the language measures in this study. Based on their performances on most of the language measures, the PC group meet the diagnostic criteria for SLI (Leonard, 1998:vi). Their average ARW language age

scores were more than three years below their average chronological age, in other words, they performed at preschool levels.

They produced shorter and less complex narratives than the other groups. The macrostructural complexity of their narratives resembled those of much younger children. Only 40% of the PC group's narratives included the complete episodes and goal-attempt-outcome structures usually expected from 9 year old children (Trabasso and Nickels, 1992:265). This finding is interpreted as evidence that they are less capable in making inferences about goal-directed behaviour and causal relationships in narratives, and may have limited understanding of story structures.

In summary, the results of the ARW and the language production measures both indicate that the PC participants performed at the level of preschool children. The poor reading abilities of this group at the end of Grade 3, combined with their generally poor receptive and expressive language skills, do not bode well for their academic futures.

7.2.3 Participants in the SCD group

One of the main aims of this study was to determine if the SCD participants performed differently than participants in the other two groups on the language measures investigated. SCD participants seem to resemble the subtype, *readers with problems in reading comprehension only.* They performed adequately at Grade 1 and 2 reading levels, and demonstrated good phonemic awareness skills. Their performances at Grade 3 level were higher than those of the PC group, but not significantly so. The results indicated that their reading deficits manifested mainly at Grade 3 level where they had to read an extended passage and where the reading tasks focused on text comprehension.

The Grade 2 level assessments comprised of single sentence with visual cues and required readers to work with sentences to interpret texts. Although the SCD group obtained pass scores at this level, they performed significantly weaker than the NC group. This finding may indicate that their comprehension deficits already started to surface at sentence reading level.

In terms of the language measures assessed in this study, the SCD group's performances only significantly differed from the PC and NC groups for noun phrase elaboration and fluency. Results reported in the previous chapter indicated that they, in general, performed better than the PC group but also poorer than the NC group. This finding may indicate that they comprise a more heterogeneous group in terms of language skills than the other two groups. More inter-individual differences regarding their language skills may account for the fact that they, as a group, did not significantly differ from the other two groups. Whereas the PC group's language performances on all the measures in this study indicate that they can be classified as having SLI, the SCD group presented with more heterogeneous language skills. This finding concurs with that of Nation et al. (2004:210) that not all readers with SCD could be classified as having SLI.

An interesting finding was that the SCD participants displayed significantly more disfluencies in their retell narratives than the other groups. No other studies could be traced that investigated the relationships between speech fluency and reading comprehension in narrative production. Some previous studies, e.g. Guo et al. (2008: 735), have shown that more speech disruptions occur in the narratives of children with SLI compared to children with typical language development. However, MacLachlan and Chapman (1988:7) found that the complexity of the production task had a direct impact on the number of disfluencies produced by children with language impairments. It was found that children with language impairments were more disfluent during narration than during conversation. It is therefore possible that the demands of the narrative retell task were particularly high for the SCD group for the reasons stated in the following paragraphs.

Previous studies have shown that speech disruptions often occur during the developmental stages of language when production and processing capacities are still limited and undergoing rapid changes (Guo et al., 2008:723). This may reflect difficulty in integrating emerging complex grammatical structures with fluent speech production (Rispoli and Hadley, 2001:1142). In the absence of a stuttering disorder, speech

disruptions in children reflect their speech-motor and linguistic vulnerability during the acquisition of complex language. The higher levels of revisions in the SCD group's narratives may indicate higher levels of self-monitoring processes (Rispoli, 2003:819). It can be speculated that the SCD group's higher levels of disfluencies indicate that they are better at self-monitoring than the PC group. The ability for self-monitoring is closely linked with text comprehension (Oakhill and Cain, 2007a:7) and may therefore explain the comprehension differences between the PC and SCD groups.

Another possibility is that their higher levels of disfluencies reflect the problems with complex syntax associated with SCD, as reported in other studies (e.g. Oakhill and Cain, 2007a:15; Cain and Oakhill, 2007c:45; Puranik et al., 2008:108; Scott, 2009:188). Their disfluencies may reflect their problems with the integration of complex grammatical structures during narrative production. Participants in the SCD group may still be in the process of acquiring complex morphosyntax and therefore experience particular difficulties during language formulation and production at discourse level. Their significantly lower skills in noun phrase elaboration may be further evidence of their problems with the processing of complex syntax. It can also be speculated, based on their reading performances at Grade 2 level, that this group, compared to the NC participants, is less competent in the integration of word recognition strategies and syntactic knowledge when they are required to read sentences.

7.2.4 Summary of group differences

As argued in section 2.7, care should be taken to infer causal relationships from correlational data because of the complex nature of language and reading comprehension. However, in terms of the two main research questions, the findings of this study seem to confirm that readers with general poor reading comprehension perform significantly poorer on a variety of linguistic measures than readers with better reading comprehension. Participants in the PC group's linguistic deficits were reflected in their oral narrative production at both micro- and macrostructural levels. This finding concurs with those of previous studies that readers with mixed comprehension deficits usually display general language impairments (Catts and Kamhib, 2005:74). Participants with

higher reading comprehension scores produced oral narratives that were significantly more complex at micro- and macrostructural levels.

The group identified as readers with specific reading comprehension disorders were, in general, not significantly different from the other two groups. This study therefore did not provide clear evidence that they present with linguistic markers that could differentiate them from the other two groups. The SCD group seemed to be more heterogeneous in terms of linguistic skills than the other groups. The findings that they, compared to the other two groups, were more disfluent during their narrative production and included fewer elaborated noun phrases need to be explored in greater depth before any conclusions regarding the links between these aspects and reading comprehension can be reached.

7.6 IMPLICATIONS FOR READING COMPREHENSION

In summary, the findings of this study confirmed the relationships between language skills and reading and reading comprehension at different levels of text processing. The most basic level of text comprehension is the surface level where the focus is on word recognition and decoding. At this level, readers rely on their vocabulary and syntactic knowledge to interpret morphological and syntactic cues presented in texts, particularly to decode irregular, low-frequency and novel words. To comprehend texts at this level the readers must access their mental lexicons to form meaning representations, and parse sentences to interpret word meaning in the syntactic context. The poor performances of most of the participants in the receptive and expressive measures that examined vocabulary knowledge and lexical development are a matter of concern. Poor vocabulary knowledge and poor lexical development, in other words, limitations of the mental lexicon, will compromise text processing at the surface code level. The majority of participants' ARW results indicated that they have limited receptive vocabulary skills. This finding is confirmed by their generally low NDW scores in their narratives, indicating that they also display limited expressive vocabulary skills.

Poor syntactic awareness skills constrain the development of accurate word recognition and have a negative impact on readers' text integration and comprehension monitoring. All the participants displayed limited levels of syntactic complexity despite the fact that retell narratives, compared to conversational analyses, usually result in more complex syntax. All the participants' narratives contained very few subordinations, low clausal density and limited noun phrase elaboration. Given their limited vocabularies and poor use of complex syntax, it is anticipated that most of the participants will experience problems with the literate language style used in academic contexts and written texts in the next phases of their school careers.

To comprehend narrative texts, readers must construct mental models that go beyond the information explicitly provided in the text. They must have an understanding of the story structure and be able to make inferences to grasp the meaning of the text as a whole. Analyses of the macrostructural aspects of the narratives produced by the participants have shown links between their narrative abilities and reading comprehension. The NC group produced more coherent narratives that contained more episodes and goal-attempt-outcome structures than those of the other groups. Their narratives therefore indicated better understanding of narrative schemas, psychological causality and perspective taking. The PC group, in contrast, produced structurally less complex narratives. These findings therefore confirm the premise of a direct relationship between narrative abilities and reading comprehension.

7.7 LIMITATIONS OF THIS STUDY

Several limitations in this study suggest caution in drawing conclusive interpretations from the results. Before drawing firm conclusions, results need to be replicated by other studies and in different populations.

The majority of the participants came from and attended schools in the lower socio-economic communities. As discussed in section 2.5, there is considerable variability in the literacy practices in different cultural and socio-economic groups in a diverse society such as South Africa. Arguments were presented for an ecological perspective on literacy

to accommodate environmental and psychological factors that have been shown to affect reading and literacy achievement. In terms of the Component Model of Reading (CMR) proposed by Aaron et al. (2008), this study focused on aspects of the cognitive domain of reading. It can be argued that the focus on individual participant's linguistic skills reflected a deficit-perspective (Dudley-Marling, 2004:488) or "black box" view (Prinsloo and Stein, 2004:67), where literacy is viewed as a neutral, cognitive activity or set of skills to be acquired. Components of the psychological domain, such as motivation and interest, attention and learning styles, and ecological components such as home literacy, the classroom environment and reading instruction practises were not investigated. The impact of aspects such as these and their contribution to the language and literacy problems in the study population remain a matter for speculation. The relatively narrow focus on participants' language skills as the main variable pertaining to reading comprehension is therefore a limitation of this study. It is acknowledged that, particularly in this study population, variables other than language skills may have contributed to their reading comprehension problems.

As atated before, this study made use of secondary data obtained from the WCED literacy assessments. A major limitation of secondary data analyses is that the researcher cannot control for data collection errors and is constrained by the original study's aims and objectives (Mouton, 2001:165; Castle, 2003:289). The researcher had, for instance, no control over the WCED sampling and assessment procedures, or the reliability and validity of the results of these assessments.

The small sample sizes of the three groups, particularly the small number of participants in the PC group, may have limited the ability to identify differences on some of the variables. Small samples sizes increase the risk of failing to represent the target populations because of sampling variations. Small sample sizes also increase the risk of not detecting small but significant differences. Replication of this study in larger populations may, for instance, provide more conclusive evidence about linguistic markers that distinguishes children with SCD from children presenting with good or generally poor reading.

The dearth of formal language tests in South Africa and issues pertaining to the reliability and validity of the language measures used in this study were discussed in chapter 5. Because all the language production measures were collected from a single narrative sample, high internal validity was achieved. However, single-time assessments increase the potential for measurement error, and data obtained from alternate tasks may have provided more conclusive evidence regarding participants' language skills. A retell format was chosen for narrative data collection because previous research has consistently indicated that retellings provide longer, more detailed and grammatically more complete language samples than personal narratives or story generation tasks (Merritt and Liles, 1987:547; McCabe and Rollins, 1994:47; Gazella and Stockman, 2003:62; Schneider and Dubé, 2005:57). However, a dynamic assessment approach, following a test-teach-retest format, to elicit narratives from the participants may have resulted in narratives that were more representative of their language production abilities. A dynamic assessment approach to assess children from culturally and linguistically diverse backgrounds provides more information about their true abilities and capacity to learn (Gutiérrez-Clellen, 2001:212). Dynamic assessment of narratives allows the clinician to observe the learning process taking place during assessment and represents a more reliable means to differentiate between language differences and language impairments (Peña Gillam, Malek, Ruiz-Felter, Resendiz, Fiestas and Sabel, 2006:1038).

