

EXAMINING THE RELATIONSHIP BETWEEN
ORAL NARRATIVE ABILITY AND
READING COMPREHENSION IN
CHILDREN WITH MIXED READING DISABILITY

Marleen F. Westerveld

(DipSLT, MSLT dist.)

Department of Communication Disorders

College of Science

University of Canterbury

A thesis submitted as fulfilment of the requirements for
the degree of Doctor of Philosophy

March, 2007

The material presented in this thesis is the original work of the candidate except as acknowledged in the text, and has not been previously submitted, either in part or in whole, for a degree at this or any other University.

Marleen F. Westerveld

ACKNOWLEDGEMENTS

The completion of this PhD study programme has been made possible by the people who have supported and guided me during the last four years. My grateful thanks are expressed to Professor Gail Gillon, my supervisor and mentor, who introduced me to the exciting field of research in child language disorders. Her ceaseless encouragement and passion for research have been a great source of inspiration.

I would like to sincerely thank the children, the children's parents, the school principals, and the class teachers for their co-operation in this research project. My grateful appreciation is also expressed to the Foundation for Research Science and Technology for their financial support through the Top Achiever Doctoral Scholarship programme.

Essential input has been provided by my colleagues and fellow students at the Department of Communication Disorders: Brigid Moriarty, Anne van Bijsterveldt, and Cecilia Kirk for their assistance with the reliability checks; Dr Emily Lin for her invaluable advice on the statistical analyses; and Dr Catherine Moran and Professor Michael Robb for their support throughout my studies.

My very grateful thanks are extended to Professor Jon Miller and Ann Nockerts from the Language Analysis Lab at the University of Wisconsin, for their expertise and help with the SALT analyses and their willingness to share their knowledge and passion for spontaneous language sampling.

Finally, I would like to acknowledge the encouragement and support of my extended family. I will always remember the hospitality and friendship of the Brinsdon family, who provided me with a second home during my numerous visits to Christchurch. I would like to thank my daughters Danielle and Jasmijn for assisting me and providing me with feedback to most of the assessments and tasks that were used in this project. I am also grateful to my

parents and to Tini Brand for looking after these girls when my work intruded upon our family time. This achievement would not have been possible, however, without the enduring love and support of my husband Peter.

ABSTRACT

Oral narrative ability has received increasing attention over the past three decades, and the importance of children's oral narrative skills to academic achievement has been well established. Children with reading disabilities are known to demonstrate difficulties in the ability to produce and comprehend oral narratives (Roth & Spekman, 1986; Snyder & Downey, 1991). However, the nature of the relationship between oral narrative ability and reading comprehension performance in children with reading disability is not clear. The experiments reported in this thesis aim to address this issue. The following questions are asked: 1) Do deficits in oral narrative ability contribute to reading comprehension difficulties? and 2) What is the likely direction of the relationship between aspects of oral narrative ability and reading comprehension performance in children with reading disabilities?

Fourteen children (aged between 6;4 and 7;8 at the initial assessment) with mixed reading disability (MRD: i.e., children who demonstrate both word recognition and listening comprehension deficits) participated in the study. Their oral narrative skills were compared to those of their chronological age-matched peers with typical development (TD) and their reading-age-matched peers with typical development (RMTD). The study consisted of three phases: 1) A longitudinal phase in which the children's oral narrative performance was assessed on three occasions over a two-year period; 2) An intervention phase (using a nonequivalent pretest-posttest control group design) in which 10 children participated in an oral narrative intervention program that focused on enhancing children's story structure knowledge; and 3) A follow-up assessment phase conducted eight months post-intervention. Oral narratives were elicited in a personal narrative context and in a story retelling context. Oral narrative production ability was analysed at macrostructure (story quality) and

microstructure (morpho-syntax and vocabulary) levels. Oral narrative comprehension was assessed in a fictional story context through questions relating to story structure elements. Reading comprehension performance was assessed using a standardised test of reading ability.

The results from the longitudinal study showed that the children with MRD demonstrated inferior oral narrative production and oral narrative comprehension performance compared to their peers with typical reading development at each assessment occasion. When comparing the poor readers' performance to the RMTD group at the third assessment trial, the results suggested that the children with MRD demonstrated a specific deficit in oral narrative comprehension. In contrast, a pattern of delay was observed on the microstructure measures of oral narrative performance. The results from the intervention indicated significant treatment effects ($p < .05$) with large effect sizes for oral narrative comprehension performance. Despite this improvement in oral narrative comprehension, there was little change in oral narrative production ability, and transfer to reading comprehension was not evident. Although the follow-up assessment indicated sustained improvement in oral narrative comprehension for the children with MRD, accelerated reading comprehension progress was not evident. The findings from the longitudinal case study highlighted the benefits of oral narrative intervention for a child considered at high risk of continuing academic difficulties.

This thesis provides evidence of the persistent oral narrative difficulties in children with MRD. The findings also provide support for the importance of narrative structure knowledge to these poor readers' oral narrative comprehension performance. The results demonstrate that oral narrative comprehension ability explains only a small amount of the variance in reading comprehension performance. Rather, the persistent word recognition difficulties of the children with MRD exert the biggest influence on their reading

comprehension performance. These results are discussed in terms of current models of reading and language development. Implications for clinical practice are also addressed.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
ABSTRACT	iv
TABLE OF CONTENTS	vii
LIST OF TABLES	xiv
LIST OF FIGURES	xvi
PUBLICATIONS ARISING FROM THIS THESIS	xviii
CHAPTER 1	1
LITERATURE REVIEW	1
1. Introduction	1
1.1 Defining reading disorder	2
1.2 Defining oral narrative ability	6
1.2.1 Personal narratives	6
1.2.2 Fictional story re/telling	9
1.3 The relationship between spoken and written language	11
1.3.1 A model of spoken and written language comprehension	12
1.3.2 The role of vocabulary knowledge	14
1.3.3 Metacognitive skills	16
1.4 Theoretical models of reading comprehension	17
1.4.1 The simple view of reading – A reading component model	17
1.4.2 Constructionist models of reading comprehension	19
1.4.3 Dynamic text comprehension	20
1.4.4 Summary of reading comprehension models	21
1.5 The role of working memory in language processing	22
1.6 Oral narrative development	25

1.6.1	<i>Narrative development and theory of mind</i>	26
1.6.2	<i>Cognitive models of narrative production and comprehension</i>	27
1.6.3	<i>Oral narrative production development</i>	28
1.7	Assessment of oral narrative ability	33
1.7.1	<i>Elicitation procedures</i>	34
1.7.2	<i>Oral narrative analysis</i>	36
1.8	Measuring reading comprehension performance	41
1.9	Defining the relationship between oral narrative ability and reading comprehension	43
1.10	Oral narrative ability in children with reading disabilities	46
1.11	Causality	48
1.11.1	<i>Longitudinal correlational studies</i>	48
1.11.2	<i>Reading-age matched studies</i>	51
1.11.3	<i>Intervention studies</i>	52
1.12	Summary and thesis aims	55
CHAPTER 2	58	
A LONGITUDINAL INVESTIGATION OF ORAL NARRATIVE ABILITY IN CHILDREN WITH MIXED READING DISABILITY	58	
2.	Introduction	58
2.1	Method	59
2.1.1	<i>Participants</i>	59
2.1.2	<i>Materials and procedure</i>	65
2.1.3	<i>Transcription and analysis</i>	71
2.1.4	<i>Reliability</i>	72
2.2	Results	73

2.3	Discussion.....	85
2.4	Summary.....	89
CHAPTER 3	90	
A READING-AGE-MATCH COMPARISON OF THE ORAL NARRATIVE SKILLS OF CHILDREN WITH MIXED READING DISABILITY	90	
3.	Introduction.....	90
3.1	Method	92
3.1.1	Participants.....	92
3.1.2	Materials and procedure	95
3.1.3	Transcription and analysis	95
3.1.4	Reliability.....	95
3.2	Results	95
3.3	Discussion.....	99
3.4	Summary.....	103
CHAPTER 4	104	
GRAMMATICAL COMPETENCE MEASURES OBTAINED IN PERSONAL NARRATIVE VERSUS STORY-RETELLING CONDITIONS	104	
4.	Introduction.....	104
4.1	Method	106
4.1.1	Materials and procedure	106
4.1.2	Analysis.....	107
4.2	Results	107
4.3	Discussion.....	113
4.4	Clinical implications	114

CHAPTER 5	116
THE EFFECTIVENESS OF ORAL NARRATIVE INTERVENTION FOR CHILDREN WITH MIXED READING DISABILITY.....	116
5. Introduction	116
5.1 Method	118
5.1.1 <i>Participants</i>	118
5.1.2 <i>Research design</i>	121
5.1.3 <i>Assessment measures</i>	122
5.1.4 <i>Transcription and analysis</i>	124
5.1.5 <i>Intervention</i>	125
5.1.6 <i>Assessment reliability</i>	128
5.1.7 <i>Treatment fidelity</i>	129
5.2 Results	129
5.2.1 <i>Treatment effects on oral narrative performance</i>	130
5.2.2 <i>Treatment effects on reading comprehension performance</i>	142
5.2.3 <i>Summary of findings</i>	142
5.3 Discussion	144
5.4 Limitations	147
5.5 Conclusions	147
CHAPTER 6	149
A FOLLOW-UP STUDY EXAMINING THE EFFICACY OF ORAL NARRATIVE INTERVENTION FOR CHILDREN WITH MIXED READING DISABILITY	149
6. Introduction	149
6.1 Method	151
6.1.1 <i>Participants</i>	151

6.1.2 Materials and procedure	151
6.1.3 Transcription and analysis	153
6.1.4 Transcript reliability	154
6.2 Results	154
6.2.1 Oral narrative comprehension.....	154
6.2.2 Oral narrative production	155
6.2.3 Reading ability.....	160
6.3 Discussion.....	163
6.4 Conclusions.....	165
CHAPTER 7	167
A DEVELOPMENTAL CASE STUDY OF A CHILD WITH MIXED READING DISABILITY	
7. Introduction.....	167
7.1 Case history	168
7.2 Methods and procedure.....	173
7.3 Results	174
7.3.1 Statistical analysis	174
7.3.2 Oral narrative comprehension.....	175
7.3.3 Oral narrative production	177
7.3.4 Reading ability.....	187
7.4 Discussion.....	188
7.5 Conclusions.....	191
CHAPTER 8	192
GENERAL DISCUSSION	
8. Introduction.....	192

8.1	Overview of methodology	193
8.1.1	<i>Longitudinal study</i>	193
8.1.2	<i>Reading-age match study</i>	193
8.1.3	<i>Intervention study</i>	194
8.1.4	<i>Longitudinal case study</i>	194
8.2	The oral narrative abilities of children with mixed reading disability	194
8.2.1	<i>The ability to comprehend an oral narrative</i>	195
8.2.2	<i>The ability to produce a high quality oral narrative</i>	196
8.2.3	<i>Performance on microstructure measures of oral narrative ability</i>	197
8.2.4	<i>Oral narrative deficit or delay?</i>	198
8.3	The relationship between aspects of oral narrative ability and reading comprehension performance over time	199
8.4	Oral narrative intervention for children with MRD	201
8.4.1	<i>Treatment effects on oral narrative comprehension</i>	201
8.4.2	<i>Treatment effects on oral narrative production (story quality)</i>	203
8.4.3	<i>Treatment effects on the microstructure measures of oral narrative production</i>	205
8.5	Treatment effects on reading comprehension performance	206
8.6	Summary of findings.....	209
8.7	Implications for speech-language therapists	209
8.8	Limitations of the present research.....	211
8.9	Directions for future research.....	213
8.10	Conclusions.....	214
	REFERENCES	216

APPENDIX A: Personal narrative language sampling protocols and photo-prompts	234
APPENDIX B: Fictional stories used in the story retelling condition	246
APPENDIX C: Oral narrative comprehension questions and scoring procedures	264
APPENDIX D: Story quality rubrics	275
APPENDIX E: An overview of the oral narrative intervention programme	287
APPENDIX F: Oral narrative intervention treatment plans	289
APPENDIX G: Oral narrative intervention progress tracking sheets.....	303
APPENDIX H: Story books used in the oral narrative intervention programme	306
APPENDIX I: Examples of intervention materials	307

LIST OF TABLES

Table 1. Two examples of personal narratives related by children with typical development.....	7
Table 2. Sally's retelling of a fictional story called "Ana gets lost", at age 6;10.....	9
Table 3. An overview of oral narrative assessment tasks	41
Table 4. Individual performance of the children with mixed reading disability at A1.....	64
Table 5. Group performance on the selection measures	65
Table 6. Group performance on the microstructure measures derived from the personal narrative samples.....	75
Table 7. Group performance on the story quality rubric	76
Table 8. Group performance on the oral narrative comprehension task.....	77
Table 9. Correlations between oral narrative measures and reading comprehension performance at each assessment time	80
Table 10. Stepwise multiple regression analyses of oral narrative performance as related to reading comprehension performance at A1, A2, and A3.....	83
Table 11. Stepwise multiple regression analyses of A1 and A2 oral narrative predictors of reading comprehension at A3	84
Table 12. Group characteristics on the reading measures at A3	94
Table 13. Group performance on the microstructure measures of oral narrative ability	98
Table 14. Group performance on the oral narrative comprehension and story quality measures.....	99
Table 15. Modality comparisons, averaged across groups, at three assessment times.....	110
Table 16. Group performance on the grammatical competence measures in the personal narrative and story retell conditions at three assessment times.....	111

Table 17. Individual reading performance of the participants with mixed reading disability at the pre- and post-intervention assessments	120
Table 18. Nonequivalent pretest-posttest control group design.....	122
Table 19. The story grammar elements in the fictional story “The Three Little Pigs”	126
Table 20. Intervention group assessment results on the oral narrative production and oral narrative comprehension measures.....	131
Table 21. Group results on the oral narrative comprehension tasks	138
Table 22. Group results on the oral narrative production measures	140
Table 23. Longitudinal research design with one intervention phase and two follow-up assessments	153
Table 24. Group results on the oral narrative comprehension and the story quality measure	156
Table 25. Group results on the microstructure measures of oral narrative ability.....	158
Table 26. Assessment data for Danielle at the initial assessment (A1)	170
Table 27. Danielle’s performance on spoken language measures (derived in the personal narrative task) compared to a database of transcripts from New Zealand children with typical development.....	172
Table 28. Danielle’s performance on the individual characteristics of the story quality rubric at all six assessment times	179
Table 29. “A Boy, a Dog and a Frog”, produced by Danielle at A3	180
Table 30. “One Frog too Many” produced by Danielle at A4 (immediately post-intervention).....	181
Table 31. Danielle’s performance on the microstructure measures of oral narrative ability derived in the story retelling task pre- and post-intervention	184
Table 32. Danielle’s performance on the NARA pre- and post-intervention	187

LIST OF FIGURES

Figure 1. Group performance on the NARA reading comprehension task at each assessment trial	79
Figure 2. Group performance on the grammatical accuracy measure in personal narrative and story retelling conditions.....	113
Figure 3. Treatment effects on the oral narrative comprehension measures for both intervention groups: a) the oral narrative comprehension task, b) the oral narrative comprehension probe.....	132
Figure 4. Intervention group performance on the verbal fluency measure, pre- and post-intervention	133
Figure 5. Treatment effects on the macrostructure measure of oral narrative production.....	134
Figure 6. Intervention group performance on the nonword reading task	135
Figure 7. Group performance on the oral narrative ability tasks on four occasions; a) Oral narrative comprehension performance in percent questions correct; and b) Oral narrative production performance.....	141
Figure 8. Reading comprehension performance of the children with MRD and their peers with typical development on four assessment occasions.	143
Figure 9. Group performance on the oral narrative comprehension measure, prior to the children with MRD receiving the intervention (A3), immediately post-intervention (A5), and eight months post-intervention (A6).	159
Figure 10. Group performance on the oral narrative production measure over time.	160
Figure 11. Group performance in reading comprehension at all six assessment times.	162

Figure 12. Group performance on the nonword reading measure at all six assessment times.....	163
Figure 13. Danielle's performance (pre- and post-intervention) on the oral narrative comprehension measure.....	176
Figure 14. Danielle's performance on the story quality measure, pre- and post-intervention.....	177
Figure 15. Danielle's performance on the semantic diversity measure (number of different words) compared to her peers with typical development at each assessment time.....	185
Figure 16. Danielle's performance on the grammatical complexity measure compared to her peers with typical development at each assessment time.....	186

PUBLICATIONS ARISING FROM THIS THESIS

PEER-REVIEWED PUBLICATIONS

- Westerveld, M. F., & Gillon, G. T. (in press). Oral narrative intervention for children with mixed reading disability. *Child Language Teaching & Therapy*.
- Westerveld, M. F., Gillon, G. T., & Moran, C. (2006). Narrative intervention for children who are poor readers. In C. Heine & L. Brown (Eds.), *Proceedings of the 2006 Speech Pathology Australia National Conference, Frontiers* (pp. 66-71). Melbourne: Speech Pathology Australia.
- Westerveld, M. F., Gillon, G. T., & Moran, C. (in press). A longitudinal investigation of oral narrative skills in children with mixed reading disability. *Advances in Speech Language Pathology*.

CONFERENCE PRESENTATIONS

- Westerveld, M., & Gillon, G. (2003). Narrative skills of New Zealand children with SLI. *The ASHA leader*, 8(15), 163.
- Westerveld, M., & Gillon, G. (2004). *Oral narrative skills of young school-age children with spoken language impairment*. Paper presented at the 26th World Congress of the International Association of Logopedics and Phoniatrics, Brisbane, Queensland, Australia.
- Westerveld, M. F., & Gillon, G. T. (2005). *Story retelling skills of children with spoken and written language impairment*. Paper presented at the Canterbury Conference on Communication Disorders, April 7 - 9, Christchurch, New Zealand.
- Westerveld, M. F., Gillon, G. T., & Miller, J. F. (2006). Morpho-syntactic language measures obtained in personal narrative versus story-retelling conditions. In *Proceedings of the*

ASHA Convention 2006 (pp. 88-89). Miami Beach, FL: American Speech-Language-Hearing Association.

Westerveld, M. F., Gillon, G. T., & Moran, C. (2006). Effects of narrative intervention on poor readers' oral narrative abilities. In *Proceedings of the ASHA Convention 2006* (p. 88). Miami Beach, FL: American Speech-Language-Hearing Association.

CHAPTER 1

LITERATURE REVIEW

1. Introduction

The ability to understand and produce discourse is critical to children's successful academic achievement and social-emotional well-being (Hughes, McGillivray, & Schmidek, 1997). School-age children are expected to understand the discourse structure of their teachers' explanations and instructions, share personal experiences, and listen to, interpret, and retell stories, amidst a variety of other such academic tasks that rely on discourse (Milosky, 1987; Ministry of Education, 1994). More particularly, deficits in oral narrative ability restrict children's social interactions with their peers (Asher & Gazelle, 1999; Hemphill & Siperstein, 1990) and adversely affect the relationship with their teachers (Reed & Spicer, 2003). Furthermore, there are close links between the ability to understand and produce well-structured oral narratives and reading comprehension performance (Feagans & Short, 1984; Oakhill, Cain, & Yuill, 1998). In general, children with reading disabilities are known to demonstrate difficulties in both the ability to produce and comprehend oral narratives (Roth & Spekman, 1986; Snyder & Downey, 1991), but the nature of the relationship between oral narrative ability and reading comprehension is not clear (Cain, 2003). Therefore, the relationship between oral narrative ability and reading comprehension is investigated in this thesis in a subgroup of children with specific reading disability. More specifically, the following questions are addressed: 1) Do deficits in oral narrative ability relate to reading comprehension difficulties? and 2) What is the likely direction of the relationship between aspects of oral narrative ability and reading comprehension performance in children with reading disabilities?

To begin addressing these questions, it is necessary to:

1. define reading disorders and associated terminology,
2. define oral narrative ability,
3. review the relationship between spoken and written language development,
4. define reading comprehension,
5. examine oral narrative development, and
6. understand the theoretical basis for a relationship between oral narrative ability and reading comprehension performance,

The next sections of this chapter will examine each of these areas in turn.

1.1 Defining reading disorder

A variety of terms have been used to label reading difficulties in children, such as dyslexia (e.g., Westby, 2002), specific reading disability (e.g., Vellutino, Fletcher, Snowling, & Scanlon, 2004), language learning disability (e.g., Scott & Windsor, 2000), and learning disability (e.g., Roth & Spekman, 1986). Traditionally, specific reading disability and dyslexia have been used interchangeably and have been defined by exclusionary criteria. This definition described dyslexia as a child's significant difficulty in learning to read in the absence of sensory, intellectual, socio-emotional and neurological impairment, despite conventional reading instruction (see Catts & Kamhi, 2005a). Numerous limitations of this definition were apparent, including the lack of details about the characteristics of the disorder. Although an acceptable definition is still being debated in the literature (see also Paul, 2007), a more inclusionary definition of dyslexia has recently been adopted by the International Dyslexia Association:

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, & Shaywitz, 2003).

Although this definition provides more clarity surrounding dyslexia than previous definitions, it does not relate to children who may have other types of reading disabilities. As Catts and Kamhi (2005b) explained “many poor readers have language impairments that go well beyond phonological processing and include difficulties in vocabulary, grammar, and text-level processing” (p.66). It is this overlap between reading impairment and spoken language impairment that has contributed to the confusion as to how to describe children with reading difficulties (Bishop & Snowling, 2004; Catts, Adlof, Hogan, & Weismer, 2005; McArthur, Hogben, Edwards, Heath, & Mengler, 2000). For example, McArthur et al. found that a large percentage of children could be equally classified as having specific reading disability or specific language impairment. The use of more consistent operational definitions of reading and/or language disabilities would not only improve the validity of research conducted in these areas but also provide direction for identification, assessment, and intervention practices (Catts & Kamhi, 2005b; Walsh, 2005).

A recent classification system, proposed by Catts and Kamhi (2005a), may provide a theory-driven option to subgroup school-age children with reading difficulties, based on both their spoken language profiles and their reading abilities (referred to as the reading component model, Aaron, Joshi, & Williams, 1999). This distinction is based on the *simple view of reading* (Gough & Tunmer, 1986), which considers reading comprehension the product of word recognition (i.e., recognising printed words) and listening comprehension (i.e., the difficulty in answering questions in response to an orally presented text, Hoover &

Gough, 1990). This approach to poor reading classification is to distinguish between poor readers on the basis of their strengths and weaknesses in word recognition and listening comprehension (e.g., Catts, Hogan, & Fey, 2003). According to this model, three main subgroups of children with specific reading disorder can be identified:

1. children who have difficulties in word recognition alone (often referred to as dyslexia or specific poor decoders, Catts, Adlof, & Ellis-Weismer 2006) ,
2. children who have difficulties in listening comprehension but not in word recognition (referred to as having a specific comprehension deficit), and
3. children with a mixed reading disability who have deficits in both word recognition and listening comprehension.

Catts et al. (2003) used this classification system and found that from a cohort of 183 second-grade poor readers, the two most common subgroups of poor readers were dyslexia and mixed reading disability, with each subgroup accounting for approximately 35%. The former group of children have been the focus of much research. Phonological processing deficits are known to be the main causal factors to word recognition impairment and subsequent reading comprehension deficits in children with dyslexia (e.g., Vellutino et al., 2004). In addition, children with dyslexia may have weaknesses in semantic and morpho-syntactic aspects of spoken language that contribute to their word recognition difficulties (see Gillon, 2004). Although the spoken language skills of children with dyslexia have been well described, less is known about the spoken language profiles of children with mixed reading disability. Given the association of poor listening comprehension to reading comprehension deficits, investigating the development of spoken language in this group becomes critical. Insights into the spoken language weaknesses that contribute to the reading comprehension deficits in children with mixed reading disability will add to our existing knowledge regarding the spoken language-bases of reading disability. The experiments described in this

thesis, therefore, focus on children who presented with a mixed reading disability in the early school years. In reviewing existing research literature, distinctions will be made between children with spoken language and/or reading disorder. When this distinction is not clear, however, and in line with current definitions (ASHA Ad Hoc Committee on Service Delivery in the Schools, 1993), the term language disorder will refer to children with spoken and/or written language difficulties.

Historically, age-equivalent scores were employed in the diagnosis of reading disability with the degree of reading deficit being measured in terms of the gap between “reading-age equivalent” and chronological age (see Bishop, 1997). The disadvantage of using age-equivalent scores is that they do not include a measure of normal variation, and no decision regarding the significance of the reading deficit can be made. For that reason, age-equivalent scores have now largely been replaced by standard scores (i.e., the child’s performance compared to that of children from the same population). The cut-off score used to define reading disorder remains controversial, however. For example, McArthur et al. (2000) classified children as reading impaired if they scored 1 standard deviation (SD) below the mean on the accuracy subtest of the Neale Analysis of Reading Ability-Revised (NARA, Neale, 1988). Catts et al. (2003) adopted more stringent measures. Children were identified as poor readers if they performed at least 1SD below the mean on a composite reading comprehension score (based on three different reading comprehension tests). In contrast, Stanovich and Siegel used the 25th percentile as a cut-off score to identify poor readers (1994). Paul (2007), however, suggested that rather than using a cut-off standard score alone, a child’s deficit in language must be sufficiently large to be noticed by parents and teachers and affect how the child functions socially or academically (p.4). Therefore, in this thesis, a combined approach to classifying children as “disordered” has been adopted. That is, 1) children have been identified by their teachers as performing significantly below their peers

on curriculum based reading assessments (affecting their academic achievement), and 2) the teachers' reports are confirmed by below average performance (using norm-referenced scores) on a standardised reading test.

1.2 Defining oral narrative ability

Narrative is one type of discourse and is variously defined. Some researchers consider there is a family of narratives that includes personal narratives, recounts, and fictional story telling (Hedberg & Westby, 1993; Hughes et al., 1997). For example Engel (1995) defines a narrative as “an account of experience or events that are temporally sequenced and convey some meaning”. Others argue that these forms of discourse are different genres because they have different social purposes, and different syntactic and semantic realisations (e.g., Young et al., 1997). In this thesis, personal narratives and fictional story retellings are used and are considered narratives as described by Engel. The New Zealand English curriculum requires children to show satisfactory abilities in these types of oral narratives (Ministry of Education, 1994). It states that 1) children should converse and talk about events and personal experiences in a group, and 2) students should listen to texts and recall and respond to the main ideas in a well structured, imaginative way.

1.2.1 Personal narratives

Personal narratives are one of the most spontaneous and earliest developing forms of extended discourse (Preece, 1987) and are accounts of specific events that have been experienced by the speaker (Hudson & Shapiro, 1991). Personal narratives are often based on a memory of one particular experience but may also include more general (background) information. Personal narratives are reported in the past tense using personal pronouns. Although they are sequenced chronologically, personal narratives are often organised around a *high point*; the information the speaker is most interested in sharing (McCabe & Rollins, 1994). Two examples of personal narratives produced by children with typical development

are provided in Table 1. Example 1 illustrates Sally's experiences with the dental nurse. She focuses on the time when she got an injection by providing a detailed description and informing the listener that it didn't hurt, even though there was blood and "yucky bits". Example 2 is a personal narrative related by William in response to the question if he's ever broken anything. In contrast to Sally, William provides a very factual account of the time he hurt his knee and had to go to the sickbay.

Table 1. Two examples of personal narratives related by children with typical development

Visiting the dental nurse by Sally, aged 6;10

- C I've been to the dental nurse a lot of times.
- C so I've had sore teeth.
- C and I had to go to the dental nurse to get this tooth out.
- E right, ok.
- C and I've had a filling.
- E uhuh.
- C and I've had a injection with my teeth.
- C (and it's like you get) yesit's like a needle.
- E yes.
- C but it x in your teeth.
- E uhuh.
- C but it didn't really hurt me.
- C it just stinged a little bit.
- E yes.
- C hurt a little bit.

- C (but when it) it felt when you just a little prickle in my mouth.
- E oh ok and then?
- C (uhm I) the dental nurse washed my mouth out with water.
- E uhuh.
- C so the blood got away.
- E yes.
- C the yucky bits.
- C (and then I put then the dental nurse put this special thing) it was on aschool day .
- E uhuh.
- C and then the dental nurse put a (sp*) special thing (uhm) where the injection was.
- C and I went back to school.
- E right ok.
- C I think it was in the afternoon.
- C yes afternoon after maths.

Playground accident. Personal narrative by William, aged 7;2

- E Have you ever broken anything?
- C yes over here {shows me}.
- C when I was running (I) I滑了.
- C and then I scraped my knee on the concrete.
- E ok and then?
- C and then I had to go to the sickbay.
- E uhuh.
- C (and uhm miss) and then I had to put a plaster then put a (uhm) icepack on it.

- E right.
- C I stayed there for a few minutes.
- E hm ok.
- E and then?
- C then I had to go back in class.
- E ok.

Note. E = Examiner; C = Child; x = unintelligible word/segment. Reformulations and dysfluencies are placed in parentheses. Braces {} are used to mark contextual descriptions. An asterisk (*) is used to indicate that the speaker has failed to complete a word.

1.2.2 *Fictional story re/telling*

The generation or retelling of a fictional story is a less spontaneous type of oral narrative and considered more difficult for children to produce than personal narratives (Hadley, 1998). An example of a fictional narrative produced by a child with typical development is presented in Table 2. Fictional narratives generally evolve around a plot, or a problem, that requires solving. In addition, many fictional stories represent another level of meaning that goes beyond the plot. This is referred to as the theme, or the lesson, that can be learnt from a story (Williams, 2002).

Table 2. Sally's retelling of a fictional story called "Ana gets lost", at age 6;10

- C (uhm:05) it was (uh) early Saturday morning.
- C and Ana's mum and dad went fishing out on the beach.
- C :06 Tom uhm :06 uhm :07>
- C Tom her big brother :10 was reading a book about sports.
- E uhuh.

- C Ana wanted (to) someone to play with.
- C she said do you want to play with me Tom.
- C no I am too busy reading this sportsbook.
- C Ana got bored.
- C and while Tom was sleeping she quietly crept out the door and started to look for her mum and dad.
- C she kepted on walking.
- C and it sooned get very dark.
- C she stopped near a dairy.
- C and she started to cry.
- C then she felt a pat on her back.
- C Ana turned around and saw a policeman.
- C hello you must be Ana.
- C yes.
- C (uhm :11) Ana got into the police car.
- C the police drove her back home.
- C her parents were happy to make sure she's safe.

Note. C = Child; E = Examiner; A colon (:) indicates a pause, followed by the length of the pause in seconds; A greater than sign (>) indicates an unfinished sentence. Reformulations and dysfluencies are placed in parentheses.

Personal narratives and story retellings, like all forms of discourse, provide the opportunity of sampling different aspects of language than the more traditional standardised tests with their focus on language abilities at word- and sentence-level. They enable clinicians

to sample discourse; that is “the ability to generate extended language, unified within and between sentences by structure, content and purpose” (Young et al., 1997, p. 116). This means that children’s ability to create coherence is also investigated. In this thesis, Cain’s (2003) description of coherence was adopted which refers to the oral narrative’s structural coherence, i.e., how the events and parts of a story are interrelated and sequenced in a meaningful way.

1.3 The relationship between spoken and written language

It is now widely accepted that reading is a language-based skill (Kamhi & Catts, 2005). The fundamental relationship between spoken language and written language is thought to be reciprocal: “Young children use their oral language skills to learn to read, while older children use their reading ability to further their language learning – they read to learn” (Westby, 2005, p.157). Apart from similarities between spoken and written language, there are clearly differences between these two language systems. Spoken language is the most natural form of communication, requiring less effort and attentional resources than written language (Kamhi & Catts, 2005; Paul, 2007; Westby, 2005). Grammar and vocabulary differences also exist between spoken and written language. Written language contains more advanced grammatical structures and utilises different types of words, referred to as the *literate* lexicon (Nippold, 1998).

Phonological processing ability is critical to the reading process (Gillon, 2004). Deficits in (aspects) of phonological processing abilities are thought to underlie most word recognition deficits in children with reading disabilities. Phonological processing refers to the use of phonological information (the sound structure of language) to process written and spoken language. Three types of phonological processing have been found to be particularly important for reading acquisition: 1) phonological awareness, 2) phonological memory – coding phonological information in working memory, and 3) rapid naming – retrieving

information from long-term memory. Although it goes beyond the scope of this thesis to provide a detailed overview of phonological awareness skills and theories of word recognition, phonological memory and its relationship to reading comprehension will be discussed in more detail in the section on working memory.

1.3.1 A model of spoken and written language comprehension

Kamhi and Catts (2005) described a useful basic model for comparing the processes and knowledge involved in spoken and written language comprehension. To understand spoken or written language, three conceptual stages occur:

Stage 1: At the perceptual analysis stage, different sensory systems are used (i.e., visual for print versus auditory for speech). Features of spoken and written words (e.g., phonetic and orthographic information) are analysed through low-level perceptual processes, such as detection and discrimination, and higher level processes, such as identification. These analyses assist in activating concepts in the mental lexicon, resulting in word recognition.

Stage 2: At the word recognition stage, the words that were seen or heard in the perceptual analysis stage activate previously stored concepts in the mental lexicon. The lexicon contains one's vocabulary and not only stores conceptual information about the word (i.e., word meanings and associations) but also includes information on the word's phonological or visual representations. In addition, the mental lexicon includes semantic and syntactic information related to parts of words, or sentences. There is general agreement that the mental lexicon is the same for spoken and written language (see also Altmann, 2001). In spoken words, however, the only way of accessing the word's meaning is by activating the word's phonological representation. When reading, the word's meaning can be activated through either phonological representations or through visual representations of the written word.

Stage 3: Discourse-level processes. Different types of knowledge (and their interaction), including structural, propositional, and world knowledge are used to comprehend units beyond the word-level (i.e., at sentence- and text-levels). For example, syntactic and morphological knowledge play an important role in sentence comprehension, whereas propositional knowledge is thought to be required for remembering the general idea of what is heard or read. A proposition is an *idea-unit* in a sentence which relies on semantic knowledge of the relationship between words. General world knowledge about specific events and interpersonal relations is then needed to construct a mental model of the situation described in discourse, or text, to assist comprehension. One major difference between spoken and written language is that spoken language comprehension requires the analysis of utterances into smaller phonological units. However, as Kamhi and Catts (2005) explain, this analysis is generally performed automatically and does not require the conscious attention of the listener.

The similarities between spoken and written language thus arise from shared underlying cognitive processes. Vocabulary knowledge is clearly of critical importance to both spoken and written language comprehension (Biemiller, 2003; National Reading Panel, 2000; Paul, 2007). Furthermore, to understand and produce written and spoken language at text-level (i.e., narratives), discourse-level processes such as structural, propositional, and world knowledge are utilised (e.g., Kintsch, 1988). Metacognitive awareness (the ability to reflect on and manage one's thinking processes) also plays an important role in the development of spoken and written language (Paul, 2007; Westby, 2005).

The following sections will provide more detail on each of these cognitive processes (i.e., vocabulary knowledge, metacognitive awareness, and discourse-level processes). The section on discourse-level processes has been integrated into an overview of theoretical models of reading comprehension. This will not only enhance our understanding of the

relationship between oral narrative comprehension ability and reading comprehension, it will also reveal how deficits in one or all of these cognitive processes may affect oral narrative ability and/or reading comprehension in children with reading disability.

1.3.2 The role of vocabulary knowledge

Vocabulary knowledge (i.e., vocabulary size and/or speed of access to vocabulary) is of critical importance to reading comprehension (Biemiller, 2003; National Reading Panel, 2000). Some research supports a direct causal link between vocabulary knowledge and reading comprehension. For example, intervention studies have shown that training in word meanings improves comprehension and recall of texts containing the trained novel words (Stahl & Fairbanks, 1986). However, adequate vocabulary knowledge in itself is not sufficient to ensure comprehension of written and/or spoken text. In addition, limited vocabulary knowledge does not always lead to reading comprehension difficulties. For that reason, a reciprocal relationship between vocabulary knowledge and reading comprehension has been hypothesised (Sternberg & Powell, 1983, cited in Nippold, 2002), in which the ability to acquire new information from context is the underlying variable that contributes to both vocabulary knowledge and reading comprehension. This ability to learn new vocabulary from context is influenced by working memory capacity, however. For example, children with limited working memory processing capacity may find it more difficult to acquire new words from context if the information is spaced throughout the passage (Cain, Lemmon, & Oakhill, 2004).

Cain, Lemmon et al. (2004) investigated the relationship between working memory capacity, vocabulary knowledge, and reading comprehension, by studying the ability to acquire new vocabulary from context in three groups of 9- to 10-year-old children: 1) skilled readers, 2) less skilled comprehenders (i.e., showing a specific reading comprehension weakness in the absence of word recognition difficulties) matched to the skilled readers for

vocabulary knowledge, and 3) children with poor reading comprehension skills and weak vocabulary skills relative to groups 1 and 2. The results showed that there were no group differences for memory for literal and factual content of a text. However, the groups of children with reading comprehension weakness demonstrated poor working memory skills, relative to their peers with typical reading skills. In addition, both groups of children with specific reading comprehension difficulties were poor at inferring new vocabulary from context. The less skilled comprehenders, who also showed weak vocabulary knowledge, had additional difficulties setting up a representation between a new word and its meaning, as evidenced by their requirement to need more exposures to novel words to acquire the meaning of those words. The results from Cain, Lemmon et al.'s study thus suggest that children with specific reading comprehension weakness demonstrate difficulties deriving new vocabulary from context when the processing demands exceed their working memory capacity.

From a developmental viewpoint, vocabulary knowledge in preschoolers with typical development predicts reading comprehension performance in grades 1 and 2 (Roth, Speece, & Cooper, 2002). During the preschool years, it is thought that children acquire new vocabulary through their interactions with caregivers and teachers, who highlight new vocabulary and explain the meanings of new words during conversations and shared book readings. Once children learn to read independently, the ability to acquire new information from written context becomes more important. Written language contains more complex and abstract vocabulary that may not be encountered in spoken contexts (Catts & Kamhi, 2005c). A reciprocal relationship has been proposed between reading development and vocabulary development: "Early success in reading enhances vocabulary growth and self esteem, which in turn leads to more reading, increases knowledge of word meanings, and therefore leads to improved reading" (Stanovich, 1986, p. 381). In support of this theory, exposure to print was

found to predict growth in receptive vocabulary in primary school-age children over a 2-year-period (Echols, 1996).

Recent research suggests, however, that vocabulary knowledge in preschool children is only one aspect of spoken language ability deemed important to the reading process. (NICHD, 2005). Researchers associated with the National Institute of Child and Human Development (NICHD) used a comprehensive battery of spoken language measures to assess the predictive importance of vocabulary as well as broader spoken language skills, to both word recognition and reading comprehension ability. Broader language skills were defined as spoken language processing abilities in the areas of vocabulary, syntax, and morphology. Broader language ability was based on a child's performance on one of two standardised broad spectrum spoken language tests. More than 1000 children were first seen when they were three years old, and re-assessed on two occasions, until they reached third grade. Although vocabulary and broader spoken language skills were highly correlated, it was found that broader spoken language skills made a unique contribution to the prediction of reading comprehension ability. These results suggest that although vocabulary knowledge is critical to reading comprehension, other spoken language skills (in the areas of syntax, morphology, and semantics) also make an important contribution to both word decoding and reading comprehension. In summary, the results from the NICHD study emphasise the importance of fully evaluating the spoken language profiles of children with reading disabilities.

1.3.3 Metacognitive skills

As children mature, they develop an awareness of the cognitive processes required for spoken and written language comprehension. By the age of five, most children with typical development learn to recognise and control their own thought processes (i.e., metacognition). For example, in a classroom setting, children are expected to monitor their own comprehension of the teacher's spoken directions and explanations (Paul, 2007). Two

metacognitive processes are particularly important to reading comprehension: 1) the ability to recognise when written text is not understood, and 2) the ability to consciously use comprehension strategies when text comprehension fails (Nicholson, 1998). Text comprehension strategies include re-reading part of a story and summarising what has been read. Research indicates that skilled readers consistently use metacognitive skills for text comprehension, whereas children with reading disabilities demonstrate less awareness and use of these strategies (see Westby, 2005). From a clinical perspective, these results suggest that intervention aimed at enhancing reading comprehension in children with reading disabilities should incorporate activities to foster metacognitive awareness.

1.4 Theoretical models of reading comprehension

The ultimate goal of reading is undoubtedly to understand what has been read. Although the ability to decode what is written is crucial to reading comprehension, there are clearly other processes involved in assigning meaning to written texts. These processes include, but are not limited to, comprehension skills at word- and sentence-level, general world knowledge, appreciation for text structure, motivation and interest, and metacognitive abilities (Torgesen, 2000). Many theoretical models of reading comprehension have been put forward. These include relatively simple models, such as the simple view of reading (Gough & Tunmer, 1986), to the more elaborate landscape model of reading (Rapp & van den Broek, 2005). An understanding of these models will offer a theoretical framework for the relationship between aspects of oral narrative ability and the ability to comprehend written language.

1.4.1 The simple view of reading – A reading component model

This basic model of reading comprehension proposes that skilled reading is the product of two independent components, namely decoding and linguistic comprehension

(Gough & Tunmer, 1986; Hoover & Gough, 1990). More recent research has added weight to this simple view of reading and the important role linguistic comprehension plays in the development of reading comprehension (Catts, Hogan, & Adlof, 2005; Catts et al., 2003; Joshi, Williams, & Wood, 1998). The independent contributions of decoding and linguistic comprehension to reading comprehension change during the course of reading development. In the early stages, decoding and linguistic comprehension are unrelated, and although both skills are associated with reading comprehension, decoding shows the strongest correlation. Consistent with a limited capacity working memory processing model, it seems likely that the slow and/or inaccurate word decoding of beginning readers utilises much of the available processing resources with little remaining for text comprehension. In later stages of reading development this pattern changes. The strength of the relationship between decoding and linguistic comprehension increases, and by eighth grade, linguistic comprehension is the dominant factor contributing to reading comprehension (Catts, Hogan et al., 2005).

Gough and Tunmer defined linguistic comprehension as “the process by which given lexical (i.e., word) information, sentences and discourses are interpreted” (Gough & Tunmer, 1986, p.7). There is general agreement that a wide range of broad-based spoken language skills at word-, sentence-, and text-level feeds into linguistic comprehension, such as semantics, morpho-syntax, and discourse. For example, Catts et al. (2003) used a combination of receptive language measures of vocabulary, grammar, and narration to assess listening comprehension skills, in an effort to group poor readers on the basis of the reading component model of listening comprehension and word recognition ability. This view is supported by numerous studies that have found broader spoken language skills to play a predictive role in reading comprehension (e.g., Bishop & Adams, 1990; Catts, Fey, Tomblin, & Zhang, 2002; NICHD, 2005; Storch & Whitehurst, 2002). As a result of these findings and using the two-component-model of reading as a framework for assessment and treatment of

spoken language difficulties in children with reading disorder, Roberts & Scott (2006) advocated a full assessment of spoken language across language domains (i.e., semantics, morpho-syntax, phonology, and discourse) and modalities.

What this simple view of reading model does not explain (nor purports to explain) is the complex cognitive activity that is involved in comprehending linguistic information, whether in spoken or in written format. In contrast to this simple view of reading, the theories in reading comprehension described below have focussed on the development of models that capture the representation of a text in memory, including the cognitive processes that help to create such a representation.

1.4.2 Constructionist models of reading comprehension

From the viewpoint of a constructionist theory, readers build multilevel representations of the text during the reading comprehension process (Kintsch, 1988). These levels include the text base (i.e., the micro- and macrostructure) and a more global level, which has been referred to as the situation model or the mental model. Inherent to this theory is the importance general knowledge plays in constructing these representations. This includes specific knowledge about words, concepts (vocabulary), syntax, and text structures, as well as more general world knowledge. Realising that this original model was too rigid, Kintsch posited that it was not sufficient to create mental representations of a text at several levels, but that an integration phase was needed to form a coherent whole (the integrated text base).

Using Kintsch' (1988) constructionist theory as a basis, Graesser, Singer, and Trabasso (1994) attempted to explain how the reader constructs knowledge-based inferences during narrative text comprehension (i.e., the constructionist inference generation model). These knowledge-based inferences are needed to build meaning representations of a text and rely on activation of background knowledge structures in long-term memory. Foundational to

this constructionist theory is the *search after meaning* principle in which the reader is actively involved in the reading comprehension process. This principle is based on three important assumptions: 1) the reader goal assumption - the reader constructs a meaning representation that is based on the reader's goal, 2) the coherence assumption - the reader tries to construct a meaning representation that is coherent at local and global levels, and 3) the explanation assumption - the reader tries to explain why actions, events, and states are mentioned in the text. These knowledge-based inferences that are created by the reader can be divided into three classes: (a) the goal of the character/s that motivates actions in a text, (b) causal antecedents, and (c) global thematic inferences. Knowledge-based inferences are created when background knowledge structures that are relevant to a particular text are activated. For example, knowledge of the typical structure of a text (e.g., schemata for fictional narratives or fairytales) or memories of particular personal experiences may be tapped.

Graesser et al.'s (1994) constructionist theory of reading comprehension is particularly well suited to narrative texts. Narrative texts typically involve goal-directed behaviour of the character/s and describe events that often have clear causes and effects. In addition, many narrative texts evolve around a theme which may, or may not, involve a moral lesson. According to constructionist theories, skilled readers use their linguistic knowledge at word- and sentence-level combined with text-structure knowledge to create mental models of a text. It is hypothesised that these mental models facilitate understanding of the read material. In addition, the importance of general world knowledge (also described as content knowledge or domain knowledge) is acknowledged, and the active role the reader plays in the comprehension process is emphasised.

1.4.3 Dynamic text comprehension

Dynamic text comprehension is a more recent model of reading comprehension which focuses on "multiple factors and their interactions during reading" (Rapp & van den Broek,

2005, p.276). This model arose from the notion that reading is a very complex cognitive activity that comprises many different components. It aims to combine the constructionist theory, described above, with a memory-based model. It is hypothesised that with each word, phrase, or concept the reader processes, other related words and concepts in memory are automatically activated (see O'Brien, Rizzella, Albrecht, & Halleran, 1998). Dynamic text comprehension regards these theoretical models as complementary (not contradictory) given that they describe different aspects of the reading process. One particular dynamic text comprehension model is the landscape model, which suggests that a reader proceeds through the text in cycles, with each cycle corresponding to a clause or sentence. At each cycle, different concepts are activated depending on the current text input, the information left over from the previous cycle, the memory representation for the text that has been constructed so far, and the reader's prior knowledge. These fluctuations then result in a "landscape" of activations (Rapp & van den Broek, 2005, p.277), the patterns of which are partly determined by a range of reader- and text- characteristics, such as working memory capacity, background knowledge, text structure, and the reader's goals and strategies. A disadvantage of dynamic text models is that they are conceptually very difficult to understand and, therefore, at a practical level do not offer more theoretical support than the aforementioned constructionist models.

1.4.4 Summary of reading comprehension models

These reading comprehension theories share the view that reading for meaning is an active process in which the reader constructs a mental model that is based on integrating textual information with the reader's background knowledge. Textual information refers to the reader's ability to decode the words, whereas background knowledge comprises vocabulary, morpho-syntactic knowledge, text structure knowledge, and more general world knowledge.

Other factors that may influence reading comprehension performance relate to a child's metacognitive skills (the ability to recognise and remediate reading comprehension failure), and his motivation or interest in reading. One central issue to the process of discourse comprehension, however, is the way information (e.g., world knowledge or story structure knowledge) is stored in, and retrieved from long-term memory and temporarily held for processing in working memory. In addition, reading comprehension is managed within a limited capacity working memory model which explains why children with limited decoding ability often struggle comprehending written text, despite having access to an adequate knowledge base. Working memory and its importance to oral narrative and reading comprehension performance is discussed in more detail in the following section.

1.5 The role of working memory in language processing

Working memory is concerned with the temporary storage and manipulation of information that is required for a wide range of cognitive tasks, such as problem solving activities or comprehension of text. The most recent theoretical model put forward by Baddeley and colleagues (see Baddeley, 2003, for a review) concerns a multi-component model of working memory (WM). It is proposed that the *central executive* is a limited-capacity management system that provides the connection with information stored in long-term memory (LTM). The central executive is supported by three processing systems: 1) a phonological loop - which stores verbal information using a phonological code, 2) a visuo-spatial sketch-pad - which holds visual information, and 3) an *episodic buffer* - in which "chunked" information from LTM is temporarily stored.

The phonological loop supports the central executive by using a phonological code to store verbal information. The phonological loop system is considered important in vocabulary acquisition and in comprehension and production of long complex sentences. It is hypothesised that an efficient phonological loop system allows for "adult" models of

language to be stored as linguistic patterns in LTM (see Adams & Gathercole, 2000). These stored representations are then available to support expressive language skills. Consistent with this hypothesis, differences in phonological memory abilities in 4- and 5-year-old children with typically developing skills have been associated with differences in oral narrative production skills (Adams & Gathercole, 1996). Adams and Gathercole found significant correlations between children's performance on a nonword repetition task and their ability to use longer sentences, containing more information when retelling a fictional story (the Bus Story, Renfrew, 1969).

The visuo-spatial sketch pad is similar to the phonological loop but temporarily holds visual information rather than phonological information. It may be involved in the visual aspects of reading tasks by facilitating accurate eye-movements when reading text (Baddeley, 2003).

The episodic buffer. The function of the episodic buffer is considered twofold. In LTM, it integrates information from visual and verbal representations into multidimensional representations. Second, it temporarily stores chunks of information from LTM that cannot be stored in either the phonological loop system or the visuo-spatial sketch pad. The main difference between the episodic buffer and the central executive is that the first is considered a storage system, whereas the central executive is responsible for controlling the memory processes.

Working memory capacity is related to discourse comprehension skills, such as the memory for facts and the inference of word meanings from context (see Cain, Oakhill, & Bryant, 2004), and has been shown to be a strong predictor of discourse processing ability (Baddeley, 2003). It remains unclear, however, if deficits in working memory underlie poor comprehension and production of oral narratives. Recent studies have highlighted the contribution of pre-existing content-relevant knowledge (residing in LTM) to the

comprehension and memory of spoken and written texts (e.g., Hambrick & Engle, 2002). Hambrick and Engle found that the participants' knowledge of the game of baseball significantly facilitated their performance on memory tasks following exposure to a tape-recorded narration of a baseball match (accounting for 54.9% of the variance). Working memory span accounted for additional significant variation in task performance, however, and enhanced the participants' performance on the narrative memory tasks. These results suggested a bi-directional relationship between working memory capacity and content knowledge in LTM.

Working memory (WM) can be assessed by evaluating 1) WM storage - tasks that evaluate the amount of information that can be stored (e.g., immediate recall of digits), or 2) WM capacity - tasks that require both storage and manipulation of information in WM (e.g., asking questions about a novel story the children have been exposed to). Although WM storage does not seem to be related to reading comprehension, a strong relationship exists between WM capacity and reading comprehension performance (Cain, Oakhill et al., 2004). Some researchers argued that, as these WM tasks utilised verbal information, it was impossible to determine if the important correlation of WM to reading comprehension was mediated by verbal / semantic ability (Nation, Adams, Bowyer-Crane, & Snowling, 1999). A longitudinal study conducted by Cain, Oakhill et al. (2004) provided some useful insights. A total of 102 children with typical reading ability were assessed at three time-points, approximately one year apart, on measures of reading ability, vocabulary and verbal skills, working memory, and component skills of comprehension (i.e., inference making, comprehension monitoring, and story structure knowledge). WM capacity was assessed in two tasks: one measuring processing and storage of digits, and one measuring processing and storage of sentences. The results from this study showed not only that the performance on these two tasks was very highly correlated but also that the performance on both these tasks

relied on verbally mediated WM resources. Hierarchical multiple regression analyses further indicated that WM capacity (using sentences) explained unique variance in the reading comprehension performance of 8- to 11-year-olds, over and above the children's other verbal skills. However, performance on component skills of comprehension was not fully mediated by WM capacity and added unique variance to reading comprehension. On the basis of these findings, it seems pertinent to take working memory capacity in children with reading disabilities into account when investigating the relationship between reading comprehension performance and oral narrative ability.

Within a limited capacity processing model, it is acknowledged that there is a restricted amount of cognitive resources (working memory space) available to perform processing tasks. This means that if the cognitive demands for one task are high, less resources will be available for other cognitive operations, resulting in either breakdown or a decrease in complexity. From a psycholinguistic perspective, linguistic processes can be divided into syntax, phonology, semantics, and a discourse level of organisation (Crystal, 1987). For example, even though a child's syntactic performance in conversation may be adequate, when asked to provide an oral narrative his or her sentence structure may show deficits. Within a limited capacity processing model, it is assumed that the complexity of the discourse task (i.e., producing a coherent narrative) may exceed the available processing resources, resulting in a decrease in complexity in productive syntax.

1.6 Oral narrative development

The ability to comprehend and produce oral narratives requires knowledge and skills in several of the areas described in previous sections (i.e., vocabulary, morpho-syntax, text-structure, and world knowledge). To understand more clearly how aspects of oral narrative ability relate to reading comprehension, an overview of theoretical models of oral narrative development is warranted.

Oral narrative development has received much attention from a wide variety of disciplines, including cognitive psychology, neuroscience, linguistics, and speech and language therapy (e.g., Bruner, 1985; Mar, 2004; Miller, 2006; Peterson & McCabe, 1983). This interest stems from the fact that oral narratives (personal narratives and fictional stories) are used extensively for human communication and can affect the way we perceive the world (e.g., Marsh & Fazio, 2006). Theoretical models of narrative development often do not distinguish between production and comprehension of narratives, implying shared underlying cognitive processes. The most common theories relating to narrative development are summarised below.

1.6.1 Narrative development and theory of mind

From a cognitive psychology perspective, oral narrative development can be viewed within the broader context of theory of mind (“an understanding of mental states – such as belief, desire, and knowledge - that enables us to explain and predict others’ behaviour,” Miller, 2006, p.142). Without theory of mind, it would be difficult to communicate effectively. For example, in the personal narrative described in Table 1, it can be argued that Sally assumes the listener has knowledge about going to the dentist - has been to the dental nurse herself and knows that dental procedures may hurt. It is believed that theory of mind develops over time, starting with *joint attention* (the ability to coordinate attention with a communication partner) in infancy. During childhood, children learn to understand that different people have different opinions and feelings that may influence their behaviour. This development of theory of mind is considered important in how children construct representations of reality (or mental representations of the world). Language development and the development of theory of mind are interconnected and based on early communication development (e.g., joint attention) and exposure to family-talk about feelings and cause-and-

effect. By the age of three, theory of mind is often reflected in children's spoken language production through the use of mental state verbs (such as *think* and *believe*).

Understanding and production of fictional narratives in particular require a certain level of development in theory of mind, which is usually acquired around four years of age (see Mar, 2004). To fully understand a plot-driven story requires the listener to assume the perspective of the character and recognise the problem, goals, plan, and mental states the character may be in. Although theory of mind itself is difficult to assess, Miller (2006) suggested using spontaneous language sampling to determine if a child includes mental state verbs. Miller also recommended using a false-belief task. False belief pertains to the ability to understand that another person may have a belief that is different to reality. Research studies investigating theory-of-mind development in school-age children with communication disorders have found deficits in theory of mind in children with pragmatic deficits (autism spectrum disorder) but not in children with specific language impairment (see Miller 2006). Although it is hypothesised that an immature theory of mind may inhibit spoken language development, empirical evidence seems to be absent. Taking the results from previous research into account, it is not expected that children with reading disorders will show particular difficulty in this area. Theory of mind will, therefore, not be explicitly addressed in the current thesis.

1.6.2 Cognitive models of narrative production and comprehension

Cognitive models of narrative ability have primarily focused on comprehension, rather than production, of narratives (Mar, 2004). Mar explained that narrative production is more complex than narrative comprehension, as it not only involves the memory processes underlying successful comprehension but also entails a semantic component. From a theoretical perspective, however, a close relationship between narrative comprehension and production at the macrostructure level is hypothesised, as both these skills require: 1) the

selection of information that is important to the story, and 2) the ability to order the information in a causal and/or temporal way.

Cognitive models of narrative comprehension often pertain to written narratives rather than oral narratives. One example is the constructionist model, described previously, in which skilled readers use their linguistic knowledge at word- and sentence-level combined with text-structure knowledge to create mental models of a narrative text to facilitate their understanding. It seems plausible that this same model applies to the understanding of oral narratives. To effectively understand an oral narrative (e.g., a fictional story), the listener would automatically activate existing background knowledge structures in long-term memory while listening to the story (rather than decoding the text). A mental model of the story is then created by adding information considered relevant to the story and/or story structure.

1.6.3 Oral narrative production development

A Theoretical Framework

It is clear that oral narrative production and comprehension rely on a range of cognitive and linguistic processing abilities. To produce a well-formed oral narrative, children need to draw on semantic and morpho-syntactic skills to formulate sentences. These sentences then need to be temporally sequenced into a coherent whole. Hudson and Shapiro (1991, p.89) proposed a practical framework for studying the development of oral narrative production ability that draws from existing theories in linguistics, child development, and discourse processes and incorporates four types of knowledge and skill: 1) content knowledge comprising general event knowledge or event schemas, memories for specific episodes, and general social knowledge, 2) structural knowledge that is required to give the narrative coherence, 3) microlinguistic knowledge and skills, and 4) contextual knowledge which refers to the purpose of the oral narrative.

1. Content knowledge

To produce an oral narrative, children must have general knowledge about the event they are describing and its associated vocabulary (or content facts, see Westby, 2005). Examples of events are birthday parties, fishing trips, or dining at a restaurant. Accessibility of this event knowledge depends on the frequency of a child's exposure to a particular event.

2. Structural knowledge

Structural knowledge refers to the understanding of the underlying structure (or macrostructure) of the narrative that is required to give it coherence. "A macrostructure is a schema that represents a frequent organisational pattern of textual elements that is *independent of specific content*" (Westby, 2005, p.159). Various researchers have developed models for analysing oral narratives on the basis of narrative structure. Examples are high point analysis for analysing personal narratives (Peterson & McCabe, 1983), and *story grammar* analysis for analysing fictional narratives (e.g., Stein & Glenn, 1979). These will be described in more detail in the oral narrative analysis section.

3. Microlinguistic knowledge

Knowledge of linguistic structures and concepts (in the areas of semantics, morphology, and syntax) is also required to produce oral narratives. For example, well-formed oral narratives contain appropriate verb tenses, conjunctions to link thoughts and sentences, and semantic concepts such as mental state verbs and linguistic verbs (e.g., *think*, *remember*, *say*) (see Westby, 2005).

4. Contextual knowledge

The context or purpose of the oral narrative is known to influence its content and organisation. For example, the narrator will adapt the oral narrative to reflect the listener's knowledge of the content of the narrative (Liles, 1985; Masterson & Kamhi, 1991). To illustrate, Liles demonstrated that children with typical development and children with

language disorders (aged 7;6 – 10;6) used more sentences, with greater cohesion when retelling the story of a movie to a listener who had not seen the film (as opposed to a listener who *had* seen the film).

These four different knowledge types are thought to reside in long term memory and are activated and made available to working memory when required. Rather than viewing these types of knowledge as separate components affecting oral narrative production, and consistent with interactionist models of language development, they should be seen as interconnected. It appears likely that these interactions are mediated by a limited cognitive processing capacity model (Crystal, 1987). From a clinical perspective, this is important, as it means that weakness or strength in one area of knowledge will indirectly affect performance in another area. For example, familiarity with the event topic may result in a better sequenced oral narrative. Similarly, rapid access to a child's structural knowledge (or story grammar) of a fictional narrative may result in more advanced microlinguistic features (e.g., more complex syntax and/or literate language use).

Oral Narrative Production Development in Children with Typical Development

Using Hudson and Shapiro's (1991) framework, the development of oral narrative ability can thus be considered as four different, but interconnected knowledge types.

Content knowledge

It is hypothesised that children develop content knowledge primarily through social interactions with other people (Stein & Albro, 1996). Content knowledge can, however, also be based on the memory of another (fictional) story. Development of content knowledge is expected to be different in children from differing cultures and in children from differing socio-economic backgrounds.

Structural knowledge

Several researchers have examined the development of oral narratives in children with typical development (e.g., Applebee, 1978; Peterson & McCabe, 1983; Stein & Albro, 1996, see also Hughes et al., 1997, for a summary of developmental levels). These studies generally focused on children's ability to organise their oral narratives at a global level (the macrostructure level). Despite the vast array of methodologies employed, it is now well accepted that children begin to produce personal narratives as early as 2½ years of age. At this age, children refer to real past events, which often involve emotional memories or injuries. Between the ages of three and five, these personal narratives increase in length and complexity, with improving sequencing of events (Peterson & McCabe, 1983). Peterson and McCabe studied personal events narratives in 96 typically developing children, aged between four and nine years. It was found that by five years of age, most children could adequately sequence events. Using a high point analysis approach, the findings indicated that by six years of age children used classic narratives in which they told well-structured stories that included an introduction, a sequence of events building up to the *high point* of the narrative, and a resolution or evaluation. Consistent with the theory of mind, Stein and Albro posited that this developmental progression in oral narrative ability during the preschool years is dependent "upon the growth of knowledge about intentional action, and that young children acquire much of this knowledge through direct social interaction with other people" (p.83). This interpersonal experience allows children to both develop general goal-directed schemes as well as semantic/content knowledge required for specific situations.

A similar developmental progression is seen in children's fictional narratives during the preschool years (see Westby, 2005):

- At first, children provide descriptive unconnected sentences to relate a story depicted in a wordless picture book.

- Children then learn to relate an action sequence with some temporal sequencing (and occasionally a central theme).
- In the later preschool years, children provide a relative sequence in which they show awareness of cause-effect relationships but do not include appropriate planning (that is typical of a complete story).

Although personal narratives and fictional narratives seem to follow a similar developmental pattern, preschool children are better able to structure their personal narratives than their fictional narratives (Hudson & Shapiro, 1991; Kaderavek & Sulzby, 2000). For example, Kaderavek and Sulzby found that young preschoolers' (aged 2;4 to 4;2) oral narratives were more sophisticated in the personal narrative context than in an emergent reading context. In the personal narrative context, there was better marking of the middle and endings of the stories, which could be explained by the children's familiarity with the topic. Consistent with a theory of mind, children may also find it more difficult to assume the perspective of characters in fictional stories at this young age.

As children start school, their exposure to oral and written narratives increases in frequency. Children are required to share personal experiences with their peers, listen to the teacher's explanations of classroom materials, read simple story books, and analyse or retell more complex stories narrated by the teacher. Although by six years of age most children can relate classic personal narratives, their fictional oral narratives still lack explicit goal-based behaviours (Hudson & Shapiro, 1991). During the early school years, children learn to tell stories that contain more story grammar elements, such as problems, characters' reactions to the problems, and a consequence. By the time children are seven or eight years of age, they can relate complete stories that comprise a problem, goal, plan, attempts to solve the problem, and a resolution (Westby, 2005).

Microlinguistic knowledge

When considering oral narrative development at a microstructure level, analyses address the length of the narrative, its syntactic complexity, the semantic diversity, and/or the use of cohesive devices (Loban, 1976). Cross-sectional studies have shown clear developmental trends of increasing mean length of utterance (MLU), verbal productivity (total number of words), and lexical diversity (Leadholm & Miller, 1992; Westerveld, Gillon, & Miller, 2004), with increasing age, in children with typical development. Oral narrative discourse requires higher-level formulation and organisation skills to integrate language skills at word-, sentence-, and text-level (Hughes et al., 1997), which is reflected in the oral narrative language samples. For example, previous research has clearly shown that spoken language samples derived in an oral narrative elicitation context are syntactically more complex (containing a higher percentage of grammatical errors) than those obtained in a conversational context (e.g., MacLachlan & Chapman, 1988; Westerveld et al., 2004).

Contextual knowledge

With increasing age, children learn to adapt their oral narratives to their specific audiences. For example, four-year-old children with typical development use less complex language when talking to younger children than when talking to their parents or same-aged peers (Hudson & Shapiro, 1991).

1.7 Assessment of oral narrative ability

The four knowledge types proposed by Hudson and Shapiro (1991) provide a useful framework for studying the development of oral narrative ability. Moreover, considering how these four knowledge types may affect children's oral narrative production skills is vital when designing oral narrative assessment tasks. For example, one needs to ensure the content of the oral narrative elicitation task is familiar to all children. Similarly, the context in which the child is required to relate the oral narrative should be carefully considered (i.e., familiar

versus unfamiliar listener). Research has clearly indicated the effects of differing elicitation procedures on the length, the syntactic complexity, and the quality of the child's oral narrative language sample.

1.7.1 Elicitation procedures

Both story generation and story retelling tasks are used in the research literature to elicit oral narrative production skills. Examples of generation tasks include telling a story about a single picture (James, 1999; Ripich & Griffith, 1988), completing a story started by the examiner (Merritt & Liles, 1989), and creating a story about something that is not real (Roth & Spekman, 1986). Story retelling tasks can be described as either spontaneous (e.g., retelling a familiar story or a TV programme) or more directed. Directed tasks include story productions after movie viewings (Gummersall & Strong, 1999; Liles, 1985) and story retelling, with or without pictures, after listening to a story (with or without pictures) (Ripich & Griffith, 1988; Schneider, 1996). There are clear advantages to using a story retelling task for assessing oral narrative production abilities (Merritt & Liles, 1989). Merritt and Liles asked 20 children with specific language impairment and 20 children with typically developing language skills to either retell a fictional story or to generate a story of their own. The results revealed that retold oral narratives were longer, containing more story grammar components and complete episode structures, for both groups of children. In contrast, the generated stories were often confusing to the listener and, therefore, difficult to score.

When asking a child to retell a story, both the quality and the length of the resulting oral narrative will depend on the elicitation tasks and the sampling conditions (Masterson & Kamhi, 1991; Schneider, 1996). Factors that may influence task performance include familiarity of the information being provided by the model story, the number of exposures to the model story, the contextual support for the story (e.g., pictures), and the linguistic complexity and length of the model story. After careful evaluation of the literature,

Westerveld and Gillon (1999/2000) concluded that optimal sampling conditions for eliciting fictional oral narratives in school-age children (with and without spoken language disorders) involved:

- A listener who is unfamiliar with the story the child is retelling (Liles, 1985; Masterson & Kamhi, 1991). Research indicates that children retell longer, grammatically more complex stories, with greater cohesion to uninformed listeners.
- Two exposures to the model story (Gummersall & Strong, 1999). The results from Gummersall and Strong's study indicated that a more informative oral narrative language sample (containing more words and more complex syntactic structures) may be obtained if a child listens to a model story twice, before being asked to retell the story.
- A retell of the story without the support of pictures (Masterson & Kamhi, 1991; Schneider, 1996). For example, Masterson and Kamhi found that children's story retelling samples that were collected without the support of pictures contained more compound sentences, higher lexical accuracy, and better fluency than those obtained in a picture supported condition. However, grammatical accuracy decreased in the absence of story pictures.
- Stimulus materials that contain levels of linguistic complexity that are similar to, or more advanced than the child's own (Griffith, Ripich, & Dastoli, 1986; Holloway, 1986).

Although most research into the oral narrative language abilities of children with language and/or reading disorders has used fictional story re/tellings (e.g., Fey, Catts, Proctor-Williams, Tomblin, & Zhang, 2004; Greenhalgh & Strong, 2001), these elicitation tasks typically do not yield a sufficient number of utterances for in-depth analysis at microstructure level. To perform a reliable microstructure analysis of a child's total linguistic

abilities, it is now commonly accepted that at least 50 complete and intelligible (C&I) utterances of spontaneous language are required (Miller, 1996). Another oral narrative elicitation context that potentially yields a sufficiently large spoken language sample for this type of analysis is personal narratives (Westerveld et al., 2004). Oral narrative language samples derived in this context will, therefore, be used for the microstructure analyses in the current thesis.

Personal narratives can either be elicited in conversation or by using a more directed task (McCabe & Rollins, 1994; Miranda, McCabe, & Bliss, 1998; Peterson & McCabe, 1983; Westerveld et al., 2004). For example, Peterson and McCabe devised a procedure called the conversational map, in which the examiner uses short story prompts embedded in conversation to elicit personal narratives in 3- to 9-year-old children with typical development. Westerveld et al. (2004) adapted this procedure by using a pocket-size photo-album with a series of carefully selected photos. In this procedure, the examiner provides a short prompting narrative with each photo, followed by the question “Has anything like that ever happened to you?” To control for content knowledge, the photos depict familiar events, such as a bee sting, a doctor’s visit, and a school trip. If the child responds “no” to the examiner’s question, the child is introduced to the next photo and its accompanying prompt. This helps ensure that the children are only asked to talk about events that are meaningful to them.

1.7.2 Oral narrative analysis

Once a sample of oral narrative ability has been collected, analysis can be performed at two levels, i.e., macrostructure and microstructure. Although macro- and microstructure measures of oral narrative performance tap different underlying language skills (Liles, Duffy, Merritt, & Purcell, 1995), competence or difficulty in one area of knowledge may affect performance in another (Crystal, 1987). For example, a child’s difficulty in producing a

complex oral narrative (at macrostructure level) may result in poorer performance on microstructure measures, such as reduced verbal fluency (characterised by pauses and reformulations) or decreased grammatical complexity. To fully evaluate children's oral narrative proficiency, careful assessment of oral narrative performance at both macro- and microstructure levels is warranted.

Macrostructure Analysis

Within Hudson and Shapiro's (1991) framework, macrostructure analysis focuses on the oral narrative sample's global properties (or its overall quality). For example, how the oral narrative sample is organised, and whether it follows the typical pattern of a particular narrative genre (also known as a story grammar). Two main approaches to macrostructure analysis have been put forward: Applebee's narrative levels and episodic analysis (Applebee, 1978; Stein & Glenn, 1979; see Hughes et al., 1997, for an overview). Applebee proposed there were six narrative levels, based on the child's ability to apply a *centering strategy* (when parts of a story cluster around a central idea) and a *chaining strategy* (when events are chained in a temporal or logical order). Episodic analysis of oral narratives involves assigning a story structure level and/or examining the oral narrative to establish the presence or absence of story grammar parts (such as setting, problem, plan, attempt, resolution and ending).

Several issues arise when deciding on a scoring system to capture the quality of the oral narrative. These include reliability of scoring and (lack of) sensitivity. Poor reliability of scoring oral narratives at macrostructure level is a reason for concern and may explain why so many different scoring systems have been devised over the past two decades (e.g., Fey et al., 2004; Pearce, McCormack, & James, 2003, see also Hughes, 1997b). Lack of sensitivity may arise when the oral narrative elicitation tasks provide too much structure (Hughes et al., 1997). Although oral narratives derived in highly structured elicitation conditions may be

easier to score (and therefore promote reliability), they may fail to identify oral narrative difficulties in children with reading disorders.

Microstructure Analysis

Microstructure typically refers to the spoken language sample's linguistic properties, such as the use of cohesive devices within and between sentences, morphological markers, vocabulary, and syntactic complexity. The aim of analysing an oral narrative at microstructure level is to provide detail of strengths and weaknesses in the language domains of semantics, syntax, and morphology. To perform a reliable microstructure analysis of a child's spoken language abilities it is now commonly accepted that at least 50 complete and intelligible (C&I) utterances of spontaneous language are required (Miller, 1996). Quantitative measures of spoken language ability that have been shown to distinguish between children with spoken language impairment and children with typical language development include:

Morpho-syntactic measures: 1) grammatical complexity - the mean length of utterance in morphemes (MLU-M), and 2) grammatical accuracy (GA) - the percentage of grammatically correct utterances (Fey et al., 2004).

Semantic diversity: Several studies have indicated that the number of different words (NDW) derived from 50 C&I's is a promising quantitative indicator of expressive vocabulary (e.g., Miller, 1996; Watkins, Kelly, Harbers, & Hollis, 1995).

Oral Narrative Comprehension

Consistent with current theories of language development, common discourse level processes and knowledge underlie successful comprehension and production of oral narratives. These are content knowledge, structural knowledge, microlinguistic knowledge, and context knowledge (Hudson & Shapiro, 1991). In addition, the child needs sufficient working memory capacity to hold extended units of discourse in working memory, to infer

information not stated directly in the story, or to draw conclusions. Procedures used for assessing oral narrative comprehension include asking the child to act out action units contained in a narrative (Feagans & Short, 1984), asking the child comprehension questions following exposure to a story (and prior to retelling that story) (Norbury & Bishop, 2002; Westerveld et al., 2004), or asking comprehension questions immediately after a child has retold a story (Liles, 1987; Snyder & Downey, 1991; Wagner, Sahlen, & Nettelbladt, 1999).

To assist in differential diagnosis, it appears crucial that both oral narrative comprehension and production skills are assessed. Merritt and Liles (1989) suggested using comprehension questions following a story retelling to identify if factors, other than expressive spoken language skills, influenced the child's oral narrative production performance. The advantage to asking comprehension questions prior to the story retelling task is, however, that a more immediate measure of oral narrative comprehension is obtained (i.e., which has not been affected by a child's difficulty to store information in short-term memory and/or which has not been influenced by the child's attempt to retell the story). Norbury and Bishop (2002) investigated story comprehension abilities of 18 children with specific language impairment (aged between 6 and 10) and 18 peers with typical development. All children were asked six comprehension questions immediately after listening to a story: two literal questions and four questions that required inferencing. Children were prompted, and ultimately provided with the correct answer if their answer was incorrect. Once they had answered the questions, children were asked to retell the story to the examiner. Retold stories were scored on the total number of original propositions (idea units). Points were also awarded for each inference that was explicitly stated in the story retell. The results showed that the children with specific language impairment had more difficulty answering story comprehension questions than their typically developing peers. Furthermore, high correlations were found between story comprehension and the ability to retell the story.

afterwards. These results support a connection between story comprehension and story retelling ability, which may well be mediated by the ability to build a stable mental model of the story.

The types of questions that are used to measure oral narrative comprehension should be selected according to the type of knowledge or skill that is being assessed. For example, if the aim is to assess a child's content knowledge, questions should pertain to specific vocabulary used in the story. When story structure knowledge is under investigation, questions should relate to the underlying story structure components (i.e., setting, characters, problem, attempts, resolution, and conclusion) (e.g., Idol & Croll, 1987).

Summary of Oral Narrative Assessment Tasks

Table 3 provides an overview of assessment tasks that measure oral narrative ability across modalities (i.e., production and comprehension). Oral narrative comprehension is assessed by asking children questions following exposure to a fictional narrative, providing information about the child's knowledge of the typical structure of the story. Oral narrative production skills are assessed in two contexts, namely fictional story retelling and personal narratives. Fictional story retellings are analysed at macrostructure level to yield information about the child's ability to apply story structure knowledge when retelling a story. Personal narrative language samples are analysed at microstructure level on measures of morpho-syntax and semantic diversity.

Table 3. An overview of oral narrative assessment tasks

Oral narrative skills	Assessment Tasks	Analysis	Knowledge types	Measures
Oral narrative comprehension	Story comprehension		Structural knowledge	No. of questions correct
Oral narrative production	Story retelling	Macrostructure	Structural knowledge	Story quality
	Personal narratives	Microstructure	Microlinguistic knowledge	Expressive vocabulary Morpho-syntax

1.8 Measuring reading comprehension performance

Children's reading comprehension performance can be assessed using a wide range of reading measures. Frequently used tests of reading comprehension rely on different underlying processes, however (Bowyer-Crane & Snowling, 2005; Cutting & Scarborough, 2006). The type of reading comprehension assessment that is used to investigate the relationship between aspects of spoken language skills and reading comprehension ability may, therefore, potentially influence the results. The main issues affecting the construct validity of reading comprehension assessments are the test format and passage dependency.

The most commonly used test formats to measure reading comprehension ability are cloze tests and question-and-answer tests. An example of a test utilising a cloze task is the Passage Comprehension subtest from the Woodcock Reading Mastery Tests - Revised (WRMT-R, Woodcock, 1998), in which the child is required to silently read one or two sentences (the first 30 items), or a passage (the remaining 38 items), and identify a missing key word. In contrast, the comprehension score derived from the Gray Oral Reading Tests-

4th edition (GORT-4, Wiederholt & Bryant, 2001) is based on the child's ability to answer multiple choice questions which are read out by the examiner, after the child has read aloud a short passage. The comprehension measures derived from question and answer tests following passage reading have been found to be more closely associated with spoken language skills than those derived from cloze tasks (see Cutting & Scarborough, 2006), suggesting cloze tasks may be more demanding of word recognition skills.

Question-and-answer tests can be divided into multiple choice tasks and open-ended-question tasks. For example, the GORT-4 uses multiple choice questions following the reading of a passage, whereas the Neale Analysis of Reading Ability (NARA, Neale, 1999) requires the child to answer a set of open-ended questions about a passage, immediately after the child has read the passage out loud. Keenan & Betjemann (2006) conducted a study to investigate if the multiple choice format that is used by the GORT-4 would be passage dependent. Passage dependent (PD) questions can only be answered correctly by using information from the passage, whereas passage independent (PI) questions can also be answered without reading the text. A total of 77 undergraduate students in Education participated in a passageless administration of the GORT-4. The results indicated that 86% of the questions used in the GORT-4 were answered correctly more than 25% of the time (i.e., above chance level). No significant correlations were found between performance on the PI items and other spoken language comprehension test measures, and performance on the PI items was not sensitive to reading disability (as identified by word recognition difficulties). Keenan and Betjemann concluded that performance on the reading comprehension measure of the GORT-4 yields information about the child's previous general world knowledge, rather than the child's ability to derive meaning from a written text.

Nation and Snowling (1997) also investigated whether different reading comprehension tests tap different underlying skills. A total of 184 children, attending year 3

and year 4 of primary school, participated in the study. All children were assessed on an older British version of the NARA (Neale, 1988) and on the Suffolk Reading Scale (Hagley, 1987, cited in Nation & Snowling, 1997). The Suffolk Reading Scale is a group-administered reading test, which uses a multiple choice sentence-completion format. There is a test time-limit of 20 minutes, and the children are encouraged to spend the maximum time allowed. The results showed that the reading comprehension measure derived from the NARA was dependent on both word recognition and listening comprehension ability. In contrast, performance on the Suffolk Reading Scale was mostly dependent on word recognition ability (as measured by single word reading). These results indicate that the NARA is more sensitive in detecting reading comprehension difficulties that stem from listening comprehension weaknesses.

The choice of reading comprehension assessment in research practice is thus considered critical and should be consistent with the theoretical model that is under investigation (Cutting & Scarborough, 2006). This thesis adopts the simple view of reading (Gough & Tunmer, 1986) (which considers reading comprehension performance the product of word recognition and listening comprehension) as a theoretical model for classifying children with reading disability. To correctly identify children with a mixed reading disability, the reading comprehension assessment tool that is used to select the participants should, therefore, be sensitive to both word recognition and listening comprehension weaknesses (Nation & Snowling, 1997). The NARA (Neale, 1999) is known to fulfil this requirement and is used in this thesis.

1.9 Defining the relationship between oral narrative ability and reading comprehension

Constructionist theories of reading comprehension provide a useful theoretical framework for linking aspects of oral narrative ability to reading comprehension

performance. To adequately understand a (spoken or written) narrative, linguistic knowledge at word-, sentence-, and text-level, combined with background schema knowledge (narrative structure knowledge) and general world knowledge are used to create a mental model of the situation described in the narrative (or story). Narrative structure knowledge supports the formation of this mental model by providing a way to organise and relate the events in a story, which then aids comprehension and memory of the story (see Bishop, 1997). Consistent with this theory, knowledge about narrative structure has been found to be positively related to reading comprehension performance. Cain, Oakhill et al. (2004) conducted a three-year longitudinal study of 102 children, aged between 8 and 11 years, which addressed the relative contribution of WM, verbal ability (vocabulary and verbal intelligence), and component skills (inference skills, comprehension monitoring, and narrative structure knowledge) to reading comprehension performance. Narrative structure knowledge was assessed by asking the children to re-arrange sentences to make up short stories and by assessing the children's understanding of story titles. The results from Cain et al.'s study indicated that narrative structure knowledge related significantly to reading comprehension performance, even after other verbal skills were taken into account.

Mental models of stories in memory not only aid the comprehension of written and spoken narratives (or stories) but also support story retelling ability. A stable mental model provides the child with ready access to the required content and with a structural framework for retelling the story. The child then needs to utilise expressive morpho-syntactic skills at word-, sentence-, and text-level to formulate the story. It is acknowledged, however, that the creation of mental models is managed within a limited capacity working memory model. For example, in a storytelling condition, ready access to narrative structure knowledge in long term-memory would allow sufficient working memory capacity to attend to micro-linguistic features of the narrative, such as novel words or complex sentence structures.

It is now proposed that analysis of oral narrative ability may be used to obtain important information about a child's spoken language abilities that are deemed important to the reading comprehension process (see also Table 3 for an overview):

- Analysis of oral narrative comprehension ability will not only determine the relative contribution made by listening comprehension to the reading comprehension process, it will also provide insights into the child's ability to identify important narrative structure elements.
- Analysis of oral narrative production ability at microstructure level will potentially provide an overview of the child's strengths and weaknesses in the spoken language domains of semantics, syntax, and morphology.
- Macrostructure analysis of oral narrative production ability will provide insight into the child's ability to apply story structure knowledge to produce a coherent narrative that contains all the important story grammar elements.

Several issues remain unclear, however. Although weaknesses in spoken language (morpho-syntactic skills and semantics), narrative structure knowledge, and/or general world knowledge will inhibit the formation of an adequate mental model required for narrative comprehension, the relative contributions of these skills to spoken and/or written narrative comprehension are not apparent. Second, it is also not conclusive whether relative strength in one area (e.g., story structure knowledge) may compensate for weakness in another area (e.g., semantic skills). Finally, it seems plausible that successful reading experience enhances children's story structure knowledge, facilitates creations of mental models in memory, and thus improves reading comprehension. The current thesis aims to address these issues by investigating the nature of the relationship between oral narrative ability and reading comprehension performance in children with reading disability.

The assessment tasks and analyses that are used in this thesis will highlight children's strengths and weaknesses in aspects of oral narrative ability that are deemed important for reading comprehension, i.e., narrative structure knowledge and microlinguistic knowledge. The assessment tasks will also take children's existing content knowledge into consideration. The content and vocabulary of the fictional stories is thought to be familiar to young school-age children, whereas the children can select which topics to respond to (i.e., that are meaningful to them) in the personal narrative condition. The following section provides an overview of existing research into the oral narrative skills of children with reading disability.

1.10 Oral narrative ability in children with reading disabilities

There is ample evidence that children with reading disability demonstrate difficulties in oral narrative production ability compared to their peers with typical development. At microstructure level, children with reading disability use fewer words (Feagans & Short, 1984), and include fewer of the original propositions (Feagans & Short, 1984; Roth & Spekman, 1986; Snyder & Downey, 1991) when retelling a story, compared to age-matched skilled readers. At macrostructure level, the story retelling samples of children with reading disability contain fewer story structure components than those of their peers with typical development (Roth & Spekman, 1986). Similarly, children with specific reading comprehension difficulties (who demonstrate age appropriate decoding skills) produce structurally less coherent stories than their peers with typically developing reading comprehension skills (Cain, 2003).

Few studies have addressed oral narrative *comprehension* performance in children with reading disabilities (Catts et al., 2006; Feagans & Short, 1984; Snyder & Downey, 1991). This is surprising, given the number of shared underlying cognitive processes involved in spoken and written language comprehension (Catts & Kamhi, 2005c). In general, results from these studies show impaired performance on oral narrative comprehension tasks in

children with specific reading disability, compared to their peers with typical reading development. Catts et al. recently investigated the nature of the listening comprehension deficits in children with specific reading comprehension difficulties (who demonstrated age-appropriate word recognition skills). Listening comprehension was measured by 1) the listening comprehension score from two age-appropriate passages of a standardised reading test, and 2) an experimental measure of oral narrative comprehension, in which the children listened to three separate stories. After each story, the examiner asked the children eight questions; four questions pertained to information that was contained within the same sentence (*near-condition*); four questions were based on information separated by four or more sentences (*distant-condition*). The performance of the children with specific reading comprehension deficits was compared to the performance of 1) children with specific decoding deficits (or dyslexia), and 2) children with typical reading skills.