7.8 CLINICAL IMPLICATIONS AND RECOMMENDATIONS

This study, the first in South Africa to investigate the relationship between reading comprehension and narrative skills, aimed to provide insight into the relationships between oral language and reading abilities that could inform and guide assessment and intervention.

The findings of this study confirmed the effectiveness of narrative analysis as a clinical tool. In the absence of appropriate formal tests that can be used in the South African context, narrative assessments are ecologically valid means to investigate communicative competence. Narratives can provide information about linguistic features directly linked

to reading comprehension, such as the understanding of story structure and the use of literate language features. Narrative micro- and macrostructural analyses present the clinician with information about a variety of linguistic features. This information can be used to distinguish between children with and without language impairments and can provide detailed linguistic profiles for individual children or clinical groups to guide and inform treatment decisions. The development of narrative assessment protocols that are relevant and appropriate for the broader South African context should therefore be a priority for speech-language therapists.

While there is ample evidence of the strong relationships between narrative skills and reading comprehension, there are no published accounts of training studies to demonstrate that narrative interventions lead to improvements in reading comprehension (Cain and Oakhill, 2007c:64). According to Cirrin and Gillam (2008:S132), narrative training is one area in which intervention procedures align well with the theoretical literature even in the absence of research demonstrating the efficacy of these procedures. Narrative interventions could, for instance, include pre-story intervention methods (e.g. directed reading activities), during-story interventions (e.g. focused questioning and episode mapping), post-story intervention (e.g. retelling and story generation activities and story grammar cueing), and narrative and expository text comprehension activities (Cirrin and Gillam, 2008:S132; Dymock, 2007:163). Intervention studies that investigate the impact of narrative intervention strategies on reading comprehension, particularly in children with poor reading comprehension, could provide valuable information about the nature of the relationships between oral and written discourse. There is therefore a need for intervention research to evaluate hypotheses, to test the validity of causal theories and to inform clinical practice. There is a particular need for research in South Africa in different cultural and socio-economic communities to establish the efficacy of narrative interventions to enhance narrative skills and reading comprehension.

The research cited in section 2.7 indicates that language comprehension problems are not modality specific. Children who experience problems understanding written language usually experience similar problems understanding spoken discourse. Previous studies

have shown that the processes required to construct meaningful representations are the same for oral discourse and written texts (Oakhill and Cain, 2007a:31). Furthermore, evidence from longitudinal studies have shown that children with early language impairments who start out as poor readers remain poor readers across the school grades and fail to catch up with their peers with normal language abilities (Catts et al., 2008:1577). It can be assumed that preschool children with language impairments are at risk for poor academic progress and reading problems. Early identification and intervention are therefore crucial for the prevention of the long-term consequences of language disorders in preschool children.

Assessment of preschool childrens' narrative abilities, such as awareness of story schemas and the ability to produce coherent narratives can identify children at risk for reading comprehension failure before they start their formal school careers. Intervention programmes that develop narrative abilities can provide children from diverse backgrounds with opportunities to acquire the discourse, practices and skills needed to succeed in school. Preschool intervention programmes, whether in classroom contexts or in speech-language therapy, could specifically focus on the improvement of childrens' syntactic-semantic, narrative and literate language skills. These language skills can be promoted by rich oral and written language activities and experiences that facilitate not only language skills, but also print awareness and phonological awareness (Catts, 1993:36). The results of this study highlighted the need for intervention to improve the acquisition of complex syntax skills such as subordination, conjunction and noun phrase elaboration.

Shared storybook interventions may be particularly useful to prepare children from diverse backgrounds for the literacy practices they will encounter in schools. Shared reading programmes in preschool environments could expose children to different story genres, literate language features, complex syntax, formal vocabulary and story schemas. Storybook interventions, particularly dialogic reading can also target metacognitive processes, such as inferencing, perspective-taking and comprehension monitoring; processes that are crucial for later reading comprehension.

7.9 CONCLUDING REMARKS

As atated at the onset, attainment of literacy and academic success is crucial for survival in a modern industrialised, knowledge-driven society. In South Africa today a large percentage of learners make poor academic progress and leave school without the literacy skills they need to ensure economic survival. This study investigated the relationships between the language skills and reading comprehension abilities of a group of monolingual, mainstream learners from lower socio-economic backgrounds.

The results of this study call for speech-language therapists and educators to be aware of the role of specific language skills in the acquisition of literacy and reading comprehension, the need for early identification of preschool children at risk for reading failure, and the need for focused intervention programmes to develop literate language and narrative skills in these populations.

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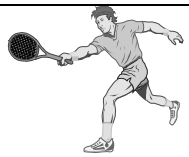
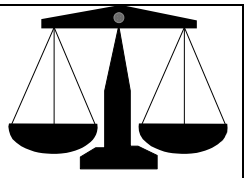
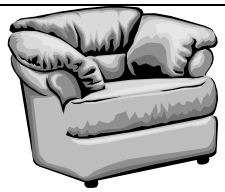
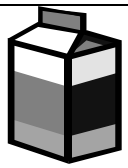
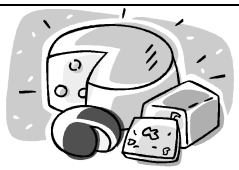
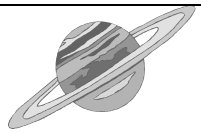
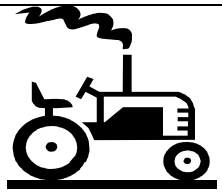
GRADE 3

Literacy

EXERCISES

Grade 1:

- **Read single words. (Skill)**
- **Uses visual cues to make meaning and uses knowledge of phonics and sight words. (Assessment Standard)**
- **LO3**
- **Choose one of four pictures to match a given word.**

1. **walk**				
2. **cheese**				
3. **telescope**				

Grade 2

QUESTION 2.

- **Reading single sentences with visual cues. (Skill)**
- **Uses word recognition strategies to read unfamiliar texts and works with sentences. (Assessment Standard)**
- **LO3 and LO6**
- **Short sentences with a missing word, and a choice of four words to complete sentence.**

1. The bird is sitting on a _____

   a. high
   b. roof
   c. branch
   d. table

2. Winnie has been told to drink lots of _____

   a. bottle
   b. glass
   c. water
   d. healthy

QUESTION 3

- **Reading single sentences without visual cues. (Skill)**
- **Uses word recognition strategies to read unfamiliar texts and works with sentences. (Assessment Standard)**
- **LO3 and LO6.**
- **Short sentences with missing word, and a choice of four words to complete sentence.**

A month ago, Rose went to visit her grandmother.

She left home at 7 in the morning and traveled by bus from

Ladismith to Worcester. It was

early	**night**	**evening**	**afternoon**

in the morning. At 12 o'clock in the afternoon she took a

taxi	axe	ostrich	tortoise

to Paarl.

The taxi

dropped	dragged	pushed	pumped

everybody

before Rose. She fell

asleep	awake	running	walking

because the journey was so long. She only woke

up	down	across	under

when the taxi stopped in Paarl.

Her

grandchild	grandfather	grandson	grandmother

was waiting for her at the bus stop.

Grade 3

QUESTION 4

- **Comprehension based on a mind map text. (Skill)**
- **Uses word recognition strategies to read unfamiliar texts and process information in different ways as well as choosing selected information from a text. (Assessment Standard)**
- **LO3 and LO5**
- **Mind map, with pictures for visual cues.**

Mr Nelson Mandela wrote the story of his life. It is called the Long Walk to freedom. On 27 April 1994 his dream came true – it was the first election for a free South Africa.

2.

1. He was born in 1918.

He was one of 13 children and the youngest of 4 boys.

3. He grew up in the village of Qunu.

For many years he dreamed of a free South Africa

4.

(Adapted from: *Long Walk to Freedom* (abridged version) 1996 Nolwazi Publications.

4.1 On what date was the country's first election?

…….

4.2 For how many years since 1994 has South Africa been a democratic country?

…….

QUESTION 5

- **Comprehension based on an extended passage.**
- **Uses word recognition strategies to read unfamiliar texts and process information in different ways, pick out selected information from a text as well as summarizes information. (Assessment Standard)**
- **LO3 and LO5.**
- **Paragraph in narrative style.**

Read the information below.

Answer the questions that follow on the next page.

On the day of the fire, the smoke filled the air and the sky turned dark. Our eyes were burning and we could not breathe. We had to put wet cloths over our mouths and noses. All over the mountain, I could see flames shooting into the sky. The wind was blowing hard and there was dust everywhere.

The firemen fought the fire long into the night. Some people had to evacuate their houses because they were dangerously close to the fire. Other people carried food and drinks to the brave firemen. Suddenly the wind stopped and it grew very quiet. The fire was out – the people went back to their houses. But we were lucky that our house did not burn down, like some others.

Circle the correct answer:

5.1 On the day of the fire, some people had to evacuate their houses as they were too close to the fire. This means that they had to ……	**a. Stay inside** **b. Leave their houses** **c. Give food to the firemen** **d. Clean their houses**
5.2 Why did it suddenly get quiet?	**a. The people left** **b. The wind stopped** **c. The helicopters were flying around** **d. The firemen stopped talking and began shouting.**

The End

The Revised National Curriculum Statement (RNCS)

Assessment standard guidelines for the learning outcome "Reading and Viewing" in the Foundation Phase (Grades R to 3) (DoE, 2002, pp.32-33) requires that the learner:

· is able to use visual clues to make meaning (Grades R-3);
· is able to role-play reading (Grades R-1);
· is able to make meaning of written text (Grades R-3);
· starts recognizing and making meaning of letters and words (Grade R);
· begins to develop phonic awareness (Grade R);
· develops phonic awareness (Grades 1 and 2);
· consolidates phonic awareness (Grade 3);
· recognizes letters and words and makes meaning of written text (Grade 1);
· reads for information and enjoyment (Grades 1-3);
· recognises and makes meaning of words in longer texts (Grade 2); and
· reads texts alone, and uses a variety of strategies to make meaning (Grade 3).