The results from the Catts et al. (2006) study indicated significant group differences on the ability to answer questions; The children with specific comprehension deficits scored significantly worse than both the children with poor decoding ability and the children with typical reading skills. In addition, the children with specific reading comprehension difficulties showed particular difficulty in answering questions in the distant condition. Although these results confirm specific listening comprehension difficulties in children with specific reading comprehension deficits, the cause of these difficulties is not clear. Catts et al. hypothesised that these listening difficulties could be evidence of working memory deficits.

It is not known if these difficulties in oral narrative production and comprehension skills in children with reading disabilities persist throughout the early school years, however. Prospective longitudinal studies into the changes in oral narrative ability as children progress through the early school years have mainly focused on children with spoken language disorders (Fey et al., 2004; Manhardt & Rescorla, 2002; Paul, Hernandez, Taylor, & Johnson,

1996). The children in Paul et al.'s study, who had a history of slow language development, seemed to outgrow their oral narrative difficulties by the time they reached second grade. In contrast, Fey et al.'s results indicated continued difficulties in oral narrative production performance (at both microstructure and macrostructure levels) in children with specific language impairment as they proceeded from second to fourth grade. Although the children studied in Fey et al. and Paul et al.'s research may be considered at risk for reading difficulties, given early language delay or spoken language impairment (Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998), the participants' reading development was not specifically examined. Thus, how the children's strengths or weakness in oral narrative ability over time related to their reading performance is not known.

1.11 Causality

To advance our understanding of the relationship between oral narrative ability and reading comprehension, issues of causality need to be addressed. This will help establish whether underlying deficits in oral narrative ability contribute to reading comprehension difficulties, or whether reading comprehension impairment restrains oral narrative development. Wagner and Torgesen (1987) proposed two main approaches to investigating causal relations: longitudinal correlational studies and experimental training studies. In addition, reading-age matched studies have been used to examine the issue of causality (Bradley & Bryant, 1978).

1.11.1 *Longitudinal correlational studies*

Snyder and Downey (1991) used a cross-sectional age comparison design to investigate the possibly changing relationship between spoken language skills (including oral narrative ability) and reading comprehension performance in groups of children with differing reading profiles. The performance of 93 children with specific reading disability

(aged between 8 and 14 years) was compared to that of 93 children with typical development. The results indicated significant differences between the two groups of children on oral narrative production (number of ideas recalled in a story retelling task) and oral narrative comprehension (ability to answer questions about fictional stories) measures. The older children within each group performed significantly better on the story retelling task than the younger children, but there was no significant effect for age on the story comprehension task. Multiple regression analyses, however, indicated that the oral narrative retell measure accounted for significant variance in the reading comprehension scores of all the typically developing children, but not for the children with reading disability. Rather, performance on the oral narrative comprehension task accounted for significant variance in the reading comprehension performance of the older children with reading disability. The results from Snyder and Downey's study not only suggest persistent oral narrative difficulties in children with specific reading disability, but also indicate a markedly different relationship between oral narrative ability and reading comprehension performance for children with specific reading disability compared to their typically developing peers.

Further evidence of the differing influence of reading profiles on the relationship between oral narrative ability and reading comprehension performance was obtained from a longitudinal study by Feagans and Short (1984). In this study, the oral narrative comprehension and production abilities of 28 children with specific reading disability were compared to those of 28 peers with typical development, over a 3-year period. It was found that the children with reading disability demonstrated persistent difficulty retelling a script-like oral narrative compared to their peers with typical development. Correlational analyses indicated moderate relationships between oral narrative measures and reading achievement for the children with specific reading disability but not for the children with typical development. The participants in both Snyder and Downey's and Feagans and Short's studies

were selected on the basis of their reading achievement, however, and their spoken language profiles were not reported. It is, therefore, not clear if the findings of these studies, pertaining to a broad group of children with specific reading disability, can be extended to a more specific group of children with a mixed reading disability, who may show a different spoken language profile.

The influence of differing spoken language profiles on reading comprehension over time has been highlighted, in recent years, by longitudinal studies into the relationship between spoken language ability and reading comprehension (Catts et al., 2002; Roth et al., 2002). Catts et al. explored this relationship by examining reading outcomes in 302 children who were identified with spoken language impairment in kindergarten. Children were classified as good or poor readers in second and fourth grades based on their performance on a reading comprehension composite score (i.e., combined scores from three different reading comprehension tests). The results indicated stable, mild to moderate concurrent correlations between spoken language measures (i.e., receptive and expressive vocabulary, grammar, and oral narrative measures) and reading comprehension in second and fourth grades. However, stepwise multiple regression analyses established that word recognition was the best predictor of reading comprehension achievement, with kindergarten grammar ability being the only language measure to account for any unique variance in fourth grade reading comprehension performance (6.5% of the variance).

In contrast to Catt's et al.'s (2002) findings, the results from Roth et al.'s (2002) investigation revealed unique predictive power of oral narrative production and/or comprehension to reading comprehension achievement. In this study, 39 children with typical language skills were assessed in kindergarten, grade one, and grade two, on measures of spoken language (structural language, metalinguistic skill, and narrative) and reading. Oral narrative ability was measured in a fictional story context in two modalities: comprehension

and production (analysed for number of propositions and episodes). Regression analyses showed that after reading related skills in kindergarten (i.e., print awareness) had been entered into the regression analysis, semantic abilities in kindergarten were most predictive of first and second grade reading comprehension. Oral narrative production (episode analysis) in kindergarten accounted for unique variance in reading comprehension performance in grade one ($R^2 = 0.6$), whereas oral narrative comprehension in kindergarten accounted for unique variance in reading comprehension in grade two ($R^2 = 0.5$). The most likely explanation for these differences in findings between the two studies relates to the differing spoken language profiles of the participants (see also Snyder & Downey, 1991).

Further research into the possibly changing relationship between aspects of oral narrative ability and reading comprehension performance in children with specific reading disability is clearly required. The longitudinal study reported in Chapter 2 of this thesis aims to address this issue.

1.11.2 Reading-age matched studies

Another important issue regarding the relationship between reading performance and oral narrative ability concerns the amount of reading exposure of the participants. Poor readers are likely to read much less frequently than good readers (Stanovich, 1986). Reduced exposure to written material may, in turn, inhibit spoken language development in the areas of semantics and morpho-syntax and restrict the development of story structure knowledge. It is possible that the oral narrative difficulties exhibited by older poor readers (e.g., Roth & Spekman, 1986) are a reflection of their more limited exposure to text or the lack of opportunities to comprehend more complex text. Alternatively, underlying spoken language weaknesses in children with specific reading disability may contribute to their reading comprehension difficulties by restricting their ability to use semantic and/or syntactic context for both word recognition and reading comprehension (Nation & Snowling, 2004).

Cain and Oakhill (1996) examined story structure knowledge in children with reading disability by using an oral narrative production task. Three groups of children participated in this study: 1) 16 children, aged 7 and 8, with specific reading comprehension difficulties, 2) a control group of 12 children labelled as “skilled” readers (matched for age, reading accuracy and sight vocabulary), and 3) a control group of fifteen 6- to 7-year-old children (matched for reading comprehension performance). All children were asked to generate oral narratives using topic prompts (e.g., the farm or the circus) and picture sequences (containing six pictures with a story title). Group comparisons revealed that the children with specific reading comprehension difficulties told significantly less well-structured oral narratives (which lacked cohesion and showed poor sequencing of events) compared to both the age-matched and the younger reading comprehension age-matched groups. Cain and Oakhill argued that it seemed unlikely that the older children with reading disability had had less exposure to reading materials than the on average two-year younger group of children with typically developing reading skills. It was, therefore, hypothesised that the poor story structure knowledge demonstrated by the children with specific comprehension difficulties was likely to be one of the causes of poor reading comprehension skill (p. 200). To control for the possible effects of reading experience, the present study compares the oral narrative performance of the group of children with a mixed reading disability to that of a group of younger children with typical development who are matched to the poor readers on reading comprehension ability (see Chapter 3).

1.11.3 Intervention studies

Experimental or training studies can also be used to investigate the causal connections between oral narrative ability and reading comprehension. If oral narrative ability and reading comprehension are causally related, then an improvement in (aspects of) oral narrative ability should result in improved reading comprehension performance. Few studies have

investigated whether specific interventions, focused at improving oral narrative abilities, are effective for children with reading disorders, and whether better understanding of the structure of oral narratives may facilitate improvement in producing and comprehending both spoken and written stories.

Narrative intervention studies for children with reading difficulties have generally focused on the effects of narrative structure intervention on children's reading comprehension performance (Fitzgerald & Spiegel, 1983; Griffey, Zigmond, & Leinhardt, 1988). This is consistent with the mental model theory, discussed previously, in which it is thought that skilled readers activate background schema knowledge (or story grammar) when reading narrative texts. This knowledge of the typical structure of a story assists not only in understanding but also in remembering, and reconstructing, stories. It is, therefore, expected that enhancing story structure knowledge will not only result in improved performance in comprehension of oral and written narratives, but also enhance children's ability to tell a well-structured oral narrative (or story).

Research investigating the effectiveness of story structure intervention in primary school-age children with learning disabilities has generally focused on treatment outcomes for reading comprehension (see Gersten, Fuchs, Williams, & Baker, 2001, for a review). Although most studies investigated older children (i.e., grade 8 and high school students), Gersten et al. concluded that, in general, intervention that targeted story structure components (i.e., characters, setting, problem, plan, attempts, resolution and conclusion) resulted in improved reading comprehension for children with learning disabilities. However, intervention outcomes relating to oral narrative comprehension and production ability were either not investigated or less conclusive.

Only one previous intervention study appears to have placed specific emphasis on improving oral narrative performance in primary school-age children with reading difficulties

(Klecan-Aker, Flahive, & Fleming, 1997). In this study, 15 students, aged between 6;2 to 8;9, who demonstrated specific learning disabilities (i.e., a gap of 1SD between IQ and achievement), participated in the intervention. Using a pretest-posttest control group design, eight students were randomly assigned to receive the treatment, which consisted of three 30-minute sessions over a 12-week period. Treatment focused on improving story telling ability through instruction in narrative structure. That is, children were introduced to story grammar components and shown how to use these components to create oral narratives (using a picture card as a prompt). The results indicated that, compared to the control group, the children who received the treatment created more complex stories (containing more story grammar components) following intervention. However, no consistent treatment effects were noticed on microstructure measures of oral narrative performance, such as the number of utterances contained in the oral narratives. Furthermore, transfer from improved story structure knowledge to measures of oral narrative comprehension and/or reading comprehension was not evaluated. Unfortunately, the selection procedures used for the participants in Klecan-Aker et al.'s study and the lack of detail on the individual children's reading and spoken language performance prior to the intervention make it difficult to identify the nature of their reading disorder. It is thus not clear if the results from Klecan-Aker et al.'s intervention study can be generalised to children with specific reading disability.

It is also not known if the improvements made by the participants in Klecan-Aker et al.'s (1997) study were sustained over time. Evidence to indicate that oral narrative intervention has long-term benefits in enhancing oral narrative ability is required to fully evaluate the effectiveness of oral narrative intervention for children with reading disability. This thesis aims to address some of the questions left unanswered by previous research. The experiments (reported in Chapters 5 and 6) will evaluate the immediate and long-term treatment effects of oral narrative intervention on oral narrative production, oral narrative

comprehension, as well as reading comprehension performance in children with specific reading disability.

1.12 Summary and thesis aims

During the early school years, children progress from learning to read to reading to learn (Paul, 2007). This process not only involves learning to decode and read words, sentences, and texts, it also requires comprehension of what is read. It has become increasingly clear that oral narrative ability plays an important role in the reading comprehension process. The relationship is complex, however, in that different aspects of oral narrative ability relate to reading comprehension in different ways. Moreover, the relationship between oral narrative ability and reading comprehension may well be reciprocal, or mediated by different variables, such as reading experience or working memory capacity.

On the basis of our current knowledge, it seems likely that oral narrative comprehension and reading comprehension share many underlying discourse-level processes, drawing from structural, propositional, and world knowledge. Furthermore, analysis of children's oral narrative production skills yields vital information about children's spoken language abilities that are deemed important to the reading comprehension process. Skilled readers use intact spoken language skills, in the domains of semantics and morpho-syntax, combined with story structure knowledge and world knowledge, to build a mental model of the situation described in a text. Analysis of oral narrative ability at microstructure level thus provides insight into a child's strengths and weaknesses in semantic and morpho-syntactic skills, whereas analysis at macrostructure level reveals a child's story structure knowledge. Once children have learned to read, it seems likely that this literacy experience fuels developmental gains in oral narrative ability, characterised by increased story structure knowledge, improved ability in producing a good quality narrative, and improved semantic

and morpho-syntactic skills. Therefore, slow reading acquisition may indeed hamper oral narrative comprehension and production development.

Despite progress in our knowledge surrounding the relationship between oral narrative ability and reading comprehension in recent years, many questions remain unanswered. The experiments reported in this thesis, therefore, aim to address the following questions:

1. How do children with mixed reading disability perform on oral narrative comprehension and production tasks compared to their peers with typical development, across a two-year-period?
2. How do difficulties in aspects of oral narrative ability relate to these children's reading comprehension difficulties?
3. Does oral narrative intervention enhance the oral narrative comprehension and production skills of children with mixed reading disability?
4. Does an improvement in oral narrative comprehension lead to improved reading comprehension performance for children with mixed reading disability?

Chapter 2 reports on a prospective longitudinal study of oral narrative development in children with mixed reading disability compared to their peers with typical development. A reading comprehension-age matched study is reported in Chapter 3, to further explore the nature of the relationship between oral narrative ability and reading comprehension performance. Chapter 4 provides additional microstructure analyses of the children's oral narrative production samples elicited in personal narrative and story retell conditions, to gain further insight into the effects of oral narrative elicitation contexts on morpho-syntactic language measures. In Chapter 5, the treatment effects of an intervention programme aimed at improving oral narrative ability are presented. Chapter 6 presents the data of a follow-up investigation, eight months post-intervention. Chapter 7 provides a longitudinal case study

detailing one of the participant's oral narrative and reading comprehension development over a 3-year period, including her response to the oral narrative intervention programme

CHAPTER 2

A LONGITUDINAL INVESTIGATION OF ORAL NARRATIVE ABILITY IN CHILDREN WITH MIXED READING DISABILITY

2. Introduction

Despite research demonstrating a relationship between aspects of oral narrative ability and reading comprehension, little is known about how young school-age children with reading disorder develop oral narrative ability, and how development in oral narrative ability is related to their reading comprehension performance over time. The study described in this chapter begins to explore this need by monitoring the development of oral narrative skills and reading comprehension ability in young school-age children who present with a mixed reading disability profile (MRD), over a two-year period. The following questions are addressed:

1. Do children with MRD exhibit difficulty in oral narrative skills compared to their peers with typical development, at three assessment trials, over a two-year period, during the early school years?
2. What is the relationship between oral narrative ability (production and comprehension) and reading comprehension performance across this two-year period?

A few longitudinal studies have addressed oral narrative ability and reading comprehension performance in children with reading disorders. These were large scale studies which did not differentiate between the different aspects of oral narrative ability that were described in Chapter 1 (story quality, microstructure measures of oral narrative ability, and oral narrative comprehension) (Botting, Simkin, & Conti-Ramsden, 2006; Catts et al.,

2002). Although the results from these studies provided evidence for the important contributions of spoken language skills to reading comprehension, both concurrently and longitudinally, they did not supply the detail required to answer questions regarding the specific nature of the relationship between these aspects of oral narrative ability and reading comprehension performance.

The study described in this chapter, therefore, extends previous research through: 1) the detailed assessment of oral narrative comprehension, oral narrative production ability, and reading comprehension performance in children with MRD and their typically developing peers, over a two-year period, and 2) a description of semantic and morpho-syntactic development of these two groups of children through microstructure analysis of personal narrative language samples. On the basis of the literature reviewed in Chapter 1, it is hypothesised that the children with MRD will show persistent difficulties in their oral narrative ability compared to their age-matched peers with typical development. It is expected that both oral narrative production performance and oral narrative comprehension performance will show a stable positive association with reading comprehension performance over the two-year-period.

2.1 Method

2.1.1 *Participants*

Fourteen children with MRD (nine boys and five girls) and 14 children with typical development, all of whom spoke standard New Zealand English as their only language, participated in the study (see Table 4). Class teachers were invited to refer children to the study who were aged between 6;0 and 8;0 years and were identified as poor readers through curriculum-based reading assessments (e.g., Marie Clay reading assessment battery, Clay, 1993). Most children in New Zealand commence school on or near the day of their 5th

birthday and, therefore, have received a full school-year of formal education by 6 years of age.

From a group of 59 children with poor reading ability referred to the study, participants were selected on the basis of a mixed reading disability profile. That is, both word recognition and listening comprehension deficits contributed to their reading comprehension difficulty. Thus, children remained in the study if they met the following criteria:

- Reading: Below average performance (i.e., percentile rank score below 23) both in reading comprehension and in reading accuracy performance on a standardised test of reading ability. Reading ability was measured using the Neale Analysis of Reading Ability, 3rd edition (NARA, Neale, 1999). This test, which has been standardised on the Australian population, consists of a series of graded passages that are to be read aloud, yielding a reading accuracy score. If the child reads a word incorrectly, the examiner prompts with the correct word. Following each passage, the children are asked comprehension questions, producing a reading comprehension score. The test provides normative data for children attending their first year at school through to their seventh year of schooling. The test consists of two parallel forms (Form 1 and Form 2). Parallel-forms reliability coefficients ranged between .89 and .98 for reading accuracy and .80 and .93 for reading comprehension. All correlations were statistically reliable above the .001 level of confidence. Reliability of the test is satisfactory, with test-retest reliability coefficients .95 for reading accuracy and .93 for reading comprehension. Internal consistency reliability coefficients (Kuder-Richardson) by year-of-schooling ranged between .85 and .96 for both reading accuracy and reading comprehension, with one exception: reliability coefficients for reading comprehension at year 1 of schooling were .71 and .81 for Form 1 and Form 2, respectively. Criterion-related validity was established by investigating predictive validity. It was found that NARA scores

at the end of year 1 correlated significantly with those obtained one year later (i.e., accuracy .83; comprehension .78). Concurrent validity was established by correlating the NARA's subtest scores with established criterion referenced tests, such as the Schonell Graded Word Reading Test (Schonell & Goodacre, 1974). Correlations were above .88 for reading accuracy and reading comprehension.

- Listening comprehension: Performance below age expectation (at or below standard score 7) on the Listening to Paragraphs subtest of the Clinical Evaluation of Language Fundamentals, 3rd edition (CELF-3, Semel, Wiig, & Secord, 1995). This supplementary subtest of the CELF-3 was designed to evaluate factual and inferential information presented in spoken paragraphs. Normative data for children aged 6 years, 0 months to 21 years, 11 months are provided. Measures of internal consistency had reliability coefficient ratings ranging from .57 to .71 for the 6- to 10-year-olds. Test-retest reliability of the CELF-3 is satisfactory, with reliability coefficients of .61 for 7-year-olds and .70 for 10-year-olds.
- Nonverbal intelligence: Performance within the average range (i.e., standard score between 85 and 115) on a test of nonverbal intelligence as measured by the Test Of Nonverbal Intelligence, 3rd edition (TONI, Brown, Sherbenou, & Johnsen, 1997).
- History: No history of physical, neurological, sensory, or intellectual impairments as indicated by teacher report and school records. Children were excluded if they had a history of speech and language difficulty that required referral to speech and language therapy services (as evidenced by teacher report and parent questionnaire).
- Vocabulary: To exclude children whose listening comprehension deficits could be explained by broader language disability, a standard score of at least 80 on the Peabody Picture Vocabulary Test – III (PPVT-III, Dunn & Dunn, 1997) was required. The PPVT-III provides normative data for children aged 2 years, 6 months, through to adulthood. Reliability of the PPVT-III is satisfactory with test-retest reliability coefficients in the .90s.

Internal consistency alpha coefficients were also in the .90s. The validity of the PPVT-III was reported across several measures. Concurrent validity was established by comparing the PPVT-III to measures of cognitive ability and spoken language. Correlations for tests of intelligence, vocabulary, and language were .88, .75, and .77 respectively.

Fourteen children met these criteria. From this group, 29% were from schools in lower socio-economic areas, with the remaining 71% from mid or high socio-economic areas, as determined by the Ministry of Education school classification system. In New Zealand all schools are assigned a decile ranking based on socio-economic factors associated with a random sample of its student addresses (e.g., household income, occupation, household crowding, and income support) [www.minedu.govt.nz/goto/deciles]. Ten children were of New Zealand European descent, and four children were of Maori descent.

Once the children were selected for inclusion into the study, the six core subtests of the Clinical Evaluation of Language Fundamentals – 3rd Edition (CELF-3, Semel et al., 1995) were administered to obtain a detailed spoken language profile of the participants. The core subtests of the CELF-3 consist of three receptive language subtests and three expressive language subtests. Normative data for children aged 6 years, 0 months to 21 years, 11 months, are provided for individual subtests. In addition, normative data are available for receptive language scores, expressive language scores, and total language scores. The receptive language subtests evaluate children's understanding of sentence structure, concepts and directions, and semantic relationships. The expressive component of the test assesses expressive morphology and sentence structure. Measures of internal consistency had reliability coefficient ratings ranging from .62 to .91 across the subtests. Test-retest reliability of the CELF-3 is satisfactory, with reliability coefficients of .50 to .91, and inter-rater reliability between 91% and 97% agreement when rating record-forms collected from 6-year-olds. Concurrent validity of the CELF-3 was evaluated by comparing the CELF-3 to other

measures of language ability. Correlation coefficients ranging from .70 to .75 were reported. Correlations between receptive and expressive language scores indicate that related, but separate constructs are being evaluated.

Table 4 details the individual children's performance on the CELF-3, as well as their scores on measures of receptive vocabulary (PPVT-III), and their reading ability (NARA). As illustrated in Table 4, as a group, the participants demonstrated spoken language ability in the low average range (Mean Total Language Score of 85 on the CELF-3; range 65 – 96).

Fourteen children were recruited from the same schools as the participants in the MRD group for the control group of children with typical reading development. These participants were selected through class-teacher referral of children who displayed grade appropriate reading skills in curriculum based assessments and who matched the children in the experimental group on age (+/- 6 months), gender, ethnicity, and year of schooling. These children were included in the control group if they scored within normal range on the following measures:

- Reading: Above the 23rd percentile rank on the comprehension and reading accuracy measures of the NARA (Neale, 1999).
- Listening comprehension: Above a standard score of 7 on the Clinical Evaluation of Language Fundamentals – 3rd edition, Listening to Paragraphs subtest (Semel et al., 1995).
- Nonverbal intelligence: Above a standard score of 85 on the Test of Nonverbal Intelligence (TONI-3, Brown et al., 1997).

Table 5 details the group performance on the selection tasks. As indicated in Table 5, there were no significant group differences on chronological age or nonverbal intelligence. In contrast, the two groups differed significantly on reading accuracy [$F(1,26) = 66.3, p < .001$], reading comprehension [$F(1,26) = 63.607, p < .001$], and listening comprehension ability [$F(1,26) = 86.345, p < .001$].

Table 4. Individual performance of the children with mixed reading disability at A1

Case	Gender	CA	TONI	PPVT-III	NARA		CELF-3		
					Accuracy	Comp.	RLS	ELS	TLS
1	F	7;1	94	82	4	3	80	82	80
2	M	7;6	88	87	14	12	78	88	82
3	M	7;5	97	81	2	3	86	80	82
4	M	6;11	102	85	8	4	86	80	82
5	M	7;3	97	95	19	19	88	92	89
6	F	7;8	100	88	21	22	96	92	93
7	M	7;6	97	86	9	15	80	90	84
8	M	7;4	94	91	7	1	84	75	78
9	F	6;4	111	88	2	10	78	88	82
10	M	6;7	89	106	1	1	86	98	91
11	F	6;8	93	83	16	10	65	69	65
12	M	7;4	100	103	14	15	100	90	94
13	F	6;4	107	111	11	19	92	102	96
14	M	6;4	107	98	5	1	92	92	91
Mean		7;1	98.3	91.7	9.5	9.6	85	87	85
SD		0;6	6.8	9.5	6.5	7.5	8.8	8.9	8.2

Note. CA = Chronological age (years;months); TONI = Test of Nonverbal Intelligence, 3rd Edition (Brown et al., 1997), standard score; PPVT - III = Peabody Picture Vocabulary Test, 3rd Edition (Dunn & Dunn, 1997), standard score; NARA = Neale Analysis of Reading Ability, 3rd Edition (Neale, 1999), percentile rank score; Comp. = comprehension; CELF-3 = Clinical Evaluation of Language Fundamentals, 3rd Edition (Semel et al., 1995); RLS = Receptive Language Score, standard score; ELS = Expressive Language Score, standard score; TLS = Total Language Score, standard score.

Table 5. Group performance on the selection measures

Group	Age (months)	Nonverbal intelligence	Listening comprehension	Reading	
				Accuracy percentile rank	Comprehension percentile rank
MRD					
Mean	84.7	98.3	6.4	10.7	9.1
SD	5.9	6.8	0.7	6.5	6.7
Range	76 - 92	88 - 111	5 - 7	1 - 21	1 - 22
TD					
Mean	86.8	102.9	10.3 *	53.2 *	51.4 *
SD	6.2	7.0	1.9	13	12.7
Range	78 - 98	93 - 118	8 - 14	27 - 86	34 - 73

Note. MRD = Mixed reading disability; TD = Typically developing; Nonverbal intelligence: performance on the TONI, Test of Nonverbal Intelligence, 3rd edition (Brown et al., 1997), standard score; Listening comprehension: Listening to Paragraphs subtest from the CELF-3 (Semel et al., 1995), standard score; Reading: Performance on the NARA (Neale, 1999).

*The TD group performed significantly better than the MRD group ($p < .001$)

2.1.2 Materials and procedure

Using a longitudinal repeated measures design, the children were assessed on three occasions (Assessment 1, Assessment 2, and Assessment 3, referred to as A1, A2, and A3, respectively). Assessments were approximately eight months apart to ensure the children received at least two full terms of classroom instruction between the assessment sessions. The English curriculum the children were exposed to during this time included specific goals to advance children's oral narrative ability. For example, in the curriculum "oral language

achievement objectives” it states that: “students should listen to texts and recall and respond to the main ideas in an organised way relating them to personal and wider experience” (Ministry of Education, 1994). None of the participants received other types of specialist intervention during the course of the longitudinal study. In the New Zealand school system, only children with severe speech and language difficulties (i.e., performance at least 3 standard deviations below the mean on a broad-based standardised spoken language assessment) qualify for speech-language support [www.minedu.govt.nz – speech-language support]. As illustrated in Table 4, the spoken language difficulties of the participants did not meet eligibility criteria for government-funded speech-language intervention.

Assessment measures administered at each assessment trial comprised a standardised reading test, a nonword reading task, oral narrative production tasks, and an oral narrative comprehension measure. All children were assessed by the author during morning sessions, to counteract effects of tiredness, and the assessments were conducted in a quiet room in the children’s school setting. Assessment sessions lasted between 1 and 2 hours.

Reading Ability

The NARA (Neale, 1999) was used to assess the children’s reading comprehension and reading accuracy ability. This test consists of a series of graded passages of fictional narratives that are to be read aloud by the child, yielding a reading accuracy score. If the child reads a word incorrectly, the examiner prompts with the correct word. The child is then required to answer comprehension questions following each passage, generating a reading comprehension score. The NARA contains two parallel forms (Form 1 and Form 2). To counteract the possible effects of familiarity with the test passages, Form 1 was used at A1 and A3, whereas Form 2 was used at A2.

Nonword reading was assessed on the Word Attack subtest of the Woodcock Reading Mastery Tests – Revised (WRMT-R, Woodcock, 1998). This test measures the child’s ability

to apply phonological decoding skills, independent of sight vocabulary. The WRMT-R provides normative data for children aged between 5 and 24 years. The test was standardised on more than 751 children from the United States. This age-norm sample closely matched the US population with regard to race/ethnicity, sex, region, and socioeconomic status. Reliability of the WRMT-R is satisfactory with split-half reliability coefficients higher than .89 in the primary school grades. The validity of the WRMT-R was reported across several measures. Concurrent validity was established by comparing the WRMT-R to other reading measures. Correlations between the Word Attack subtest of the WRMT-R and the Word Attack subtest from the Woodcock Johnson Reading Test (Woodcock, 1978) ranged between .64 and .90.

Oral Narrative Production Tasks

Oral narrative production skills were elicited in two contexts at each assessment time, namely personal narratives and story retelling. The oral narrative production and comprehension elicitation procedures outlined in the Language Sampling Protocol (LSP) developed by Westerveld and Gillon (2002) were used in this study.

Personal narratives. The personal narrative protocol used an oral narrative elicitation procedure developed by Peterson & McCabe (1983). This technique uses short narrative prompts, embedded in conversation, to encourage children to share personal experiences with the examiner. Peterson and McCabe used this procedure to elicit personal narratives in 96 children with typical development, aged between 3;6 and 9;6. Up to 18 verbal prompts were used per child. Only two children (aged 4 and 7, respectively) produced fewer than three narratives, with the average number of narratives produced exceeding 11. No effects of experimenter were found on the length of the narratives produced by the children, suggesting the procedure was successful in eliciting narratives, independent of experimenter variables. In adapting this technique for the current investigation, photo prompts were used to encourage

the children to share one of their own personal experiences. A pocketsize photo album with a series of carefully selected photos was used for the stimulus items. Topics depicted in the photos included: a bee sting, a car accident, a playground accident, a birthday party, a school trip, and a doctor's visit. These topics were found to be successful in eliciting personal narratives in 6- to 8-year-old children (Peterson & McCabe, 1983; Westerveld & Gillon, 2001).

Different photos, depicting similar topics, were used at each assessment time to maintain the children's interest in the task. Each photo was presented individually in separate sleeves of the photo album. The examiner provided a short prompting narrative with each photo followed by the question "Did anything like that ever happen to you?" If the child responded "no," the examiner turned the page of the photo album to the next photo. If the child responded "yes," a follow-up question was asked, "Can you tell me about it?" The child was encouraged to tell as much as possible by using as many neutral sub-prompts as needed, such as "Can you tell me more?" or "And then (what happened)?" Personal narratives were excluded from the analysis if the child responded "no," or if the child only provided one utterance in response to the examiner's request to "Tell me about it." The personal narrative language sampling protocol and the photos used at all three assessment times are presented in Appendix A.

Story retelling. In the story retelling context, the child was required to listen twice to an audio recording of an unfamiliar story (while looking at pictures in a story book, which either had text in a language other than English or was wordless). After listening to the story for a second time, the child was asked to retell the story without the use of the pictures.

At A1, the child listened to an English translation of a Tokelauan story "Ko au na galo" ("Ana Gets Lost," Swan, 1992). The story is about a Pacific Islands girl who gets lost in the city, while looking for her mum and dad. At A2, the children listened to an English

translation of a Dutch story “Kikker is een Held” (“Frog is a Hero,” Velthuijs, 1995). This is a story about four friends whose houses get flooded. At A3, the children listened to a story accompanying the wordless picture book “A Boy, a Dog and a Frog” (Mayer, 1967). The story is about a boy who decides to catch a frog for a new pet, which proves difficult. The stories were selected for several reasons: Presenting a wordless picture book or a text in an unknown language prevented the children from reading the text while they heard the story, and thus removed any reading advantage. Having no text or a text written in another language also provided a convincing reason for listening carefully to the tape recording (of the English version) of the text. Children from different cultures living in New Zealand were expected to be familiar with the stories’ content and vocabulary translation, thus ensuring children’s content knowledge would not differentially affect their oral narrative performance.

Different books were used at each assessment time to maintain the children’s interest and avoid children becoming too familiar with the story. Therefore, at A2 and A3, stories were chosen that were comparable in story structure to the story used at A1. All three stories involved goal-directed behaviour carried out by animate characters and included six common story structure elements as summarised by Hughes et al. (1997, pp. 118-119), i.e., setting, problem, attempts (actions to solve the problem), consequence, resolution, and ending. The stories used at A1, A2, and A3 are presented in Appendix B.

Oral Narrative Comprehension

The fictional stories used for the oral narrative production (story retelling) task were used to assess oral narrative comprehension. After hearing the story for the first time, the children were asked comprehension questions tapping underlying story structure elements, such as characters, setting, problem, attempts, and resolution.

At A1, the children were asked eight questions, whereas at A2 and A3, ten questions were asked. To ensure all children had access to the same information prior to the second

exposure, children were provided with the correct information after answering the questions if they provided no reply, or if their answers were clearly incorrect. Therefore, if children generated weak stories, they were likely to be the result of the children's difficulty in applying story structure knowledge when retelling the story, rather than the result of the children's failure to remember and/or pay attention to important elements of the story. The questions used for the oral narrative comprehension task are presented in Appendix C.

Validation of the Oral Narrative Elicitation Procedures

Details on the development and piloting of the protocol are reported in Westerveld and Gillon (1999/2000, 2001). The pilot project investigated the suitability of the LSP with children from different cultural backgrounds in New Zealand. The results indicated there were no group differences in performance on the oral narrative tasks between the Maori, New Zealand European, and the Pacific Islands children.

Using the LSP, a New Zealand database was created comprising oral narrative language samples from more than 250 children with typical development (from a range of cultural and socio-economic backgrounds), aged between 4;6 and 7;6 years (Gillon, Westerveld, Miller, & Nockerts, 2002). The protocol proved a reliable tool to accurately describe children's strengths and weaknesses in speaking situations relevant to school, family, and social routine. Analyses of the oral narrative language samples contained in the database revealed a clear developmental trend of increasing syntactic complexity, semantic diversity, and verbal productivity with increasing age of the participants. Furthermore, the elicitation context had a significant impact on the language production measures obtained, with the story retelling context yielding syntactically more complex language samples than the personal narrative context for the 5- to 7-year-old age groups (Westerveld et al., 2004)

2.1.3 Transcription and analysis

All oral narrative language samples were tape-recorded, using an Olympus DM-1 Digital Recorder. Samples were transcribed by the author, using standard Systematic Analysis of Language Transcripts conventions (SALT, Miller & Chapman, 2003). Utterance segmentation was based on communication units (CU), using Loban's (1976) rules. A CU is defined as a group of words that cannot be further divided without the loss of their essential meaning (p.105). Only complete and intelligible (C&I) utterances were used for analysis; Interrupted and abandoned sentences were excluded, as well as utterances containing unintelligible segments. The personal narrative language samples were used for microstructure analysis, whereas the story retelling samples were used for macrostructure analysis.

Microstructure Analysis

The personal narrative samples were cut after the first 50 C&I utterances and analysed at microstructure level. At A3, one experimental child and one control child only produced 31 and 42 utterances, respectively. In these cases, their full personal narrative language transcripts were included in the analyses. Quantitative measures of language ability that have been shown to distinguish between children with language impairment and children with typical language development were selected, and calculated automatically using SALT.

- Grammatical competence was measured as 1) grammatical complexity: the mean length of CU in morphemes (MLCU-M), and 2) grammatical accuracy (GA): the percentage of grammatical CU's (Fey et al., 2004).
- Semantic diversity was based on the number of different words (NDW). Several studies have indicated that NDW derived from 50 C&I's is a promising quantitative indicator of expressive vocabulary (e.g., Miller, 1996; Watkins et al., 1995).

Macrostructure Analysis

The full story retelling samples were transcribed and analysed at macrostructure level. To evaluate the child's ability to apply story structure knowledge when retelling a story, the story retellings were scored on a story quality rubric. The rubric was adapted from Jones and Lodholz (1999) and assessed inclusion of six story structure elements (introduction, main character/s, supporting character/s, conflict, resolution, and conclusion) as well as a measure of structural coherence. It also investigated whether the child included the theme ("the overall coherent topic of the text and its essential points," Westby, 2005, p.162) of the story. Points were awarded for each characteristic: 5 points if the child proficiently included the characteristic; 3 points if the skill was emerging; and 1 point if the child provided minimal or no information. The rubric included specific scoring examples to promote easy and reliable scoring by other examiners. The scores were totalled to yield a *story quality* score. As a consequence, the minimum score was 8, and the maximum score was 40. At A2 and A3, the same rubric was used, but the scoring examples were changed to reflect the different stories. The story quality rubrics used at A1, A2, and A3 are included in Appendix D.

2.1.4 Reliability

Twenty percent of the transcripts were analysed by an independent examiner, experienced in language transcription, who was blind to the children's group status. The percentage of agreement between the two examiners at each assessment time was as follows. Transcription reliability (including utterance segmentation) in % utterance agreement: Stories A1: 98.4%, A2: 100%, A3: 97.8%; Personal narratives A1: 97.2%, A2: 99%, A3: 99.5%. Error coding reliability in % error-code agreement: Stories A1: 86.75%, A2: 94%, A3: 93.3%; Personal narratives A1: 89.7%, A2: 97%, A3: 96.8%.

With regards to the story quality rubric, the independent examiner was trained in scoring the stories by the first author. Five stories were then independently scored by the second examiner, and any disagreements were discussed and/or the wording of the rubric was revised. Following this training period, another eight stories were independently scored, and reliability of the total scores on the story quality rubric in Cronbach's Alpha was: A1: .97, A2: .98, A3: .96. The total scores (of all individual stories) awarded by the two examiners differed by 4 points or less.

2.2 Results

Repeated measures analyses of variance (ANOVA) were used to determine group differences in oral narrative ability and reading ability between the children with mixed reading disability (MRD) and their peers with typical development (TD), at each assessment time (SYSTAT Version 10). Effect size indices (f) were calculated for all statistically significant results from the ANOVA's, to provide an indication of the power of the findings. The effect size index f is based on the root of the between-group sum of squares, divided by the error sum of squares. Conventional values of f were used in the interpretation, i.e., small effect size $f = 0.10$, medium $f = 0.25$, large $f = 0.40$ (Portney & Watkins, 2000).

Microstructure Analysis

All transcripts were cut after the first 50 C&I's and analysed on measures of semantic diversity and grammatical competence. Table 6 reports the means and standard deviations at A1, A2, and A3.

Grammatical competence:

1. Grammatical complexity (in MLCU-M): The children with TD consistently outperformed the children with MRD, and there was a significant main effect for group [$F(1,26) = 12.909, p < .05, f = 0.5$]. There was a significant main effect for time [$F(2,52) = 6.837, p < .05, f = 0.26$], indicating MLCU-M improved significantly over time. The

interaction Group x Time was not significant ($p = .731$), indicating the two groups of children made similar progress. The follow-up one-way ANOVA's indicated significant differences between the two groups at all three assessment times: A1 [$F(1,26) = 5.932, p < .05, f = 0.33$], A2 [$F(1,26) = 9.733, p < .05, f = 0.37$], and A3 [$F(1,26) = 10.417, p < .05, f = 0.40$].

2. Grammatical accuracy: The children with MRD produced a lower percentage of grammatically correct sentences than the children with TD (main group effect [$F(1,26) = 5.803, p < .05, f = 0.22$]). The main effect for time was not significant ($p = .68$), nor was the interaction Group x Time ($p = .491$). The results from the follow-up one-way ANOVA's indicated no significant differences between the two groups at A1 ($p = .140$), and A3 ($p = .460$), but a significant difference at A2 [$F(1,26) = 7.849, p < .05, f = 0.30$].

Semantic diversity – NDW: The results from the two way repeated measures ANOVA showed a significant main effect for group [$F(1,26) = 8.918, p < .05, f = 0.34$], and a significant effect for time [$F(2,52) = 5.64, p < .05, f = 0.22$], but the interaction Group x Time was not significant ($p = .618$). The follow up one-way ANOVA's showed that the MRD group underperformed the TD group at each assessment time: A1 [$F(1,26) = 4.315, p < .05, f = 0.17$], A2 [$F(1,26) = 5.060, p < .05, f = 0.19$], and A3 [$F(1,26) = 8.627, p < .05, f = 0.33$].

Macrostructure Analysis

The full story retelling transcripts were used and scored on the story quality rubric (see Table 7). The results from the two-way repeated measures ANOVA indicated a significant main effect for group, with the children with TD outperforming the children with MRD [$F(1,26) = 15.524, p < .05, f = 0.60$]. The main effect for time was not significant ($p = .231$), nor was the interaction Group x Time ($p = .793$). The follow-up one-way ANOVA's indicated that the TD group outperformed the MRD group at every assessment time: A1 [$F(1,26) = 6.060, p < .05, f = 0.23$], A2 [$F(1,26) = 10.841, p < .05, f = 0.42$], A3 [$F(1,26) = 9.212, p < .05, f = 0.35$].

Table 6. Group performance on the microstructure measures derived from the personal narrative samples

Group	NDW			MLCU-M			GA		
	A1	A2	A3	A1	A2	A3	A1	A2	A3
MRD									
Mean	110	120.3	114.7	5.57	5.9	6.08	90.1	89.3	91.6
SD	16.9	16.9	18.8	0.99	0.87	1.0	5.4	5.7	7.9
Range	86 - 134	94 - 145	85 - 140	4.2 – 6.7	4.5 – 7.0	3.7 – 7.8	82 - 100	78 - 98	70 - 100
TD									
Mean	123.4*	134.1*	133.9*	6.47*	6.91*	7.26*	92.7	94.3*	93.4
SD	17.3	15.7	15.5	0.96	0.83	0.94	3.4	3.5	4.8
Range	91 - 159	113 - 162	107 - 162	4.7 – 8.2	5.4 – 8.7	5.1 – 8.3	88 - 98	90 - 100	82 - 100

Note. MRD = Mixed reading disability; TD = Typically developing. NDW = Number of different words; MLCU-M = Mean length of communication unit in morphemes; GA = Grammatical accuracy: percent grammatically correct utterances. Transcripts were cut after the first 50 complete and intelligible utterances. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3. Assessments were approximately 8 months apart.

* The TD group performance was significantly better than the MRD group ($p < .05$).