Level	Test item	Score	Learning outcome	Skill	Assessment standard
Grade 1	Selection of one of 4 pictures to match a given word	/10	LO3: Reading and viewing	Reads single word with visual cues	Uses phonic and word recognition skills to decode new or unfamiliar words in context
	Total score Grade 1	/10			
Grade 2	Selection of one of 4 words to complete a sentence, with pictures provided	/8	LO3: Reading and viewing LO6: Language structure and use	Reads single sentence with visual cues	Uses visual cues to make meaning Recognises and makes meaning of words in longer texts Works with sentences to interpret texts
	Selection of one of 4 words to complete a sentence	/8	LO3: Reading and viewing LO6: Language structure and use	Reads single sentence without visual cues	Recognises and makes meaning of words in longer texts Works with sentences to interpret texts
	Total score Grade 2	/16			
Grade 3	Mind map with pictures for visual cues	5	LO3: Reading and viewing LO5: Thinking and reasoning	Comprehension based on a mind map text	Uses visual cues to make meaning Recognises and makes meaning of words in longer texts Processes information in different ways Selects information from texts
	Paragraph in narrative style	7	LO3: Reading and viewing LO5: Thinking and reasoning	Comprehension based on an extended passage	Recognises and makes meaning of words in longer texts Processes information in different ways Selects information from texts Summarises information
	Total score Grade 3	/12			

APPENDIX 3
WCED Letter of approval

Navrae / Enquiries / IMibuzo: Dr RS Cornelissen

Telefoon / Telephone / IFoni: (021) 467-2286

Faks / Fax / IFeksi: (021) 425-7445

Verwysing / Reference / ISalathiso: 20041109-0034

Wes-Kaap Onderwysdepartement

Western Cape Education Department

ISebe leMfundo leNtshona Koloni

Mrs Daleen Klop
Department of Speech-Language Therapy
University of Stellenbosch
P. O. Box 19063
TYGERBERG
7505

Dear Mrs D. Klop

RESEARCH PROPOSAL: CORRELATION OF READING SKILLS IN GRADE 3 WITH PRECURSORS TO LITERACY AT SCHOOL ENTRY.

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Educators' programmes are not to be interrupted.
5. The Study is to be conducted from **19th January 2005 to 23rd September 2005.**
6. No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December 2005).
7. Should you wish to extend the period of your survey, please contact Dr R. Cornelissen at the contact numbers above quoting the reference number.
8. A photocopy of this letter is submitted to the Principal where the intended research is to be conducted.
9. Your research will be limited to the following schools:
10. A brief summary of the content, findings and recommendations is provided to the Director: Education Research.
11. The Department receives a copy of the completed report/dissertation/thesis addressed to:

    The Director: Education Research
    Western Cape Education Department
    Private Bag X9114
    CAPE TOWN
    8000

We wish you success in your research.

Kind regards.

Signed: Ronald S. Cornelissen
for: **HEAD: EDUCATION**
DATE: 19th January 2005

APPENDIX 4
Stellenbosch University Research Committee for Human Reseach:
Letter of approval

UNIVERSITEIT·STELLENBOSCH·UNIVERSITY
jou kennisvennoot • your knowledge partner

22 September 2004

Mev D Klop
Dept Spraak-Taal- en Gehoorterapie

Geagte mev Klop

NAVORSINGSPROJEK: "CORRELATION BETWEEN PRECURSORS TO LITERACY AND READING SKILLS IN GRADE 3"
PROJEKNOMMER : N04/08/138

Dit is vir my aangenaam om u mee te deel dat die Komitee vir Mensnavorsing op sy vergadering van 8 September 2004 bogenoemde projek goedgekeur het, ook wat die etiese aspekte daarvan betref.

Die projek is nou geregistreer en u kan voortgaan met die werk. U moet asseblief in verdere korrespondensie na bogenoemde projeknommer verwys.

Ek vestig graag u aandag daarop dat pasiënte wat deelneem aan 'n navorsingsprojek in Tygerberg Akademiese Hospitaal nie gratis behandeling sal ontvang nie aangesien die PGWK nie navorsing finansieel ondersteun nie.

Die verpleegkorps van die Tygerberg Akademiese Hospitaal kan ook nie omvattende verpleeghulp met navorsingsprojekte lewer nie weens die swaar werkslading waaronder hulle reeds gebuk gaan. Dit kan dus van 'n navorser verwag word om in sulke gevalle privaat verpleegkundiges te verkry.

Met vriendelike groete

CJ VAN TONDER
NAVORSINGSONTWIKKELING EN -STEUN (TYGERBERG)

CJVT/ev

C:\DOCUMENTS AND SETTINGS\EVISAGIE.000\MY DOCUMENTS\KMNPROJEKTE\2004\N04-08-138-001.DOC

SPRAAK-TAAL-EN GEHOORTERAPIE
2004 -09- 28

Fakulteit Gesondheidswetenskappe • Faculty of Health Sciences

Verbind tot Optimale Gesondheid • Committed to Optimal Health
Afdeling Navorsingsontwikkeling en -steun • Division of Research Development and Support
Posbus/PO Box 19063 • Tygerberg 7505 • Suid-Afrika/South Africa
Tel: +27 21 938 9207 • Faks/Fax: +27 21 933 6330
E-pos/E-mail: cjvt@sun.ac.za

APPENDIX 5
Parent consent form

DEELNEMERINLIGTINGSBLAD EN -TOESTEMMINGSVORM VIR GEBRUIK DEUR OUERS/WETTIGE VOOGDE

TITEL VAN DIE NAVORSINGSPROJEK:

Korrelasies tussen voorlopers van geletterdheid en leesvaardighede in Grade 3

VERWYSINGSNOMMER: (N04/08/138)

HOOFNAVORSER: **Mev Daleen Klop**

ADRES:
Afdeling Spraak-Taal- en Gehoorterapie
Departement Interdissiplinêre Gesondheidswetenskappe
Fakulteit Gesondheidswetenskappe
Universiteit van Stellenbosch
Tygerberg

KONTAKNOMMER:
021 9389494 0845116563

U kind *(of pleegkind, indien van toepassing*) word genooi om deel te neem aan 'n navorsingsprojek. Lees asseblief hierdie inligtingsblad op u tyd deur aangesien die detail van die projek daarin verduidelik word. Indien daar enige deel van die projek is wat u nie ten volle verstaan nie, is u welkom om my daaroor uit te vra. U kind se deelname is ook **volkome vrywillig** en dit staan u vry om deelname te weier op enige tydstip.

Hierdie studie is deur die Komitee vir Mensnavorsing van die Universiteit Stellenbosch **goedgekeur en sal uitgevoer word volgens die etiese riglyne en beginsels van die Internasionale Verklaring van Helsinki en die Etiese Riglyne vir Navorsing van die Mediese Navorsingsraad (MNR).**

Wat behels hierdie navorsingsprojek?

Hierdie projek sal slegs plaasvind nadat toestemming gegee is deur die Wes-Kaap Onderwysdepartement, u kind se skoolhoof, uself en u kind.

Indien u toestemming verleen dat u kind aan die projek deelneem, sal sy/haar gehoor en taalvaardighede deur opgeleide spraak-taalterapeute getoets word. Indien 'n gehoorprobleem bestaan sal u kind se gehoor volledig getoets word en sal u gekontak word deur ons sodat u die kind vir 'n mediese ondersoek kan neem. 'n Verslag van die taaltoetse sal die skoolhoof verskaf word sodat u kind hulp kan ontvang indien nodig. Alle resultate sal vertroulik hanteer word.

Die navorsingsprogram bestaan daaruit dat 'n opgeleide spraakterapeut u kind se taalvaardighede sal toets. Toetsing sal tydens skooltyd plaasvind.

<u>Alle inligting sal vertroulik hanteer word. Enige resultate wat gepubliseer word of bekend gemaak word sal nie u of u kind se identiteit bekend maak nie.</u>

Die volgende vorm moet asseblief deur u voltooi word

Verklaring deur ouer/wettig voog

Met die ondertekening van hierdie dokument onderneem ek, (*naam van ouer/wettige voog*) …….....…….., om my kind *(naam van kind)* …….....…….., wat ..... jaar oud is, te laat deelneem aan 'n navorsingsprojek getiteld:
Korrelasies tussen voorlopers van geletterdheid en leesvaardighede in Grade 3

Ek verklaar dat:

- Ek hierdie inligtings- en toestemmingsvorm gelees het of aan my laat voorlees het en dat dit in 'n taal geskryf is waarin ek vaardig en gemaklik mee is.
- My kind moet instem om aan die navorsingsprojek deel te neem as hy/sy ouer as 7 jaar is, en dat sy/haar INSTEMMING op hierdie vorm aangeteken sal word.
- Ek geleentheid gehad het om vrae te stel en dat al my vrae bevredigend beantwoord is.
- Ek verstaan dat deelname aan hierdie projek **vrywillig** is en dat daar geen druk op my geplaas is om my kind te laat deelneem nie.
- My kind te eniger tyd aan die projek mag onttrek en dat hy/sy nie op enige wyse daardeur benadeel sal word nie.
- My kind gevra mag word om aan die projek te onttrek voordat dit afgehandel is indien die navorser van oordeel is dat dit in sy/haar beste belang is, of indien my kind nie die ooreengekome studieplan volg nie.
- **<u>Dat my kind se identiteit nie bekend gemaak sal word indien die resultate van die studie gepubliseer of bekendgemaak word nie</u>**

Geteken te (*plek*) .....…….. op (*datum*) ……...…….. 2006.

..... **.....**

Handtekening van ouer/wettige voog Handtekening van getuie

Verklaring deur navorser

Ek (naam) …… verklaar dat:

- Ek die inligting in hierdie dokument verduidelik het aan

…….....……..

- Ek hom/haar aangemoedig het om vrae te vra en voldoende tyd gebruik het om dit te beantwoord.
- Ek tevrede is dat hy/sy al die aspekte van die navorsingsprojek soos hierbo bespreek, voldoende verstaan.

Geteken te (*plek*) .....…….. op (*datum*) ……...…….. 2006.

..... **.....**

Handtekening van navorser Handtekening van getuie

APPENDIX 6
Phonemic awareness

Only the level 3 assessment section was used in the study

FONOLOGIESE BEWUSTHEIDSPROTOKOL

Vlak 1 Segmentasie op lettergreepvlak **(*Instruksies*:** *<u>In **boomslang** is daar 2 klappies</u> (demonstreer); <u>hoeveel is daar in **hondehok**</u>? Demonstreer indien verkeerd, moenie voortgaan voor die kind dit kan doen nie)*		✗✓
Hoeveel klappies in **poskantoor?**	**3**	
Hoeveel klappies in **winkel?**	**2**	
Hoeveel klappies in **strykyster?**	**3**	
Hoeveel klappies in **trein?**	**1**	
Hoeveel klappies in **vensterbank?**	**3**	
TOTAAL /5		

Vlak 2 Segmentasie op woordvlak Verduidelik segmentasie met behulp van 2 prentkaarte. *<u>Sê **netbal**, sê dit weer, maar moenie **net** sê nie; wat bly oor? **(bal)**</u>* *<u>Sê **hoendereier**, sê dit weer, maar moenie **hoender** sê nie; wat bly oor? **(eier)**</u>* As die leerder beide items kan doen, begin die toetsitems *sonder* prentkaarte afneem		✗✓
Sê **skoolseun**, sê dit weer, maar moenie **seun** sê nie	**- skool**	
Sê **strykplank**, sê dit weer, maar moenie **stryk** sê nie	**- plank**	
Sê **sonskyn,** sê dit weer, maar moenie **son** sê nie	**- skyn**	
Sê **posbus,** sê dit weer, maar moenie **bus** sê nie	**- pos**	
Sê **muishond**, sê dit weer, maar moenie **hond** sê nie	**- muis**	
TOTAAL /5		

Vlak 3 Segmentasie van woord in onset - rime		✗ ✓
Sê **koud**, sê dit weer, maar moenie **k** sê nie	**- oud**	
Sê **meet**, sê dit weer, maar moenie **m** sê nie	**- eet**	
Sê **boog**, sê dit weer, maar moenie **b** sê nie	**- oog**	
Sê **rys**, sê dit weer, maar moenie **r** sê nie	**- ys**	
Sê **vin**, sê dit weer, maar moenie **v** sê nie	**- in**	
TOTAAL /5		
GROOTTOTAAL /15		

Instructions:
Say to the child: *I'm going to tell you a story that goes with the pictures you see here.* (Place the 8 laminated pictures in the correct sequence in two rows in front of the child and track your finger from the first to the last picture). When I'm finished I want you to tell the story. *The story starts here*: (point to picture 1). Tell the story to the child, pointing to the pictures as indicated in the model narrative.