Table 7. Group performance on the story quality rubric

Group	Story Quality Score		
	A1	A2	A3
MRD			
Mean	24.3	22.0	24.4
SD	6.3	4.6	5.8
Range	16 - 36	14 - 30	14 - 32
TD			
Mean	29.4*	28.7*	30.1*
SD	4.7	6.1	4.0
Range	20 - 36	22 - 38	22 - 34

Note. MRD = Mixed reading disability; TD = Typically developing. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3. Assessments were approximately 8 months apart. Minimum score = 8; Maximum score = 40.

*The TD group performed significantly better than the MRD group ($p < .05$).

Oral Narrative Comprehension

For ease of comparison, the scores were converted to percentage of questions answered correctly. A repeated measures ANOVA showed a significant group effect [$F(1,26) = 42.664, p < .001, f = 1.64$], with the TD group answering more comprehension questions correctly (see Table 8). No comparisons over time were made because different questions were used at each assessment time. As indicated in Table 8, the TD group outperformed the MRD group at every assessment time, and these differences were significant: A1 [$F(1,26) = 9.253, p < .05, f = 0.36$], A2 [$F(1,26) = 20.926, p < .001, f = 0.80$], and A3 [$F(1,26) = 14.174, p = .001, f = 0.55$].

Table 8. Group performance on the oral narrative comprehension task

Group	Performance		
	A1	A2	A3
MRD			
Mean	70.5	59.3	57.1
SD	18.1	16.9	16.4
Range	37.5 - 100	30 - 90	30 - 80
TD			
Mean	88.4*	84.3*	75.7*
SD	12.5	11.6	8.5
Range	62.5 - 100	60 – 100	60 - 90

Note. MRD = Mixed reading disability; TD = Typically developing. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3. Assessment times were approximately 8 months apart. Performance is presented as percentage of questions answered correctly.

*The TD group performed significantly better than the MRD group ($p < .05$).

Reading Performance

The raw scores derived from the Word Attack subtest of the WRMT-R (Woodcock, 1998) were used to determine group differences in phonological decoding ability (i.e., nonword reading). The raw scores derived from the Neale Analysis of Reading Ability- 3rd Edition (NARA, Neale, 1999) were used to determine group differences over time on reading accuracy and reading comprehension.

Nonword reading: The results from a two-way repeated measures ANOVA showed a significant main effect for group [$F(1,26) = 36.398, p < .001, f = 1.4$], with the TD group outperforming the MRD group. There was a significant effect for time [$F(2,52) = 31.831, p < .001, f = 1.22$], but the interaction Group x Time was not significant ($p = .196$), indicating

that the two groups of children made significant, but similar progress over time. The follow-up one-way ANOVA's indicated significant differences between the two groups at A1 [$F(1,26) = 37.655, p < .001, f = 1.45$], A2 [$F(1,26) = 23.989, p < .001, f = 0.92$], and A3 [$F(1,26) = 28.258, p < .001, f = 1.09$].

Reading accuracy: The results from a two-way repeated measures ANOVA showed a significant main effect for group [$F(1,26) = 47.057, p < .001, f = 1.81$], with the TD group outperforming the MRD group. There was a significant effect for time [$F(2,52) = 77.766, p < .001, f = 2.99$], but the interaction Group x Time was not significant ($p = .501$), indicating that the two groups of children made significant, but similar progress over time. The follow-up one-way ANOVA's indicated significant differences between the two groups at A1 [$F(1,26) = 66.3, p < .001, f = 2.55$], A2 [$F(1,26) = 38.768, p < .001, f = 1.49$], and A3 [$F(1,26) = 32.644, p < .001, f = 1.26$].

Reading comprehension: The results from a two-way repeated measures ANOVA showed a significant main effect for group [$F(1,26) = 52.710, p < .001, f = 2.03$], with the TD group outperforming the MRD group. There was a significant effect for time [$F(2,52) = 42.398, p < .001, f = 1.63$], but the interaction Group x Time was not significant ($p = .507$). The follow-up one-way ANOVA's indicated significant differences between the two groups at A1 [$F(1,26) = 23.607, p < .001, f = 2.4$], A2 [$F(1,26) = 38.511, p < .001, f = 1.48$], and A3 [$F(1,26) = 33.684, p < .001, f = 1.3$]. Figure 1 illustrates the groups' performance on the reading comprehension measure and shows that the MRD group demonstrated weaker reading performance compared to the TD group at each trial, but that both groups made similar progress over time.

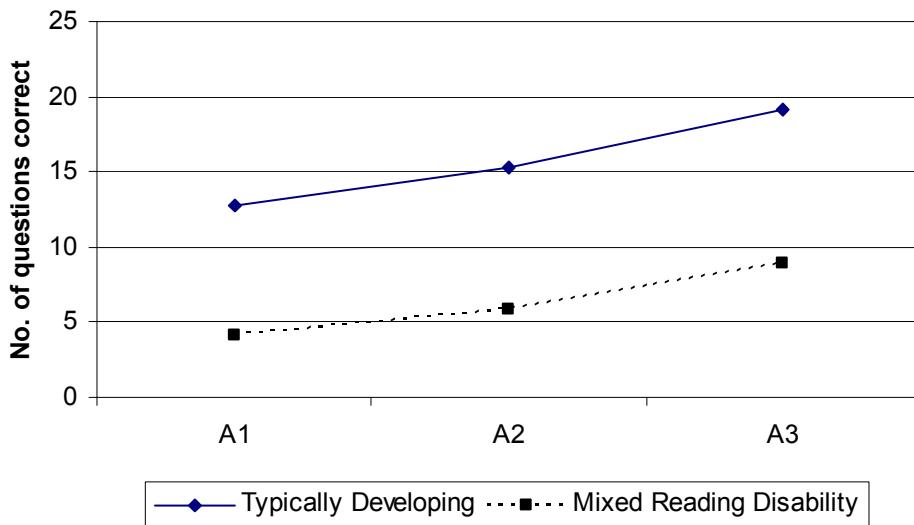


Figure 1. Group performance on the NARA (Neale, 1999) reading comprehension task at each assessment trial. Scores are presented as the number of questions answered correctly. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3. Assessment times are approximately 8 months apart.

Oral Narrative Ability and Reading Comprehension Performance

Correlations at each assessment time were calculated to examine the relationship between reading comprehension performance and all aspects of oral narrative ability (see Table 9). Because reading comprehension is typically heavily dependent on word recognition during the early school years, children's reading accuracy performance was also entered in the analyses. Oral narrative production ability was measured at microstructure (MLCU-M, GA, and NDW) and macrostructure (story quality) level. For both groups combined, significant correlations were found between reading accuracy ability and reading comprehension performance at all three assessment times ($p < .001$). In addition, mild to moderate correlations were found between the oral narrative measures and reading comprehension at A1, A2, and A3. Oral narrative comprehension significantly correlated

with reading comprehension at A1 and A2, whereas the story quality measure significantly correlated with reading comprehension at A2 and A3.

Table 9. Correlations between oral narrative measures and reading comprehension performance at each assessment time

(a) A1

Measures	RC	RA	MLCU-M	GA	NDW	SQ	ONC
RC	1.000						
RA	.905**	1.000					
MLCU-M	.427	.406	1.000				
GA	.321	.270	.09	1.000			
NDW	.450	.455	.894**	.003	1.000		
Story Quality	.541	.556*	.386	.324	.401	1.000	
ONC	.563*	.472	.327	.272	.339	.535	1.000

(b) A2

Measures	RC	RA	MLCU-M	GA	NDW	SQ	ONC
RC	1.000						
RA	.841**	1.000					
MLCU-M	.567*	.432	1.000				
GA	.495	.476	.157	1.000			
NDW	.390	.317	.876**	.113	1.000		
Story Quality	.563*	.383	.312	.427	.173	1.000	
ONC	.693*	.555*	.215	.665*	.143	.509	1.000

Key: see next page

(c) A3

Measures	RC	RA	MLCU-M	GA	NDW	SQ	ONC
RC	1.000						
RA	.900**	1.000					
MLCU-M	.483	.450	1.000				
GA	.198	.266	-.204	1.000			
NDW	.602	.346	.832**	-.133	1.000		
Story Quality	.650*	.538	.498	.245	.439	1.000	
ONC	.504	.485	.177	.141	.193	.396	1.000

Note. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3; RC = Reading comprehension (number of questions answered correctly on the NARA (Neale, 1999); RA = reading accuracy (raw score on the NARA); MLCU-M = Mean length of communication unit in morphemes; GA = Grammatical accuracy: percent grammatically correct utterances; SQ: Story quality; ONC: Oral narrative comprehension: number of questions answered correctly.

* Correlations are significant at $p < .05$; ** $p < .001$.

The results concerning the concurrent relationships between oral narrative ability and reading comprehension performance indicate a stable relationship over the two years between some aspects of oral narrative ability and reading comprehension performance. To better understand the relationship between these aspects of oral narrative ability and reading comprehension performance, stepwise multiple regression analyses were performed. This helped determine which aspect of oral narrative ability made the most valuable contribution to reading comprehension performance (Portney & Watkins, 2000).

For both groups combined, exploratory stepwise multiple regression analyses were performed at each assessment time, with the reading comprehension score as the dependent variable, and the performance on the oral narrative tasks as the independent variables. To control for the children's skill in word reading ability, the reading accuracy scores (derived

from the NARA) were also entered as independent variables (Table 10). As expected, reading accuracy accounted for a large proportion of the variance in reading comprehension performance at all three assessment times (82%, 70.7%, and 80.9%, respectively).

Once word reading ability was entered into the regression equations, different aspects of oral narrative ability accounted for additional variance in reading comprehension performance at A1, A2, and A3 (see Table 10). At A1, only the oral narrative comprehension task accounted for additional variance in reading comprehension (2.4%), although this just failed to reach significance ($p = .062$). At A2, oral narrative comprehension performance accounted for a significant 7.4% of the variance in the reading comprehension score. The next variable with the highest significant partial correlation was MLCU-M, which accounted for an additional 5.6% of the variance in reading comprehension. At A3, performance on the story quality measure accounted for 3.9% of the variance in the reading comprehension score. No other partial correlations reached significance.

Caution in interpreting these findings needs to be taken, however, as the number of cases per independent variable exceeds the recommended ratio of 5:1 (Tabachnick & Fidell, 1989). More definitive conclusions could have been drawn if 30 cases rather than the current 28 cases had been used in the analyses.

Table 10. Stepwise multiple regression analyses of oral narrative performance as related to reading comprehension performance at A1, A2, and A3.

Assessment times	r ²	r ² change	Partial correlations
A1			
1. Word reading ability	.820		.905
2. Oral narrative comprehension	.844	.024#	.364
A2			
1. Word reading ability	.707		.841
2. Oral narrative comprehension	.781	.074*	.503
3. MLCU-M	.837	.056*	.503
A3			
1. Word reading ability	.809		.900
2. Story Quality	.848	.039*	.450

Note. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3. Assessments were approximately 8 months apart. MLCU-M = Mean length of communication unit in morphemes.

* Additional unique variance is significant at $p < .05$. # Additional unique variance failed to reach significance ($p = .062$).

Finally, exploratory stepwise multiple regression analyses were performed to determine if performance on aspects of oral narrative ability could predict reading comprehension performance over time (see Table 11). Reading comprehension performance at A3 was entered as the dependent variable, with the A1 oral narrative measures and the word reading ability measure entered as the independent variables. For both groups combined, word reading ability at A1 was the best predictor of reading comprehension performance at A3, explaining 71.5% of the variance. With word reading ability removed,

oral narrative comprehension achieved the highest partial correlation and accounted for an additional 4.8% of the variance in reading comprehension.

Word reading ability at A2 was the best predictor of reading comprehension at A3, accounting for 72.8% of the variance. Once word reading ability was entered into the regression equation, oral narrative comprehension at A2 accounted for a significant portion of the variance in reading comprehension (7.6%).

Table 11. Stepwise multiple regression analyses of A1 and A2 oral narrative predictors of reading comprehension at A3

Assessment times	r^2	r^2 change	Partial correlations
A1			
1. Word reading ability	.715		.846
2. Oral narrative comprehension	.763	.048*	.410
A2			
1. Word reading ability	.728		.853
2. Oral narrative comprehension	.804	.076*	.530

Note. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3. Assessments were approximately 8 months apart.

* Change in the total variance is significant at $p < .05$

2.3 Discussion

In this longitudinal experiment, the oral narrative abilities of 14 children with mixed reading disability (MRD) were compared to those of 14 age-matched peers with typical development (TD), on three occasions, approximately eight months apart. The first question the study addressed was whether the children with MRD would show difficulty in oral narrative ability compared to their peers with typical reading development over this two-year period.

The results from this experiment indicated that the children with MRD demonstrated difficulty in oral narrative comprehension and production ability compared to their peers with TD on all three assessment trials. This is consistent with the results from previous studies that have investigated aspects of oral narrative ability in children with reading disorders, such as oral narrative comprehension (i.e., the ability to answer questions about a story) (Snyder & Downey, 1991) and oral narrative production at macrostructure level (i.e., the number of propositions or action units recalled) (Feagans & Short, 1984; Roth & Spekman, 1986; Snyder & Downey, 1991). The findings from the current study extend previous research by demonstrating that the children with MRD also exhibited weaknesses in microstructure measures of oral narrative ability, such as grammatical complexity and semantic diversity. The results from the present study, therefore, demonstrated that the children with MRD performed poorly in all aspects of oral narrative ability that were tested, and that these difficulties persisted over a two-year period.

The oral narrative comprehension difficulties experienced by the children with MRD were not surprising, given that these participants were selected on the basis of listening comprehension deficits at the commencement of the study. As anticipated, the results indicated that the children with MRD showed inferior performance on the oral narrative comprehension task (which measured their ability to answer questions relating to underlying

story structure elements) compared to their peers with typical development. It was also expected that the children with MRD would demonstrate difficulties in their ability to tell a well-structured story, containing all the critical story elements (including setting, characters, problem, attempts, resolution, and ending), as captured in the story quality rubric. However, the results from this longitudinal investigation indicated that these difficulties were persistent, despite a national language curriculum that aims to develop these skills.

The finding that the children with MRD earned consistently lower scores on measures of semantic diversity and grammatical competence compared to their peers with TD was unexpected. Expressive language impairment had not previously been identified by the children's teachers or parents, and none of the children had been referred, nor were on any waiting list, for speech and language assessment. The findings from the microstructure analyses for these 14 children with MRD are, however, consistent with the unidentified spoken language difficulties of other populations who have been portrayed as having a specific reading disorder, described in previous research (Gillon & Dodd, 1994; Nation, Clarke, Marshall, & Durand, 2004), and underline the need for comprehensive assessment of both spoken and written language competency in children who present with reading difficulties.

The results from this longitudinal investigation also highlighted that the reading difficulties of the children with MRD persisted over time despite a classroom curriculum that is effective in developing their peers' reading abilities. When comparing the groups' progress in reading skills over the two years, it was found that both groups made significant, but similar gains in both reading accuracy (including phonological decoding) and reading comprehension ability. This was of some surprise and appears to go against the commonly accepted Matthew effects in reading phenomenon (Stanovich, 1986). Based on this theory, different rates of progress in reading ability would have been expected between the two

groups of children. A plausible explanation for this finding relates to the extra attention most of the children received from their schools and/or teachers during the course of this investigation. All of these children had already been identified by their teachers as struggling in their ability to learn to read (which was one of the selection criteria). Subsequently some children received “reading recovery” (Clay, 1993). In addition, although New Zealand embraces a whole language approach to reading, some schools have included phonics in their classroom curriculum. Taken together these remediations may have ensured that the children with reading impairment improved in their reading ability at a similar rate to that of their peers with typically developing reading skills. However, the results of this study also suggest that these possible interventions were not been sufficient to promote the accelerated growth needed by the group of children with MRD to catch up to their typically developing peers.

The second question this experiment addressed concerned the relationship between aspects of oral narrative ability (except GA at A3) and reading comprehension performance, across the 2-year-period of the longitudinal study. As expected, mild to moderate correlations were found between all aspects of oral narrative ability and reading comprehension performance. The two oral narrative measures that required story structure knowledge (i.e., oral narrative comprehension and oral narrative production at macrostructure level) showed the strongest correlation to reading comprehension performance.

When investigating the relative contribution made by aspects of oral narrative ability to reading comprehension performance, it was found that different components of oral narrative ability accounted for portions of the variance in reading comprehension performance, once word reading ability was controlled for. Multiple regression analyses revealed that, after word reading ability had been entered into the analysis, it was oral narrative comprehension ability in particular that accounted for additional unique variance in reading comprehension performance. This is consistent with previous research investigating

the relationship between spoken language skills and reading comprehension in typically developing children (Nation & Snowling, 2004). In contrast to Nation and Snowling's results, however, in the current study, the unique variance in reading comprehension at A3 predicted by the oral narrative comprehension measure at A1 and A2 was much smaller. This may be explained by the nature of the reading assessment that was used (i.e., the NARA). In the NARA, the test is discontinued once a child makes more than 12 errors when reading a passage, after which no comprehension questions are asked. Inherently, word reading ability and reading comprehension scores derived from this test are often highly correlated, and it seems likely that this correlation is strongest in children with poor word reading skills.

Although morpho-syntactic skills showed a moderate association with reading comprehension at the second assessment trial (A2), only MLCU-M predicted some of the variance in reading comprehension at A2. Morpho-syntactic ability did not predict any significant portion of the variance in reading comprehension 8 to 16 months later. On the basis of Catts et al.'s (2002) findings, this was surprising. Several possible factors may account for these differences in findings. First, the children in the Catts et al. study demonstrated a more severe spoken language impairment. Only 14% of the children in the present study demonstrated a total language score below 80 on the CELF-3, whereas the participants in the Catts et al. study performed at least 1.25 SD below expectation, on at least two out of five language composite scores. One could therefore expect the children in the Catts et al. study to demonstrate a more severe grammatical weakness than the children with MRD in the present study. Second, different measures of morpho-syntactic ability were used in the two studies. Catts et al. calculated a composite grammar score that was based on performance on several standardised subtests of the CELF-3, whereas the current investigation employed a spontaneous measure of spoken language production, derived in a personal narrative elicitation condition. It is possible that the personal narrative elicitation

context is not sensitive enough to reveal children's grammatical weaknesses once they reach a certain age. Third, the combination of reading comprehension tests that was used by Catts et al. (ranging from cloze procedures to passage comprehension questions) may account for the differences in findings.

2.4 Summary

The results from this experiment confirm a relationship between all aspects of oral narrative ability and reading comprehension development in children who demonstrate a mixed reading disability profile. The findings suggest it is oral narrative comprehension in particular that has concurrent and longitudinal links with reading comprehension performance in this group of children. However, oral narrative comprehension accounted only for a small amount of variation in the children's reading comprehension performance. In contrast, reading accuracy ability explained most of the variance in reading comprehension ability.

One possible explanation for the poor oral narrative abilities of the children with MRD may be their more limited reading experience. The following chapter reports a reading comprehension-age match design to investigate this issue further.

CHAPTER 3

A READING-AGE-MATCH COMPARISON OF THE ORAL NARRATIVE SKILLS OF CHILDREN WITH MIXED READING DISABILITY

3. Introduction

Children who demonstrate reading difficulties are likely to read much less frequently than good readers (Cunningham & Stanovich, 1997). This lack of reading experience may inhibit spoken language development in the areas of semantics and morpho-syntax and restrict the development of story structure knowledge (Nippold, 1998). It is possible, therefore, that the oral narrative difficulties exhibited by the children with mixed reading disability (MRD), described in Chapter 2, are a consequence of their more limited exposure to (more complex) texts. Alternatively, existing spoken language weaknesses in the areas of semantics and morpho-syntax in these children may have contributed to their reading comprehension difficulties. The experiment described in this chapter aims to address this issue by using a reading-age match design.

Reading-ability match designs have been used extensively in reading disability research, since its concept was introduced by Bradley and Bryant (1978). In this design, the performance of children with reading disability on measures of interest is compared to the performance of younger children who are matched to the poor readers on word decoding ability. The likely causes of reading disability can then be established because the differences in performance between the groups of children cannot be linked to differences in word decoding ability. In a similar way, a reading comprehension-age match design has been proposed to investigate the possible causes of reading comprehension failure (Cain et al.,

2000). In this design, the poor readers are matched to younger children on reading comprehension ability, and the likely causes of their reading comprehension deficits can be investigated. The limitations of both these reading ability-match designs include the effects of chronological age and cognitive maturity of the older children with reading disability.

To investigate the possible effects of reading experience on the oral narrative performance (including story structure knowledge) of the children in the current thesis, a reading comprehension-age match design was used. This involved matching the children with MRD to younger children who displayed similar reading comprehension skills, on the basis of their performance on a standardised reading test. Previous research using this design indicated that poor story structure knowledge was a potential cause of reading comprehension difficulties in children demonstrating a specific reading comprehension deficit (i.e., reading comprehension difficulties in the absence of word recognition deficits) (Cain, 2003). It seems likely that the results obtained by Cain can be extended to the subgroup of poor readers who are the focus of this thesis, i.e., children with a mixed reading disability profile. However, differences in exposure to more advanced reading materials are hypothesised between the children with MRD and the participants in Cain's study, because of the more limited word recognition abilities of the children with MRD (Cunningham & Stanovich, 1997). Because Cain did not investigate children's performance on microstructure measures of oral narrative ability, it is not clear if story structure knowledge is the only aspect of oral narrative ability contributing to the poor readers' reading comprehension difficulties.

The experiment reported in this chapter thus aimed to investigate whether the children with MRD, who had shown persistent difficulty in their reading ability compared to their peers with typical development over a two-year period, showed deficits or delay in aspects of their oral narrative performance compared to their younger reading-ability matched peers. The children were matched on reading comprehension-age as well as reading accuracy-age,

to control for word recognition ability as well as reading comprehension performance. In summary, this experiment addressed the following question:

- How do children with MRD perform on oral narrative production and comprehension tasks compared to their reading-age matched peers with typical development?

Based on the findings from previous investigations and the longitudinal study described in Chapter 2, it is hypothesised that the children with MRD will demonstrate inferior story structure knowledge compared to their reading-age matched peers with typical development (RMTD) (Cain, 2003; Cain & Oakhill, 1996). It is expected that the children with MRD will show difficulty in the two tasks tapping story structure knowledge, i.e. the ability to answer questions related to the underlying story grammar components of a story (oral narrative comprehension) and the ability to produce well-structured oral narratives.

At microstructure level, no differences in performance are hypothesised between the group of children with MRD and the RMTD group on measures of morpho-syntax and semantics. Consistent with the results from previous research, the children with MRD are expected to show delayed development in semantics and syntax (e.g., Gillon & Dodd, 1994) because of the more limited exposure to reading materials than their chronological age matched peers with typical development (TD).

3.1 Method

3.1.1 Participants

At the completion of the third assessment trial in the longitudinal study (reported in Chapter 2), there continued to be significant differences between the MRD and the TD groups on reading accuracy [$F(1,26) = 32.644, p < .001, f = 1.26$] and reading comprehension performance, [$F(1,26) = 33.684, p < .001, f = 1.3$]. Visual inspection of the children's

individual data revealed that 12 of the 14 children with MRD continued to perform below average on the reading comprehension measure of the NARA (two children's reading comprehension scores had improved to within normal range: percentile ranks of 23, and 28, respectively – case 12 and case 13, Table 4). This remaining group of eight boys and four girls (referred to hereafter as persistent poor readers; PPR) was then matched to: 1) the children from the group with typical development (TD) who participated in the longitudinal study (Chapter 2) for chronological age, and 2) to younger average readers for: a) reading comprehension ability (reading comprehension age +/- 6 months on the NARA), and b) reading accuracy ability (reading accuracy age +/- 6 months on the NARA). Results from *t*-tests showed there were no significant differences between the younger average readers and the persistent poor readers on reading comprehension age ($p = .901$) or reading accuracy age ($p = .875$). Table 12 reports the mean reading accuracy and reading comprehension scores of the 12 persistent poor readers, and the two control groups of children with typical development.

The reading-age matched participants with typical development (RMTD) were recruited from two of the schools the poor readers attended, to help control for socioeconomic backgrounds and teaching environment. Class teachers were invited to refer children who demonstrated grade appropriate reading and language skills and were aged between 6;0 and 7;6 (the current reading comprehension age of the PPR group). Children were included in this experiment if their reading accuracy and reading comprehension skills were age-appropriate (i.e., age-equivalent score no more than 6 months above or below chronological age on the NARA), and if their reading comprehension and reading accuracy age (derived from the NARA) could be matched to that of one of the experimental children (i.e., no more than six months difference between the age-equivalence scores). All children spoke standard New Zealand English as their only language and were from mid socio-

economic areas as determined by the Ministry of Education school classification system. There were seven girls and five boys. Table 12 lists the RMTD group's characteristics on the reading measures.

Table 12. Group characteristics on the reading measures at A3

Reading Group	Age	Reading Accuracy		Reading Comprehension	
		Age equivalent	Raw score	Age equivalent	Raw score
PPR (n=12)					
Mean	8;7	6;9	22	6;9	7.8
SD	0;6	0;8	10.6	6;9	3.3
Range	7;10 – 9;2	5;11 – 7;10	6 - 38	6;0 – 7;5	3 - 12
TD (n=12)					
Mean	8;8	9;6	53.7	8;11	18.3
SD	0;6	1;7	14	1;3	4.8
Range	7;11 – 9;7	7;7 – 13;1	35 - 82	7;3 – 11;9	11 - 28
RMTD (n=12)					
Mean	6;9	6;8	21.4	6;9	7.6
SD	0;5	0;6	6.9	0;6	3.2
Range	6;0 – 7;5	5;11 – 7;6	7 - 34	6;0 – 7;5	2 - 12

Note. A3: Assessment time 3 from the longitudinal study. Ages are in years;months. Reading measures are based on the NARA: Neale Analysis of Reading Ability, 3rd Edition (Neale, 1999); PPR = Persistent poor readers; TD = Typically developing; RMTD = Reading-age matched group of children with typical development.

3.1.2 Materials and procedure

The oral narrative tasks from the longitudinal study were administered to the RMTD participants. The same testing procedures and conditions that the persistent poor readers and the TD group received at A3 were applied.

3.1.3 Transcription and analysis

The same transcription and analysis procedures that were used for the longitudinal study (reported in Chapter 2) were employed for this experiment. That is, the personal narrative language samples were cut after the first 50 complete and intelligible utterances, but the complete story retelling samples were used. This time, however, both the personal narrative and the story retelling samples were used for microstructure analysis. To investigate the length of the retold stories, a verbal productivity measure (total number of utterances) was added. The story retelling samples were also used for macrostructure analysis.

3.1.4 Reliability

Similar reliability procedures to the longitudinal study were followed. Twenty percent of the transcripts were analysed by an independent examiner, who was blind to the children's group status. Transcription reliability in % utterance agreement was 95% for the stories and 98% for the personal narratives. Error coding reliability in % error-code agreement: Stories 93%; Personal narratives 96%. Five stories were independently scored on the story quality rubric, and the reliability of the total scores in Cronbach's Alpha was .96.

3.2 Results

The third assessment trial (A3) results of the oral narrative analyses for the 12 persistent poor readers were compared to those of the 12 RMTD children and the 12 children with TD who participated in the longitudinal experiment (SYSTAT, version 10). For the

ANOVA's, effect size indices f were calculated. To determine the magnitude of the group differences in the post-hoc comparisons, the effect size index Cohen's d was calculated (Portney & Watkins, 2000). This effect size is calculated as the difference between the means divided by the root mean square of the groups' standard deviations and reported as Cohen's d . Conventional values of d were used in the interpretation, i.e., small effect size $d = 0.20$, medium $d = 0.50$, and large $d = 0.80$.

Microstructure Analysis

Personal narratives

Statistical analysis using ANOVA indicated significant group differences in grammatical complexity, MLCU-M: $[F(2,33) = 4.696, p < .05, f = 0.28]$, and semantic diversity, NDW: $[F(2,33) = 4.408, p < .05, f = 0.27]$, but not in grammatical accuracy (GA: $p = .72$). Table 13 lists the means and standard deviations for the three groups across the three productive language measures derived in the personal narrative context. Post-hoc analyses (Bonferroni) indicated the following:

Grammatical complexity: the TD group produced significantly longer sentences than the PPR group ($p < .05, d = 1.1$), but no significant differences were found between the PPR group and the RMTD group ($p = .242$), or between the TD group and the RMTD group ($p = .666$).

Semantic diversity: the TD group used significantly more different words than the PPR group ($p < .05, d = 1.03$). No significant differences in semantic diversity were found between the PPR group and the RMTD group ($p = .105$), or between the TD group and the RMTD group ($p = 1.00$).

Story retelling

An ANOVA indicated significant group differences in verbal productivity $[F(2,33) = 5.199, p < .05, f = 0.32]$, and semantic diversity $[F(2,33) = 6.786, p < .05, f = 0.41]$, but not in

grammatical complexity (MLCU-M: $p = .141$), or grammatical accuracy (GA: $p = .067, f = 0.18$). Table 13 lists the means and standard deviations for the three groups, across the four productive language measures derived in the story retelling context. Post-hoc analyses (Bonferroni) indicated the following:

Verbal productivity: the difference between the TD group and the PPR group approached significance ($p = .055, d = .99$), with the TD group using more sentences to retell the story. The TD group used significantly more utterances than the RMTD group ($p = .014, d = 1.2$). There were no differences between the PPR and the RMTD groups ($p = 1.00$).

Semantic diversity: the TD group used significantly more different words to retell the story than both the PPR group ($p < .05, d = 1.16$) and the RMTD group ($p < .05, d = 1.42$). No significant differences were found between the PPR group and the RMTD group ($p = 1.00$).

Macrostructure Analysis

A one-way ANOVA showed a significant effect for group [$F(2,33) = 5.941, p < .05, f = 0.36$]. Post-hoc analysis (Bonferroni) indicated that the TD group produced significantly better stories than both the PPR group ($p < .05, d = 1.2$) and the RMTD group ($p < .05, d = 1.3$). No significant differences in performance were found between the PPR group and the RMTD group ($p = 1.00$). Group scores are reported in Table 14.

Oral Narrative Comprehension

A one-way ANOVA indicated a significant effect for group [$F(2,33) = 10.5, p < .001, f = 0.64$]. Post-hoc analysis (Bonferroni) indicated that the PPR group scored significantly below both the TD group ($p = .003, d = 1.44$) and the RMTD group ($p < .001, d = 1.5$). There were no significant differences between the TD group and the RMTD group ($p = 1.00$). Means and standard deviations for all three groups are reported in Table 14.

Table 13. Group performance on the microstructure measures of oral narrative ability

Reading group	Personal narrative #			Story retell			
	MLCU-M	GA	NDW	Total no. Utterances	MLCU-M	GA	NDW
PPR							
Mean	6.2 ^a	90.8	116 ^b	25	8.9	84.1	77.1 ^d
SD	1.0	8.4	19	7.9	0.9	15	19.6
TD							
Mean	7.3 ^a	92.8	134 ^b	33.3 ^c	9.5	93.4	99.3 ^{de}
SD	1.0	4.9	16	8.8	1.1	4.8	18.8
RMTD							
Mean	6.8	92.5	130	23.2 ^c	8.9	91.3	71.9 ^e
SD	0.6	5.1	12	7.9	0.6	6.5	19.8

Note. PPR = Persistent poor readers; TD = Typically developing; RMTD = Reading-age matched group of children with typical development; MLCU-M = Mean length of communication unit in morphemes; GA = Grammatical accuracy: percent grammatically correct utterances; NDW = Number of different words.

Transcripts derived in the personal narrative condition were cut after the first 50 complete and intelligible utterances. Values with the same superscript letter for each variable within the same assessment measure are statistically different ($p < .05$). For example, the PPR group used significantly shorter sentences (MLCU-M) than the TD group in the personal narrative condition (^a).

Table 14. Group performance on the oral narrative comprehension and story quality measures

Reading group	Oral narrative comprehension	Story Quality
PPR		
Mean	5.7 ^{ab}	23.7 ^c
SD	1.6	5.9
TD		
Mean	7.5 ^a	29.8 ^{cd}
SD	0.9	4.3
RMTD		
Mean	7.8 ^b	24.2 ^d
SD	1.2	4.2

Note. PPR = Persistent poor readers; TD = Typically developing; RMTD = Reading-age matched group of children with typical development. Oral narrative comprehension: number of correct answers out of 10 questions. Story Quality: maximum score is 40. Values with the same superscript letter for each variable within the same assessment measure are statistically different ($p < .05$). For example, analysis of the oral narrative comprehension task showed that the PPR group answered significantly fewer questions correctly than both the TD group (^a) and the RMTD group (^b).

3.3 Discussion

The study reported in this chapter aimed to further investigate the nature of the relationship between oral narrative ability and reading comprehension performance in children with mixed reading disability (MRD). The research question posed whether there

would be differences in oral narrative performance between the children with MRD and a control group of reading-age matched children with typical development (RMTD). First, it was hypothesised that the children with MRD would demonstrate difficulties in oral narrative tasks tapping story structure knowledge compared to their reading-age matched peers. The results from this experiment partially support this hypothesis. The findings showed that the children with MRD performed significantly below the reading-age matched group on oral narrative comprehension. No group differences were found on the macrostructure measure of oral narrative ability (i.e., story quality). Second, it was hypothesised that the children with MRD would perform like the younger RMTD group on microstructure measures of oral narrative ability. The results support this hypothesis. The microstructure analyses of the oral narrative language samples revealed no group differences in performance between the children with MRD and their reading-age matched peers with typical development. The findings are summarised and their implications discussed, in turn.

The finding that the children with MRD performed significantly below the RMTD group on the oral narrative comprehension measure indicates a specific oral narrative comprehension deficit. It suggests that the children with MRD may have problems forming an accurate mental model of the situation described in the story. As Bishop described (1997, p.169) “information that is not integrated into a mental model is much more fragile and prone to be forgotten,” resulting in poor identification and/or memory of the underlying structural elements of the story (e.g., setting, characters, problem, and resolution). Although these difficulties in oral narrative comprehension experienced by the children with MRD could be the result of limited exposure to text, this seems unlikely, for two reasons. First, it seems doubtful that the children in the RMTD group, who are on average two years younger than the children in the MRD group, would have had more exposure to print. Second, the RMTD group and the MRD group demonstrated similar word reading ability, and previous research

has shown strong links between word reading ability and exposure to print (see Cain et al., 2000, for a discussion on this topic).

When investigating the story retellings at macrostructure level, the results indicated that the children with MRD performed at a similar level compared to their RMTD peers. This was unexpected in view of the poor readers' weak oral narrative comprehension performance. That is, inferior performance in understanding the story compared to the younger reading-age matched group could be expected to lead to inferior performance in retelling the same story. The methodology that was used in the story comprehension task may account for this unexpected finding. The opportunity to listen to the story a second time, and the provision of the correct answer to the story comprehension questions, may have provided the extra support needed for the poor readers to reach the level of the young good readers (see also Cain & Oakhill, 1996). Further research is needed to explore methods that enhance the story retelling performance of children with reading disability.

The microstructure analyses of the personal narrative language samples (containing 50 utterances) revealed that the children with MRD performed much like their younger reading-age matched peers with typical development, suggesting a pattern of spoken language delay. The only oral narrative language measure that failed to show sensitivity to age or reading ability profile (in the personal narrative elicitation context) was the grammatical accuracy measure. These findings suggest that the children with MRD did not show specific morpho-syntactic deficits, as have been reported in the oral narrative development of children with spoken language impairment (Fey et al., 2004). Rather, the oral narratives derived in the personal narrative context of the children with MRD, in this study, were characterised by relatively short, but grammatically correct sentences.

When analysing the story retelling samples at microstructure level, it was found that the performance on this task was sensitive to reading ability. Both the children with MRD

and the RMTD group related shorter stories (as indicated by large effect sizes), containing fewer different words, than the older group of typically developing children, whose reading skill was on average 2 years more advanced. Initial support for the hypothesis that typically developing children learn to tell longer, semantically more dense stories as they proceed through the primary school years, comes from previous cross-sectional research investigating oral narrative skills in typically developing 6- to 7-year-old children (Westerveld et al., 2004). The results from the Westerveld et al. study indicated that the story retelling context was more sensitive to age on measures of semantic diversity than the personal narrative context. Further longitudinal research into the story retelling abilities of children with spoken and/or written language difficulties is required to further test this hypothesis.

In the story retelling context, there were no group differences on the morpho-syntactic measures. Although visual inspection of the data indicates that the older children with typical development used longer sentences, containing fewer grammatical errors than both the MRD group and their reading-age matched peers, this was not statistically significant. Based on the group performances in the personal narrative elicitation condition, group differences on the MLCU-M measure in the story retelling condition were expected. One likely explanation is that the syntactic complexity of the model story that was used in the story retelling context differentially influenced the children's syntactic output (Holloway, 1986). It seems plausible that the model story (to which the children were exposed twice) provided the children in the MRD group with additional support, which enabled them to improve their performance in syntactic complexity. However, consistent with a limited capacity processing model (e.g., Crystal, 1987), grammatical accuracy decreased. Further research into the effects of the structural complexity of the model stories on the story retelling performance of children with differing spoken language and/or reading profiles is clearly required.

3.4 Summary

The results from the present investigation indicate that the children with MRD demonstrate significant difficulty in oral narrative comprehension ability that cannot be explained by their lack of reading experience alone. The more likely explanation is that the weakness in oral narrative comprehension and/or a lack of story structure knowledge has contributed to their reading comprehension difficulties. These findings provide further evidence to the results from the longitudinal study, reported in Chapter 2, which showed that the children with MRD performed consistently more poorly on the oral narrative comprehension task than their age-matched peers with typical development. To further inspect the issue of causality between story structure knowledge and reading comprehension performance, intervention studies are needed in which one of these variables is manipulated. The intervention study reported in Chapter 5, therefore, aims to enhance storystructure knowledge in children with MRD and investigate the treatment effects of this type of intervention on the children's oral narrative skills and reading comprehension performance.

CHAPTER 4

GRAMMATICAL COMPETENCE MEASURES OBTAINED IN PERSONAL NARRATIVE VERSUS STORY-RETELLING CONDITIONS

4. Introduction

The context in which a spontaneous language sample is elicited can have a significant impact on the language production measures obtained. Typically, *oral narrative* elicitation contexts elicit syntactically more complex language samples than *conversational* contexts (MacLachlan & Chapman, 1988; Westerveld et al., 2004). Differences in language production measures have also been found between spoken language samples obtained in different oral narrative sampling contexts (e.g., Merritt & Liles, 1989; Westerveld et al., 2004). The results from the Westerveld et al. study showed that a story retelling task yielded syntactically more complex, but grammatically less accurate spoken language samples than a personal narrative task in 4- to 7-year-old children with typical development. The investigation reported in this chapter aims to investigate if these findings can be extended to children with reading disabilities who are known to have a different spoken language profile (Gillon & Dodd, 1994; Nation, 2004).

Previous research into the effects of sampling conditions on language production skills indicated differences in syntactic performance in children with differing spoken language profiles (Masterson & Kamhi, 1991). Three groups of children, aged between 6;0 and 9;0, who demonstrated normal nonverbal intelligence, participated in the Masterson and Kamhi study: 1) 10 children with typical development, 2) 10 children with specific reading disability, and 3) 10 children with language-learning disability (i.e., performance below 1SD

on standardised tests of spoken language production, word identification, and reading comprehension). A significant interaction was found between group status and elicitation context ('description of experiments' versus story-telling condition) on the percentage of morphological markers that were used correctly. Although the morphological performance of the children with typical development and the children with reading disability did not vary across elicitation contexts, the children with language-learning disability made fewer morphological errors during the descriptions than during story-telling activities. The present study investigates if the different oral narrative sampling conditions, employed in this thesis, differentially affect the morpho-syntactic performance of the children with mixed reading disability (MRD) and their peers with typical development.

The longitudinal investigation, reported in Chapter 2, investigated microstructure measures of oral narrative ability derived in a personal narrative context. The results indicated consistent differences between the children with MRD and their peers with typical development on measures of semantic diversity and grammatical complexity. However, no consistent group differences were found on the grammatical accuracy measure. The children with MRD demonstrated more grammatical errors than the TD group only at assessment time 2. One possible reason for this finding is that the personal narrative context is not sufficiently challenging to reveal children's weaknesses in oral narrative performance (Hughes et al., 1997). The present investigation aims to determine if the story retelling condition is more sensitive to group differences in grammatical accuracy than the personal narrative condition.

The following two questions are addressed:

1. Does the oral narrative elicitation context affect grammatical competence in 6- to 9-year-old children with MRD and/or in their peers with typical development?
2. Are there differences in grammatical accuracy between the children with MRD and their peers with typical development in the story retelling condition?

Based on the results from previous research, it is hypothesised that the story retelling condition will consistently yield grammatically more complex spoken language samples than the personal narrative condition (Westerveld et al., 2004). It is also expected that the story retelling condition will be more sensitive to group differences on measures of grammatical accuracy than the personal narrative condition.

4.1 Method

4.1.1 Materials and procedure

The oral narrative language samples from the 14 children with MRD and the 14 children with typically developing skills, all of whom participated in the longitudinal study (see Chapter 2), were used for analysis in the current investigation. These oral narrative samples were elicited in two contexts, i.e., personal narrative and story retelling, on three occasions (A1, A2, and A3), approximately eight months apart. A full description of the elicitation procedures is reported in Chapter 2.

In the story retelling condition, different books were used at each assessment time, to maintain the children's interest in the task and to avoid the children becoming too familiar with the stories. Although the chosen books were comparable in story structure, the lengths of the stories differed significantly, and there were differences in the grammatical complexity of the model stories (see Appendix B). Therefore, oral narrative language samples derived from these two elicitation conditions were compared at each assessment time. No comparisons over time were made. The following stories were used:

- A1: "Ana Gets Lost" (Swan, 1992): number of utterances 25; MLCU in words 7.68.
- A2: "Frog is aH ero" (Velthuijs, 1995): number of utterances 100; MLCU in words 7.3.

- A3: “A Boy, a Dog and a Frog” (Mayer, 1967): number of utterances 49; MLCU in words 11.45.

4.1.2 Analysis

The full story retelling samples were used, but the personal narrative samples were cut after the first 50 complete and intelligible utterances. The personal narrative samples and the story retelling samples were analysed on two measures tapping grammatical competence: 1) grammatical complexity: the mean length of communication unit (CU) in morphemes (MLCU-M), and 2) grammatical accuracy (GA): the percentage of grammatical CU’s (Fey et al., 2004). The length of the oral narrative samples obtained (in number of utterances) was also recorded and is reported in Table 15.