Retelling Instructions
Say to the child: *''Now I want you to tell the story. Look at all the pictures and try to tell the best story you can*". Allowable prompt if the child is hesitant to begin: "*Tell me what happens in story*" (point to pictures).

If the child is silent in the middle of the story, encourage the child to continue and tell you more: "*Anything else*?", "*Continue*", "*Tell me some more*", "*Let's see what else happens in the story*" etc.

Refrain from asking questions such as "*What is he doing here*?", "*Who is running*?", "*And what happened then/now*?" "*What's this*?" "*What/whom do you see on the picture*?"

Model narrative

Pictures 1 and 2

Eendag was daar 'n mier wat in die veld geloop het.

Hy was vreeslik dors en daarom stap hy na die dam toe

Die dam is vol water en die mier kan daar lekker koel water drink

Die mier buk vooroor om van die koel water te drink,

maar toe val hy binne-in die koue water

"Help my! Help my!" roep die mier bang, want hy kan glad nie swem nie.

One day there was an ant that walked in the fields.

He was very thirsty and therefore walked to the dam.

The dam is filled with water and the ant can drink nice cool water there.

The ant bends forward to drink some of the cool water,

but then he fell into the cold water.

"Help me! Help me!" the ant called anxiously, because he cannot swim at al'.

Pictures 3 and 4

"Ek moet die arme mier gaan help" sê die duif.
Hy pluk vinnig 'n groot groen blaar af en gooi dit vir die bang mier.
Die mier klim blitsvinnig op die blaar en dryf na die wal van die dam toe.
"Dankie tog" sê hy bly.
"Ek het baie groot geskrik, want ek was baie bang dat ek gaan verdrink"

"I have to go and help the poor ant" says the dove.
He quickly plucks off a big green leaf and throws it to the scared ant.
The ant climbs onto the leaf as fast as lightning and floats towards the dam wall.
"Thank you" he says gladly.
"I had a big fright, because I was scared that I was going to drown".

Pictures 5 and 6

Skielik sien die mier 'n man met groot skoene wat al hoe nader kom.
Die man dra 'n bruin sak en ook 'n gevaarlike geweer,
want hy soek na iets om te skiet.
Toe die man die duif hoog in die boom sien, besluit hy om die arme duif te skiet.
Hy lig sy geweer en mik versigtig na die duif toe,
want hy wil nie mis skiet nie.

Suddenly the ant sees a man with big shoes gradually approaching.
The man carries a brown bag as well as a dangerous gun,
because he is looking for something that he can shoot at.
When the man sees the dove high up in the tree, he decides to shoot it.
He lifts up his gun and carefully aims at the dove,
because he doesn't want to miss his shot.

Picture 7

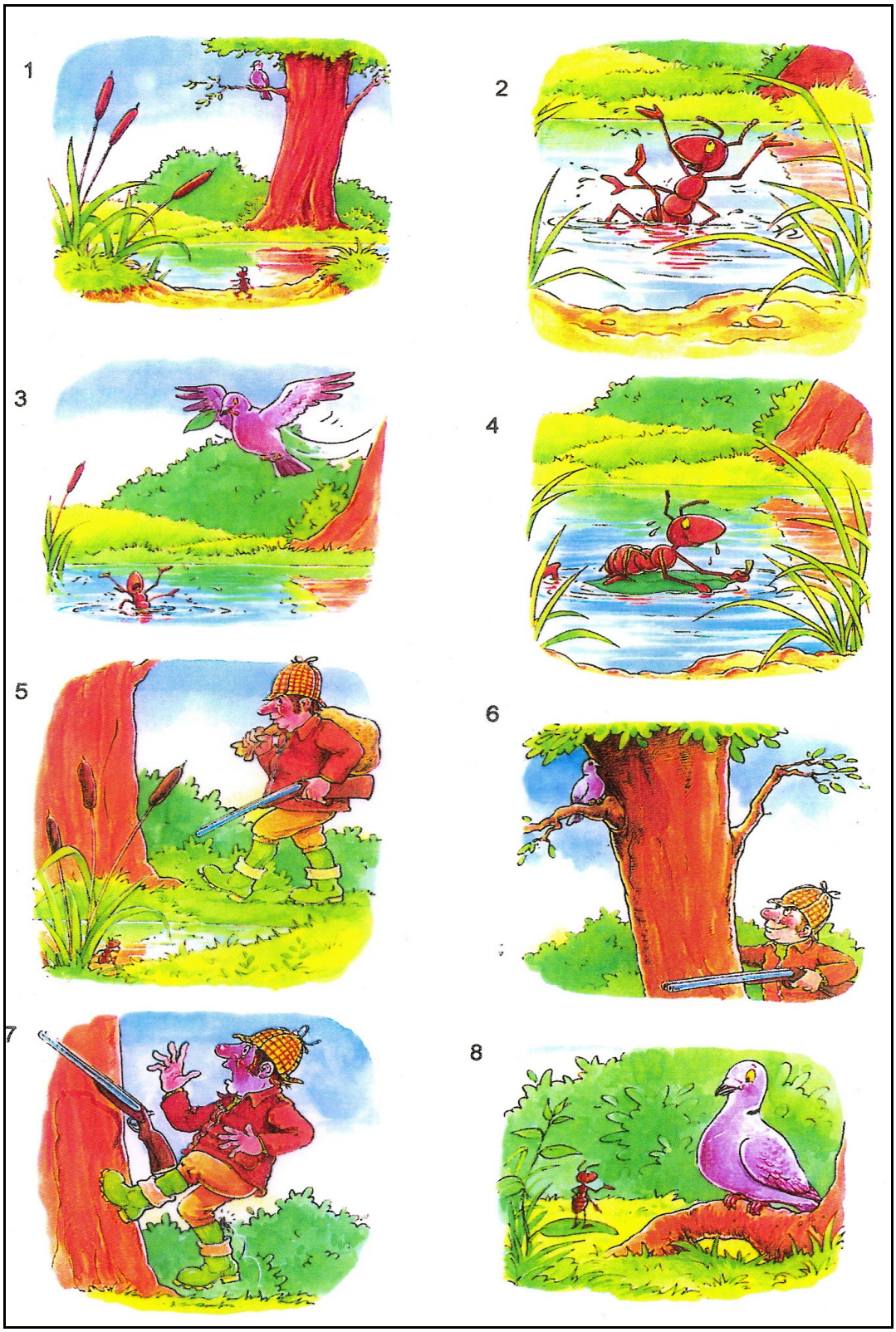
"Ek moet gou 'n plan maak" sê die mier, want hy wil sy vriend help.
Hy byt die man hard op sy been.
"Eina" skreeu die man kwaad, want die mier byt seer.
Hy laat val sy geweer op die grond en hardloop vinnig weg.

"I must quickly make a quick plan" says the ant, because he wants to help his friend.
He bites the man on his leg.
"Ouch"shouts the man, because the ant's bite is painful.
He drops his gun to the ground and quickly runs away.

Picture 8

Die duif vlieg uit die boom na die mier toe en gaan sit langs hom op die grond.
"Baie dankie, liewe mier" sê die duif.
"Omdat jy my gehelp het gaan ek vir altyd en altyd jou beste vriend wees".
"Ag wat" sê die mier, "dis net 'n plesier,
want jy het mos vir my ook gehelp toe ek amper verdrink het".

The dove flies down from the tree and sits next to the ant on the ground.
"Thank you, dear ant" the dove says.
Because you helped me, I will always be your best friend.
"Oh well" says the ant, "it was only a pleasure,
because you also helped me when I almost drowned".



From: Smallman, S. & Nestling, P. 1993. *Kom ons lees: Die mier en die duif.* Braamfontein: MacMillan Boleswa

THE PRUNING PROCESS

Pruning and segmentation to prepare the transcribed narrative data for the different analyses were done by following the guidelines in The Test for Oral Language Production (TOLP) (Vorster, 1980:26-29). To prepare the data for micro- and macrostructural analyses, all unintelligible utterances, speech disruptions, incomplete utterances and other superfluous utterances were identified and coded for use in the fluency analyses only.

1. FLUENCY

Narrative transcriptions were analysed for the following speech disruptions, underlined in examples: (S) sentence structure corrections, (W) choice of word corrections, (R) repetitions, (I) incomplete utterances, (Non) non-word insertions and unintelligible utterances:

S

a) Sentence structure corrections, e.g. ***toe het hy***..*hy wou water drink*
'**then he did**…he wanted to drink water'

W

b) Choice of word corrections, e.g. *hy* ***is*** ..*was dors*
'he **is**…was thirsty'

R

c) Repetitions, e.g. **hy wou**…*hy wou swem*
'**he wanted to**… he wanted to swim'

I

d) Incomplete utterances, e.g. ***toe val die geweer op die***….*toe hardloop hy weg*
'**then the gun fell on the**….then he ran away'

Non

e) All non-word utterances such as ***oops*** and ***uhm***

f) All unintelligible utterances were discarded

All superfluous words, phrases and sentences were underlined and identified by writing the type of disruption above the underlined word or words. If only one word changed in a repeated string of words, the whole string was coded as a self-correction. The underlined words, excluding the non-word utterances, were used in the fluency analyses, but ignored in the micro- and macrostructural analyses.

CODING CONVENTIONS

a) Sentence structure corrections

Self-corrections were classified as sentence structure corrections when it was evident that the participant revised the structure of the utterance,

e.g. ***toe het hy***….*hy wou water drink* '**then he did**...he wanted to drink water'
toe wil die…*toe pluk hy 'n blaar af* '**then it wanted**…then he plucked off a leaf'

b) Choice of word corrections

Self-corrections were classified as choice of word corrections when participants

i) replaced a word with another word,

e.g.	*die mier sit **langs**… op die stomp*	'the ant sits **next to**….on the log'
	*die mier **was**…het dam toe gegaan*	'the ant **was**….went to the dam'

ii) replaced a word with a synonym,

e.g.	*sy **maat** …vriend was bly*	'his **buddy**….friend was happy'

c) Repetitions

Repetitions of parts of words, words, and phrases or sentences that were exact replicas of adjoining phrases and sentences were coded as repetitions,

e.g.	*hy **ga**… gaan water drink*	'**he is go**...going to drink water'
	***hy wil**… hy wil die mier red*	'**he wants**….he wants to save the ant'
	***toe wil hy skiet**…toe wil hy skiet*	'**then he wanted to shoot**…. then he wanted to shoot'

Multiple repetitions of the same structure were coded as individual repetitions. A sentence repetition later in the narrative sequence was not coded as a repetition.

d) Incomplete sentences

Sentences were coded as incomplete when it was evident that the sentence was abandoned before completion, usually by leaving out the last one or two words. In contrast with self-corrections, incomplete sentences did not represent a change of mind on the part of the narrator, but merely that the sentence was left incomplete before continuing with the rest of the narrative,

e.g. ***toe val die geweer op die****….toe hardloop hy weg*
'**then the gun fell on the**…the he ran away'

daar sit die duif in die*….hy sien die mier*
'**there the dove sat in the**…he sees the ant'

e) Elliptical utterances as a result of dialogue between the examiner and the participant, were not coded,

e.g. H*y loop water toe*. (E: *ja, en wat nog?*) ~~*drink*~~.
'He walks to the water (E: yes, and what else?) ~~drinks'~~

f) Dialogue regarding the procedure were deleted and ignored,

e.g. (E: *ja, en wat nog?*) ~~*ek weet nie meer nie*~~
'(E: yes, and what else?) ~~I don't know anymore'~~

g) Fillers and non-word insertions such as *oops* and *uhm,* were deleted and not coded

h) English words in the narratives (e.g. gun, aim) were accepted

2. SEGMENTATION INTO T-UNITS

All words and phrases involved in the fluency analyses were coded and excluded from the transcriptions. Following Vorster (1980:28, 29) the transcriptions were prepared for micro and macrostructural analyses by segmentation into T-units. A T-unit comprises a main clause with all its concomitant subordinate clauses and phrases (Owens, 2004:190). Co-ordinate clauses are always clauses themselves, while subordinate clauses form part of a T-unit.

Segmentation into T-units was done by drawing a slash line at the end of each T-unit, including the last one. When 2 T-units were joined by a co-ordinating conjunction, the line was drawn through the conjunction,

e.g. *die duif vlieg af ~~en~~/ hy red die mier/* (2 T-units)
'the dove flies down ~~and~~/ he saves the ant/'

die duif vlieg af en red die mier/ (1 T-unit)
'the dove flies down and saves the ant/'

CODING CONVENTIONS

a) In the case of direct or indirect speech, the *he says* part, and what followed were coded as 1 T-unit,
   e.g. *hy sê: Ek gaan jou help* 'he says: I'm going to help you'
   dankie dat jy my gehelp het, sê hy 'thank you that you helped me, he says'

b) Where verbless retrospective expansions formed part of the T-unit in question, it was coded as 1 T-unit

   e.g. *hy het die blaar afgegooi, vir die mier* 'he threw the leaf down, for the ant'

c) *And* were not coded as a segmentation in the following cases:

- where it did not fall between 2 T-units
  e.g. *die duif **en** die mier was baie bly*
  'the dove **and** the ant were very happy'

- when a verb was repeated for effect
  e.g. *hy het geswem **en** geswem* 'he swam **and** swam'

- when a single action was expressed by two verbs
  e.g. *hy sit **en** kyk vir die mier* 'he sits **and** looks at the ant'

- when conjunction-reduction occurred
  e.g. *hy het die blaar afgepluk **en** vir die mier gegooi*
  'he plucked off the leave **and** threw it down at the ant'

APPENDIX 9
Microstructure analyses:
Productivity, lexical diversity and syntactic complexity

After the narrative data were segmented into T-units the following microstructural analyses were performed:

1. PRODUCTIVITY

a) Total Number of Words (TNW)

To calculate the TNW, all deletions, speech disruptions, and co-ordinating conjunctions were discarded. The remaining words per narrative were counted to compile the TNW. Contractions such as *hy't* 'he had' and *daar's* 'there's' were counted as two words. Compound words such as *boomstam* 'tree trunk' and *damwal* 'dam wall' were counted as one word

b) Total number of T-units

All the slash lines at the end of each T-unit, including the last one, were added up to compile the total number of T-units per narrative

2. LEXICAL DIVERSITY

a) Number of Different Words (NDW)

To calculate the NDW, all the different words in each narrative were written down on an alphabetised scoring sheet. The alphabetical columns made it possible to determine if a particular word had already been written down.

Coding conventions

- in general, all words that were spelt differently, were counted as two words
- contractions such as *hy't* 'he had' and *daar's* 'there's' were counted as two words.
- compound words such as *boomstam* 'tree trunk' and *damwal* 'dam wall' were counted as one word
- homonyms such as *sy* 'she' (as in: *sy* help die mier '*she* helps the ant') and *sy* 'his' (as in: *dit is* ***sy*** *geweer* 'it is his gun') were counted as two words
- singulars and their corresponding plurals, such as *blaar – blare* 'leaf – leaves', were counted as two words
- infinitives and their corresponding participles, such as, *loop – geloop* 'walk – walked', were counted as two words

b) Metaverbs

Metaverbs comprised metalinguistic and metacognitive verbs. Metalinguistic verbs refer to the various acts of speaking using linguistic verbs such as *sê* 'say', *roep* 'call', and *vra* 'ask'. Metacognitive verbs, such as *dink* 'think', *weet* 'know' and *besluit* 'decide', refer to the acts of thinking and indicate the user's awareness of characters' mental states, motivations, intentions and goals.

Coding conventions

- metaverbs in the narratives were identified, circled and indicated with a **ML→** (metalinguistic verb) or **MC→** (metacognitive verb) in the margin.
- metacognitive verbs that occurred in the narratives were: *dink, weet, besluit*, *gedink,* and *geweet* 'think, know, decide, thought, knew and devise'
- metalinguistic verbs that occurred in the narratives were: *skree, sê, dank, roep, vra, geskreeu* en gesê 'shout, say, thank, call, ask, shouting and said'

3. SYNTACTIC COMPLEXITY

To investigate the syntactic complexity of the narratives produced by participants four measures usually employed in research for this purpose, namely, number of words per T-unit, number of subordinate clauses, the subordination index, and number of elaborate noun phrases (ENPs), were used.

a) Number of words per T-unit

Coding conventions

- all the slash lines indicating T-units were added up
- to determine the number of words per T-unit, the TNW, calculated earlier, were divided by the number of T-units
- numbers were rounded off to one decimal place.

b) Subordination index

Following Scott (1988a:58) and Nippold et al. (2005:1053), the subordination index was obtained by adding up the total number of independent (main) and dependent (subordinate) clauses and dividing them by the total number of T-units in each narrative.

Coding conventions

- independent and dependent clauses were identified, underlined and marked with **Ind** or **Sub** above the underlined section
- clauses were coded as independent or main clauses when they contained a subject and a main verb that made a complete statement,
  e.g. *die mier val in die water* 'the ant falls into the water'
  hy was dors 'he was thirsty'
- clauses were coded as dependent or subordinate clauses if they contained a subject and a main verb, but did not make a complete statement and could therefore not stand alone,
  e.g. *hy dink* ***dat hy sy vriend moet help***
  'he thinks **that he must save his friend'**

c) Elaborated noun phrases (ENPs)

Following Greenhalgh and Strong (2001:125) and Owens (2004:199) ENPs were defined as noun phrases that had more than two modifiers preceding the noun,

e.g. ***die groot groen*** *blaar* '**the big green** leaf'

or had qualifiers such as prepositional phrases,

e.g. *die duif* ***in die boom*** **'**the dove **in the tree**'

or relative clauses following the noun,

e.g. *die duif* ***wat in die boom sit*** 'the dove **that sits in the tree**'

Coding conventions

- Modifiers
  - noun modifiers were identified, underlined and marked with **Mod** above the underlined section
  - complex descriptive noun phrases comprising 2 or more descriptive elements, including adjectives and noun modifiers, were coded as **Mod**
  - determiners such as *'n* and *die*, were counted as modifiers

    e.g. ***die*** *groot, groen blaar* '**the** big green leaf'

    'n *groot, gevaarlike geweer* '**a** big, dangerous gun'

- Qualifiers
  - noun qualifiers were identified, underlined and marked with **Qual** above the underlined section
  - prepositional phrases preceding the noun were coded as ENPs, e.g.

    die duif ***in die boom*** 'the dove **in the tree'**
  - relative clauses following the noun were coded as ENPs, e.g.

    die man ***met die groot skoene*** 'the man **with the big shoes'**
  - the following were coded as 1 ENP

    daar was 'n man met groot skoene en 'n geweer
    'there was a man with big shoes and a gun'

    hy soek iets om te skiet en te eet
    'he is searching for something to shoot and to eat'

APPENDIX 10
Macrostructure analyses: Structural complexity

GENERAL PRINCIPLES

Following Stein and Glenn (1979), Petersen and McCabe (1991) and Westby (2005) the main decision in episodic analysis of the narratives related to the stated goal-directed behaviour (GDB) of the protagonists in the episodes. An episode schema consists of problems faced by a character, his plans, goals and actions to overcome or solve the problem, and the consequences of these actions in terms of the success or failure in attaining the goal. A narrative was coded as an episode if it contained a *motive* of a character, followed by *goal-directed behaviour*, and resulted in a *consequence* related to the attainment of the goal.