4.2 Results

To answer research question one, which posed whether the oral narrative elicitation context affects grammatical competence in 6- to 9-year-old children with MRD and/or in their peers with typical development, two-way (group and context) multivariate analyses of variance (MANOVA) were used, at all three assessment times, to compare the grammatical competence measures obtained in the personal narrative and story-retelling contexts (SYSTAT, version 10). When the main effects were significant, follow-up ANOVA’s were performed to determine differences between groups and/or elicitation contexts. Effect size indices (f) were calculated for all statistically significant results from the ANOVA’s to provide an indication of the power of the findings. The effect size index f is based on the root of the between-group sum of squares divided by the error sum of squares. Conventional values of f were used in the interpretation, i.e., small effect size $f = 0.10$, medium $f = 0.25$, large $f = 0.40$ (Portney & Watkins, 2000).

Assessment Time 1 (A1)

There was a significant main effect for group (Wilks' Lambda) [$F(2,51) = 10.72, p < .001$], and a significant main effect for context, [$F(2,51) = 25.938, p < .001$]. There were no interactions between Group x Context ($p = .809$), indicating there were no differences in how the two groups responded to the elicitation contexts. Table 15, therefore, reports the modality comparisons for the grammatical competence measures *across groups*, at all three assessment times. The results from the follow-up one-way ANOVA's indicated that, for both groups combined:

- The story retelling condition yielded significantly longer utterances: MLCU-M [$F(1,52) = 51.836, p < .001, f = 0.997$].
- The story retelling condition yielded significantly lower grammatical accuracy [$F(1,52) = 10.137, p < .05, f = 0.19$].

Assessment Time 2 (A2)

There was a significant main effect for group (Wilks' lambda) [$F(2,51) = 15.906, p < .001$], and a significant main effect for context, [$F(2,51) = 26.236, p < .001$]. There were no interactions between Group x Context ($p = .825$), indicating there were no differences in how the two groups responded to the elicitation contexts. The results from the follow-up one-way ANOVA's indicated that, for both groups combined:

- The story retelling condition yielded significantly longer utterances: MLCU-M [$F(1,52) = 50.552, p < .001, f = 0.97$].
- The story retelling condition yielded significantly lower grammatical accuracy: GA [$F(1,52) = 9.648, p < .05, f = 0.19$].

Assessment Time 3 (A3)

There was a significant main effect for group (Wilks' lambda) [$F(2,51) = 12.931, p < .001$], and a significant main effect for context, [$F(2,51) = 52.833, p < .001$]. There were no

interactions between Group x Context ($p = .369$), indicating there were no differences in how the two groups responded to the elicitation contexts. The follow-up ANOVA's indicated that for both groups combined:

- The story retelling condition yielded significantly longer utterances: MLCU-M [$F(1,52) = 102.16, p < .001, f = 1.96$].
- The elicitation conditions yielded no differences in grammatical accuracy ($p = .157$).

Summary of Results

The elicitation context had a significant effect on the grammatical competence measures obtained from both groups of children at all three assessment times. There were no significant interactions between Group x Context at any of the assessment times, indicating that the two groups responded in a similar manner to the elicitation context. For both groups combined, the story retelling condition consistently yielded longer sentences than the personal narrative condition. The oral narrative language samples elicited in the story retelling condition showed lower grammatical accuracy than those obtained in the personal narrative condition at A1, and A2, but not at A3.

Table 15. Modality comparisons, averaged across groups, at three assessment times

Measures	A1		A2		A3	
	PN*	Story retell	PN*	Story retell	PN*	Story retell
Number of						
Utterances						
Mean	50	13.2	50	28.4	49	29.3
SD	0	5.9	0	12.2	3.8	8.3
MLCU-M						
Mean	6.02	7.97	6.41	8.06	6.67	9.33
SD	1.06	1.15	0.98	0.96	1.12	1.04
GA						
Mean	91.6	84.4	92.0	86.1	92.5	89.1
SD	4.7	11.4	5.3	9.5	6.5	11.1

Note: A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3. Assessment times are approximately 8 months apart. * PN = Personal narratives. The personal narratives were cut after the first 50 complete and intelligible utterances. At A3, 1 child from the MRD group only produced 31 utterances, and 1 child from the TD group only produced 42 utterances. MLCU-M = Mean length of communication unit in morphemes; GA = Grammatical accuracy: percent grammatically correct utterances.

To answer question two, which posed whether the story retelling condition would be sensitive to group differences on the grammatical accuracy measure, separate two-sample *t*-tests were performed at each assessment time. Effect sizes were calculated as the difference between the means divided by the root mean square of the groups' standard deviations, and reported as Cohen's *d* (Portney & Watkins, 2000). Conventional values of *d* were used in the

interpretation, i.e., small effect size $d = 0.20$, medium $d = 0.50$, and large $d = 0.80$. Table 16 lists the group means and standard deviations for the grammatical competence measures, at each assessment time. Figure 2 graphically displays the groups' performance on the grammatical accuracy measure, obtained in the different elicitation conditions. Two-sample t -tests showed the following:

- At A1, there were no group differences in grammatical accuracy in either the personal narrative ($p = .088$) or the story retelling ($p = .211$) elicitation contexts.
- At A2, there were significant group differences in grammatical accuracy in both the personal narrative condition [$t(26) = 3.09, p < .05, d = 1.2$] and the story retelling condition [$t(26) = 2.167, p < .05, d = 0.83$].
- At A3, there were no significant group differences on the grammatical accuracy measure in the personal narrative condition ($p = .47$). Significant group differences were found in the story retelling condition [$t(26) = 2.074, p < .05, d = 0.87$].

Table 16. Group performance on the grammatical competence measures in the personal narrative and story retell conditions at three assessment times

(a) A1

Group	Personal narratives			Story retell		
	Utts.	MLCU-M	GA	Utts.	MLCU-M	GA
MRD						
Mean	50	5.57	90.1	12.7	7.46	81.6
SD	0	0.99	5.3	7.1	1.0	11.6
TD						
Mean	50	6.47	93.1	13.7	8.47	87.1
SD	0	0.96	3.4	4.7	1.09	10.9

(b) A2

Group	Personal narratives			Story retell		
	Utts.	MLCU-M	GA	Utts.	MLCU-M	GA
MRD						
Mean	50	5.9	89.3*	25	7.67	82.5*
SD	0	0.87	5.7	12.3	0.89	10.5
TD						
Mean	50	6.91	94.7	31.8	8.45	89.8
SD	0	0.83	3.3	11.5	0.88	7.0

(c) A3

Group	Personal narratives			Story retell		
	Utts.	MLCU-M	GA	Utts.	MLCU-M	GA
MRD						
Mean	48.6	6.08	91.6	25.2	8.98	85.0*
SD	5.1	1.0	7.9	7.5	0.85	14
TD						
Mean	49.4	7.26	93.4	33.3	9.68	93.2
SD	2.1	0.94	4.8	7.3	1.12	4.8

Note. MRD = Mixed reading disability; TD = Typically developing. Utts. = Total number of utterances. MLCU-M = Mean length of communication unit in morphemes; GA: Grammatical accuracy: percent grammatically correct utterances. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3; Assessment times are approximately 8 months apart. Personal narrative transcripts were cut after the first 50 C&I utterances. At A3, 1 child from the MRD group produced 31 utterances, and 1 child from the TD group produced 42 utterances.

* The MRD group performed lower than the TD group ($p < .05$).

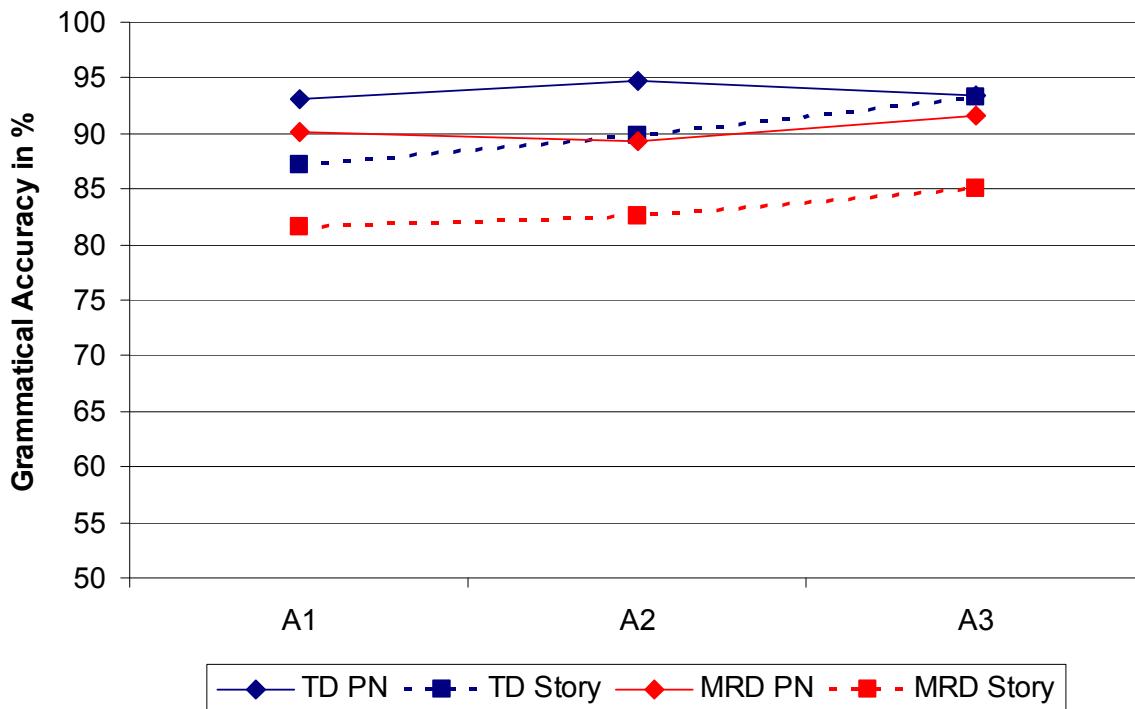


Figure 2. Group performance on the grammatical accuracy measure in personal narrative and story retelling conditions. Grammatical accuracy is based on the percentage of grammatically correct sentences the children produced.

4.3 Discussion

This experiment examined the oral narrative samples of the children with mixed reading disability (MRD) and the children with typically developing reading skills (TD), in two elicitation conditions (personal narratives, and story retelling), on three separate occasions. The first question this experiment addressed was whether the oral narrative elicitation context affected the grammatical competence of the children with MRD and/or their peers with TD. As hypothesised, the story retelling condition consistently yielded grammatically more complex language than the personal narrative condition. Both groups of

children consistently used longer sentences in the story retelling condition than in the personal narrative condition. The results regarding the grammatical accuracy measure were inconsistent, however. For both groups combined, the story retelling condition yielded grammatically less accurate language samples than the personal narrative condition at A1, and A2, but not at A3. The most likely explanation is that, with increasing age, the fictional narrative elicitation context has ceased to challenge the children's grammatical skills. This assumption finds support from previous research that has analysed grammatical errors contained in oral narrative samples from primary school-age children with typical development, from grade 1 through to grade 8 (see Hughes et al., 1997).

The second question this experiment addressed was whether the story retelling condition was sensitive to group differences on the grammatical accuracy measure. Consistent with the hypothesis, the results indicated significant group differences in grammatical accuracy at A2 and A3. In contrast, there were no differences in performance between the two groups of children at A1. Because different model stories were used at each assessment time, caution should be taken in interpreting these results. They do suggest, however, that the story retelling condition is more sensitive to group differences on this measure of grammatical accuracy than the personal narrative condition.

4.4 Clinical implications

When investigating the length of the oral narrative transcripts obtained, there was large variation in the length of the story retelling samples. Some children provided only nine utterances. Although such short samples are unlikely to provide a clinician with sufficient information about a child's total spoken language abilities (Miller, 1996), they may reveal weaknesses in a child's morpho-syntactic ability that would have been undetected in the personal narrative sampling condition. Together, these results suggest that eliciting oral narrative production skills in both personal narrative and story retelling contexts will provide

complementary information. These findings reinforce the importance of collecting spontaneous language samples in a variety of contexts (Hadley, 1998).

CHAPTER 5

THE EFFECTIVENESS OF ORAL NARRATIVE INTERVENTION FOR CHILDREN WITH MIXED READING DISABILITY

5. Introduction

Few studies have investigated whether specific interventions focused on improving children's oral narrative performance (through instruction in oral narrative structure) are effective in enhancing written and spoken narrative comprehension in children with reading disabilities. From a theoretical perspective, understanding how an improvement in narrative structure knowledge may affect the production and comprehension of both spoken and written narratives will enhance our knowledge of models of language development. It is hypothesised that narrative structure knowledge contributes to the development of accurate mental models required for spoken and written story comprehension (Westby, 2005). These mental models not only assist in comprehending a narrative (or story), they also facilitate memory and retrieval of the important elements in a story. The results from the experiments described in previous chapters suggest a causal connection between oral narrative comprehension ability and reading comprehension performance. The intervention study described in this chapter was designed to provide further evidence of the nature and the strength of the relationship between oral narrative ability and reading comprehension performance.

Intervention to enhance oral narrative performance can be conducted at two levels: macrostructure and microstructure. At the macrostructure level, the overall quality of the oral narrative the child produces is targeted. This level of intervention may include developing the child's ability to understand and apply the typical narrative structure of a story (using story

grammar elements, such as characters, setting, problem, goal, attempts, resolution, and conclusion; see Hughes et al., 1997). It may also address the oral narrative's overall coherence (i.e., producing a narrative that is organised in a meaningful way) (Cain, 2003). At the microstructure level, teaching emphasis would be placed on the linguistic structures or the types of words used to create an oral narrative.

Although macro- and microstructure measures of oral narrative performance tap different underlying language skills (Liles et al., 1995), competence or difficulty in one area may affect performance in another because of limited working memory processing capacity (Crystal, 1987). For example, a child's difficulty in producing a complex oral narrative (at macrostructure level) may result in poorer performance on microstructure measures, such as reduced verbal fluency (characterised by pauses and reformulations) or decreased grammatical complexity. Given the hypothesised importance of narrative structure knowledge to children's reading comprehension performance (see Chapter 1 for a detailed discussion), intervention directed at the oral narrative's macrostructure level is crucial. Because of the participants' persistent difficulties in *all* aspects of oral narrative ability, however, careful assessment of their oral narrative performance at both macro- and microstructure levels, before and after intervention, is warranted. This will ensure that a complete picture of the children's oral narrative proficiency is obtained.

The current study investigated the treatment effects of oral narrative structure intervention on measures of oral narrative ability and reading comprehension for a group of children with a mixed reading disability profile (MRD, described in Chapter 2). The results obtained from the two-year longitudinal investigation, described in Chapter 2, indicated persistent difficulties in oral narrative production and comprehension ability in this group of children.

The following questions were asked:

1. Does oral narrative intervention enhance the oral narrative comprehension and production skills of the children with MRD?
2. Does oral narrative intervention improve these children's reading comprehension performance?

It was hypothesised that intervention directed at improving narrative structure knowledge in the children with MRD would result in improved narrative comprehension performance in both spoken and written modalities. It was also hypothesised that an improvement in story structure knowledge would assist the children in producing a well-structured oral narrative, containing all the important narrative structure elements. In addition, consistent with theories of limited linguistic processing capacity (Crystal, 1987), it was expected that increased attention to the macrostructure of the story during retelling would result in poorer performance on the microstructure measures of oral narrative ability (i.e., verbal fluency and grammatical accuracy).

5.1 Method

5.1.1 Participants

Upon completion of the longitudinal phase of the project (reported in Chapter 2), ten children (aged between 7;11 and 9;2) were available for intervention. These children continued to demonstrate significant reading impairment. Table 17 reports their reading performance immediately prior to the intervention. From this group, four children were from schools in lower socio-economic areas, with the remaining six from mid- or high-socio-economic areas, as determined by the school's decile ranking. In New Zealand, the Ministry of Education assigns a decile ranking to all schools based on socio-economic factors associated with a random sample of its student addresses [www.minedu.govt.nz/

goto/deciles]. Six children were of New Zealand European descent, and four children were of Maori descent. The group of children consisted of seven boys and three girls.

Ten children with typical development, who also participated in the longitudinal study, served as a comparison group. Because no normative data were available for the experimental measures of oral narrative ability, performance of this group of children with typical development was used as a benchmark for grade-appropriate oral narrative ability, both during the longitudinal study and at the post-intervention assessments.

Table 17. Individual reading performance of the participants with mixed reading disability at the pre- and post-intervention assessments

Case	Intervention	CA	Reading		Reading		
			Group	Accuracy ^a		Comprehension ^a	
				Pre	Post	Pre	Post
1	1	8;7	3	2	2	7	
2	1	9;1	9	16	7	10	
3	1	9;0	1	1	1	1	
4	1	8;5	3	5	7	4	
5	1	8;1	1	4	1	8	
6	2	8;10	3	4	13	8	
7	2	9;2	10	12	5	13	
8	2	9;1	4	12	1	13	
9	2	8;11	8	27	14	13	
10	2	7;11	2	3	1	4	
Mean		8;8	4.4	8.6	5.2	8.1	
SD		0;5	3.3	8.2	5.0	4.2	

Note. CA = Chronological age (years;months) at pre-test (Assessment time 3:A3).

^a Reading scores are expressed in percentile rank scores (which are based on the child's "year of schooling"), derived from the NARA (Neale, 1999). Form 1 was used pre-intervention, and Form 2 was used post-intervention. The approximate time between pre- and post-intervention assessments was 8 months. Children in intervention Group 1 received the intervention first.

5.1.2 Research design

The study utilised a nonequivalent pretest-posttest control group design, in which one group was randomly assigned to immediate treatment (Group 1), and the other group was assigned to a delayed treatment (Group 2), as shown in Table 18. The 10 participants formed two groups that were based on the geographical location of the schools. Group 1 received the oral narrative intervention first, during school-term 2, and Group 2 received the oral narrative intervention in school-term 3. Table 18 outlines the assessment and intervention schedule. As illustrated in Table 18, the performance scores on the third assessment trial of the longitudinal study (A3) were used as pre-test measures for the intervention. Group 2 served as a non-treatment control group for Group 1 during school-term 2. Independent *t*-tests showed no significant differences between the two groups on pre-intervention scores (A3) for age ($p = .621$), spoken language abilities (Total Language Score on the CELF-3, $p = .597$), nonverbal intelligence (TONI, $p = .203$), reading comprehension (NARA, percentile rank, $p = .341$), or reading accuracy (NARA, percentile rank, $p = .345$). In addition, there were no significant differences pre-intervention on any of the oral narrative measures (i.e., comprehension, story quality, and microstructure measures of oral narrative ability). However, four children from Group 1 were from low socio-economic areas, whereas all children from Group 2 were from mid- to high-socio-economic areas as determined by the Ministry of Education school classification system.

All children continued to receive their regular classroom reading and oral language programme during the oral narrative intervention period. According to the New Zealand English curriculum, specific goals pertaining to written and spoken language in grades 3 and 4 include, for example, “listen to texts and recall and respond to the main ideas in an organised way, relating them to personal and wider experience” (Ministry of Education, 1994).

Table 18. Nonequivalent pretest-posttest control group design

Group	A1^a	A2^a	A3^a	X	A4	X	A5
Group 1	Pre	Pre	Pre	Inter- vention	Post		Post
Group 2	Pre	Pre	Pre		Pre	Inter- vention	Post
Typical ^b	✓	✓	✓			✓	
Interval							
(months)	---- 8 -----	- 8 -----	----- 4 -----	----- 4 -----			

Note. ^a Pre-intervention assessment trials from the longitudinal study. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3. Intervention Group 2 acted as a control group for Group 1, when Group 1 received the intervention first.

^b The ticks indicate at which assessment times the children with typical development were assessed.

5.1.3 Assessment measures

The children's performance scores on the reading comprehension and oral narrative tasks from the third assessment trial in the longitudinal study were used as pre-intervention test measures (A3 in Table 18). These procedures are described in detail in Chapter 2. At A4 and A5, the same tasks (using different materials as described below) were used.

Reading Ability

The Neale Analysis of Reading Ability, 3rd Edition (NARA, Neale, 1999) was used to assess children's reading ability. The NARA contains two parallel forms, Form 1 and Form 2.

To counteract the possible effects of familiarity with the test passages, Form 1 was used pre-intervention (A3), whereas Form 2 was used post-intervention (A5). The average reliability coefficient for these alternative forms is .93.

Oral Narrative Production

Different books were used at each assessment time to maintain the children's interest and to avoid the children becoming too familiar with the story. The chosen stories were comparable in length and in story structure (i.e., they all involved goal-directed behaviour and included the following story grammar elements: setting, problem, attempt, consequence, resolution, and ending). The following stories were used: A3: "A Boy, a Dog and a Frog" (Mayer, 1967); A4: "One Frog too Many" (Mayer & Mayer, 1975); and A5: "Frog Where are you" (Mayer, 1969). The stories are included in Appendix B.

Oral Narrative Comprehension

The fictional stories used for the oral narrative production task were used to assess oral narrative comprehension. After hearing the story for the first time, the children were asked 10 comprehension questions tapping underlying story structure elements (see Idol & Croll, 1987), such as characters, setting, problem, attempts, and resolution. For example, "Who is the story about?" (*Characters*); "Did the boy get what he wanted? Explain" (*Resolution*). Children were awarded one point for each correct answer. The questions used in the oral narrative comprehension task are included in Appendix C.

An additional oral narrative comprehension probe was administered pre- and post-intervention (at A3, A4, and A5), i.e., The Dragon Story from the Test of Narrative Language (TNL, Gillam & Pearson, 2004). In this task, children listened to a story about a dragon that was read by the examiner. After reading the story, the examiner asked the child 10 comprehension questions that tapped underlying story structure components as well as more general questions. For example, "Where were they walking before they saw the dragon?"

(*Setting*), “What were the problems in the story?” (*Problem*), “What did Daniel and Michelle do when they got home?” Using the scoring procedures of the TNL, three questions could be awarded more than one point, bringing the maximum score to 14.

Treatment Control Probe

A control probe was administered at A3, A4, and A5. This consisted of the first 24 items of the Woodcock Reading Mastery Tests – Revised (WRMT-R, Woodcock, 1998). This nonword reading task required the child to apply phonic (letter-sound associations) and structural analysis (phonological awareness) skills to decode unfamiliar and/or nonsense words.

5.1.4 Transcription and analysis

The same transcription procedures that were used for the longitudinal study (reported in Chapter 2) were employed for this experiment. The transcripts were analysed for the following measures:

Microstructure Analysis

The following spoken language measures were calculated automatically, using SALT-NZ (Gillon et al., 2002):

- Verbal productivity was based on the total number of complete and intelligible (C&I) utterances used to retell the story.
- Verbal fluency was based on the percentage of maze words. A maze refers to any filled pause, false start, repetition, or reformulation, and is marked by enclosing that part of the utterance in parentheses during transcription. Mazing behaviour is a sign of formulation load on the speaker (Miller, 1996).
- Grammatical competence was measured as 1) grammatical complexity: the mean length of communication unit (CU) in morphemes (MLCU-M), and 2) grammatical accuracy (GA): the percentage of grammatical CU's (Fey et al., 2004).

- Semantic diversity was based on the number of different words (NDW) used to retell the story.

Macrostructure Analysis

To evaluate the child's ability to apply story structure knowledge when retelling a story, all story retellings were scored on a story quality rubric. The story quality rubrics used at A3, A4, and A5 are included in Appendix D. Full details of the scoring procedures are reported in Chapter 2.

5.1.5 Intervention

The intervention consisted of 12, one-hour group sessions over a 6-week period, which were conducted by the author (a speech-language therapist) in a quiet work room in the children's schools. Three children only received 11 sessions due to illness or holidays. Children participated in small-group intervention sessions with either two or three other children involved in the study.

The intervention aimed to increase children's knowledge of story structure by introducing them to seven story grammar elements: setting, characters, problem, goal/plan, attempts, resolution, and conclusion. In session one, the well-known story "The Three Little Pigs" was used as an example (see Table 19). An overview of the 6-week intervention programme is included in Appendix E. Written treatment plans were used and narrowly adhered to (see Appendix F). As seen in Appendix F, new stories (both familiar and unfamiliar) were introduced each session, and the relevant story grammar elements were discussed. Occasionally books/stories were re-used several sessions later. Emphasis in the sessions was on spoken language and listening rather than reading. However, children were allowed to read passages of the books on request.

Table 19. The story grammar elements in the fictional story “The Three Little Pigs”

Story Grammar	The Three Little Pigs
Element	
Theme	Outwitting your enemy
Setting	<p>Once upon a time there were three little pigs.</p> <p>One day, the three little pigs decided to leave home.</p> <p>“Watch out for the big, bad wolf,” said their mother as she waved goodbye.</p> <p>The first little pig built a house of straw.</p> <p>The second little pig built a house of sticks.</p> <p>The third little pig built a house of bricks.</p> <p>A big bad wolf crept up to the house of straw.</p>
Problem	The wolf was hungry and wanted to eat the pigs but he had to catch them first.
Plan	He decided to blow down the little pigs’ house/s so he could catch them and eat them.
Attempt/s	<ol style="list-style-type: none"> 1) The wolf blew down the house of straw. But the little pig escaped and went to his brother’s house. 2) The wolf blew down the house of sticks. But both little pigs escaped and went to their brother’s house of bricks. 3) The wolf tried to blow down the house of bricks but it was too strong. 4) The wolf climbed up on the roof to get in through the chimney.
Resolution	The third little pig quickly put a pot of boiling water underneath the chimney. The wolf fell down the chimney, right into the pot of boiling water.
Ending	And the three little pigs lived happily ever after in their house of bricks.

All sessions adhered to the following four principles adapted from Hutson-Nechkash (2001):

1. Exposure to well-formed literature and a literate style of language. The children were introduced to existing children's stories (using trade books) that contained a well-defined story structure (e.g., "Grandpa's Cardigan," Watson, 1993, see Appendix H for a complete list of books used in the intervention). Although new vocabulary was explained, and difficult sentences were analysed or discussed, no focused activities were undertaken to systematically enhance vocabulary or syntax.
2. Development of meta-narrative awareness. The children were encouraged to think and talk about stories by discussing what makes a *good* story, identifying story grammar elements in stories, and providing each other with feedback when re/telling stories (e.g., on the number of story grammar elements included).
3. Use of scaffolding techniques by the speech-language therapist to assist the children in oral narrative construction. The children were provided with varying degrees of assistance during intervention (e.g., when identifying story grammar elements of a story, or when retelling a story) until they were able to perform a task independently. Examples of scaffolding questions are: "From the clues in the story, what can you tell me about the setting?" and "What was the problem in the story?"
4. Use of graphic organisers. A *story map* (see Idol & Croll, 1987) and laminated story grammar labels were used to help the children understand, structure, and remember oral narratives and specific story grammar elements (see Appendix I).

Based on these four principles, a typical session would contain the following key points:

- Discuss/explain/review a story-grammar element.
- The speech-language therapist reads (part of) a story.
- The child identifies story grammar element/s using the story map.
- The child retells part of the story, including the story grammar element/s discussed in the intervention session. The other children in the group provide feedback about the number of story grammar elements included in the retelling.

To monitor progress, and to ensure that all children received an equal number of turns in identifying story grammar elements after listening to a story, or in retelling (part of) a story, tracking sheets were used during the sessions to mark the performance of individual children. Examples of tracking sheets are included in Appendix G.

5.1.6 Assessment reliability

The reliability procedures were similar to those that were used in the longitudinal study (Chapter 2). The percentage of agreement, in accuracy of words transcribed, between the two examiners, at the three assessment times (based on a random selection of 20% of the transcripts) was as follows: A3: 97.8%, A4: 99.5%, A5: 99.5%. The percentage of agreement on deciding whether sentences were grammatically correct was: A3: 98.9%, A4: 100%, A5: 98.5%. With regards to the story quality rubric, 25% of the stories were independently scored, and reliability of the total scores on the story quality rubric in Cronbach's Alpha was: A3: .96, A4: .98, A5: .93. The total scores (of all individual stories) awarded by the two examiners differed by 4 points or less.

5.1.7 Treatment fidelity

All intervention sessions were recorded; approximately 50% were video-recorded, and the remaining sessions were recorded using a digital voice recorder. A structured treatment protocol (see Appendix F) was followed to ensure consistency across sessions. An independent examiner, trained on the treatment protocol, randomly selected 10% of the video-recordings and observed 1) if the therapist adhered to the four assessment principles, and 2) if the activities as set out in the session plans were followed. No obvious discrepancies were observed.

5.2 Results

Research question one posed whether the oral narrative intervention would enhance the oral narrative comprehension and production skills of the children with MRD. To answer this question, the following analyses were conducted:

1. At A4, after Group 1 had received the intervention, Group 1's performance was compared to that of Group 2, who had not yet received the intervention.
2. The performance of Group 2 was inspected at A5, to determine if changes in performance occurred as a result of the intervention and to provide further evidence of the effectiveness of the intervention.
3. Once both groups had received the intervention, the performance of the children with MRD was compared to that of their peers with typical development (TD), at A5.

To answer research question two, which related to the possible impact of the oral narrative intervention on the children's reading comprehension performance, the reading comprehension performance of the children with MRD (pre- and post-intervention) was compared to the reading comprehension performance of their peers with typical development.

Prior to the intervention, Mann-Whitney U-tests revealed no *gender* differences for age ($p = .732$), spoken language abilities (Total Language Score on the CELF-3, $p = 1.00$), nonverbal intelligence (TONI, $p = .247$), reading comprehension (NARA, percentile rank, $p = .479$), or reading accuracy (NARA, percentile rank, $p = .729$). In addition, there were no significant gender differences on any of the oral narrative measures (i.e., comprehension, story quality, and microstructure measures of oral narrative ability). Therefore, children's gender was not used as a factor in any of the subsequent analyses.

5.2.1 Treatment effects on oral narrative performance

Treatment Effects on Oral Narrative Performance for Group 1

At A4, the results were analysed to compare Group 1 and Group 2 on the oral narrative measures (i.e., after Group 1 had received the intervention, but before Group 2 received the intervention). Improvement scores were calculated as percent gain scores (i.e., gain score divided by the pre-intervention score), and group comparisons were made using independent $t -$ tests. Levene's tests were carried out to assess equality of variance. Effect sizes were calculated using Cohen's d (as expressed by the difference between the two sample means divided by the root mean square of the groups' standard deviations) (Portney & Watkins, 2000). Conventional values of d were used in the interpretation, i.e., small effect size $d = 0.2$, medium $d = 0.5$, large $d = 0.8$.

Oral narrative comprehension

Group comparisons at A4 indicated a significant treatment effect, with the children in Group 1 showing an improvement in their oral narrative comprehension ability compared to the children in Group 2: on the story comprehension task [$t(8) = 2.451, p < .05, d = 1.55$] and on the story comprehension probe [$t(8) = 2.991, p < .05, d = 1.89$]. Table 20 details the groups' results on the story comprehension measures, and Figure 3 illustrates the improvement made by Group 1 following intervention.

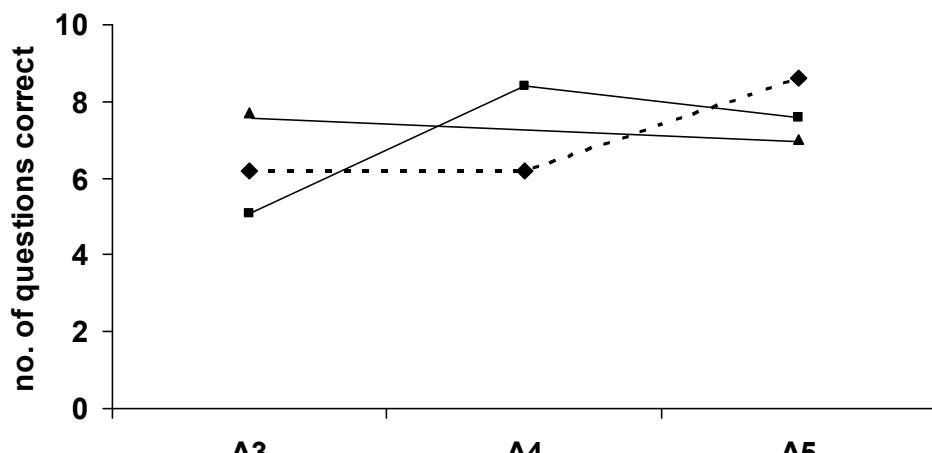
Table 20. Intervention group assessment results on the oral narrative production and oral narrative comprehension measures

	Oral Narrative Measures	Group 1			Group 2		
		n = 5			n = 5		
		A3 Pre	A4 Post	A5 Post	A3 Pre	A4 Pre	A5 Post
Oral narrative comprehension							
Task ^a	Mean	5.1	8.4	7.6	6.2	6.2	8.6
	SD	1.9	1.1	1.1	1.3	1.6	0.5
Probe ^b	Mean	8	11	11.4	8.6	8.6	10.8
	SD	1.2	2.0	1.9	1.1	0.5	0.8
Oral narrative production							
No. of Utts.	Mean	30.8	33.6	41.8	23.8	27.2	43.2
	SD	5.8	3.5	8.9	4.4	9.0	17.6
% Maze words	Mean	8	12.2	12	11.2	11.4	15.8
	SD	1.9	3.9	3.8	5.1	6.5	5.9
NDW	Mean	89.8	90.6	113	75.8	79	123.2
	SD	18.3	10.9	9.5	4.0	27.5	28.2
MLCU-M	Mean	9.34	8.31	9.26	8.83	8.83	9.66
	SD	0.73	0.6	0.52	0.89	1.11	0.69
GA	Mean	75.1	87.3	91.3	86.7	86	88.7
	SD	13.3	6.5	6.5	14.2	12.1	9.3
Story quality	Mean	24.8	30.8	27.6	24	24.4	26.8
	SD	6.7	3.0	3.0	4.9	6.2	4.8

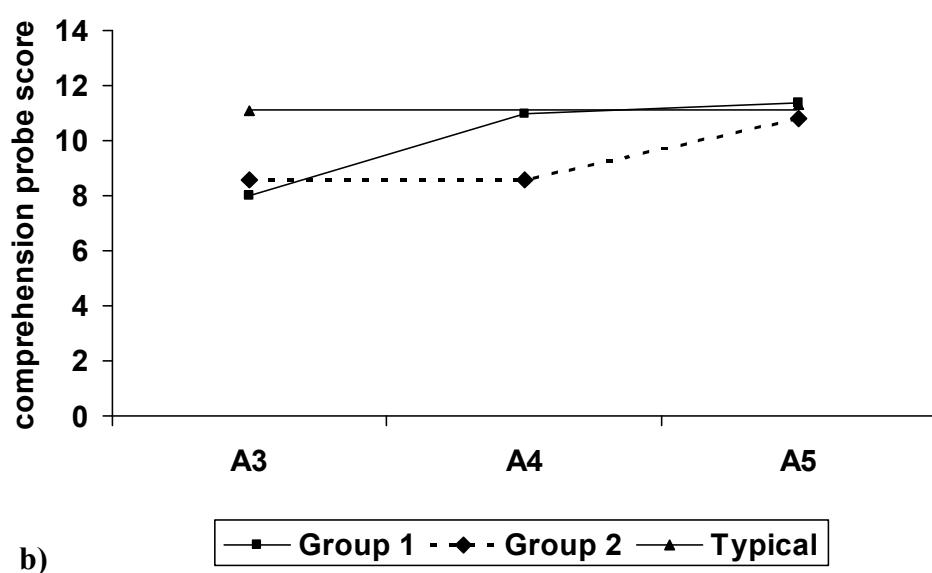
Note. A3, A4, and A5: Assessment times 3, 4, and 5, respectively.

^a This task used the story from the oral narrative production task. Maximum score is 10.

^b This task used the Dragon Story from the Test of Narrative Language (Gillam & Pearson, 2004). Maximum score is 14. Intervention Group 1 received the intervention first. Utts. = utterances; NDW = Number of different words; MLCU-M = Mean length of communication unit in morphemes; GA = Grammatical accuracy: percent grammatically correct utterances.



a)



b)

Figure 3. Treatment effects on the oral narrative comprehension measures for both intervention groups: a) the oral narrative comprehension task (maximum score is 10), b) the oral narrative comprehension probe (maximum score is 14). Group 1 received the intervention first (from Assessment time 3 (A3) to A4); Group 2 received the intervention delayed (A4 to A5). Typical: performance of the group of children with typical development.

Oral narrative production

Microstructure analysis. Group comparisons at A4 showed no significant treatment effects for number of utterances ($p = .925$), number of different words ($p = .938$), or grammatical competence (MLCU-M: $p = .186$; GA: $p = .175$). There was a significant treatment effect, however, for verbal fluency [$t(8) = 2.883, p < .05, d = 1.65$], with Group 1 showing an increase in mazing behaviour following intervention. Table 20 lists the groups' performance on the microstructure measures at the pre- and post-intervention assessments. Figure 4 shows the change in mazing behaviour in Group 1 as a result of the intervention.

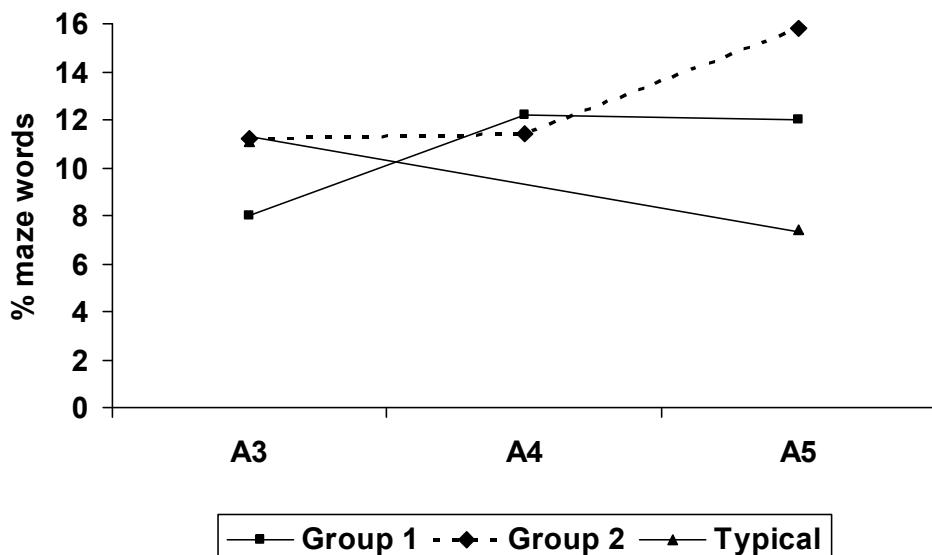


Figure 4. Intervention group performance on the verbal fluency measure, pre- and post-intervention. Verbal fluency is reported as percent maze words. Group 1 received the intervention first (Assessment time 3 (A3) to Assessment time 4); Group 2 received the intervention second (A4 to A5). Typical: performance of the children with typical development. Assessment times are 4 months apart.

Macrostructure analysis. Although Group 1 appeared to show an improvement in story retelling ability (as captured by the story quality score) compared to Group 2 immediately following intervention, this improvement was not statistically significant ($p = .286$). Group performance on the oral narrative production task is reported in Table 20 and graphically illustrated in Figure 5.

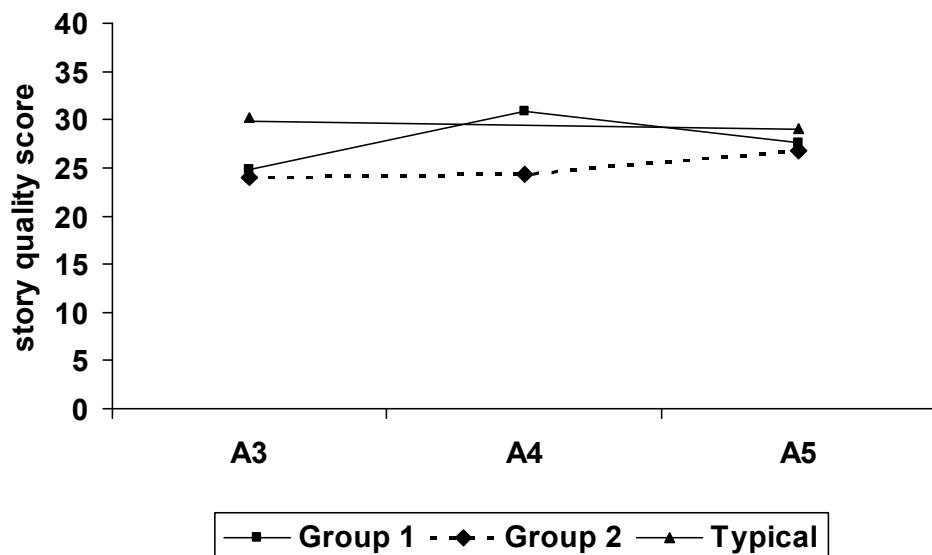


Figure 5. Treatment effects on the macrostructure measure of oral narrative production. Performance is based on the story quality score (maximum score 40). Intervention Group 1 received the intervention first (Assessment time 3 (A3) to Assessment time 4). Group 2 received the intervention delayed (A4 to A5). Typical: performance of the children with typical development. Assessment times are 4 months apart.

Treatment control probe

As expected, there was no significant treatment effect on the children's ability to decode nonwords between A3 and A4 ($p = .341$). As Figure 6 illustrates, both groups made small, but similar gains in nonword reading between A3 and A4.

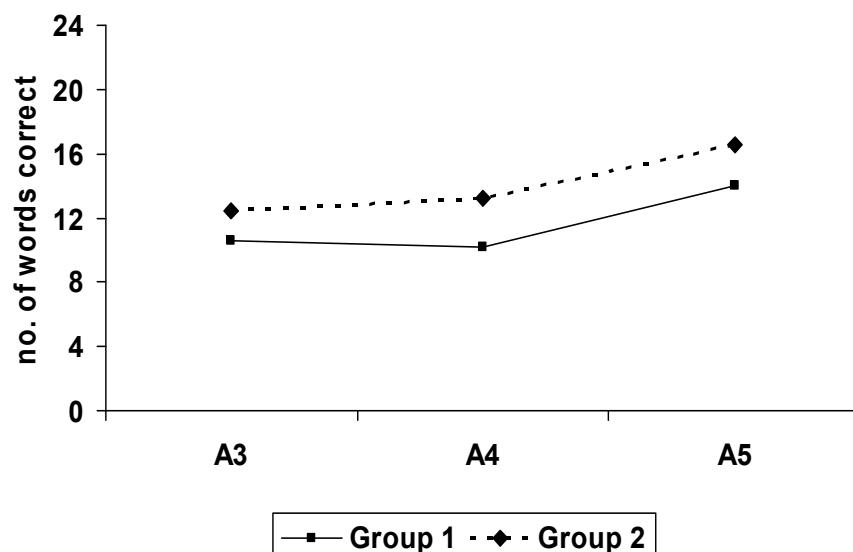


Figure 6. Intervention group performance on the nonword reading task, which served as a control probe. Nonword reading performance was based on the first 24 items from the Word Attack subtest of the WRMT-R (Woodcock, 1998). Intervention Group 1 received the intervention first (Assessment time 3 (A3) to Assessment time 4). Group 2 received the intervention delayed (A4 to A5). Assessment times are 4 months apart.

Treatment Effects on Oral Narrative Performance for Group 2

At A5, the results were analysed to evaluate the change in oral narrative ability for Group 2 following intervention. An ANOVA showed a significant improvement in oral narrative comprehension performance between A4 and A5 [$F(1,8) = 9.6, p < .05, f = 0.61$].

There was no change in performance on the story quality rubric ($p = .587$). Visual inspection of the graphic display of the data (see Figure 3) shows that Group 2's performance on both the oral narrative comprehension measures improved following intervention (from A4 to A5). On the microstructure measures of oral narrative production, visual inspection of the mazing behaviour shows that, like Group 1, Group 2 showed an increase in the percentage of maze words (see Figure 4). No change was seen on the macrostructure measure of oral narrative production, as illustrated in Figure 5.

As Figure 6 illustrates, both groups made similar progress in nonword reading ability during the intervention phases (i.e., from A3 to A4, and from A4 to A5), indicating the oral narrative treatment had no direct effect on the groups' performance on this treatment control probe.

Treatment Effects on Oral Narrative Performance for the Children with MRD compared to their Peers with TD

To evaluate to what extent the intervention improved the oral narrative skills of the children with MRD, their performance (Group 1 and Group 2 combined) was compared to that of their chronological-age matched peers with typically developing reading skills (TD) at A3 and A5 (see Table 18). Two-way (group and time) repeated measures analyses of variance (ANOVA) were used. Effect size calculations were based on the effect size index f , where a small effect size $f = 0.1$, medium $f = 0.25$, and large $f = 0.4$ (see (Portney & Watkins, 2000). Table 21 and Table 22 list the results on the oral narrative comprehension and the oral narrative production measures for both groups of children (MRD and TD), pre- and post-intervention.

Oral narrative comprehension

Story comprehension task. A two-way repeated measures ANOVA showed no significant main effect for group ($p = .197$). There was a significant effect for time [$F(1,18) =$

$7.967, p < .05, f = 0.44]$, however, and the interaction Time x Group was also significant [$F(1,18) = 25.18, p < .001, f = 1.4$], indicating there were significant differences in performance over time between the two groups of children. The follow-up one-way ANOVA's showed that the TD group significantly outperformed the MRD group pre-intervention [$F(1,18) = 13.013, p < .05, f = 0.72$]. Post-intervention, however, the children with MRD significantly outperformed the TD group [$F(1,18) = 8.442, p < .05, f = 0.47$]. Figure 7 shows that the MRD group demonstrated significant difficulties in oral narrative comprehension, compared to their peers with TD, during the 2-year longitudinal phase of the study (A1, A2, A3). In contrast, the MRD group showed superior performance post-intervention (see also Figure 3a).

Story comprehension probe. A two-way repeated measures ANOVA indicated a significant main effect for group [$F(1,18) = 12.5, p < .05, f = 0.69$], a significant main effect for time [$F(1,18) = 29.779, p < .001, f = 1.65$], and a significant interaction for Time x Group [$F(1,18) = 22.368, p < .001, f = 1.24$]. The follow-up ANOVA's indicated a significant difference between the groups pre-intervention [$F(1,18) = 30.678, p < .001, f = 1.7$], with the TD group outperforming the MRD group. However, no significant differences between the groups were found post-intervention ($p = .697$; see Figure 3b).

Table 21. Group results on the oral narrative comprehension tasks

Group	Oral narrative comprehension			
	Task ^a		Probe ^b	
	A3 Pre	A5 Post	A3 Pre	A5 Post
MRD (n = 10)				
Mean	5.6	8.1	8.3	11.1
SD	1.6	1.0	1.2	1.4
TD (n = 10)				
Mean	7.7	7.0	11.1	11.3
SD	0.8	0.7	1.1	0.7

Note. A3: Assessment time 3; A5: Assessment time 5. Assessments are approximately 8 months apart. MRD = Mixed reading disability; TD = Typically developing.

^a This task used the story from the oral narrative production task; Maximum score is 10.

^b This task used the “Dragon Story” from the Test of Narrative Language (Gillam & Pearson, 2004); Maximum score is 14.

Oral narrative production

Microstructure analysis. A multivariate analysis of variance (MANOVA) at pre-intervention (A3) revealed a significant main effect (Wilks' Lambda: $p = .019$), with the TD group outperforming the MRD group. Results from the follow-up one-way ANOVA's revealed significant differences between the groups on grammatical accuracy, GA [$F(1,18) = 7.531, p < .05, f = 0.42$], and semantic diversity, NDW [$F(1,18) = 4.719, p < .05, f = 0.26$], but not on verbal productivity ($p = .112$), verbal fluency ($p = .626$), or grammatical complexity (MLCU-M, $p = .278$).

The two-way (time and group) repeated measures ANOVA's (based on performance at A3 and A5) indicated no significant main effects for group on measures of verbal productivity or grammatical complexity. However, significant main effects were found for verbal fluency [$F(2,17) = 8.273, p < .05$], grammatical accuracy [$F(2,17) = 3.205, p = .05$], and semantic diversity [$F(2,17) = 3.205, p = .05$]. The follow-up ANOVA's (post-intervention, at A5) showed the following:

- The MRD group produced a significantly higher percentage of maze words compared to the TD group [$F(1,18) = 6.774, p < .05, f = 0.38$]. As illustrated in Figure 4, the children with TD showed a decrease in verbal fluency between A3 and A5.
- There was no longer a significant difference between the groups on grammatical accuracy ($p = .314$).
- There was no longer a difference between the groups on semantic diversity ($p = .853$).

Macrostructure analysis. A two-way (time and group) repeated measures ANOVA showed a main effect for group that failed to reach significance ($p = .062$). Results from the planned follow-up one-way ANOVA's indicated that the TD group clearly outperformed the MRD group pre-intervention, at A3 [$F(1,18) = 6.85, p < .05, f = 0.38$], but that this difference was no longer statistically significant post-intervention (at A5: $p = .355$). Figure 5 illustrates the performance of the two intervention groups of children with MRD compared to the control group of typically developing children. Figure 7b illustrates the longitudinal group data on oral narrative production performance by the MRD and TD groups. As Figure 7b shows, there were no significant group differences on the story quality measure at the post-intervention assessment trial.

Table 22. Group results on the oral narrative production measures

Group	No. Utterances		% Maze words		NDW		MLCU-M		GA		Story quality	
	A3	A5	A3	A5	A3	A5	A3	A5	A3	A5	A3	A5
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
MRD												
(n = 10)												
Mean	27.3	42.5	9.6	13.9	82.8	118.1	9.08	9.46	80.9	90	24.4	27.2
SD	6.1	13.2	4	5.1	14.5	20.6	0.82	0.61	14.4	7.7	5.6	3.8
TD												
(n = 10)												
Mean	33.2	39.9	11.1	7.4	99.9	120.6	9.59	10.2	94.1	93.2	30.2	29
SD	9.4	15.2	8.7	6.0	20.2	36.8	1.18	1.19	4.9	6	4.3	4.6

Note. A3: Assessment time 3; A5: Assessment time 5. Assessments are approximately 8 months apart. MRD = Mixed reading disability; TD = Typically developing; NDW = Number of different words; MLCU-M = Mean length of communication unit in morphemes; GA = Grammatical accuracy: percent grammatically correct utterances. Pre: Pre-intervention; Post: Post-intervention. Story quality: Maximum score is 40.

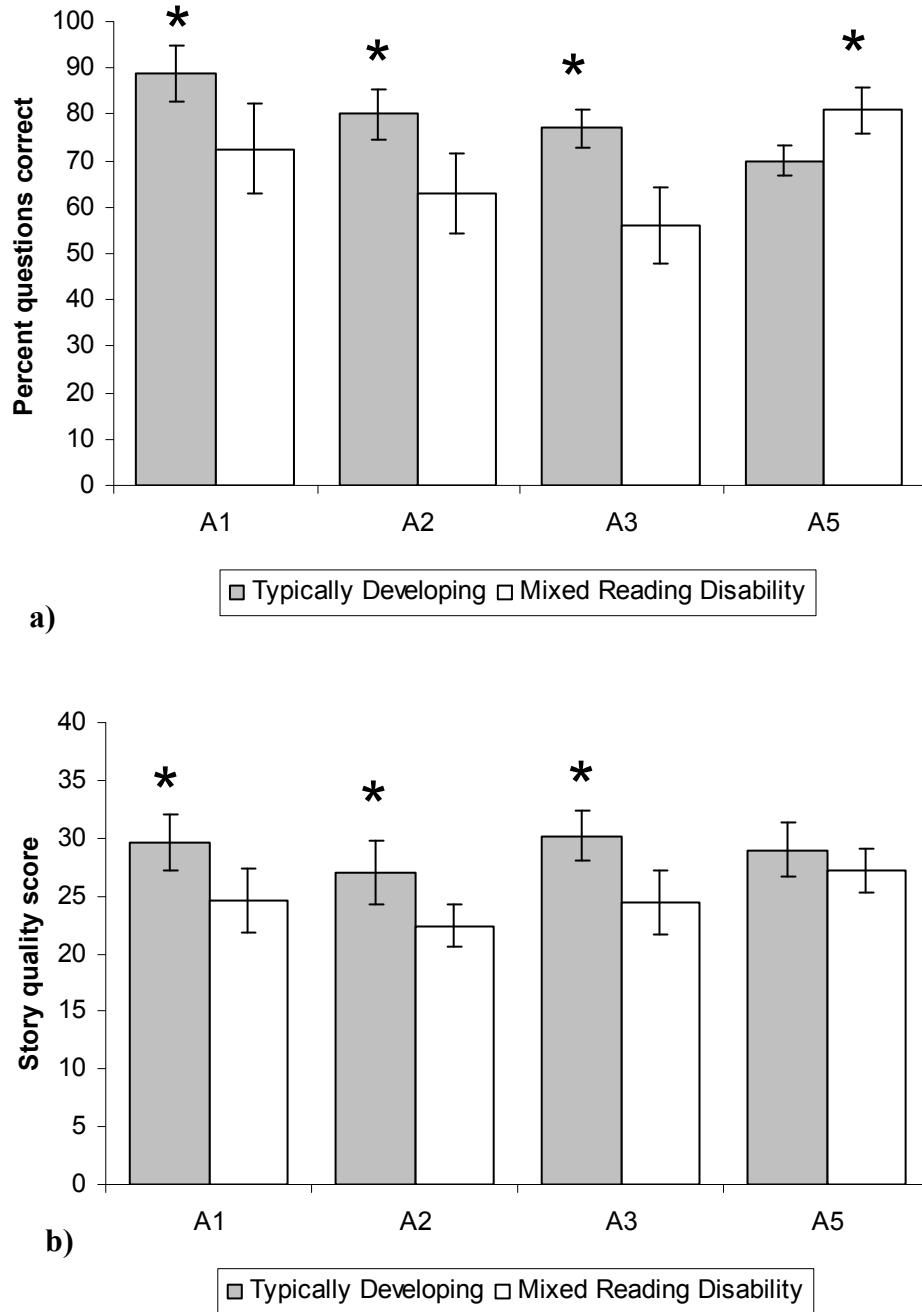


Figure 7. Group performance on the oral narrative ability tasks on four occasions; the three pre-intervention measures (A1, A2, and A3) were taken during the longitudinal phase of the study; the post-intervention measure was taken after the children with MRD had received the intervention (A5). All assessment times are approximately eight months apart; a) Oral narrative comprehension performance in percent questions correct; and b) Oral narrative production performance, based on the story quality score. * $p < .05$.

5.2.2 *Treatment effects on reading comprehension performance*

The second research question posed whether the oral narrative intervention would result in improved reading comprehension performance for the children with MRD. The reading comprehension percentile rank scores (derived from the NARA) of the group of children with MRD were compared to those of their peers with typical development at the pre- and post-intervention trials (A3 and A5). A two-way (group and time) repeated measures ANOVA indicated a significant main effect for group [$F(1,18) = 25.186, p < .001, f = 1.4$]. No significant effects were found for time ($p = .571, f = 0.02$), nor for the interaction between Group x Time ($p = .071, f = 0.20$), indicating that the two groups of children did not show any change in reading comprehension performance during the intervention phase of the study. Table 17 reports the pre- and post-intervention reading scores for the children with MRD. Figure 8 illustrates the groups' performance (in percentile rank scores) on the reading comprehension measure, at eight-monthly intervals, at four assessment times, i.e., during the 2 years prior to the intervention as well as post-intervention. As Figure 8 shows, the children with typically developing reading skills significantly outperformed the children with MRD at every assessment time, and the intervention did not accelerate the reading comprehension development of the children with MRD.

5.2.3 *Summary of findings*

The oral narrative intervention programme significantly enhanced the oral narrative comprehension performance of the children with MRD. Not only was there a significant improvement in oral narrative comprehension as a result of the intervention, the MRD group outperformed their peers with typical development post-intervention. However, the intervention programme had no significant effect on the children's oral narrative production ability at macrostructure level. At microstructure level, the intervention resulted in increased

mazing behaviour in the children with MRD. The intervention did not accelerate the MRD group's performance on a standardised test of reading comprehension.

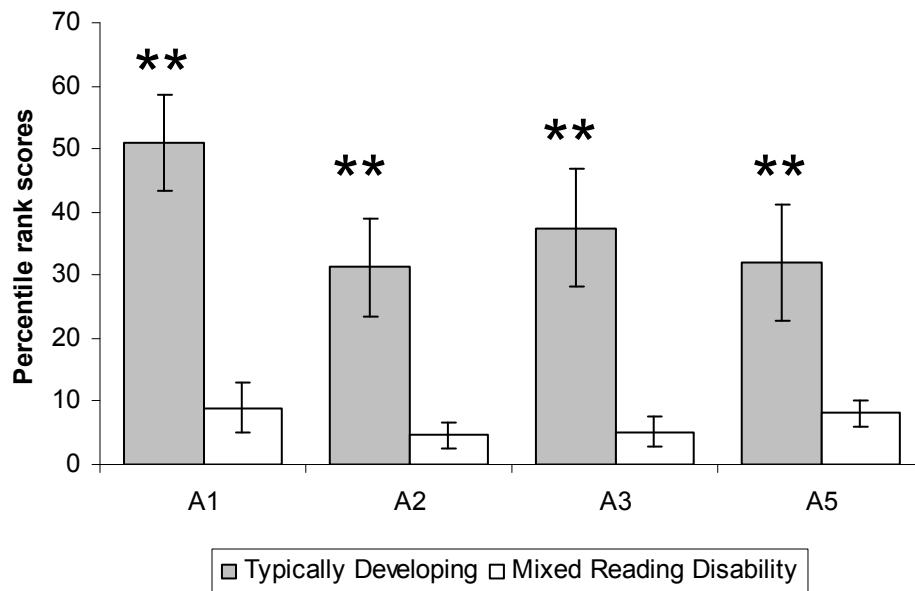


Figure 8. Reading comprehension performance of the children with MRD and their peers with typical development on four assessment occasions. The three pre-intervention measures (A1, A2, and A3) were taken during the longitudinal phase of the study; the post-intervention measure was taken after all children with MRD had received the intervention (A5). All assessment times are approximately eight months apart. Reading comprehension performance is reported as percentile rank scores derived from the NARA (Neale, 1999). Two parallel forms were used; Form 1 was used at A1 and A3. Form 2 was used at A2 and A5. ** $p < .001$.

5.3 Discussion

This experiment investigated the effects of an oral narrative intervention programme on the oral narrative and reading comprehension performance of a group of children with a mixed reading disability (MRD) profile. Ten children, aged between 7;11 and 9;2 years, participated in the study. These children had shown persistent deficits in oral narrative comprehension (i.e., the ability to answer questions relating to story structure elements), oral narrative production (i.e., the ability to retell a well structured story containing all important story elements), and reading comprehension performance compared to their peers with typical development, before intervention commenced.

The first question this study addressed was whether the oral narrative intervention improved the oral narrative comprehension and production skills of the participants. Consistent with the hypothesis, the results indicated that the intervention programme had a significant effect on the children's oral narrative comprehension performance. Moreover, the children with MRD showed superior performance in oral narrative comprehension compared to their age-matched peers with typical development post-intervention. These results not only support the theory that improved story structure knowledge results in improved oral narrative comprehension performance, but also clearly demonstrate that a focused small-group intervention was successful in enhancing the oral narrative comprehension ability of the children with MRD to the level of that of their peers with typical development.

Given the improvement in oral narrative comprehension, progress in oral narrative production was also expected. However, there were no direct treatment effects to suggest that the children with MRD improved in their ability to tell a well-structured story (as captured in the story quality rubric) as a result of the intervention (see Figure 7b). Nevertheless, the performance of the children with MRD did appear to improve relative to their peers with typical development over the course of the intervention. Further research is needed to

examine the sensitivity of the oral narrative production measure in evaluating change following short periods of intervention.

The analyses of the children's story retelling transcripts at microstructure level indicated that the oral narrative intervention did not immediately affect the children's oral narrative production skills in the areas of semantics or morpho-syntax. However, the children with MRD showed an improvement on measures of semantic diversity and grammatical accuracy (from pre- to post-intervention), when their performance was compared to that of their peers with typical development. It is difficult to ascertain if this improvement was a result of general maturation, as there was no immediate change in these spoken language measures following intervention. There was, however, an increase in mazing behaviour in the children with MRD that appeared a direct result of the intervention. The most likely explanation involves a trade-off between the children's increased attention to the overall structure of their oral narrative and a reduction in verbal fluency (Crystal, 1987).

The second question this study addressed was whether the oral narrative intervention would enhance the reading comprehension performance of the children with MRD. Contrary to the hypothesis, the results from this study failed to show evidence of improved reading comprehension performance following intervention on a standardised test of reading. There are several possible explanations for this lack of transfer from improved oral narrative comprehension to reading comprehension performance. The most likely explanation concerns the poor word recognition abilities of the children with MRD. Nine out of the 10 children scored below the average range on the reading accuracy measure derived from the NARA at the post-intervention assessment (see Table 17). As Kamhi and Catts (2005) discussed, comprehension is managed within a limited capacity working memory model. According to this model, the word recognition difficulties of the participants would use much of the

available working memory resources and thus prevent the children from accessing their improved knowledge base (i.e., story structure knowledge) for reading comprehension.

Additional explanations for the lack of transfer from oral to written narrative comprehension concerns the nature of the intervention tasks. First, even though the intervention used existing children's literature and other written material, the emphasis was on spoken language rather than written language. Previous research has also found that the positive effects of story structure intervention in children with learning disabilities were most likely to be evident on measures that closely resembled the specific instruction provided (see Gersten et al., 2001). Future research should investigate if prompting the children with MRD to use their newly acquired story structure knowledge during the reading comprehension task would have enhanced their reading comprehension performance. Alternatively, the children with MRD may need more time to consolidate their newly learned skills and apply them in a different modality. Although the improvement in reading comprehension made by the children with MRD was not considered statistically significant, the small to medium effect size indicates that this change in performance might be noticeable in the course of normal observation (Portney & Watkins, 2000). Chapter 6 reports the results from a follow-up assessment (eight months post-intervention) to help establish if this improving trend continues.

Informal observations of the behaviour of the children involved in this project showed that they enjoyed the sessions. This is important, as many of these children were struggling in their academic achievements, and some of them had started to develop a negative attitude towards learning in general, and reading in particular. It was found that peer interactions in a small-group setting encouraged motivation and persistence.

5.4 Limitations

The use of a design in which the control group received delayed intervention makes it difficult to ascertain which aspect of the intervention contributed most significantly to the intervention outcome. It is possible that the improvement in oral narrative ability observed in the children was a result of the extra time the children spent interacting with adults and books during the group sessions. This seems unlikely for two reasons. First, oral narrative intervention directed at enhancing narrative structure knowledge is not a new concept, and the results from the current study are consistent with previous findings that have demonstrated improved story structure knowledge following intervention (e.g., Fitzgerald & Spiegel, 1983; Idol, 1987). Second, the participants had been identified as poor readers at the start of the longitudinal study, approximately two years prior to the intervention. The persistent nature of their oral narrative difficulties suggests that regular classroom instruction and adult interactions were not sufficient to improve their oral narrative performance.

A second limitation to the current study is the small number of children involved in each intervention group, which limits the applicability of the findings to a wider population. However, effect size indices for the treatment effects on oral narrative comprehension were large, indicating that these changes are clinically important and would have been evident in the course of normal observation.

5.5 Conclusions

The results from this study suggest that targeting story structure knowledge in children with MRD can improve their oral narrative comprehension performance. Without direct intervention, the children's difficulties in oral narrative comprehension persisted over time, despite a National English curriculum that aims to develop these skills within the classroom.

Notwithstanding the improvements in oral narrative comprehension, the children with MRD continued to demonstrate significant difficulties in their reading comprehension performance. These results lend support to the finding reported in Chapter 2 concerning the relatively small contribution of listening comprehension ability to the reading comprehension performance of this group of children. Rather, the poor readers' word recognition difficulties appear to restrain their reading comprehension performance. Taken together, the findings from this experiment support the claim that intervention for children with MRD should target word recognition ability as well as listening comprehension skill (e.g., Catts, Hogan et al., 2005).

To fully evaluate the effectiveness of the oral narrative intervention for the children with MRD, and to justify the allocation of speech and language therapy resources for this type of intervention, evidence to indicate that the oral narrative intervention has long-term benefits in enhancing oral narrative ability and/or reading comprehension performance is required. To address this issue, Chapter 6 reports the follow-up data for the children with MRD eight months post-intervention.

CHAPTER 6

A FOLLOW-UP STUDY EXAMINING THE EFFICACY OF ORAL NARRATIVE INTERVENTION FOR CHILDREN WITH MIXED READING DISABILITY

6. Introduction

To evaluate the efficacy of oral narrative intervention for children with mixed reading disability (MRD), evidence to indicate this intervention has long-term benefits in enhancing spoken and written language development is needed. The results from the intervention study (reported in Chapter 5) indicated that oral narrative intervention, aimed at improving narrative structure knowledge, can be effective in enhancing oral narrative comprehension skills in children with MRD immediately post-intervention. These findings suggest that improved story structure knowledge facilitates formation of a more accurate mental model, which in turn enhances children's understanding of the story. If, as has been hypothesised, story structure knowledge is stored in long-term memory, then it is expected that these gains in oral narrative comprehension will be maintained over time.

Contrary to expectations, there were no direct treatment effects on the children's ability to retell a well-structured oral narrative, containing all the important story elements, as captured by the story quality rubric. However, the performance of the children with MRD did appear to improve relative to their peers with typical development over the course of the intervention. It was postulated that the rubric that was used to assess story quality (i.e., oral narrative ability at macrostructure level) may not have been sensitive enough to detect small changes in oral narrative performance immediately following intervention. A follow-up

assessment will help determine if this improving trend in oral narrative production performance in the children with MRD is maintained over time.

When analysing the children's oral narrative skills at microstructure level, it was found that the oral narrative intervention resulted in increased mazing behaviour in the children with MRD. Consistent with a limited processing capacity model, it was suggested that the children's increased attention to narrative structure during story retelling caused an overload of available working memory capacity, resulting in a breakdown in fluency (Crystal, 1987). It is expected, however, that once the children consolidate their newly learned narrative structure knowledge, activation of this knowledge in long-term memory will be less taxing on their working memory capacity, and as a result, mazing behaviour should return to pre-intervention levels.

The results from the intervention study (reported in Chapter 5) failed to show treatment effects on reading comprehension performance on a standardised test of reading ability. This was unexpected, given the hypothesised links between oral narrative comprehension and reading comprehension. If oral narrative comprehension and reading comprehension share many of the same cognitive processes, then an improvement in oral narrative comprehension should result in improved comprehension of written text. It was suggested that the children with MRD may need more time to consolidate their newly learned skills and apply them in a different modality. The follow-up assessment of the children's reading comprehension skills reported in this chapter aims to examine this issue.

The current experiment re-assessed the children with MRD who received the intervention as well as their age-matched peers with typical development, approximately eight months post-intervention. Specifically, the following questions were asked:

1. Are the improvements in oral narrative comprehension observed in the children with MRD still evident eight months post-intervention?

2. How do the children with MRD perform on the oral narrative production task eight months post-intervention, compared to their peers with typical development?
3. What are the long-term effects of the oral narrative intervention on the children's reading comprehension performance?

It is hypothesised that the children with MRD will show sustained improvement in oral narrative comprehension and production ability. At microstructure level, a decrease in mazing behaviour is expected. An improvement in reading comprehension performance is also hypothesised.

6.1 Method

6.1.1 Participants

All 10 children with mixed reading disability (MRD) who participated in the oral narrative intervention (described in Chapter 5) were available for re-assessment, approximately eight months post-intervention. These children were aged between 9;2 and 10;5 years and attended Year 5 or Year 6 of their local primary school. Their performance was compared to nine children (one child had moved overseas) from the age-matched control group of children with typical development (TD). They were aged between 9;3 and 10;10 at the time of re-assessment.

6.1.2 Materials and procedure

The children were re-assessed on measures of reading ability, oral narrative comprehension, and oral narrative production ability. The same procedures that were used in the longitudinal study (Chapter 2) and the intervention study (Chapter 5) were used for the follow-up assessment (A6, see Table 23). To maintain the children's interest in the oral narrative tasks, a different story was used. The following measures were used:

- The Neale Analysis of Reading Ability, 3rd Edition (NARA, Neale, 1999) was used to assess the children's reading accuracy and reading comprehension ability. The NARA contains two parallel forms, Form 1 and Form 2. Because Form 2 was used immediately post-intervention (at A5, see Table 23), Form 1 was used at A6.
- The Word Attack subtest from the Woodcock Reading Mastery Tests – Revised (WRMT-R, Woodcock, 1998) was used to assess the children's nonword reading ability.
- The story "Frog Goes to Dinner" (Mayer, 1974) was used to evaluate the children's oral narrative production ability. This book is comparable in length and story structure to the books used in the intervention study (Chapter 5). The story is included in Appendix B.
- The story "Frog Goes to Dinner" was also used to assess oral narrative comprehension. After hearing the story for the first time, the children were asked 10 comprehension questions tapping underlying story structure elements. The questions used in this task are included in Appendix C.

Table 23. Longitudinal research design with one intervention phase and two follow-up assessments

Group	A1 ^a	A2 ^a	A3 ^a	X	A5	A6
MRD	Pre	Pre	Pre	Inter- vention	Post	Post
Typical ^b	✓	✓	✓		✓	✓
Interval						
(months)	----- 8 -----	- ----- 8 -----	----- 8 -----	----- 8 -----		

Note. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3; A5: Assessment time 5; A6: Assessment time 6. MRD = Mixed reading disability.

^a Pre-intervention assessment trials from the longitudinal study (Chapter 2).

^b The ticks indicate at which assessment times the children with typical development were assessed.

6.1.3 Transcription and analysis

All stories were transcribed using standard SALT procedures (see Chapter 2 for a detailed description). Utterance segmentation was based on communication units (CU's, Loban, 1976). The stories were scored on a story quality rubric to evaluate the children's ability to apply story structure knowledge when retelling a story. The story quality rubric is included in Appendix D. Full details on this scoring procedure are reported in Chapter 2. In addition, SALT-NZ (Gillon et al., 2002) was used to generate the following microstructure measures:

- Verbal productivity was based on the total number of complete and intelligible (C&I) utterances used to retell the story.

- Verbal fluency was based on the percentage of maze words.
- Grammatical competence was measured as 1) grammatical complexity: the mean length of CU in morphemes (MLCU-M), and 2) grammatical accuracy (GA): the percentage of grammatical CU's (Fey et al., 2004).
- Semantic diversity was based on the number of different words (NDW) used to retell the story.

6.1.4 Transcript reliability

The reliability procedures were similar to those that were used in the longitudinal study (Chapter 2). The percentage of agreement, in accuracy of words transcribed, between the two examiners (based on a random selection of 20% of the transcripts) was 97%. The percentage of agreement on deciding whether sentences were grammatically correct was: 97.2%. With regards to the story quality rubric, 25% of the stories were independently scored, and reliability of the total scores on the story quality rubric in Cronbach's Alpha was .94. The total scores (of all individual stories) awarded by the two examiners differed by 4 points or less.

6.2 Results

6.2.1 Oral narrative comprehension

A two-way (time and group) repeated measures analysis of variance (ANOVA) was used to investigate group differences in performance on the oral narrative comprehension measure at A5 and A6. Effect sizes (f) were calculated by dividing the root of the between-group sum of squares by the error sum of squares. Conventional values of f were used in the interpretation, i.e., small effect size $f = 0.10$, medium $f = 0.25$, large $f = 0.40$ (Portney & Watkins, 2000).

The results showed a significant main effect for group [$F(1,17) = 4.74, p = .044, f = 0.28$], but not for time ($p = .277$), nor for the interaction Group x Time ($p = .178$). The follow-up one-way analyses showed there was a significant group difference at A5, with the MRD group outperforming the TD group [$F(1,17) = 10.019, p = .006, f = 0.59$]. There was no group difference at A6 ($p = .698$). Table 24 details the group results at A5 and A6. Figure 9 shows sustained improvement in oral narrative comprehension for the children with MRD.

6.2.2 Oral narrative production

Macrostructure Analysis

A two-way (group and time) repeated measures ANOVA was used to investigate group differences in performance on the story quality rubric at A5 and A6. The results showed no significant effects for group ($p = .61$), or time ($p = .227$), nor for the interaction Group x Time ($p = .725$). Table 24 details the group results at A5 and A6. Figure 10 shows that the performance of the children with MRD improved to the level of that of their peers with typical development, over the course of the study.

Table 24. Group results on the oral narrative comprehension and the story quality measure

Group	Oral narrative		Story quality	
	comprehension	A5	A5	A6
		A6		
MRD (n = 10)				
Mean	8.1*	8.0	27.2	29.2
SD	1.0	1.2	3.8	5.6
TD (n = 9)				
Mean	7.0	7.8	29	29.8
SD	0.7	1.3	4.6	5.9

Note. A5: Assessment time 5; A6: Assessment time 6. Assessments are approximately 8 months apart. MRD = Mixed reading disability; TD = Typically developing. Oral narrative comprehension: maximum score is 10. Story quality: maximum score is 40.

* The MRD group performed significantly better than the TD group ($p < .05$).

Microstructure Analysis

Table 25 shows the group performance on the microstructure measures at A5 and A6. Two-way (group and time) repeated measures ANOVA's were used to investigate changes in performance from A5 to A6. The following findings were significant (at $p < .05$):

- Grammatical complexity (MLCU-M). The main effect for group was not significant ($p = .098$). There was a significant main effect for time [$F(1,17) = 5.845, p = .027, f = 0.34$], but no significant interaction for Group x Time, indicating both groups used significantly longer sentences at A6 than at A5.
- Mazing behaviour. The main effects for group and time were not significant ($p = .202, p = .889$, respectively). There was a significant effect for the interaction Group x Time, however [$F(1,17) = 5.833, p = .027, f = 0.33$], with a decrease in mazing behaviour in the children with MRD.
- Verbal productivity. There was no significant effect for group ($p = .794$), nor for the interaction Group x Time ($p = .54$). However, a significant effect was found for time [$F(1,17) = 8.646, p = .009, f = 0.51$], with both groups producing less utterances at A6 than at A5.

Table 25. Group results on the microstructure measures of oral narrative ability

Group	Oral narrative production									
	No. Utterances		% Maze words		NDW		MLCU-M		GA	
	A5	A6	A5	A6	A5	A6	A5	A6	A5	A6
MRD (n = 10)										
Mean	42.5	33.6	13.9	10.4	118	114	9.5	10.4	90	86.1
SD	13.2	6.1	5.1	4.6	21	22	0.6	1.1	7.7	6.1
TD (n = 9)										
Mean	39.9	33.8	7.4	10.2	121	127	10.2	11	93.2	89.9
SD	15.2	13.2	6.0	9.1	37	41	1.2	1.6	6.4	6.6

Note. A5: Assessment time 5; A6: Assessment time 6. Assessments are approximately 8 months apart. MRD = Mixed reading disability; TD = Typically developing. NDW = Number of different words; MLCU-M = Mean length of communication unit in morphemes; GA = Grammatical accuracy: percent grammatically correct utterances.

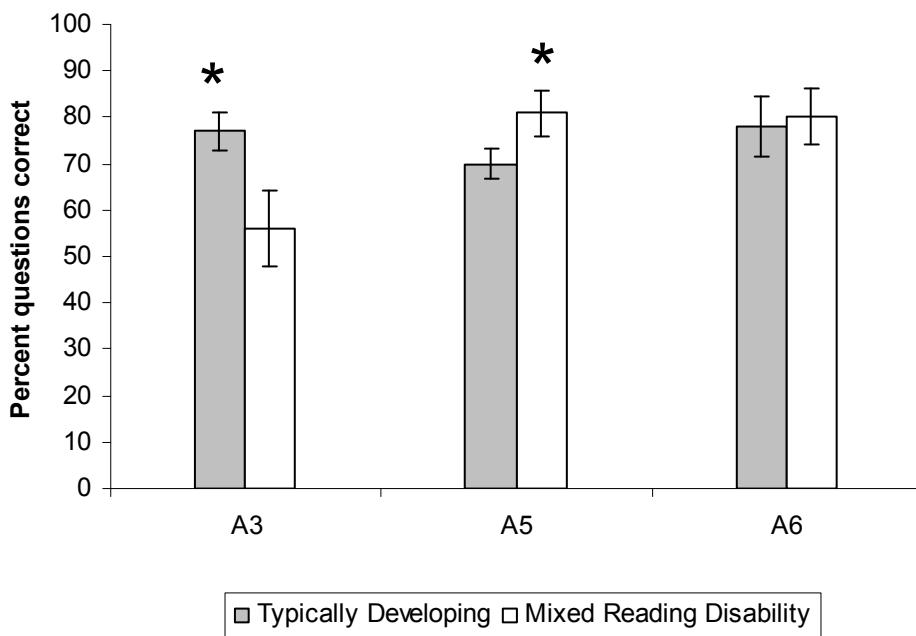


Figure 9. Group performance on the oral narrative comprehension measure, prior to the children with MRD receiving the intervention (A3), immediately post-intervention (A5), and eight months post-intervention (A6). Assessment times are approximately 8 months apart. Scores are presented as the number of questions answered correctly divided by the total number of questions (i.e., percent questions correct). * $p < .05$.

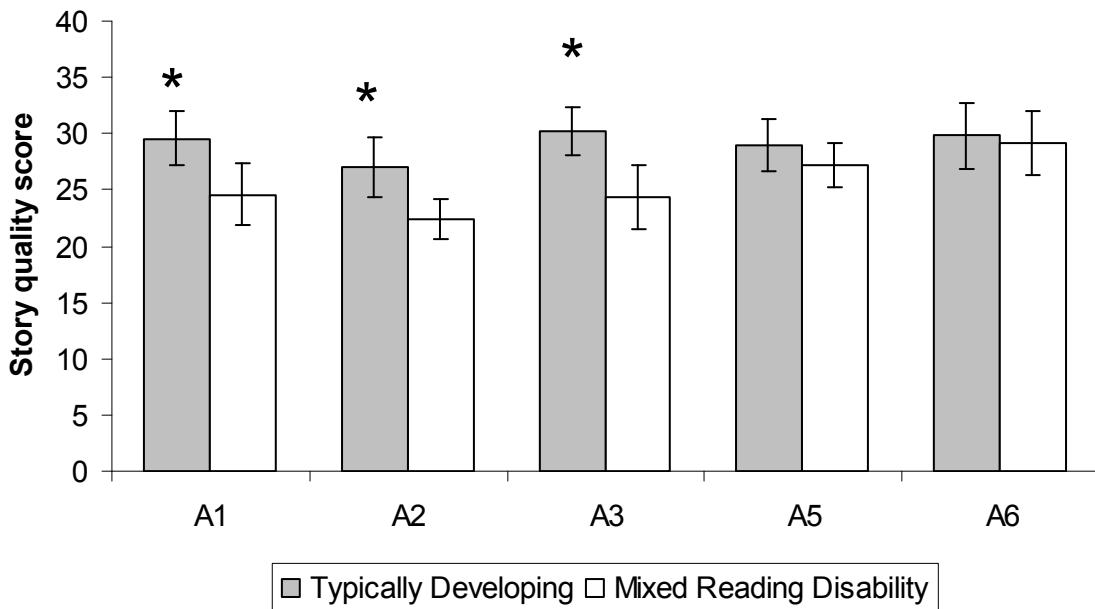


Figure 10. Group performance on the oral narrative production measure over time. Performance is based on the story quality score. Assessment times are approximately 8 months apart. *The two groups differed significantly at the three pre-intervention assessment trials ($p < .05$), i.e., at A1, A2, and A3. There were no significant group differences post-intervention at A5 or A6.

6.2.3 *Reading ability*

Reading Comprehension Performance

Using the raw scores derived from the reading comprehension test (NARA), a two-way repeated measures ANOVA was used to investigate group differences in reading comprehension. The results showed a significant effect for group [$F(1,17) = 20.057, p < .001$, $f = 1.18$], and for time [$F(1,17) = 16.457, p = .001, f = 0.97$], but not for the interaction Group x Time ($p = .065, f = 0.23$), indicating that both groups made a significant, but similar improvement in reading comprehension between A5 and A6. Follow-up one-way ANOVA's

showed there were significant group differences at A5 [$F(1,17) = 16.117, p = .001, f = 0.95$], and A6 [$F(1,17) = 19.165, p < .001, f = 1.13$], with the TD group consistently outperforming the MRD group. Figure 11 shows the change in reading comprehension performance over time for the two groups of children. As Figure 11 illustrates, although the children with MRD improved in reading comprehension performance, they did not show the accelerated progress needed to catch up to their peers with typical development.

Reading Accuracy Performance

To further investigate the nature of the children's reading comprehension difficulties, their performance on the reading accuracy measure of the NARA was analysed. A two-way repeated measures ANOVA was used to investigate group differences in reading accuracy. The results showed a significant effect for group [$F(1,17) = 31.64, p < .001, f = 1.86$], and for time [$F(1,17) = 19.557, p < .000, f = 1.15$], but not for the interaction Group x Time ($p = .415$), indicating both groups made a significant, but similar improvement in reading accuracy ability between A5 and A6. Results from the follow-up one-way ANOVA's showed there were significant group differences at A5 [$F(1,17) = 24.223, p < .001, f = 1.42$], and A6 [$F(1,17) = 39.119, p < .001, f = 2.3$], with the TD group consistently outperforming the MRD group.

Closer inspection of the children's individual results showed that only one child with MRD performed within the average range on the reading accuracy measure of the NARA (percentile rank 26) at A6. The remaining nine children continued to demonstrate severe reading accuracy difficulties (Mean 6.2, Range 1 – 15).

Nonword Decoding Ability

Using the raw scores from the Word Attack subtest of the WRMT-R, a two-way repeated measures ANOVA was used to investigate group differences in nonword reading ability. The results showed a significant effect for group [$F(1,17) = 17.866, p = .001, f =$

1.05], and for time [$F(1,17) = 9.718, p < .05, f = 0.57$], but not for the interaction Group x Time ($p = .816$), indicating that both groups made a significant, but similar improvement in nonword reading ability between A5 and A6. The follow-up one-way ANOVA's showed there were significant group differences at A5 [$F(1,17) = 14.103, p < .05, f = 0.83$], and A6 [$F(1,17) = 21.109, p < .001, f = 1.24$], with the TD group consistently outperforming the MRD group. Figure 12 shows the change in nonword reading ability over time for the two groups of children. As Figure 12 illustrates, although the children with MRD improved in their ability to phonologically decode nonwords, they did not show the accelerated progress needed to catch up to their peers with typical development.

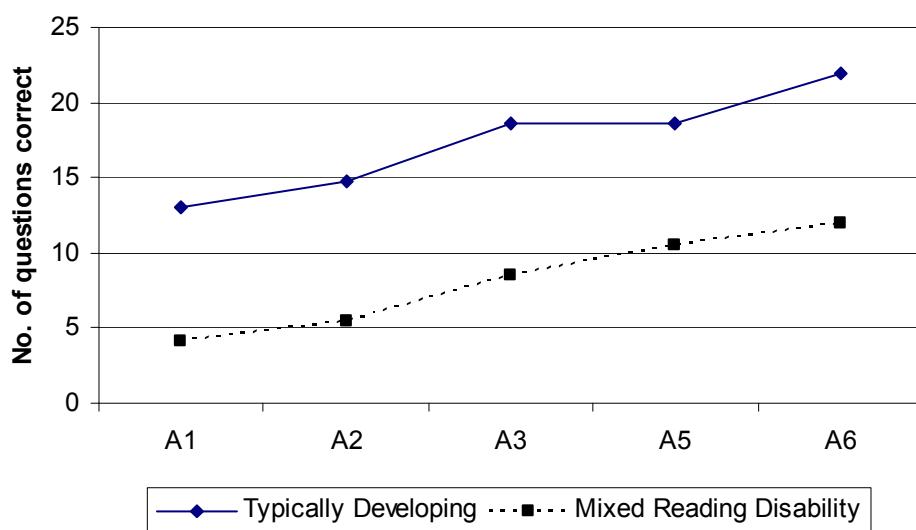


Figure 11. Group performance in reading comprehension (based on raw scores derived from the NARA, Neale, 1999) at all six assessment times. The first three measures were taken during the longitudinal phase of the study (Assessment 1 (A1), A2, A3) before the children with MRD received the intervention. Assessment times are approximately 8 months apart.