1) **Motives** are initiating events that cause the character to respond with purposeful goal-directed behaviour. Initiating events include the following:

    a) **Natural occurrence**: Changes in the physical environment that are not caused by an animate being or the characters' actions, e.g. *It was a very hot day*
    b) **Action**: An action by a character that initiates a response in a character, e.g. *The ant saw a man with a gun in the forest*
    c) **Internal event**: Perception of an internal or external event, or changes in internal states such as pain or hunger, e.g. *The ant was thirsty*
    d) **Verbalization:** An initiating event expressed in dialogue form, e.g. *The ant said: "I must help my friend"*

2) **Goal-directed behaviour** describes planned and/or intentional actions and attempts by the protagonist to attain a goal. Goal-directed behaviour is indicated by internal plans, responses expressing the character's desires or intentions, and actions or attempts to attain his goals

    a) **Internal plan**: Describes the character's strategy for attaining his goal, e.g. *The ant was thirsty (initiating event). He decided to go to the dam to drink water (internal plan)*
    b) **Internal response**: Describes the character's desires or intentions, e.g. *So he wanted to save his friend*
    c) **Attempt:** The character's overt actions to attain the goal, e.g. *The man aimed the gun at the dove*

If no **explicit goal** was stated or could be inferred, the episode was coded as one of the following sequences:

i) **Descriptive sequence**: Describes characters, environment, and habitual actions without chronological or causal relationships
ii) **Action sequence**: Lists actions that are chronologically rather than causally related
iii) **Reaction sequence**: Causally related events, but without planning involved; a set of changes that cause other changes

If the **goal was not explicitly stated**, but could be inferred the episode was coded an **abbreviated episode.** The following two components were required:

i) **Motive** in terms of an initiating event as described earlier
ii) A **consequence** that achieves or fails to achieve the character's goal

If the **goal was explicitly stated** and there was clear evidence of planning and intentional behaviour in the form of attempts to achieve the goal, followed by a consequence, the episode was coded as a **complete episode**

If the **goal was explicitly stated**, and followed by actions and attempts but no **consequence** in terms of attaining or not attaining the goal, the episode was coded as **incomplete**

3) **Consequences** describe characters' success or failure at attaining his goals, and changes in the sequence of events resulting from characters' actions, e.g. *The ant got onto the leaf and was saved.* **Reactions** as a result of the character's actions were also coded as consequences, e.g. *the man screamed* (when bitten by the ant)

BINARY DECISION TREE (adapted from Westby, 2005:181)

Does the narrative imply goal-directed behaviour? **YES ↓**	**NO →**	Sequence
Is planning explicit? **YES ↓**	**NO →** but planning can be inferred; narrative contains motives (IE), actions (A) and consequences (DR, R)	Abbreviated episode
Does the narrative contain motives (IE), goal-directed actions (IP, A) and consequences (DR, R)? **YES ↓**	**NO →** no consequence related to attainment/non-attainment of goals	Incomplete episode
Does the narrative describe events from the perspectives from both characters with goals stated for both characters?	**NO →**	Complete episode
YES →		Interactive episode

CODING DECISIONS

Is the goal explicitly stated? If no goal = sequence
If goal is not explicitly stated, but has to be implied = abbreviate episode
If explicit goal, but no consequence = incomplete episode

EPISODE 1
Setting (*eendag was daar..; die mier het in die veld geloop*) (once there was..; the ant walked in the fields'

Motive	→ initiating event	(*mier is dors*) (ant is thirsty)
↓		
Goal-directed action	→ plan	(*wil water drink*) (wants to drink water)
	→ attempt	(*gaan na die water*, *buk vooroor*) (go to the water; lean forward)
(to qualify as GDB the intention to drink water has to be stated)		
↓		
Consequence	→ direct consequence	(*mier val in water, verdrink amper*) (ant falls into the water, almost drowns)
	→ reaction	(*mier skreeu "help"*) (ant shouts "help")

EPISODE 2
Setting (*duif sit in die boom*) (dove sits in the tree)

Motive	→ initiating event	(previous episode)
↓		
Goal-directed action	→ plan	(*wil mier gaan help*) (wants to go and help ant)
	→ attempt	(*duif gooi blaar af*) (dove throws down leaf)
↓		
Consequence	→ direct consequence	(*mier klim op blaar*, *mier word gered*) (ant climbs on leaf, ant is saved)
	→ reaction	(*mier sê dankie*) (ant says thank you)

EPISODE 3
Setting (*man kom aan*) (man arrives)

Motive	→ initiating event	(*man sien duif; man soek iets om te skiet*) (man sees dove; man looks for something to shoot)
↓		
Goal-directed action	→ plan	(*wil duif skiet, wil nie misskiet nie*) (wants to shoot dove; does not want to miss)
	→ attempt	(*mik na duif, lig sy geweer*) (aims at bird; lifts his gun)
↓		
Consequence	→ direct consequence	(does not succeed in goal; *laat val geweer, hardloop weg)* (drops gun; runs away)
	→ reaction	(*man skreeu; man skrik groot*) (man shouts; man get a big fright)

EPISODE 4
Setting

Motive	→ initiating event	(previous episode; *mier sien man*) (ant sees man)
↓		
Goal-directed action	→ plan	(intention to prevent man from shooting dove; *wil duif gaan help*) (wants to go and help dove)
	→ attempt	(*mier byt man*) (ant bites man)
↓		
Consequence	→ direct consequence	(*man skreeu; laat val geweer; hardloop weg*) (man shouts; drops gun; runs away)
	→ reaction	(*mier/duif sê dankie*) (ant/dove says thank you)

EPISODE 3 &4

Episodes 3 and 4 were coded as an **interactive episode** if one set of events was described from both characters' perspectives, where both had goals and there actions influenced each other. The interactive episode usually started where the ant observes the man approaching.

CODA

The ending was coded as only one statement or proposition, i.e. **reaction**. Statements expressing the gratitude of the characters (*die mier/duif sê dankie*) (the ant/dove says thank you), and/or the intention to be friends (*ek sal van nou af jou maatjie wees*) (from now on I'll be your friend), and/or the moral of the story (*ek het jou gehelp, want jy het my gehelp*) (I helped you, because you helped me) were all coded as reactions.

CONJUNCTIONS

Following Greenhalgh and Strong (2001:125) the conjunctions *en* 'and', *toe* 'then' and *en toe* 'and then' were excluded from the analyses of conjunction use in the participants' narratives because children often use these structures as discourse markers rather than conjunctions between propositions.

CODING CONVENTIONS

- conjunctions were identified, underlined and marked with **Conj**

- coordinating conjunctions (excluding *en*, *toe* and *en toe*) that connected T-units were coded,

  e.g. *die mier is bang **want** hy kan nie swem nie*
  'the ant is scared **because** he cannot swim'

- subordinating conjuctions in embedded clauses were coded,

  e.g. *ek het jou gehelp **omdat** jy my ook gehelp het*
  'I helped you **because** you helped me too'

- conjunctions were coded as temporal (e.g. *nadat* 'after' *terwyl* 'while'), causal (e.g. *want* 'because', *omdat* 'because/since', *sodat* 'so that') or adversative (e.g. *maar* 'but', *anders* 'otherwise)

APPENDIX 12
Macrostructure analyses:
Cohesion - Referencing

REFERENCING

Following Liles (1985:132-133) an element was identified as a cohesive marker if its meaning could not be adequately interpreted by the listener and the listener had to search outside the statement for the completed meaning. A device is not a cohesive marker if the information referred to is recoverable within the statement, e.g. *die man lig sy geweer* (the man lifts his gun . The possessive *sy* (his) is not a cohesive device because the information is recoverable within the sentence, whereas in the statement *toe byt die mier sy been* (then the ant bit his leg), the possessive *sy* (his) refers to a previously mentioned character and is therefore a cohesive device.

Two aspects of cohesion were investigated:

- referential cohesion (frequency and nature of the referential ties used to introduce, maintain reference and reintroduce main characters)
- adequacy of the cohesive ties (percentage of complete, incomplete and erroneous ties per narrative)

Referential cohesion
The ability of the participants to refer appropriately to the 3 protagonists (*mier, duif, man*) *(*ant, dove, man*)* in the story was investigated. The types of references used to were analyzed following Pearce (2006), Van der Lely (1997) and Norbury & Bishop (2003).

- *introduce* characters when they were referred to for the first time (use of definite or indefinite NP)
- *reintroduce* characters after a different character had been introduced (use of nominal or pronominal references), and
- *maintain* reference to a character in after his identity has been established (use of nominal or pronominal references, or use of zero anaphor)

Cohesive adequacy
Following Liles (1985:132-133) ties were classified as

- ***complete*** when the information referred to by the cohesive marker is easily found and defined with no ambiguity,
  *eendag was daar **'n mier / hy** het water gedrink*
  'once there was **an ant / he** drank water'

- ***incomplete*** when the information referred to by the cohesive marker is not provided in the text, but has to be recovered outside the text
  ***die duif** pluk 'n blaar / toe klim **hy** op die blaar*
  '**the dove** plucks a leave / then **he** climbed onto the leave'

- ***erroneous*** when the listener is guided to ambiguous or incorrect information
  *die **duif** val in die water*
  'the **dove** falls into the water'

CODING CONVENTIONS

Coding procedure

- Narrative transcriptions were coded into propositions. A proposition was defined as an idea-unit consisting of a predicate and a relatively small number of arguments (Mandler, 1984:62). In contrast with the T-unit as unit of analysis used in the microstructural analyses, propositions could be sentences or clauses expressing ideas. Codas were *included* in the cohesion analyses

  e.g. *the man aimed to shoot the bird* (I T-unit)
  the man aimed (action) *to shoot the bird* (goal) (2 propositions)

- Each proposition was analyzed as a separate unit for cohesive markers and nominal, pronominal and zero anaphor references were identified and colour coded
- The total number of references and the number of nominal, pronominal and zero anaphor references per narrative were calculated
- The cohesive devices were separately coded for each protagonist (*duif, mier* and *man*) *(*dove, ant and man*)* and references used to *introduce* characters were coded as definite NP, indefinite NP or pronouns
- The cohesive devices used to *reintroduce* characters were coded as nominal or pronominal references
- The cohesive devices used to *maintain reference* to characters were coded as nominal, pronominal or zero anaphor references
- The cohesive *ties* used was judged as complete, incomplete or erroneous and recorded

Coding conventions
(Adapted from Van der Lely (1997) and Norbury & Bishop (2003))

	Complete tie	Incomplete tie	Erroneous tie
Introduction of protagonist	Use of an indefinite noun phrase, e.g. *'n mier/duif/man* (a ant/dove/man) **C^{id}**	Use of a definite noun phrase, e.g. *die mier/duif/man* (the ant/dove/man) **I^{d}**	Use of a pronoun, e.g. *hy* (he) **E^{p}** or proper name, e.g. *Mier* (Ant) **E^{n}** or omission of article, e.g. *[] mier val in die water* ([] ant falls into the water) **E^{om}**
Reintroduction of protagonist	Use of a definite noun phrase, e.g. *die mier/duif/man* (the ant/dove/man) **C^{n}**	Use of a pronoun, e.g. *hy* (he) **I^{p}**	Use of an indefinite noun phrase, e.g. *'n mier/duif/man* (a ant/dove/man) **E^{n}**
Maintenance of reference	Use of a pronoun, e.g. *hy* (he) **C^{p}** to refer to a character previously introduced by a lexical item Use of a definite noun phrase, e.g. *die mier/duif/man* (the ant/dove/man) **C^{n}** Use of zero anaphor, e.g. *die duif pluk 'n blaar en [] gooi dit vir die mier* (the dove plucks a leave and [] throws it at the ant) **C^{ø}** to refer to a character previously introduced by a lexical item Use of possessives, e.g. *die mier byt sy been* (the ant bites his leg) **C^{p}** to refer to a character previously introduced by a lexical item		Incorrect or illogical naming or identification of character, e.g. *die duif val in die water* (the dove falls into the water) **E^{n}** Omission of character reference or agent of statement, e.g. *help, help* (help, help) **E^{om}** Omission of article, e.g. *hy sien [] mier in die water* (he sees [] ant in the water) **E^{om}**

REFERENCING (example)

PARTICIPANT DV (3)

		mier			duif			man		
	Proposition	intro	reintro	maint	intro	reintro	maint	intro	reintro	maint
1	daar was 'n mier *(there was an ant)*	C^{id}								
2	hy't in die veld rongeloop *(he walked around in the fields)*			C^{p}						
3	toe gaan hy dam toe *(then he went to the dam)*			C^{p}						
4	toe val hy in die dam *(then he fell in the dam)*			C^{p}						
5	toe skree hy "Help! Help!" *(then he shouted, "Help! Help!")*			C^{p}						
6	toe was daar 'n voël in die boom *(then there was a bird in the tree)*				C^{id}					
7	hy sit in die boom *(he sits in the tree)*						C^{p}			
8	toe pluk die voël 'n blaar af *(then the bird plucked a leave off)*						C^{n}			
9	toe gooi hy dit in die dam *(then he threw it in the dam)*						C^{p}			
10	vinnig klim die mier op *(quickly the ant climbs up)*		C^{n}							
11	en dryf op die blaar *(and floats on the leave)*			C^{0}						
12	en dryf na die wal *(and floats towards the wall)*			C^{0}						
13	die mier sien 'n man *(the ant sees a man)*		C^{n}					C^{id}		
14	die man sien die voël *(the man sees the bird)*		C^{n}						C^{n}	
15	die man aim *(the man takes aim)*									C^{n}
16	om die voël te skiet *(to shoot the bird)*					C^{n}				
17	toe kom die mier *(then the ant came)*		C^{n}							
18	toe byt die mier hom op sy been *(then the ant bit him on his leg)*			C^{n}					I^{p} I^{p}	
19	toe los die man sy geweer *(then the man dropped his gun)*									C^{n} C^{p}
20	toe skree hy *(then he shouted)*									C^{p}
21	toe sê die voël: "Dankie mier dat jy my lewe gered het" *(then the bird said, "Thank you ant for saving my life")*					C^{n}				
22	toe sê die mier vir die voël: "Jy het my lewe ook gered *(then the ant said to the bird, "You saved my life too)*		C^{n}				C^{n}			

Total references	28
Total ties complete	26
Total ties incomplete	2
Total ties erroneous	0

CAUSAL ANALYSIS

Connections between propositions can be **temporal, causal** or **unrelated**. Causal relations between two adjacent propositions were determined according to Kemper's taxonomy of causal events (Kemper 1986, 1988); adapted by Gutierrez-Clellan and Iglesias (1992). According to the taxonomy, the causal chain is violated when an action is followed by another action, or a physical state by another physical state. Causal and temporal connections are mutually exclusive and temporal connections between two adjacent propositions were determined according to Trabasso and Sperry's (1985:601) two criteria for successiveness or coexistence. **Unrelated** propositions were statements without temporal or causal relationships with other propositions, in other words, propositions that did not contribute to the development of the narrative.

In coding the causal events, the codas were *excluded* from analyses. Statements in the coda (depicted in the last picture sequence card) expressing the gratitude of the characters (*die mier/duif sê dankie*) (the ant/dove says thank you), and/or the intention to be friends (*ek sal van nou af jou maatjie wees*) (from now on I'll be your friend), and/or the moral of the story (*ek het jou gehelp, want jy het my gehelp*) (I helped you, because you helped me) were not considered part of the causal chain and not coded.

CAUSAL ANALYSIS

The coding for causal analysis was based on the following procedures:

1. **Propositions were coded into narrative event categories (following Gutierrez-Clellan and Iglesias, 1992; adapted from Kemper, 1983, 1986, 1988).**

   Physical states
   Enduring, observable (but not necessarily permanent) characteristics of people, places and things – states of possession (*hy het 'n geweer gehad)* (he had a gun), attributes and specification, e.g. *daar was 'n mier, die duif was in die boom, die dam was vol water*) (there was an ant, the dove was in the tree, the dam was filled with water)

   Mental states
   Express unobservable emotions (*die mier was bang*) (the ant was afraid), cognitions *("ek moet 'n plan maak" sê die mier*) ("I must make a plan" says the ant), intentions *(die man wil die duif skiet*) (the man wants to shoot the dove) and dispositions (*die man was kwaad*) (the man was angry) of people or animate things. Propositions containing verbs such as to see or to hear, that involve an *experiencer* were coded as mental states.

   Action
   Actions and activities of the characters (e.g. *die duif gooi 'n blaar af, hy lig die geweer op*).(the dove throws down a leaf, he lifts the gun) Actions answer questions such as "*What's happening*?" or "*What happened*?" Actions can be expressed in progressive tenses and the imperative.

Goals
Propositions expressing the purpose of an action (e.g. *hy gooi die blaar af (**A**) om die mier te red (**G**))* (e.g. he throws down the leaf **(A)** to save the ant **(G)**). Coded backwards when "*om te*" ("to) was used to reflect the causal link between **goal** and **action**

2. **Causal links were identified between adjacent propositions to establish causal chains**

Resultant causation
Actions *result* in physical states (e.g. *hy val in die water/ hy is nat*) (he falls into the water / he is wet)

Initiation causation
Actions *initiate* mental states (e.g. *die mier val in* / *hy was bang*) (the ant falls in / he was scared)
Physical states *initiate* mental states (e.g. *daar was 'n mier / hy wil water drink*) (there was an ant / he want to drink water)

Enablement causation
Physical states *enable/disenable* actions (e.g. *die man het 'n geweer/ hy mik na die duif*)

Motivation causation
Mental states *motivate* actions (e.g. die *mier is dors / hy gaan drink water*) (the ant is thirsty / he will drink water)
Goals *motivate* actions (e.g. *hy mik na die duif / omdat hy hom wil skiet*) (he aims at the dove / because he wants to shoot him)

3. Propositions not causally linked were coded as temporal or unrelated

4. Following Low and Durkin (1998:212) temporal connections between two adjacent propositions were determined according to Trabasso and Sperry's (1985:601) two criteria for successiveness or coexistence

    - **succesive**
      2 adjacent events merely follow each other (e.g. *die mier pluk 'n blaar af* (A) *en gooi dit vir die mier* (B); *hy lig sy geweer* (B) *en mik na die duif* (B)
      (the ant plucks a leaf (A) and throws it at the ant (B), he lifts his gun (B) and aims at the dove (B))

    - **co-existence**
      2 events occur at the same time (e.g. *die man het groot bruin skoene* (A) *en hy dra 'n gevaarlike geweer* (B)
      (the man has big brown shoes (A) and he carries a dangerous gun (B))

5. Relatedness/unrelatedness of events according to the Kemper taxonomy (Kemper 1986, 1988); adapted by Gutierrez-Clellan and Iglesias (1992).
   A event is unrelated if it is outside the causal chain. The chain opens with the setting statement and/or the introduction of the protagonist. The chain closes with the attainment of the goal or direct consequences of failure to attain the goal. Unrelated propositions were

propositions without temporal or causal connections with adjacent propositions (e.g. *die mier was bang* (A), *die duif gooi 'n blaar af* (B)
(the ant was scared (A), the dove throws down a leaf (B))

CODING CONVENTIONS

1. Narrative transcriptions were coded into propositions. Following Mandler (1984:62), a proposition was defined as an idea-unit consisting of a predicate and a relatively small number of arguments. In contrast with the T-unit as unit of analysis used in the microstructural analyses, propositions could be sentences or clauses expressing ideas
   e.g. *the man aimed to shoot the bird* (I T-unit)
   the man aimed (Action) *to shoot the bird* (goal) (2 propositions)

2. Each proposition was classified according to one of the four narrative event categories described by Gutierrez-Clellan and Iglesias (1992) based on Kemper (1986, 1988)
   - physical states (PS)
   - mental states (MS)
   - goals (G)
   - actions (A)

3. Causal links between adjacent propositions were identified, using the criteria for clausal links (enablement, resultant, motivation, initiation) in terms of the Kemper taxonomy. The causal chain is discontinued when none of the causal events took place
   - resultant causation (Res)
   - initiation causation (Init)
   - enablement causation (Enab)
   - motivation causation (Mot)

   ACTIONS — result in→ **PHYSICAL STATES**
   ACTIONS — initiate → **MENTAL STATES**

   PHYSICAL STATES — initiate → **MENTAL STATES**
   PHYSICAL STATES — (dis)enable →**ACTIONS**

   MENTAL STATES — motivate → **ACTIONS**
   GOALS — motivate → **ACTIONS**

4. Propositions that were not part of the causal chain were classified as temporal (TEMP) or unrelated (UNREL)

CODING DECISIONS

toe sê hy dankie ; toe skree hy "eina" → **A** not **MS**
(then he said thank you; then he shouted "ouch")
*die mier is **dors**; die man is **honger*** → **PS** (attribute)
(the ant is **thirsty**; the man is **hungry**)
hy kan nie swem nie → **PS** (attribute)
(he cannot swim)

*hy **wil** iets skiet; hy **wil** water drink* → **MS** (intention)
(he **wants** to shoot something; he **wants** to drink water)
*hy was **dors**, hy was **bang*** → **MS** (emotion)
(he was **thirsty**; he was **scared**)
*toe **kom** daar 'n man/mier/duif* → **A**
(then there arrived a man/ant/dove)
*toe **was** daar 'n man/mier/duif* → **PS** (specification)
(then there was a man/ant/dove)

Goals were only coded in terms of action; when followed/preceded by action
G → propositions expressing the purpose of an action, mostly coded backwards

hy soek na iets → **A**
(he is looking for something)
om te skiet → **G**
(to shoot)
hy gooi die blaar af → **A**
(he throws down the leaf)
om die mier te red → **G**
(to save the ant)

toe skrik hy oor hy amper geval het → **MS** (cognition)
(then he got a fright because he almost fell)
toe dink hy, hy gaan sy vriend help → **MS** (intention)
(then he thought, he is going to help his friend)
help, ek kan nie swem nie → **MS** (cognition)
(help, I cannot swim)
die mier sê: jy het my gehelp → **MS** (cognition)
(the ant says: you helped me)
die mier sê: ek het amper verdrink → **MS** (cognition)
(the ant says: I almost drowned)
ek het amper verdrink → **MS** (cognition)
(I almost drowned)

EXAMPLE Causal analysis coding

	PARTICIPANT DV (3)	Narrative event categories				Causal links						
	Proposition	PS	MS	AC	G	RES	INIT	ENAB	MOT		TEMP	UNREL
1	daar was 'n mier (there was an ant)	x										
2	hy't in die veld rongeloop (he walked around in the fields)			x				o				
3	toe gaan hy dam toe (then he went to the dam)			x							t	
4	toe val hy in die dam (then he fell into the dam)			x							t	
5	toe skree hy, "Help! Help!" (then he shouted, "Help! Help!")			x							t	
6	toe was daar 'n voël in die boom (then there was a bird in the tree)	x										
7	hy sit in die boom (he sits in the tree)	x									t	
8	toe pluk die voël 'n blaar af (then the bird plucked a leaf)			x				o				
9	toe gooi hy dit in die dam (then he threw it in the dam)			x							t	
10	vinnig klim die mier op (quickly the ant climbs up)			x							t	
11	en dryf op die blaar (and floats on the leaf)			x							t	
12	en dryf na die wal (and floats towards the bank)			x							t	
13	die mier sien 'n man (the ant sees a man)		x									ø
14	die man sien die voël (the man sees the bird)		x									
15	die man aim (the man takes aim)			x					o			
16	om die voël te skiet (to shoot the bird)				x				o			
17	toe kom die mier (then the ant came)			x							t	
18	toe byt die mier hom op sy been (then the ant bit him on his leg)			x							t	
19	toe los die man sy geweer (then the man dropped his gun)			x							t	
20	toe skree hy (then he shouted)			x							t	
	toe sê die voël: "Dankie mier dat jy my lewe gered het" (then the bird said, "Thank you for saving my life"											
	toe sê die mier vir die voël: "Jy het my lewe ook gered (then the ant said to the bird, " You saved my life too".											