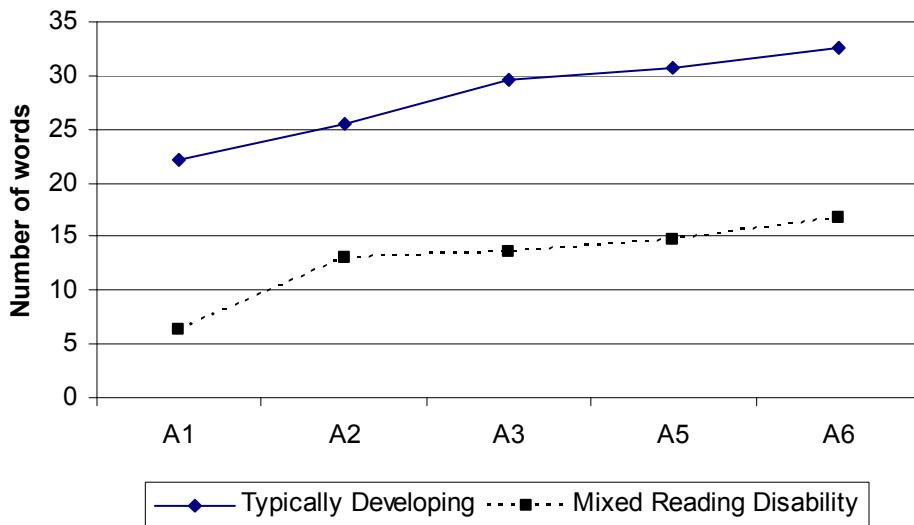


Figure 12. Group performance on the nonword reading measure (based on the raw scores derived from the Word Attack subtest from the WRMT-R, Woodcock, 1998) at all six assessment times. The first three measures were taken during the longitudinal phase of the study (Assessment 1 (A1), A2, A3) before the children with MRD received the intervention. Assessment times are approximately 8 months apart.

6.3 Discussion

This experiment investigated the long-term effects of oral narrative intervention on the oral narrative and reading comprehension performance of children with a mixed reading disability (MRD) profile. All 10 children who participated in the intervention (reported in Chapter 5) were re-assessed approximately eight months post-intervention, and their performance was compared to that of their peers with typical development. The first question addressed whether the improvement in oral narrative comprehension observed in the children with MRD immediately following intervention was maintained over time. The results clearly indicated sustained improvement in the children's ability to answer questions relating to the underlying story grammar elements of a story. At eight months post-intervention, there were

no significant differences in performance between the group of children with MRD and their peers with typical development. From a theoretical perspective, these results support the theory that the intervention was successful in establishing a permanent underlying representation of narrative structure in long-term memory.

The second research question pertained to the oral narrative production performance of the children with MRD. The performance of the MRD group was compared to that of the TD group on the macrostructure and microstructure measures of oral narrative production at the follow-up assessment trial. The statistical analyses revealed no group differences in the children's ability to retell a well-structured story containing important story grammar elements at the two post-intervention assessment trials. These results, therefore, suggest "grade-appropriate" oral narrative production performance in the children with MRD post-intervention. In contrast, the results from the longitudinal study (reported in Chapter 2) demonstrated sustained significant group differences in oral narrative production pre-intervention. The improvement in the oral narrative production skills of the children with MRD thus coincided with a period of time during which they received the intervention. There were no *immediate* treatment effects on this story quality measure (see Chapter 5), however. It seems plausible that the oral narrative production task that was used in the current study (i.e., a story retelling condition) provided too much structure and therefore lacked sensitivity in detecting small changes in oral narrative production performance following short periods of intervention (Hughes et al., 1997). Future research should investigate if oral narrative elicitation tasks that provide less structure (such as fictional story generation) are more sensitive to changes in narrative structure knowledge.

At microstructure level, there was a decrease in mazing behaviour in the group of children with MRD between the two post-intervention assessment trials (A5 and A6). Consistent with a limited capacity working memory model, these results suggest that, with

time, less processing capacity was required to access story structure knowledge when generating a story. As a result, more processing resources became available to formulate sentences, resulting in increased verbal fluency.

The third question the experiment addressed was whether the oral narrative intervention had any long-term benefits on the children's reading comprehension performance. Contrary to expectations, there was no evidence to suggest the oral narrative intervention enhanced the children's reading comprehension skills. The most likely explanation for this lack of transfer from oral to written narrative comprehension concerns the poor word recognition abilities of the participants. At group level, the children with MRD continued to perform significantly below their peers with typical reading development on the nonword reading task. Inspection of the children's individual reading performance showed that 9 of the 10 children with MRD continued to demonstrate severe reading accuracy difficulties on the NARA. It seems plausible that the poor word recognition skills of the children utilise much of the available cognitive resources needed for text comprehension.

Unfortunately, the way in which the NARA assesses reading comprehension performance may also account for the absence of progress in this area. Although Nation and Snowling (1997) found that the NARA is sensitive to detecting reading comprehension difficulties that stem from listening comprehension weaknesses, the test may not be sensitive enough to show progress in reading comprehension in children with severe word recognition difficulties following intervention.

6.4 Conclusions

The results from this follow-up investigation indicate that oral narrative intervention for children with MRD is successful in enhancing these children's oral narrative comprehension skills. The results also suggest, however, that improved oral narrative comprehension is not sufficient to ensure progress in reading comprehension performance.

Rather, intervention directed at remediating these children's word recognition deficits seems indicated (e.g., Gillon & Dodd, 1994; Torgesen et al., 1999).

Progress in oral narrative production skills was less consistent. The results from Chapter 5 indicated there were no immediate treatment effects on oral narrative production performance. However, as a group, the children with MRD, performed at similar levels compared to their peers with typical development at the two post-intervention assessment trials. Inspection of the children's individual results reveals considerable overlap in scores between the MRD group and their peers with typical development. It seems plausible that children's broader spoken language abilities (i.e., semantics, morpho-syntax) and cognitive processing skills affected their oral narrative production performance. To investigate this issue further, the next chapter reports a detailed longitudinal case study.

CHAPTER 7

A DEVELOPMENTAL CASE STUDY OF A CHILD WITH MIXED READING DISABILITY

7. Introduction

Subgrouping children with reading disability according to the reading component model is useful when investigating the causal bases of reading impairment (Catts et al., 2003). Individual variation within groups, however, will always be evident due to the complex interrelationship between spoken and written language development and the influence of environmental variables. Inspection of individual performance on standardised spoken language tasks for the participants in this study indicates a range of abilities within the criteria established to determine mixed reading disability profiles. This variation may have influenced the intervention outcomes described in Chapters 5 and 6. From a clinical perspective, a description of a single case study may yield important information on how individual children respond to an intervention procedure and allows for a more detailed examination of the spoken language characteristics that may have contributed to the child's progress. The current chapter provides a comprehensive description of one of the children involved in the intervention project. This child could be considered at high risk of ongoing academic difficulties based on the results from the initial assessment battery. Although her performance on standardised broad-spectrum spoken language tests was not sufficiently low to qualify for government-funded speech and language therapy services, she demonstrated significant weaknesses in all areas of her spoken and written language development.

The following questions were asked:

1. What are the effects of the oral narrative intervention on the oral narrative abilities of a child with a mixed reading disability profile?
2. Does oral narrative intervention improve this child's reading comprehension performance?

7.1 Case history

Danielle (pseudonym) was 7;1 when she was invited for inclusion in the longitudinal study. She was from European/Maori descent as indicated by her parents on the school enrolment form. Danielle was the only child; her parents were expecting a baby within three months of the start of the study. She attended grade 3 at her local school, which had a low socio-economic ranking as determined by the Ministry of Education school classification system. The results from the parent questionnaire showed that she had no known history of speech and/or language difficulties and had not received speech-language therapy or other educational services in the past. Danielle was described by her teachers as a cooperative, reasonably quiet girl.

To develop a detailed profile of spoken and written language proficiency (see Gillon, 2004), several assessments were administered (see Table 26):

- The results from the Clinical Evaluation of Language Fundamentals - 3rd Edition (CELF-3, Semel et al., 1995) indicated below average performance (total language standard score 80, receptive language score 80, expressive language score 82). Closer inspection of Danielle's performance on subtests of the CELF-3 showed particular difficulties on subtests tapping syntactic ability and on the Listening to Paragraphs subtest.
 - Peabody Picture Vocabulary Test – 3rd Edition (PPVT-III, Dunn & Dunn, 1997).
- Danielle gained a below average standard score (82) on this measure of receptive vocabulary.

- The results from the Test of Nonverbal Intelligence (TONI, Brown et al., 1997) indicated age-appropriate performance (standard score 94).
- Reading ability was assessed using the Neale Analysis of Reading Ability, 3rd Edition (NARA, Neale, 1999). Danielle demonstrated significant difficulties in both reading accuracy (percentile rank 4) and reading comprehension (percentile rank 3).
- Nonword reading was assessed on the Word Attack subtest of the Woodcock Reading Mastery Tests - Revised (WRMT-R, Woodcock, 1998). This test measures the child's ability to apply phonological decoding skills, independent of sight vocabulary. Danielle achieved a standard score of 100, which implies age-appropriate performance. However, as this test was standardised on children in the USA, caution in interpretation needs to apply. Children in New Zealand typically start their formal education on their fifth birthday, which is almost a year earlier than the children in the USA. Because formal reading tuition is likely to affect performance on a nonword reading task, using the grade-equivalent score of the WRMT-R may be a more appropriate measure to compare Danielle's score against. In Danielle's case, she obtained a grade-equivalent of 1;6, which is almost 2 years below her grade level.
- Phonological processing ability was assessed using subtests from the Comprehensive Test of Phonological Processing (CTOPP, Wagner, Torgesen, & Rashotte, 1999):
 - a) The Elision subtest was used to measure phonological awareness. Danielle achieved a standard score of 9.
 - b) The Nonword Repetition and the Memory for Digits subtests were used to measure phonological memory. Danielle obtained standard scores of 5 on both subtests.
 - c) Danielle achieved a standard score of 6 on the Rapid Naming subtest.

Table 26. Assessment data for Danielle at the initial assessment (A1)

Assessment Measures	Scores*
Age (years;months)	7;1
Year of Schooling	3
CELF-3 receptive language subtests:	
Listening to Paragraphs	5
Sentence Structure	6
Concepts and Directions	7
Word Classes	7
Total Receptive Language Score	80
CELF-3 expressive language subtests:	
Formulating Sentences	5
Word Structure	10
Recalling Sentences	6
Total Expressive Language Score	82
Total Language Score CELF - 3	80
PPVT-III	82
TONI	94
Rapid Automatic Naming (CTOPP)	6
Nonword repetition (CTOPP)	5
Memory for digits (CTOPP)	5
NARA – reading accuracy – percentile rank	4
NARA – reading comprehension – percentile rank	3
Word-Attack (WRMT-R)	100
Grade-equivalent	1;5
Elision (CTOPP)	9

Note. CTOPP: Comprehensive Test Of Phonological Processing (Wagner et al., 1999); NARA: Neale Analysis of Reading Ability - Revised (Neale, 1999); PPVT-III: Peabody Picture Vocabulary Test – 3rd Edition (Dunn & Dunn, 1997); TONI: Test of Nonverbal Intelligence (Brown et al., 1997); WRMT-R: Woodcock Reading Mastery Tests – Revised (Woodcock, 1998). A1: Assessment time 1 of the longitudinal study.

*All scores are presented as standard scores, unless indicated otherwise. Standard scores between 7-13 or 85 – 115 are within the normal range. Percentile rank scores between 23 and 77 are within the normal range.

Danielle's spontaneous narrative language sample, obtained in the personal narrative context, was transcribed and analysed using SALT-NZ (Gillon et al., 2002). She produced a total of 173 complete and intelligible (C&I) utterances in 14 minutes. The first 50 C&I utterances were compared against the performance of 56 children with typical development from the New Zealand database (+/- 6 months) (see Table 27). The results showed below average performance in verbal fluency (% maze words) and grammatical errors (at word and utterance level). Closer analysis of the grammatical errors revealed two instances of overgeneralisation ('hurted') and two instances of incorrect use of prepositions ('on the other day'). Grammatical complexity (MLCU-M) and semantic diversity (NDW) were within normal limits (see Table 27). However, the type token ratio (TTR: number of different words divided by the total number of words) was well below average (-1.67 SD). To determine if this indicated a weakness in semantics, a larger sample of 100 C&I utterances was compared against the database (28 subjects, +/- 6 months). Danielle's performance on the NDW measure was 1.59 SD below the mean.

Table 27. Danielle's performance on spoken language measures (derived in the personal narrative task) compared to a database of transcripts from New Zealand children with typical development

Language Measure	Danielle	NZ Database	
	Database Mean	+ / - SD	
MLCU-M	6.64	6.23	0.46
NDW	113	122.55	- 0.67
TTR	0.37	0.43	- 1.67*
% Maze words	19	9.72	+ 2.35*
Word-level error codes	6	1.48	+ 3.06*
Utterance-level error codes	2	0.61	+ 1.79*

Note. Danielle's performance (at age 7;3) was compared against the performance of 24 females and 32 males, age range: 6;9 – 7;7 from the New Zealand database. Transcripts were cut after the first 50 complete and intelligible utterances. MLCU-M = Mean length of communication unit in morphemes; NDW = Number of different words; TTR = Type token ratio. * Performance is at least 1SD above or below the database mean.

Summary of Assessment Results

Danielle demonstrated mild to moderate spoken language impairment on a standardised broad-spectrum language test and a severe reading impairment on a standardised test of reading ability. Further testing revealed specific weaknesses in passage comprehension (answering questions related to a story). She also demonstrated difficulties in phonological memory and rapid naming. Spontaneous language sampling analysis revealed that, compared to her chronological-age matched peers, Danielle showed difficulties in utterance formulation as evidenced by the high percentage of maze words. She also demonstrated a limited expressive vocabulary.

7.2 Methods and procedure

Intervention

An overview of the intervention procedure is provided in Chapter 5, and Appendix F provides a full description. Danielle attended 12 one-hour sessions, in her school setting, with three other children. She generally appeared to enjoy the activities as indicated by her cooperative manner and her enthusiastic participation in the game activities. Danielle had some difficulty remembering the names of the story grammar labels compared to the other participants, but she correctly listed the names of all seven story grammar parts in the eighth session. Danielle required much prompting when retelling stories during the sessions. In the last session, prompts still needed to be provided for inclusion of the *goal/plan* and *resolution* story grammar parts.

Assessment Measures

The NARA (Neale, 1999) was used to assess reading performance. This standardised reading test yields a reading comprehension and a reading accuracy score. For this case study, reading rate was also noted and calculated as the total number of words read, divided by the total time. The oral narrative assessment measures and the procedures for administration of tests have been described in detail in Chapters 2 and 5. An additional spoken language measure of speaking rate was included (and calculated automatically using SALT). In summary, the following measures were used:

- Oral narrative comprehension.
- Oral narrative production at macrostructure level.
- Oral narrative production at microstructure level:
 - a) Verbal productivity – total number of utterances and total number of words
 - b) Grammatical complexity (MLCU-M) and grammatical accuracy (GA)
 - c) Semantic diversity – number of different words (NDW)

- d) Verbal fluency – percent maze words
- e) Rate – number of words per minute.

7.3 Results

7.3.1 Statistical analysis

To investigate the effects of the intervention on Danielle's oral narrative and reading comprehension abilities, several methods were employed.

1. The celeration line and the two standard deviation band methods were used to identify if variation between baseline and post-treatment phases were indicative of significant improvement across the phases (Portney & Watkins, 2000). A celeration line is a linear expression of a trend within a group of data. The celeration line was calculated for the baseline phase and graphed from the baseline phase through to the post-intervention phase. As a consequence, it was possible to see if the post-intervention performance differed from the performance expected if the baseline trend had continued. The two standard deviation band method involves calculating the mean and standard deviation of the baseline phase. The mean, and two standard deviations above and below the mean of the baseline phase are then plotted along the baseline and post-intervention phases. If at least two consecutive data points in the post-intervention phase fall outside the banded area, the change in performance is considered significant.
2. Danielle's responses to treatment were graphically displayed and analysed by contrasting her assessment results pre- and post-intervention to the typical control group ($n=10$; see Chapter 5 for a full description of this control group).
3. Qualitative analyses of Danielle's reading comprehension performance were conducted.

7.3.2 *Oral narrative comprehension*

Pre-intervention (A1, A2, and A3), Danielle's performance was well below the average performance of the children with typical development (TD). As illustrated in Figure 13, there was a sharp decline in performance at A3. It seems likely that the difficulty of the task used at A3 resulted in lower scores both for Danielle and the group of children with TD. Although the questions used for the oral narrative comprehension task tapped underlying story grammar elements at every assessment time, the story used at A1 was much shorter, and the questions used at A2 were more specific than those used from A3 onwards (see Appendix C). The questions and stories used at A3, A4, A5, and A6 were closely matched for difficulty.

Post-intervention, visual analysis of the results shows that Danielle's performance resembled that of her peers with typical development. Using the two standard deviation band method, her performance at A6 falls above the banded area, indicating performance that is significantly better compared to her pre-intervention performance. Although the improvement in oral narrative comprehension immediately post-intervention (at A4 and A5) is not considered statistically significant, her performance post-intervention clearly moves away from the pre-intervention celeration line. Using the celeration line equation, Danielle's performance at A4 was expected to be 26.5% questions correct (i.e., $-16.25 \times 3.5 + 83.33$). Instead, Danielle answered 70% of the questions correctly.

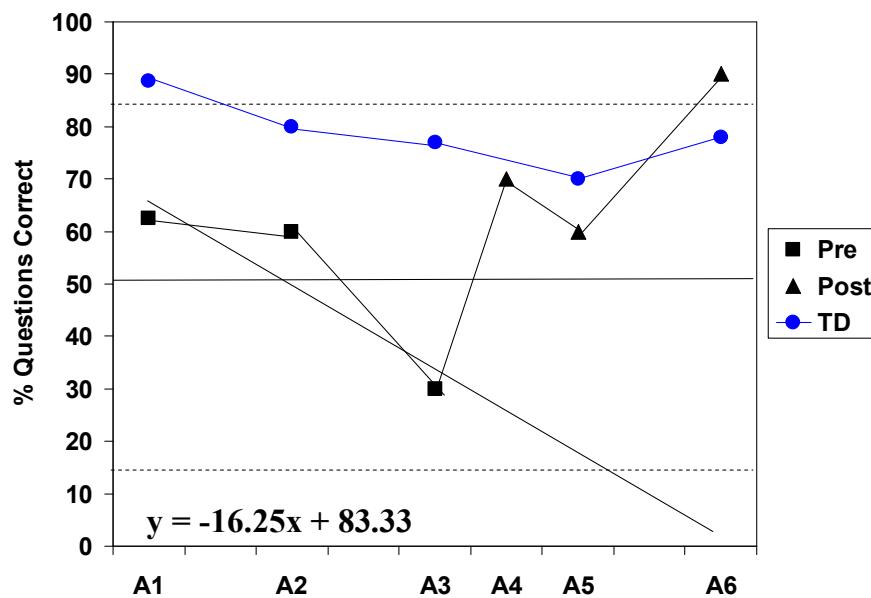


Figure 13. Danielle's performance (pre and post-intervention) on the oral narrative comprehension measure. Oral narrative comprehension scores were calculated as the percentage of questions answered correctly. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3; A4: Assessment time 4; A5: Assessment time 5; A6: Assessment time 6. The pre-intervention measures were taken during the longitudinal phase of the study. Danielle received the intervention between A3 and A4.

Note. The celeration line equation is presented at the bottom of the graph. The solid line represents the mean of the baseline series, and the dashed lines show two standard deviations above and below the mean of the baseline series.

7.3.3 Oral narrative production

Macrostructure Analysis

As illustrated in Figure 14, there was a clear improvement in story retelling performance (as captured by the story quality rubric) as a result of the intervention. Danielle's post-intervention scores all fall outside the banded area and resemble those of her peers with typical development.

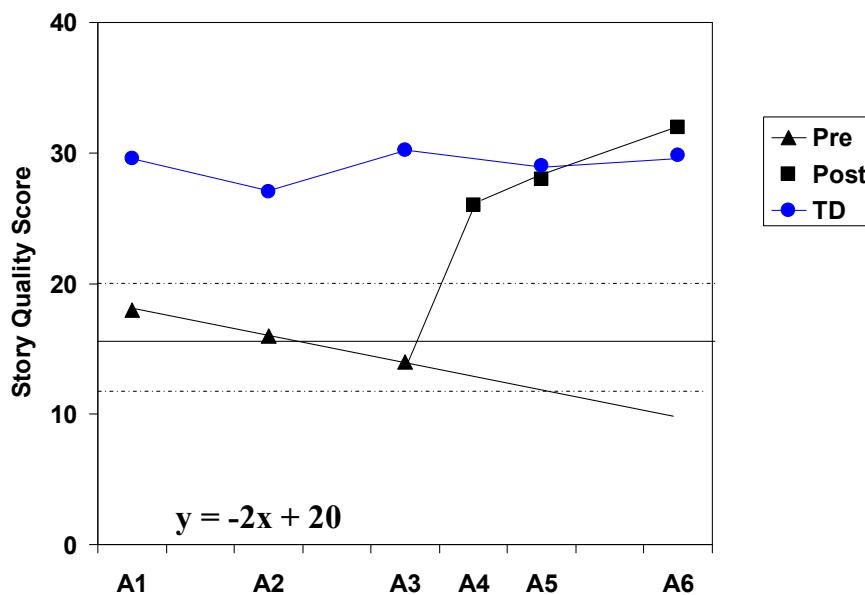


Figure 14. Danielle's performance on the story quality measure, pre- and post-intervention. Maximum score is 40. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3; A4: Assessment time 4; A5: Assessment time 5; A6: Assessment time 6. The pre-intervention measures were taken during the longitudinal phase of the study. Danielle received the intervention between A3 and A4.

Note. The celeration line equation is presented at the bottom of the graph. The solid line represents the mean of the baseline series, and the dashed lines show two standard deviations above and below the mean of the baseline series.

Closer analysis of Danielle's performance on the individual characteristics of the story quality rubric (see Table 28) revealed that particular improvement was seen in the overall coherence of the story (i.e., the ability to include critical events and sequence these in a logical order. See Appendix D). Progress was also evident on the inclusion of *setting* elements (i.e., appropriate introduction of the story), and the inclusion of the overall *theme* of the story. In addition, Danielle was more likely to achieve a maximum score in the *ending* category, indicating she provided a smooth transition to the conclusion of the story and included the relevant information. To illustrate her improvement in oral narrative production ability, the story retelling transcripts from A3 and A4 are presented in Tables 29 and 30. For example, pre-intervention at A3, Danielle included only the *setting* information relating to the boy spotting a frog on a lily pad. She did not introduce the story by informing us that the boy and the dog went into the forest to try and catch a frog for a new pet. At A4, Danielle correctly mentioned that the boy received a parcel containing a little frog. Because she failed to mention that the little boy opened the parcel, she did not achieve the maximum 5 points, but a score of 3 (see Appendix D).

Table 28. Danielle's performance on the individual characteristics of the story quality rubric at all six assessment times

Story quality rubric characteristic	A1 Pre	A2 Pre	A3 Pre	A4 Post	A5 Post	A6 Post
Setting	1	1	1	3	5	3
Theme	5	1	1	3	3	5
Main character	1	3	3	3	5	3
Supporting character	3	1	3	3	3	3
Problem	3	3	1	3	3	5
Resolution	3	3	1	3	3	3
Ending	1	3	3	5	3	5
Coherence	1	1	1	3	3	5
TOTAL	18	16	14	26	28	32

Note. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3; A4: Assessment time 4; A5: Assessment time 5; A6: Assessment time 6. The pre-intervention measures were taken during the longitudinal phase of the study. Danielle received the intervention between A3 and A4. The story quality rubrics are included in Appendix D. The maximum score per characteristic is 5. The total maximum score on the story quality rubric is 40.

Table 29. “A Boy, a Dog and a Frog”, produced by Danielle at A3

- C once upon a time the boy and the dog had a bucket and a net.
- C and then he looked behind the trees and the bushes.
- C and then he saw (it) the frog on a lily pad.
- C and then he was running (with the do uhm) with the net and the bucket.
- C and the dog ran too.
- C and then they tripped over the wood was there.
- C and then they hit their head land first.
- C and then the boy had the bucket on his head.
- C and then he said to the dog go on the other side of the branch.
- C and I'll go that way.
- C then the dog went on the branch.
- C and then the boy did.
- C (and the then the boy s) and then the dog growled the frog.
- C and then the frog jumped off.
- C and the boy caught the dog in the net.
- C and (then the d) then the boy said :06 that (you're) you're hard to catch.
- C I can't catch you.
- C I've got no one to play with now.
- E uhuh.
- C (and :15) and then the dog and the boy went home with the net and the bucket.
- C and they went.
- C and they had mud and water on them.
- C and then they got home.

- C and (their boots his boot) the boy's boots were muddy.
- C and the dog's footprints were muddy all the way through the house.
- C and then they had a bath.
- C then the frog came along and followed the footprints.
- C and he jumped on the dog's head.
- C and they lived happily ever after.

Note. C = Child; E = Examiner; A colon (:) indicates a pause with the length of the pause specified in number of seconds. Reformulations and dysfluencies are placed in parentheses.

Table 30. “One Frog too Many” produced by Danielle at A4 (immediately post-intervention)

- C one day the little boy saw a box outside with a ribbon on it.
- C there was a card.
- C and it said it was for him.
- C (in the little) in the box was a little frog.
- C the dog and the turtle and the little boy (l*) liked (the frog) the little frog.
- C and the (f*) big frog didn't like the little frog.
- C :09 and then the (t*) :09 turtle (bit his) bit the little frog's leg.
- C and the little frog said ouch.
- C then the little boy picked the frog up and told the big frog off.
- C :15 then the boy was leading the animals while the (f*) big frog and the little frog were having a ride on the turtle.
- C they were following the little boy with his pirate suit.
- C :20 then the big frog :07 pushed the little frog off the turtle.

- C (and said) and was crying.
- C (then the boy :04) then they were at the lake.
- C then the boy said you won't be coming on.
- C (and the f*) then the frog jumped on the raft and :05 kicked the little frog off.
- C and poked the tongue.
- C then the frog (pat) was patting the boy on the leg.
- C then the boy (:05 how) said how did the big frog get on the raft.
- C (then :10) and then he got off the raft.
- C (and they tried to look) they were searching for him.
- C and saying frog frog.
- C then the little boy was crying all the way home.
- C then he laid down on his bed.
- C and the turtle and the dog were sad.
- C and the frog was sad.
- C the big frog.
- C (:08 and they heard) out the window they heard a %frabbitfrabbit.
- C then jumped the little frog on to the turtle.
- C and then everybody was happy.

Note. C = Child; An asterisk (*) indicates an unfinished word; % indicates an environmental or animal sound; Reformulations and dysfluencies are placed in parentheses. A colon (:) indicates a pause with the length of the pause specified in number of seconds

Microstructure Analysis

Danielle's performance on the microstructure measures of oral narrative performance was evaluated using SALT. Table 31 illustrates her performance pre- and post-intervention. Her performance immediately before (A3) and immediately after (A4) intervention was compared. Results showed there was:

- no significant change in verbal productivity (i.e., number of utterances and total number of words),
- no significant change in grammatical complexity (MLCU-M),
- no significant change in semantic diversity (number of different words),
- a marked increase in mazing behaviour,
- a noticeable decrease in rate,
- a clear decrease in grammatical accuracy.

When evaluating Danielle's performance over time (A5 and A6), a clear improvement was observed on measures of grammatical complexity and semantic diversity. Although her speaking rate slowly increased, her grammatical accuracy fluctuated. At A6, it seems likely that the increase in grammatical complexity resulted in a decrease in grammatical accuracy.

Table 31. Danielle's performance on the microstructure measures of oral narrative ability derived in the story retelling task pre- and post-intervention

Measures	A3	A4	A5	A6
	Pre	Post	Post	Post
Age	8;7	9;0	9;2	9;10
Total no. of utterances	28	30	48	32
MLCU-M	8.93	9.07	9.85	11.44
TNW	230	254	439	336
NDW	82	80	123	130
% Maze words	8	11	13	10
Rate (words/minute)	82.46	56.55	60.86	67.84
GA	85.7%	76.7%	89.6%	78.1%
Story quality	14	26	28	32

Note. A3: Assessment time 3; A4: Assessment time 4; A5: Assessment time 5; A6: Assessment time 6. MLCU-M = Mean length of communication unit in morphemes; TNW = Total number of words; NDW = Number of different words; GA = Grammatical accuracy: percent grammatically correct utterances.

Danielle's performance on the grammatical complexity and semantic diversity measures was further investigated and compared to the performance of her peers with typical development. Figure 15 displays the results on the semantic diversity measure. As Figure 15 illustrates, Danielle appears to have made accelerated progress in semantic diversity during the intervention phase of the project.

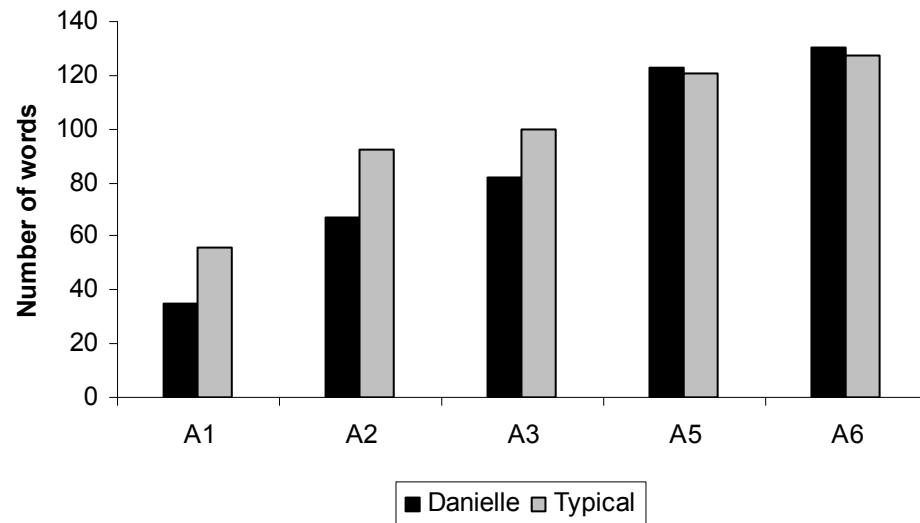


Figure 15. Danielle's performance on the semantic diversity measure (number of different words) compared to her peers with typical development at each assessment time. Measures were obtained in the story retelling condition. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3; A5: Assessment time 5; A6: Assessment time 6. The pre-intervention measures were taken during the longitudinal phase of the study (A1, A2, and A3). Assessment times are approximately 8 months apart.

Figure 16 shows Danielle's performance on the grammatical complexity measure (MLCU-M) compared to that of her peers with typical development. In contrast to the semantic diversity measure, no accelerated gains were evident in grammatical complexity.

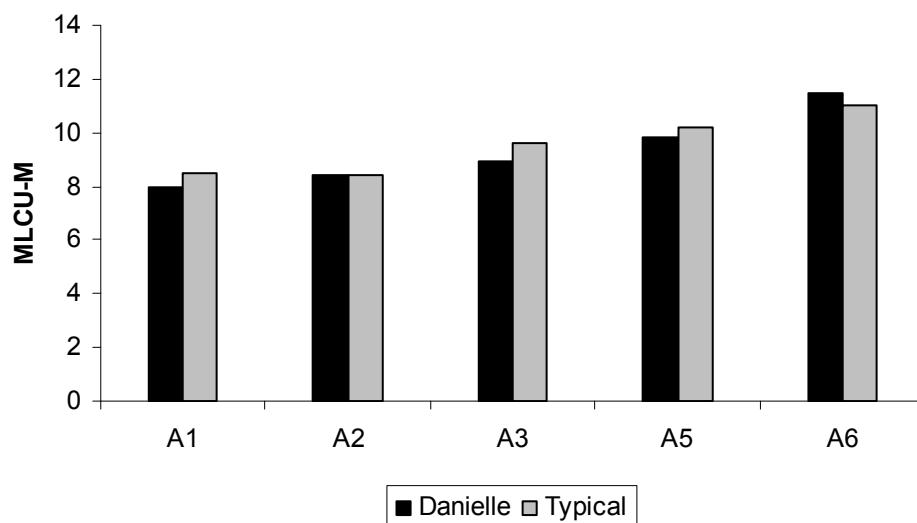


Figure 16. Danielle's performance on the grammatical complexity measure compared to her peers with typical development at each assessment time. Grammatical complexity is presented as the mean length of communication unit in morphemes (MLCU-M) obtained in the story retelling task. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3; A5: Assessment time 5; A6: Assessment time 6. The pre-intervention measures were taken during the longitudinal phase of the study (A1, A2, and A3). All assessments are approximately 8 months apart.

7.3.4 *Reading ability*

Danielle scored well below average (i.e., percentile rank score below 10) in both reading accuracy and reading comprehension at every assessment time. Table 32 shows her performance on the NARA (Neale, 1999).

Table 32. Danielle's performance on the NARA pre- and post-intervention

Reading Assessment	A1	A2	A3	A5	A6
Measures	Pre	Pre	Pre	Post	Post
NARA Form	1	2	1	2	1
Age	7;1	7;11	8;7	9;3	9;10
RA – raw score	7	18	26	25	33
RA – percentile rank	4	4	3	2	5
Rate – raw score	16	27	54	42	35
Rate – percentile rank	6	4	21	6	7
RC – raw score	3	9	8	11	14
RC – percentile rank	3	7	2	7	9
Passages read	1	2	2	2	3
Total number of RC questions	4	12	12	12	20

Note. A1: Assessment time 1; A2: Assessment time 2; A3: Assessment time 3; A5: Assessment time 5; A6: Assessment time 6. A1, A2, and A3 are pre-intervention data. All assessments are approximately 8 months apart. RA = Reading accuracy; RC = Reading comprehension. NARA = Neale Analysis of Reading Ability (Neale, 1999). The NARA has two parallel forms: Form 1 and Form 2.

Closer inspection of Danielle's performance reveals the ceiling effects of the NARA. For example, at A1, Danielle correctly answered 3 out of 4 questions. Similarly, at A5, her score was 11 out of a possible maximum of 12. At A6, Danielle correctly answered 14 out of 20 questions. On this passage, however, she made 12 errors, and her reading rate was very slow; Danielle achieved an overall reading rate of 35 words / minute (percentile rank 7, see Table 32). Her reading rate on the first two passages was 120 and 82 words per minute, respectively. On passage 3, this declined to 21 words per minute.

7.4 Discussion

This experiment investigated the treatment effects of oral narrative intervention on both the oral narrative and reading comprehension performance of a child (Danielle) with a mixed reading disability profile. At the start of the longitudinal study, Danielle demonstrated significant difficulties in reading accuracy and reading comprehension performance (percentile rank scores < 5) as well as mild to moderate spoken language impairment (total language score of 80 on the CELF-3). Despite these deficits in spoken language and reading performance, Danielle did not meet the criteria for government-funded speech-language therapy intervention.

The first question this experiment addressed was whether the oral narrative intervention would enhance Danielle's oral narrative abilities. Although the results indicated a dramatic improvement in oral narrative comprehension (between A3 and A4, see Figure 13), this was only considered statistically significant at A6 (i.e., 8 months post-intervention). No stable baseline was achieved during the longitudinal part of the study because of Danielle's superior performance on this task at A1 and A2. The phrasing of the questions used for the oral narrative comprehension task may account for the decline in performance between A2 and A3. From A3 onwards, the oral narrative comprehension task used questions that were less specific and required more inferencing. This can, therefore, be considered a

more difficult task, particularly for children with spoken language impairment (Wright & Newhoff, 2001).

The results indicated that the oral narrative intervention significantly improved Danielle's oral narrative production skills. At macrostructure level, Danielle performed at similar levels to her peers with typical development immediately post-intervention, and this improvement was maintained over time (see Figure 14). These results suggest the oral narrative intervention was successful in providing Danielle with a stable story structure model in long-term memory that could be accessed when retelling a fictional story.

At microstructure level, a decline in verbal fluency and grammatical accuracy was observed following the oral narrative intervention. Danielle's initial assessment results (at A1) indicated reduced working memory capacity, with well-below average scores on tasks measuring storage and/or retrieval of phonological information. Consistent with a limited capacity working memory processing model, the increased cognitive processing required to access and retain the story structure model during retelling most likely resulted in less capacity being available for other cognitive operations. In Danielle's case, this caused a decrease in grammatical complexity and verbal fluency. Closer inspection of her performance at the two follow-up assessments indicates continued trade-offs between different linguistic processes. For example, an increase in syntactic complexity (MLCU-M) at A6 appears to negatively affect grammatical accuracy (Crystal, 1987).

An improvement in Danielle's expressive vocabulary following intervention was evident. Although she had shown persistently poorer performance on the semantic diversity measure compared to her age-matched peers with typical development during the longitudinal phase of the study, she performed at similar levels post-intervention (see Figure 15). There are several possible explanations for this sudden improvement in expressive vocabulary. Consistent with the results from previous research, the increased exposure to oral

stories during the intervention could have enhanced Danielle's vocabulary skills (Elley, 1989; Penno, Wilkinson, & Moore, 2002). Penno et al. showed that primary school-age children acquired new vocabulary through incidental learning while listening to stories, especially after repeated exposures. Another explanation concerns the possible relationship between improved story structure knowledge and the acquisition of new information from context. It is hypothesised that a child's ability to acquire new information from context is influenced by the child's processing capacity (Cain, Lemmon et al., 2004). If fewer resources are needed to grasp the overall meaning of the story, more processing capacity is available to focus on individual novel words and derive their meaning from the context. Further research is needed to test this hypothesis.

The oral narrative intervention did not result in improved reading comprehension performance on the NARA. Closer inspection of Danielle's reading comprehension results, however, suggests a ceiling effect on this standardised test of reading ability that was caused by her poor reading accuracy ability. These findings suggest it may be difficult to find a standardised test of reading comprehension ability that is sensitive to narrative comprehension difficulties in children with poor word recognition abilities or that can be used to detect progress in reading comprehension following oral narrative intervention. Consistent with Kamhi and Catts' (2005) recommendations, a test of listening comprehension (i.e., oral narrative comprehension) may therefore be more appropriate. Danielle's progress in oral narrative comprehension over time suggests that once her word recognition difficulties are remediated, her listening comprehension skills for narrative texts should be sufficient to enable her to understand what she is reading.

7.5 Conclusions

The results from this longitudinal case study indicated the positive treatment effects of the oral narrative intervention on Danielle's ability to comprehend and produce oral narratives. Prior to the specific oral narrative intervention, Danielle demonstrated persistent difficulties in oral narrative abilities that are deemed important to the English curriculum (Ministry of Education, 1994). It is promising, therefore, that only six weeks of focused intervention conducted in group sessions was sufficient to accelerate her oral narrative development. Given that oral narrative difficulties can affect relationships with peers and teachers, (e.g., Asher and Gazelle, 1999; Reed and Spicer, 2003), the importance of progress in oral narrative competence to Danielle's social-emotional wellbeing should not be underestimated.

Despite the significant improvement in oral narrative performance, Danielle continued to demonstrate difficulties in reading comprehension. Taking her persistent difficulties in word recognition ability into consideration, these results indicate that intervention directed at remediating her word recognition difficulties is urgently needed (e.g., Gillon & Dodd, 1994; Torgesen et al., 1999).

CHAPTER 8

GENERAL DISCUSSION

8. Introduction

This thesis investigated the nature of the relationship between oral narrative ability and reading comprehension performance in a group of children with a mixed reading disability (MRD) profile. Several aspects of oral narrative ability were investigated: oral narrative comprehension (i.e., narrative structure knowledge), oral narrative ability at macrostructure level (story quality), and oral narrative ability at microstructure level (i.e., semantics and morpho-syntax). The specific research aims were:

1. How do children with MRD perform on oral narrative comprehension and oral narrative production tasks compared to their peers with typical development?
2. How do difficulties in aspects of oral narrative ability relate to reading comprehension difficulties?
3. Does oral narrative intervention improve the oral narrative abilities of children with MRD?
4. Does an improvement in oral narrative comprehension lead to improved reading comprehension performance for children with MRD?

To address these research questions, four experiments were conducted: a) A longitudinal investigation, b) a reading-age matched comparison study, c) an intervention study, and d) a longitudinal case study of one of the participants. A brief summary of the individual experiments is provided, followed by a discussion of the results of the experiments as they relate to the research aims. It will be argued from the findings reported in this thesis that the difficulties in oral narrative comprehension in the children with MRD contribute to

their reading comprehension impairment. This contribution is small, however, and the persistent word recognition difficulties of the children with MRD appear to restrain their reading comprehension during their middle primary school years.

8.1 Overview of methodology

8.1.1 Longitudinal study

This experiment monitored several aspects of oral narrative ability in 14 children (aged between 6;4 and 7;8 at the initial assessment) with mixed reading disability (MRD). Consistent with the reading component model (Aaron et al., 1999), these children demonstrated both word recognition and listening comprehension deficits at the start of the investigation. None of these children had previously been identified with spoken language impairment (on the basis of school records and a parent questionnaire). Their oral narrative performance was compared to the performance of 14 chronological age-matched peers with typical development (TD) on three assessment occasions, eight months apart. Oral narratives were elicited in a personal narrative context and a story retelling context. Oral narrative production ability was analysed at macrostructure (story quality) and microstructure (morpho-syntax and vocabulary) levels. Oral narrative comprehension was assessed in a fictional story context through questions relating to story structure elements. Reading comprehension performance was measured on a standardised test of reading ability.