Total: Narrative event categories	3	2	14	1							
Total: propositions = 20											
Total: causal links = 4							2	2			
Total: temporal links =12										12	
Total: unrelated links = 1											1
% causal links (4/20) = 20											

CONTENT INFORMATION SCORE

Each narrative was analyzed to determine the number of relevant items of information from the adult telling that the participants included in the retelling of the story. A checklist was constructed containing all the possible relevant items of information that could be recalled from the narrative. Items were grouped, following Pearce (2006) in the following categories: characters; objects; places; description of characters; events or actions with different characters as agents; goals, desires and thoughts of different agents; feelings of different agents; plans or goals of different agents; and dialogue of different agents. Each element was scored only once and a total score was calculated for each participant.

CODING CONVENTIONS

1. Characters

Names of the protagonists

mier, duif/voël, man (ant, dove/bird, man)

2. Objects

Names of the objects mentioned in the model narrative

dam/water; (river not accepted) (dam/water)
boom (tree)
blaar (leaf)
skoene (shoes)
sak (bag)
geweer (gun)

3. Place

Propositions denoting setting and orientation information by means of prepositional phrases

in die *veld (in the* fields*)*
in die/by die *water/dam (in the/at the* water/dam*)*
op die *blaar (on the* leaf*)*
na die *wal* toe/ na die *kant* van die dam/water (na die *punt* van die dam was not accepted)
(towards the *wall*/ to the *side* of the dam/water (*to the* tip *of the dam* was not accepted)
in die *boom (in the* tree*)*
op/agter sy *been/voet (on/behind his* leg/foot*)*
op die *grond/ langs mekaar/ bymekaar* (mier,duif) *(on* the ground/ next to each other/ together *(ant, dove))*

4. Feelings

Propositions referring to internal states of characters

dors/lus vir water (mier) *(thirsty/craving for water (ant))*
bang (mier) *(scared (ant))*
bly (mier) *(glad (ant))*
geskrik (mier) *(big fright (ant))*
kwaad (man) *(angry (man))*

5. Goals/ thoughts

Propositions referring to internal plans, intentions, cognitions and/or goals that serves to initiate actions of characters

Propositions containing *om te* e.g. *die man lig sy geweer om die duif te skiet* (the man lifts his gun to shoot the dove) were interpreted as expression of goals of characters

wil water drink (mier) *(wants to drink water (ant))*
kan nie swem nie (mier) *(cannot swim (ant))*
gaan verdrink (mier) *(will drown (ant))*
wil duif help / moet plan maak (mier) *(wants to help dove / must make a plan (ant))*
wil mier help / moet plan maak (duif) *(want to help ant / must make a plan (dove))*
soek iets om te skiet (man) *(looks for something to shoot (man))*
wil duif skiet (man) *(wants to shoot the dove (man))*
wil nie mis skiet nie (man) *(does not want to miss his shot (man))*

6. Time

eendag *(someday)*
skielik *(suddenly)*

7. Actions

Propositions containing verbs to describe actions of characters. Propositions containing verbs such as to see or to hear, that involve an *experiencer* were considered to be mental states and not actions

loop in die veld (mier) *(walks in the field – ant)*
loop dam toe (mier) *(walks to the dam – ant)*
buk vooroor (mier) *(bends forward – ant)*
val in dam (mier) *(falls into the dam – ant)*
skreeu (mier) *(shouts – ant)*
klim op blaar (mier) *(climbs onto the leaf – ant)*
dryf op blaar (mier) *(floats on the leaf – ant)*
byt die man (mier) *(bites the man – ant)*

pluk blaar (duif) *(plucks leaf – dove)*
gooi af vir die mier (duif) *(throws down at the ant – dove)*
vlieg af na die mier (duif) *(flies down to the ant - dove)*

kom nader / *kom* daar aan (man) *(approaches / arrives there – man)*
lig sy geweer (man) *(lifts up his gun – man)*
mik na die duif (man) *(aims at the dove – man)*
skreeu (man) *(shouts – man)*
laat val geweer (man) *(drops the gun – man)*
hardloop weg (man) *(runs away – man)*
(dra/het 'n sak, geweer (man) not accepted as actions)
(carries/has a bag, gun – not accepted as actions)

8. Description – objects

Propositions containing adjectives to describe objects

vol/ koel/ koue water (full, cool, cold water)
groot/ groen blaar (big / green leaf)
groot skoene (big shoes)

bruin sak (brown bag)
gevaarlike geweer (*gevaarlike ding* not accepted) (dangerous gun) – (dangerous thing was not accepted)

9. Description – actions

Propositions containing adverbs to describe actions

byt *hard* (mier) *(bites hard – ant)*
byt *seer* (mier) *(bites sore – ant)*
klim *vinnig/blitsvinnig* op die blaar (mier) *(climbs fast/ fast as lightning on the leaf – ant)*
pluk *vinnig* (duif) *(plucks fast – dove)*
mik *versigtig* (man) *(aims carefully – man)*
hardloop *vinnig* (man) *(runs fast – man)*

10. Dialogue

Propositions containing dialogue uttered by characters, usually followed by *sê* (says). Propositions not in dialogue format e.g. *toe bedank hy die mier* (then he thanked the ant) were not accepted

"help my" (mier) *("help me" – ant)*
"dankie tog" (mier) *("thank you" – ant)*
"dis net 'n plesier", "dis niks nie" (mier) *("it's only a pleasure, "it's nothing" – ant)*
"jy het my gehelp, ek help jou, ons is vriende" (mier) *("you helped me, I help you, we are friends – ant)*
"eina" / "ouch" / die mier byt seer (man) *("ouch" / the ant bites sore – man)*
"baie dankie" (duif) *("thank you" – dove)*
"jy het my gehelp, ek help jou, ons is vriende" (duif) *("you helped me, I help you, we are friends" – dove)*

NARRATIVE CONTENT INFORMATION CHECKLIST

Category	Item			Category	Item		
Characters				**Event/action**			
	mier (ant)			*Mier* (ant) as agent	*loop* in die veld (*walks* in the field)		
	duif (dove)				*loop* dam toe (*walks* to the dam)		
	man (man)				*buk* vooroor (*bends* forward)		
	sub total		/3		*val* in dam (*falls* into the dam)		
					Skreeu (shouts)		
Object					*klim* op blaar (*climbs* onto the leaf)		
	dam/water (dam/water)				*dryf* op blaar (*floats* on the leaf)		
	boom (tree)				*klim* op man (*climbs* onto the man)		
	blaar (leaf)				*byt* die man (*bites* the man)		
	skoene (shoes)						
	sak (bag)			*Duif* (dove) as agent	*pluk* blaar (*plucks* leaf)		
	geweer (gun)				*gooi* af vir die mier (*throws* down at the ant)		
	sub total		/6		*vlieg* af na die mier (*flies* down to the ant)		
Place				*Man* (man) as agent	*kom* nader/*kom* daar aan (*approaches/ arrives there*)		
	in die *veld* (in the *field*)				*lig* sy geweer (*lifts* his gun)		
	in die/by die *water/dam* (in the/at the *water/dam*)				*mik* na die duif (*aims* at the dove)		
	op die *blaar* (on the *leaf)*				*Skreeu (shouts)*		
	na die *wal/kant* toe (to the *wall/side)*				*laat val* geweer (*drops* gun)		
	in die *boom* (in the *tree)*				*hardloop* weg (*runs* away)		
	op/agter sy been (on/behind his *leg)*				sub total		/18
	op die *grond/ langs / by mekaar*(mier,duif) (on the *ground/ next to/ together* (ant, dove))						
	sub total		/7	**Description-object**			
Feelings					*vol/ koel/ koue* water (*full/ cool/ cold* water)		
Mier (ant) as agent	dors (thirsty)				*groot/ groen* blaar (*big, green* leaf)		
	bang (scared)				*groot* skoene *(big* shoes)		
	bly (glad/happy)				*bruin* sak (*brown* bag)		
	geskrik (frightened)				*gevaarlike* geweer (*dangerous* gun)		
Man (man) as agent	kwaad (angry)				sub total		/5
	sub total		/5	**Description-action**			
				Mier (ant) as agent	byt *hard (*bites *hard)*		
Goals/thoughts					byt *seer (*bites *sore)*		
Mier (ant) as agent	wil water drink (wants to drink water)				klim *vinnig/blitsvinnig (*climbs *fast/ fast as lightning)*		
	kan nie swem nie (cannot swim)						
	gaan verdrink (will drown)			*Duif* (dove) as	pluk *vinnig (*plucks *fast)*		

				agent			
	wil duif help / plan maak (wants to help dove / make a plan)						
				Man (man) as agent	mik *versigtig (*aims *carefully)*		
Duif (dove) as agent	wil mier help / plan maak (wants to help ant / make a plan)				hardloop *vinnig (*runs *fast)*		
					sub total		/6
Man (man) as agent	soek iets om te skiet (looks for something to shoot)						
	wil duif skiet (wants to shoot dove)			**Dialogue**			
	wil nie mis skiet nie (does not want to miss the shot)			*Mier* (ant) as agent	"help my" ("help me")		
	sub total		/8		"dankie tog" ("thank you")		
					"dis net 'n plesier" ("it's only a pleasure")		
Time					"jy het my gehelp, ek help jou, ons is vriende" ("you helped me, I help you, we are friends")		
	Eendag (one day)			*Man* (man) as agent	"eina" "ouch"		
	Skielik (suddenly)			*Duif* (dove) as agent	"baie dankie" ("thank you")		
	sub total		/2		"jy het my gehelp, ek help jou, ons is vriende" ("you helped me, I help you, we are friends"		
					sub total		/7
					Total		**/67**