8.1.2 Reading-age match study

At the third assessment trial of the longitudinal investigation, the poor readers' performance on the oral narrative tasks was compared to the performance of a control group of children with typical reading skills, matched to the poor readers on reading-age (RMTD). The children in the RMTD group were on average two years younger than the group of children with MRD.

8.1.3 Intervention study

This experiment investigated the treatment effects of oral narrative structure intervention on measures of oral narrative ability and reading comprehension. Ten children with MRD, who had shown persistent reading comprehension difficulties during the longitudinal study, participated in the intervention programme. The participants were divided into two groups, depending on the geographical location of the schools, and one group was randomly assigned to receive the intervention first. Intervention consisted of 12 one-hour group sessions over a 6-week period. The children participated in small group intervention sessions, with either two or three other children involved in the study, in their regular school environment.

To investigate the long-term benefits of this type of intervention, all children who participated in the intervention programme were re-assessed on measures of oral narrative ability and reading comprehension eight months post-intervention.

8.1.4 Longitudinal case study

A longitudinal case study was presented of a child who could be considered at high risk of ongoing academic difficulties on the basis of her initial assessment results. All aspects of this child's oral narrative performance were examined to investigate the interaction between these aspects of oral narrative ability in response to the oral narrative intervention. A detailed analysis of the child's reading comprehension performance was also presented.

8.2 The oral narrative abilities of children with mixed reading disability

The first question the experiments addressed was whether the children with MRD would show difficulties in oral narrative performance compared to their peers with typical development, over a two-year period. The results from the longitudinal investigation support the hypothesis. The findings showed that the children with MRD demonstrated persistent

difficulties in oral narrative ability during the course of the longitudinal study. Significant group differences in performance were found on all aspects of oral narrative performance: oral narrative comprehension (narrative structure knowledge), microstructure measures of oral narrative ability (morpho-syntax and semantics), and oral narrative ability at macrostructure level (story quality). Furthermore, the results from the longitudinal investigation revealed that these difficulties were persistent, despite a National English curriculum that aims to develop these skills in young school-age children (Ministry of Education, 1994).

8.2.1 The ability to comprehend an oral narrative

The finding that the children with MRD had difficulty answering questions related to a story was not surprising, given that the participant selection was based on impaired performance on a listening comprehension task. At group-level, however, these results confirm the appropriateness of using a listening comprehension task to identify children whose reading comprehension difficulties cannot be explained by their word recognition deficits alone (Catts & Kamhi, 2005a). Listening comprehension deficits in children with reading disabilities often go unnoticed in the early school grades because reading comprehension is typically more heavily dependent on word recognition than listening comprehension (Gough, Hoover, & Peterson, 1996).

The oral narrative comprehension difficulties of the children with MRD are consistent with previous research into the oral narrative comprehension skills of children with specific reading comprehension deficits (Catts et al., 2006). Catts et al. recently investigated the nature of the listening comprehension deficits in children with specific reading comprehension deficits (who demonstrated age-appropriate word recognition skills) by comparing their performance on oral narrative comprehension tasks to the performance of children with specific decoding ability and children with typically developing reading skills.

The results from this study confirmed specific listening comprehension deficits in children with specific reading comprehension deficits. Catts et al. hypothesised that these listening difficulties could be evidence of working memory deficits. The results from the current thesis suggest that an alternative, or additional cause of listening comprehension deficits in children with reading comprehension impairment relates to weakness in story structure knowledge. This hypothesis is investigated in more detail in the section on oral narrative intervention.

8.2.2 The ability to produce a high quality oral narrative

The results from the longitudinal study indicate that the children with MRD demonstrate significant difficulties narrating well-structured stories. This is consistent with previous research into the oral narrative skills of children with specific reading comprehension deficits (i.e., who demonstrate difficulties in listening comprehension but not in word recognition) (Cain, 2003; Oakhill et al., 1998). Cain and colleagues also found that children with specific reading comprehension difficulties told significantly less well-structured stories compared to their peers with typical reading development. These findings suggest a relationship between the ability to relate a high quality story and the listening comprehension component in the reading component model (Aaron et al., 1996). It seems likely that this relationship between oral narrative production at macrostructure level (i.e., story quality) and oral narrative comprehension is mediated by the child's story structure knowledge. Further research into the oral narrative production skills (at macrostructure level) of children with specific decoding difficulties (or dyslexia, i.e., difficulties in word recognition in the absence of listening comprehension difficulties) is needed to test this assumption. Comparing the oral narrative production skills of children with differing reading profiles (using the reading component model as the basis for reading disability classification) will advance our understanding of the relationship between spoken and written language disorders (Catts et al., 2006).

8.2.3 Performance on microstructure measures of oral narrative ability

The children with MRD demonstrated significant morpho-syntactic and semantic difficulties when asked to narrate fictional and/or personal narratives. Although these results were unexpected, because none of the children had previously been identified with spoken language impairment, they are consistent with the results from other investigations into the spoken language abilities of children with reading impairment (Catts et al., 2006; Gillon & Dodd, 1994; Nation et al., 2004). The results from the standardised broad-spectrum spoken language test, which was administered at the start of the longitudinal study, did not suggest a significant spoken language impairment in the children with MRD, however. The results from the Clinical Evaluation of Language Fundamentals – 3rd Edition (CELF-3; Semel et al., 1995) indicated that, as a group, the children with MRD scored in the low-average to mildly impaired range. Only one child was considered to have a moderate spoken language impairment, using accepted psychometric discrepancy criteria (i.e., a total language score more than 1.5 SD below the mean).

Several reasons may account for this discrepancy between the children's performance on the microstructure measures of oral narrative ability and their performance on the CELF-3. First, the CELF-3 has not been standardised on a New Zealand sample. This may explain why the children performed worse than expected from their standardised language scores on the spontaneous language sampling analyses. Alternatively, the analysis of spontaneous language measures derived in an oral narrative context may be more sensitive to spoken language impairment than the use of psychometric discrepancy criteria (cf. Dunn, Flax, Sliwinski, & Aram, 1996).

It seems plausible that the difficulties in semantics and morpho-syntax experienced by the children with MRD are an indication of more general weaknesses with language processing. These weaknesses could lead to difficulties in understanding spoken and written

stories. This study, therefore, provides further evidence of the overlap between reading impairment and spoken language deficits (Nation et al., 2004). These weaknesses in semantic and morpho-syntactic processing may affect reading development in two ways. Not only do they hamper reading comprehension by restricting children's ability to derive meaning from the text at word- and sentence-level, they also impact on word recognition ability (e.g., Nation & Snowling, 1998).

8.2.4 Oral narrative deficit or delay?

Given that the spoken language skills that are needed for comprehension of early reading materials develop during the preschool years, it seems possible that the reading comprehension difficulties experienced by the children with MRD are at least partially caused by weaknesses in spoken language (i.e., oral narrative) ability. Alternatively, the difficulties in oral narrative ability demonstrated by the children with MRD could be a reflection of their more limited exposure to written material and their lack of opportunities to comprehend more complex text.

The experiment reported in Chapter 2 compared the oral narrative performance of the children with MRD to the performance of their reading-age-matched peers with typical development. The aims were 1) to investigate the possible influence of reading experience on oral narrative ability, and 2) to ascertain if the oral narrative weaknesses demonstrated by the children with MRD resembled impaired or delayed development in oral narrative ability. The results from this experiment were twofold. First, the children with MRD showed significant difficulties in their ability to answer questions relating to underlying story structure elements compared to their reading-age matched peers. These results indicate a specific deficit in oral narrative comprehension and lend support to the hypothesis that story structure knowledge may be a contributing factor to the reading comprehension difficulties experienced by the children with MRD. Second, a pattern of delay was observed on the microstructure measures

of oral narrative ability. It was found that the children with MRD performed at similar levels compared to their reading-age matched peers (who were on average two years younger) on measures of semantic diversity and grammatical complexity. These results suggest that the more limited reading experience of the children with MRD may have resulted in delayed semantic and syntactic development during the early primary school years.

The results from the longitudinal and reading-age matched studies provide initial evidence for a relationship between reading comprehension deficits and oral narrative ability in children with MRD. A specific deficit in oral narrative comprehension is implicated as a contributing factor to these children's reading comprehension difficulties. Further evidence of this relationship is derived from understanding how oral narrative ability relates to reading comprehension performance over time.

8.3 The relationship between aspects of oral narrative ability and reading comprehension performance over time

The nature of the relationship between several aspects of oral narrative ability and reading comprehension performance was further explored by performing correlational analyses. Because reading comprehension is typically heavily dependent on word recognition during the early school years, the analyses took children's reading accuracy performance into consideration. As expected, children's word reading ability was highly correlated to their reading comprehension performance. This is consistent with previous research (e.g., Hoover & Gough, 1990) and reflects the nature of the standardised reading test that was used in this study (i.e., the NARA; Neale, 1999). Performance on the oral narrative ability tasks that tapped children's story structure knowledge (i.e., oral narrative comprehension and story quality) also showed significant correlations with their reading comprehension performance. In contrast, the only microstructure measure that showed a significant correlation to reading comprehension was the grammatical complexity measure (MLCU-M) at assessment time 2.

To examine the amount of variance in reading comprehension accounted for by aspects of oral narrative ability, multiple regression analyses were performed. Reading accuracy scores were used as an independent variable to control for the children's word reading ability. Once word reading ability was controlled for, it was oral narrative comprehension ability in particular that accounted for additional unique variance in predicting reading comprehension performance. The variance was small, however, with oral narrative comprehension at assessment time 1 (A1) only accounting for 4.8% of unique variance in reading comprehension at assessment time 3 (A3). This amount of unique variance increased to 7.6% when predicting reading comprehension at A3 from performance on the oral narrative comprehension task at assessment time 2 (A2). Although it seems likely that these numbers are conservative, given the nature of the NARA, coupled with the fact that the small number of cases may limit the power of the findings (Tabachnik & Fidell, 1989), they are consistent with the results from previous research (Catts, Hogan et al., 2005).

There were no persistent correlations between the microstructure measures of oral narrative ability and reading comprehension performance over the course of the longitudinal investigation. The most likely explanation is that the morpho-syntactic and semantic weaknesses of the children with MRD were not severe enough to influence their reading comprehension performance. Rather, oral narrative comprehension was the only aspect of oral narrative ability that consistently contributed to reading comprehension performance. Nevertheless, this influence was small, and the poor word recognition skills of the participants clearly contributed the most to these children's reading comprehension difficulties.

The results from the longitudinal investigation and the reading-age match study suggest that oral narrative comprehension may play a causal role in reading comprehension impairment for children with MRD. Not only was there a persistent pattern of difficulty in

oral narrative comprehension over the course of the investigation, a specific deficit in oral narrative comprehension was observed in the reading-age match study. To further investigate the nature and the strength of this relationship, an intervention study was undertaken which aimed to enhance the poor readers' oral narrative comprehension skills.

8.4 Oral narrative intervention for children with MRD

The third research question pertained to the effectiveness of oral narrative intervention for children with MRD. Ten children with MRD participated in an intervention programme that aimed to enhance their oral narrative comprehension skills. Given the hypothesised importance of story structure knowledge to oral narrative comprehension, the intervention specifically aimed to improve children's knowledge of storystructure in fictional stories. The children were also instructed how to apply this story structure knowledge to the telling and retelling of fictional stories.

Although the emphasis during the intervention was on story structure knowledge (i.e., at macrostructure level), competence or difficulty in one aspect of oral narrative ability may affect performance in another because of limited working memory processing capacity (Crystal, 1987). A child's difficulty in producing a complex oral narrative (at macrostructure level) may, for example, result in poorer performance on microstructure measures (semantics or morpho-syntax), or vice versa. Given the persistent difficulties the children with MRD had demonstrated on all aspects of oral narrative ability during the longitudinal investigation, a full evaluation of their oral narrative proficiency at both macro- and microstructure levels was performed pre- and post-intervention.

8.4.1 Treatment effects on oral narrative comprehension

The oral narrative intervention resulted in a significant improvement in oral narrative comprehension performance in the children with MRD. The results indicated immediate

treatment effects on the children's ability to answer questions relating to story structure elements after listening to a story. Post-intervention, the children with MRD demonstrated superior performance on this oral narrative comprehension measure compared to their peers with typical development, and these improvements were maintained over time. These results lend support to the important contribution of story structure knowledge to oral narrative comprehension.

Several other conclusions can be made regarding the nature of the oral narrative comprehension deficits of the children with MRD. It seems likely that the poor oral narrative comprehension performance of these children during the longitudinal phase of the study did not just reflect a general weakness in receptive spoken language skills at microlinguistic level. No systematic work was undertaken during the intervention sessions to practise answering the types of questions that were asked at the assessment occasions (see Appendix C). Rather, the intervention specifically targeted story structure elements and encouraged the participants to identify these elements in fictional stories.

The results support the generalisation of story structure knowledge to a more general understanding of the story. Although the questions of the oral narrative comprehension task tapped underlying story grammar elements, no explicit mention of these story grammar elements was made during the assessments (see Appendix C). Similarly, the oral narrative comprehension probe that was used pre- and post-intervention (Dragon Story from the Test of Narrative Language, Gillam & Pearson, 2004) contained questions relating to story grammar elements as well as more general questions (see Chapter 5). These findings are consistent with the theory that the connection between story structure knowledge and oral narrative comprehension is mediated by the ability to build a more stable mental model of the situation described in the story; As Bishop explained: "Information that is integrated into a mental model is easier to understand" (1997).

The role of working memory in oral narrative comprehension performance has been well established. To adequately understand a story, children need to be able to temporarily store and manipulate the information (contained in a story) in working memory. While it remains unclear if deficits in working memory capacity underlie the oral narrative comprehension difficulties seen in the children with MRD, the results from the current investigation suggest these deficits can at least be compensated for by adequate story structure knowledge.

The findings from the follow-up investigation clearly showed that the improvement in oral narrative comprehension performance was maintained long-term. Therefore, the intervention appeared successful in establishing a permanent underlying representation of story structure in long-term memory.

8.4.2 Treatment effects on oral narrative production (story quality)

There were no immediate treatment effects on the macrostructure measure of oral narrative production (i.e., story quality). When analysing the pre- and post-intervention scores, there was no significant increase in story quality scores in either of the intervention groups. This was surprising, given the significant improvement in oral narrative comprehension in the children with MRD. It was anticipated that improved story structure knowledge and satisfactory comprehension of a story would result in improved story retelling performance. That is, children were expected to include more story structure elements and sequence them in a logical way. Nevertheless, the intervention phase did coincide with accelerated progress on the story quality measure in the children with MRD, when compared to their peers with typical development. Although the children with MRD scored persistently lower than the children with typical development during the longitudinal phase of the study, there were no significant group differences in performance at the two follow-up assessments (A5 and A6). It is suggested that the oral narrative production measure that was used (i.e., the

story quality rubric) may lack sensitivity in evaluating change in story quality following short periods of intervention. Several explanations are put forward:

- The story quality rubric proved useful in detecting group differences in oral narrative production performance. Closer inspection of the scoring procedures used for the rubric, however, shows that performance on some characteristics of this rubric is also dependent on other spoken language skills. For example, a child would receive a low score on the two story grammar characteristics involving *characters* if he/she is poor at using correct pronouns, even when all the characters are mentioned during retelling. In addition, there is little room for improvement on the *coherence* characteristic. An increase in the number of story structure elements in a child's fictional story retelling may, therefore, not necessarily result in a significant increase in the overall story quality score.
- The ability to produce a good-quality story may not be easily broken down into small developmental steps. The results from the longitudinal investigation reported in this thesis indicated stable performance on the story quality measure by the group of children with typical development as they progressed through the early school years. These results suggest developmental changes in story quality may only be present over a longer time frame. This hypothesis finds support in the results from previous investigations (Fey et al., 2004; Snyder & Downey, 1991; Ukrainetz et al., 2005). For example, Ukrainetz et al. investigated the development of expressive elaboration (i.e., the quality of the story) in fictional narratives in 5- to 12-year-old children with typical development. The results indicated that age effects were not continuous. Rather, three age-clusters were detected: 4-6-year-olds, 7-9-year-olds and 10-12-year-olds.

- It is possible that the oral narrative production task that was used in the current study (i.e., a story retelling condition) provided too much structure and therefore lacked sensitivity in detecting changes in oral narrative production performance following short periods of intervention (Hughes et al., 1997). However, observation of the range in scores obtained by the children (18 to 38) does not reveal this as a major issue.

8.4.3 Treatment effects on the microstructure measures of oral narrative production

As expected, the intervention did not significantly affect the children's oral narrative performance at microstructure level. The intervention programme did not aim to systematically enhance the semantic and/or morphosyntactic spoken language skills of the children with MRD. There was, however, an increase in mazing behaviour in the children with MRD that appeared a direct result of the intervention. The most likely explanation involves a "trade-off" between the children's increased attention to the overall structure of their oral narrative and a reduction in verbal fluency (Crystal, 1987). This mazing behaviour returned to pre-intervention levels eight months post-intervention, suggesting that with time less processing capacity is required to access story structure knowledge when generating a story. As a result, more processing resources become available to formulate sentences, resulting in increased verbal fluency.

The intervention period coincided with an improvement in the poor readers' semantic and morpho-syntactic skills relative to the performance of their peers with typical development. It is difficult to ascertain if this improvement was a result of general, perhaps delayed maturation. As mentioned earlier, at group-level no immediate changes in these spoken language measures were observed post-intervention. The results from the case study reported in Chapter 7, however, clearly indicated improved performance on the semantic diversity measure following intervention. Interestingly, this child obtained one of the lowest receptive language scores on the Clinical Evaluations of Language Fundamentals – 3rd

Edition (CELF3; Semel et al., 1995). These findings suggest a relationship between story structure knowledge and word learning. It seems possible that improved story structure knowledge not only enhances the child's ability to grasp the overall meaning of the story, but also facilitates the attachment of meaning to novel words or phrases that are encountered in the story. It is unclear, at this stage, if this effect would vary for children with differing spoken language profiles, and further research is clearly warranted.

8.5 Treatment effects on reading comprehension performance

The findings from the oral narrative intervention study do not provide evidence for a primary role of oral narrative comprehension to the reading comprehension deficits observed in the children with MRD. Despite the significant improvement in oral narrative comprehension, there was no treatment effect on reading comprehension performance. These findings cast serious doubt on the strength of the relationship between oral narrative comprehension and reading comprehension performance in 9- to 10-year-old children with a mixed reading disability profile.

The most likely explanation for the lack of transfer from oral to written narrative (text) comprehension relates to the relatively small amount of influence listening comprehension exerts on the reading comprehension process during the middle primary school years. Rather, word recognition ability plays a major role in reading comprehension performance. It is well established that with age, reading comprehension becomes more dependent on listening comprehension skills and less reliant on word recognition abilities (Catts et al., 2005; Gough et al., 1996). More specifically, Catts et al. found that listening comprehension accounted for only 9% of unique variance in second-grade reading comprehension in children with typical development. This increased to 21% in fourth grade and 36% in eighth grade. Upon completion of the oral narrative intervention programme in the present study, the children with MRD were in school-year 5 or 6 of their local primary

schools. At this age, listening comprehension may, therefore, only exert a relatively small amount of unique influence on reading comprehension performance. Consistent with this hypothesis, oral narrative comprehension predicted a very small proportion of unique variance in reading comprehension in the current study (see Chapter 2).

The word recognition difficulties of the children with MRD may utilise most of their available working memory resources. As a result, children may be prevented from accessing their improved story structure knowledge that is needed for the comprehension of written narratives. Consistent with a limited capacity working memory model, the results from the intervention study suggest that the children with MRD are susceptible to trade-offs between different linguistic processes. For example, an improvement in story quality resulted in a decrease in verbal fluency, following intervention. To further test this hypothesis, longitudinal follow-up of the participants is needed.

An alternative explanation for the lack of transfer from spoken to written narrative comprehension relates to the difficulty children with learning problems may have in generalising learned behaviours or skills to untrained modalities (Gersten et al., 2001). The emphasis during the oral narrative intervention was on spoken language, rather than written texts, even though most of the sessions evolved around existing children's literature. Consistent with previous research, it seems plausible that the children with MRD may have difficulty applying their improved story structure knowledge in a different modality.

The standardised reading test that was used in this thesis (the NARA, Neale, 1999) may lack sensitivity in detecting change in reading comprehension performance following short periods of intervention. The stories used in the NARA get progressively more difficult and longer, and the test is discontinued once a child makes more than 12 reading errors. Because of the word recognition deficits of the participants, many children could only read

the first two or three passages of the NARA, which limited their opportunity to answer more questions.

The types of questions that are used in the NARA may not tap into the same underlying representations as the oral narrative comprehension task (i.e., questions related to the underlying story structure elements) that was used in the current thesis. A recent analysis of the questions used in the first six passages of the NARA suggested that 30% of the questions require knowledge-based inferences, and 15% of the questions are vocabulary dependent (Bowyer-Crane & Snowling, 2005). Correct answering of almost half of the questions in the NARA, therefore, requires the reader to apply real-world knowledge to the text and/or to have understanding of a particular keyword. It seems possible that the children with MRD do not have the appropriate real-world knowledge to successfully answer the questions, perhaps as a result of reduced reading experience, compared to their peers with typical reading development. Alternatively, the children with MRD may be unaware of the need to draw on this knowledge when the questions are presented to them. Further research is required to investigate existing real-world knowledge in children with differing reading profiles.

The findings of this thesis suggest it may be difficult to find a standardised test of reading ability that is suitable in detecting progress in reading comprehension following oral narrative intervention in children with poor word recognition abilities. Consistent with Kamhi and Catt's (2005) recommendations, a test of listening comprehension (i.e., oral narrative comprehension) may thus be more appropriate. The significant progress in oral narrative comprehension made by the children with MRD suggests that once their word recognition difficulties are remediated, their listening comprehension skills for narrative texts may be sufficient to enable understanding of the read material.

8.6 Summary of findings

This thesis aimed to investigate the nature of the relationship between oral narrative ability and reading comprehension performance in children with a mixed reading disability profile. On the basis of the evidence gathered from the experiments reported in this thesis, it can be concluded that:

1. Children with MRD demonstrate persistent weaknesses in *all* aspects of their oral narrative ability compared to their peers with typical development.
2. Children with MRD show a specific deficit in oral narrative comprehension ability. In contrast, their performance on microstructure measures of oral narrative ability show a pattern of delayed development.
3. Oral narrative comprehension ability accounts for only a small amount of the unique variance in the children's reading comprehension performance, whereas their word recognition skills account for at least 70% of the variance at every assessment time.
4. Intervention directed at enhancing narrative structure knowledge results in significant long-term improvement in oral narrative comprehension in the children with MRD. These findings suggest that narrative structure knowledge plays an important causal role in the poor readers' oral narrative comprehension difficulties.
5. Improved oral narrative comprehension performance does not result in improved reading comprehension performance for the children with MRD. These results are consistent with the finding from the longitudinal study which showed that the main contributing factor to the reading comprehension difficulties of the children with MRD relates to their weakness in word recognition.

8.7 Implications for speech-language therapists

The findings from this study provide further evidence of the hidden language impairments in children with reading disabilities (Catts et al., 2006; Gillon & Dodd, 1994;

Nation et al., 2004). This supports the findings of others that hidden language impairments are more likely to be revealed when children's discourse is considered (Fey et al., 2004; Hadley, 1998). A thorough analysis of their spontaneous oral narrative samples revealed weaknesses in all areas of oral narrative ability in the children with MRD. Although the spoken language difficulties of these children could be considered mild, the results from the longitudinal study indicated that these weaknesses were persistent and did not improve without direct intervention. Furthermore, oral narrative comprehension was implicated as one of the likely contributors to their reading comprehension deficits. It is clear that speech and language therapists could play a vital role in revealing these spoken language difficulties in children with reading disorders.

The use of the Listening to Paragraphs subtest of the CELF-3 (Semel et al, 1995) proved a valuable measure in diagnosing a listening comprehension deficit in children with reading disability. Superficially, the children with MRD were undistinguishable from children with dyslexia (or specific poor decoders), based on teacher reports. Inclusion of a listening comprehension test as part of the assessment battery of a speech-language therapist will thus aid differential diagnosis and provide direction for intervention practices for children with reading disabilities (Catts & Kamhi, 2005a).

The results from the intervention study highlight the benefits of targeting story structure knowledge in children with MRD. Twelve one-hour sessions of focused intervention in a small group setting were sufficient to enhance these children's oral narrative comprehension skills to the level of their peers with typical development. Introducing children to story structure knowledge (or story grammar) is not a new concept and forms part of the standard New Zealand English curriculum. The findings from this thesis suggest that more intensive training is needed for this type of intervention to be effective in children with MRD.

Despite the progress in oral narrative comprehension, the children with MRD continued to struggle in their reading comprehension ability. The most likely cause is their poor word recognition skills. Although the children with MRD made significant progress in word reading ability over the course of the investigation, they did not make the accelerated progress needed to catch up to their peers with typical development. The results from previous research indicate that intervention directed at enhancing these children's phonological processing abilities is urgently needed (see Gillon, 2004). It is argued that a speech-language therapist with skills in all areas of spoken language development would have the necessary expertise to help coordinate the assessment, planning, and implementation of intervention programmes that enhance both word recognition and listening comprehension skills in children with MRD.

8.8 Limitations of the present research

One limitation of the present study concerns the small number of participants and the reliance on teacher referral for recruitment of the participants. A larger population-based sample would have allowed for more certainty regarding the generalisability of the results to all children with a mixed reading disability profile. Nevertheless, the results are consistent with those obtained from previous studies and add to our growing knowledge base regarding children with differing reading disability profiles (Catts et al., 2006).

More in-depth insights into the usefulness of the reading component model (Aaron et al., 1999) in classifying children with reading disabilities for intervention purposes would have been obtained from inclusion of a second experimental group of children who demonstrate a specific comprehension deficit. This would have allowed for more definitive conclusions regarding the relationship between the current participants' word recognition difficulties and their lack of progress in reading comprehension post-intervention. Based on the results derived from the present research, children with a specific reading comprehension

deficit would have been expected to show improved reading comprehension performance following intervention.

Tighter matching of the oral narrative materials, that were used for the fictional story tasks in the longitudinal study (assessment trial at A1, A2, and A3), would have allowed for more in-depth analysis of the development of oral narrative comprehension in the children with MRD. Moreover, developmental progress on microstructure measures of oral narrative ability derived in the story retelling task could have been investigated. Using different narrative elicitation procedures in longitudinal investigations is not uncommon, however. For example, Paul et al. (1996) studied oral narrative development in children with a history of slow language development and employed a story generation task in kindergarten and second grade, and a story retelling task in first grade. Similarly, Catts et al. (2002) used a narrative retell task in kindergarten and a narrative generation task in grades 2 and 4, in their longitudinal investigation of reading outcomes in children with language impairments. One explanation for using different oral narrative tasks at different stages of children's development pertains to the expected maturation of the participants in a longitudinal investigation. To avoid ceiling effects, different stories, of differing levels of difficulty need to be used at successive assessment times. One possible solution may be to use the same story generation task at each level of development (e.g., Fey et al., 2004).

More information about the relationship between reading comprehension and oral narrative ability would have been obtained if an experimental task of reading comprehension had been included pre- and post-intervention. Because of the positive treatment effects on oral narrative comprehension in the present study, it is hypothesised that the children with MRD would have shown progress in reading comprehension if this task had been more closely matched to the oral narrative comprehension task. The poor word recognition skills of the participants present a problem, however. The reading task would need to be at a reading

level that is easy to read for the children with MRD, yet at a narrative level that is challenging for 9- and 10-year-olds. It is hypothesised that by using easy-to-decode texts, enough working memory capacity would be available to access the newly learned story structure knowledge. The children can then use this knowledge to form a clear mental model of the situation described in the text. Using a written text at the appropriate level of difficulty, from a narrative point of view, would also avoid ceiling effects.

8.9 Directions for future research

As discussed in the literature review, many underlying representations are needed to construct adequate mental models when reading or listening to stories. In the present study, the focus was on narrative structure knowledge. The oral narrative tasks were designed to control for real-world knowledge and content knowledge. In contrast, a standardised test of reading comprehension was utilised that did not control for these variables. This discrepancy may, therefore, also play a role in the lack of transfer from spoken to written narrative comprehension in the current study. Future research into the relationship between oral narrative ability and reading comprehension performance should more closely investigate other areas of knowledge that are known to contribute to the reading comprehension process. This will enhance our understanding of the relative contributions of each of these skills to the spoken and written narrative comprehension process.

Although the children with MRD, as a group, demonstrated weaknesses in oral narrative ability compared to their peers with typical development, there are currently no norm-referenced criteria to determine if an individual child scores above or below age expectations on these particular oral narrative tasks. Moreover, it is not known if performance on these tasks is effective in identifying children with spoken and/or written language impairment. Although general developmental trends (e.g., narrative stages or narrative levels) in oral narrative performance have been well documented (see Hughes et al., 1997),

normative tests of oral narrative ability have only recently been developed (e.g., Gillam & Pearson, 2004; Bishop, 2004). Further research is required to determine if performance on these tests would differentiate between children with mixed reading disability and their peers with typical reading development.

8.10 Conclusions

The simple view of reading (Gough & Tunmer, 1986) has gained much support and popularity, since its conception two decades ago (Catts et al., 2003; Gough et al., 1996; Roberts & Scott, 2006). The classification of reading disabilities that is based on this theory offers direct implications for intervention, both for speech-language therapists and educationalists. Much research attention has focused on two subgroups of children with reading disabilities, namely children with specific word recognition problems (i.e., specific poor decoders or dyslexia) (e.g., Vellutino et al., 2004) and children with specific comprehension deficits (in the absence of word recognition difficulties) (e.g., Cain & Oakhill, 1996, Nation, 2005). From a theoretical perspective, research into subgroups of children with reading disability who show a dissociation between word recognition and listening comprehension has provided clearer insights into the spoken language deficits in these groups of children. In children with dyslexia, word recognition problems clearly stem from a phonological processing deficit, whereas children with specific comprehension impairment generally demonstrate spoken language comprehension problems in the absence of phonological processing difficulties.

The current thesis contains one of the first studies to investigate spoken language abilities in children who have been specifically identified with deficits in both word recognition and listening comprehension. This subgroup of poor readers forms a sizeable portion of the total number of children with reading disability who attend our regular school system (Catts et al., 2003). Although the participants in the current study had been identified

with a reading impairment, spoken language (comprehension) difficulties were not generally considered an issue by their teachers. The results from this thesis, therefore, not only contribute to our growing knowledge base on the overlap between spoken and written language disorders, they also raise the awareness of professionals involved with the children of the importance of spoken language skills to the reading comprehension process. Although the findings demonstrate that intervention strategies can be effective in promoting listening comprehension skills in children with a mixed reading disability, future endeavours should clearly be directed at prevention and early intervention of both their word recognition and their listening comprehension deficits.

REFERENCES

- Aaron, P. G., Joshi, M., & Williams, K. A. (1999). Not all reading disabilities are alike. *Journal of Learning Disabilities, 32*(2), 120-137.
- Adams, A. M., & Gathercole, S. E. (1996). Phonological working memory and spoken language development in young children. *Quarterly Journal of Experimental Psychology Section a-Human Experimental Psychology, 49*(1), 216-233.
- Adams, A. M., & Gathercole, S. E. (2000). Limitations in working memory: Implications for language development. *International Journal of Language & Communication Disorders, 35*(1), 95-116.
- Altmann, G. T. M. (2001). The language machine: Psycholinguistics in review. *British Journal of Psychology, 92*, 129-170.
- American Speech-Language-Hearing Association Ad Hoc Committee on Service Delivery in the Schools (1993). Definitions of communication disorders and variations. *Asha, 35*(Suppl.10), 40 - 41.
- Applebee, A. (1978). *The child's concept of story*. Chicago: University of Chicago Press.
- Asher, S. R., & Gazelle, H. (1999). Loneliness, peer relations, and language disorder in childhood. *Topics in Language Disorders, 19*(2), 16-33.
- Baddeley, A. (2003). Working memory and language: An overview. *Journal of Communication Disorders, 36*(3), 189-208.
- Biemiller, A. (2003). Vocabulary: Needed if more children are to read well. *Reading Psychology, 24*, 323-335.
- Bishop, D. V. M. (1997). *Uncommon understanding. Development and disorders of language comprehension in children*. East Sussex: Psychology Press.
- Bishop, D. V. (2004). *Expression, reception and recall of narrative instrument (ERRNI)*. Oxford, UK: Harcourt Assessment.

- Bishop, D. V. M., & Adams, C. (1990). A prospective study of the relationship between specific language impairment, phonological disorders, and reading retardation. *Journal of Child Psychology and Psychiatry, 31*, 1027-1050.
- Bishop, D. V. M., & Snowling, M. J. (2004). Developmental dyslexia and specific language impairment: Same or different? *Psychological Bulletin, 130*(6), 858-886.
- Botting, N., Simkin, Z., & Conti-Ramsden, G. (2006). Associated reading skills in children with a history of Specific Language Impairment (SLI). *Reading and Writing, 19*(1), 77-98.
- Bowyer-Crane, C., & Snowling, M. J. (2005). Assessing children's inference generation: What do tests of reading comprehension measure? *British Journal of Educational Psychology, 75*, 189-201.
- Bradley, L., & Bryant, P. (1978). Difficulties in auditory organisation as a possible cause of reading backwardness. *Nature, 271*, 746 - 747.
- Brown, L., Sherbenou, R., & Johnsen, S. (1997). *Test of nonverbal intelligence: A language-free measure of cognitive ability* (3rd ed.). Austin, TX: Pro-ed.
- Bruner, J. (1985). Narrative and paradigmatic modes of thought. In E. Eisner (Ed.), *Learning and teaching the ways of knowing* (pp. 97-115). Chicago: University of Chicago Press.
- Cain, K. (2003). Text comprehension and its relation to coherence and cohesion in children's fictional narratives. *British Journal of Developmental Psychology, 21*, 335-351.
- Cain, K., Lemmon, K., & Oakhill, J. (2004). Individual differences in the inference of word meanings from context: The influence of reading comprehension, vocabulary knowledge, and memory capacity. *Journal of Educational Psychology, 96*(4), 671-681.

- Cain, K., & Oakhill, J. (1996). The nature of the relationship between comprehension skill and the ability to tell a story. *British Journal of Developmental Psychology, 14*, 187-201.
- Cain, K., Oakhill, J., & Bryant, P. (2000). Investigating the causes of reading comprehension failure: The comprehension-age match design. *Reading and Writing: An Interdisciplinary Journal, 12*, 31-40.
- Cain, K., Oakhill, J., & Bryant, P. (2004). Children's reading comprehension ability: Concurrent prediction by working memory, verbal ability, and component skills. *Journal of Educational Psychology, 96*(1), 31-42.
- Catts, H., Adlof, S., & Ellis-Weismer, S. (2006). Language deficits in poor comprehenders: A case for the simple view of reading. *Journal of Speech, Language, and Hearing Research, 49*(2), 278-293.
- Catts, H. W., Adlof, S. M., Hogan, T. P., & Ellis-Weismer, S. (2005). Are specific language impairment and dyslexia distinct disorders? *Journal of Speech, Language, and Hearing Research, 48*(6), 1378-1396.
- Catts, H. W., Fey, M. E., Tomblin, J. B., & Zhang, X. (2002). A longitudinal investigation of reading outcomes in children with language impairments. *Journal of Speech, Language, and Hearing Research, 45*(6), 1142-1157.
- Catts, H. W., Hogan, T. P., & Adlof, S. M. (2005). Developmental changes in reading and reading disabilities. In H. W. Catts & A. G. Kamhi (Eds.), *Connections Between Language and Reading Disabilities* (pp. 25 - 40). Mahwah, NJ: Lawrence Erlbaum.
- Catts, H. W., Hogan, T. P., & Fey, M. E. (2003). Subgrouping poor readers on the basis of individual differences in reading-related abilities. *Journal of Learning Disabilities, 36*(2), 151-164.

- Catts, H. W., & Kamhi, A. G. (2005a). Classification of reading disabilities. In H. W. Catts & A. G. Kamhi (Eds.), *Language and reading disabilities* (2nd ed., pp. 72-93). Boston, MA: Pearson Education.
- Catts, H. W., & Kamhi, A. G. (2005b). Defining reading disabilities. In H. W. Catts & A. G. Kamhi (Eds.), *Language and reading disabilities* (2nd ed., pp. 50 - 71). Boston, MA: Pearson Education.
- Catts, H. W., & Kamhi, A. G. (2005c). *Language and reading disabilities* (2nd ed.). Boston, MA: Pearson Education.
- Clay, M. M. (1993). *An observation survey of early literacy achievement*. Auckland, NZ: Heinemann.
- Crystal, D. (1987). Towards a "bucket" theory of language disability: Taking account of interaction between linguistic levels. *Clinical Linguistics and Phonetics*, 1, 7-22.
- Cunningham, A. E., & Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental Psychology*, 33(6), 934-945.
- Cutting, L. E., & Scarborough, H. S. (2006). Prediction of reading comprehension: Relative contributions of word recognition, language proficiency, and other cognitive skills can depend on how comprehension is measured. *Scientific Studies of Reading*, 10(3), 277-299.
- Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test - III*. Circle Pines, MN: American Guidance Service.
- Dunn, M., Flax, J., Sliwinski, H., & Aram, D. (1996). The use of spontaneous language measures as criteria for identifying children with specific language impairment: An attempt to reconcile clinical and research incongruence. *Journal of Speech and Hearing Research*, 39(3), 643-654.

- Echols, L. D., West, R. F., Stanovich, K. E., & Zehr, K. S. (1996). Using children's literacy activities to predict growth in verbal cognitive skills: A longitudinal investigation. *Journal of educational psychology, 88*(2), 296-304.
- Elley, W. B. (1989). Vocabulary acquisition from listening to stories. *Reading Research Quarterly, 24*(2), 174-187.
- Elliot, D. (1999). *Sydney and the sea monster*. Auckland, New Zealand: Random House.
- Engel, S. (1995). *The stories children tell: Making sense of narratives in childhood*. NY: W.H. Freeman.
- Feagans, L., & Short, E. J. (1984). Developmental differences in the comprehension and production of narratives by reading-disabled and normally achieving children. *Child Development, 55*, 1727-1736.
- Fey, M. E., Catts, H. W., Proctor-Williams, K., Tomblin, J. B., & Zhang, X. (2004). Oral and written story composition skills of children with language impairment. *Journal of Speech, Language, and Hearing Research, 47*(6), 1301-1318.
- Fitzgerald, J., & Spiegel, D. L. (1983). Enhancing children's reading comprehension through instruction in narrative structure. *Journal of Reading Behavior, XV*(2), 1-17.
- Gersten, R., Fuchs, L. S., Williams, J. P., & Baker, S. (2001). Teaching reading comprehension strategies to students with learning disabilities: A review of research. *Review of Educational Research, 71*(2), 279-320.
- Gillam, R. B., & Pearson, N. A. (2004). *Test of Narrative Language*. Austin, TX: Pro-ed.
- Gillon, G., & Dodd, B. J. (1994). A prospective study of the relationship between phonological, semantic and syntactic skills and specific reading disability. *Reading and Writing: An Interdisciplinary Journal, 6*, 321-345.

- Gillon, G., Westerveld, M., Miller, J., & Nockerts, A. (2002). Systematic analysis of Language Transcripts New Zealand Version [Computer software]. Christchurch, New Zealand: University of Canterbury.
- Gillon, G. T. (2004). *Phonological awareness: From research to practice*. New York: The Guilford Press.
- Gough, P. B., Hoover, W. A., & Peterson, C. L. (1996). Some observations on a simple view of reading. In C. Conoldi & J. Oakhill (Eds.), *Reading comprehension difficulties* (pp. 1 - 13). Mahwah, NJ: Lawrence Erlbaum.
- Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, 7(1), 6-10.
- Graesser, A. C., Singer, M., & Trabasso, T. (1994). Constructing inferences during narrative text comprehension. *Psychological Review*, 101(3), 371-395.
- Greenhalgh, K. S., & Strong, C. J. (2001). Literate language features in spoken narratives of children with typical language and children with language impairments. *Language, Speech, and Hearing Services in Schools*, 32(2), 114-125.
- Griffey, Q. L., Zigmond, N., & Leinhardt, G. (1988). The effects of self-questioning and story structure training on the reading comprehension of poor readers. *Learning Disabilities Research*, 4(1), 45 - 51.
- Griffith, P. L., Ripich, D. N., & Dastoli, S. L. (1986). Story structure, cohesion, and propositions in story recalls by learning-disabled and nondisabled children. *Journal of Psycholinguistic Research*, 15, 539-555.
- Gummersall, D. M., & Strong, C. J. (1999). Assessment of complex sentence production in a narrative context. *Language, Speech, and Hearing Services in Schools*, 30, 152-164.
- Hadley, P. A. (1998). Language sampling protocols for eliciting text-level discourse. *Language, Speech, and Hearing Services in Schools*, 29, 132-147.

- Hagley, F. (1987). *Suffolk Reading Scale*. Windsor: NFER-Nelson.
- Hambrick, D. Z., & Engle, R. W. (2002). Effects of domain knowledge, working memory capacity, and age on cognitive performance: An investigation of the knowledge-is-power hypothesis. *Cognitive Psychology*, 44(4), 339-387.
- Hedberg, N.L. & Westby, C.E. (1993) *Analyzing storytelling skills*. Tucson, AZ: Communication Skill Builders.
- Hemphill, L., & Siperstein, G. N. (1990). Conversational competence and peer response to mildly retarded children. *Journal of Educational Psychology*, 82, 128-134.
- Holloway, K. F. C. (1986). The effects of basal readers on oral language structures: A description of complexity. *Journal of Psycholinguistic Research*, 15, 141-151.
- Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing: An Interdisciplinary Journal*, 2, 127-160.
- Hudson, J. A., & Shapiro, L. R. (1991). From knowing to telling: The development of children's scripts, stories, and personal narratives. In A. McCabe & C. Peterson (Eds.), *Developing Narrative Structure* (pp. 89-136). Hillsdale, NJ: Lawrence Erlbaum.
- Hughes, D., McGillivray, L., & Schmidek, M. (1997). *Guide to narrative language: Procedures for assessment*. Eau Claire, WI: Thinking Publications.
- Hughes, D. L. (1997a). Introduction to narrative language. In *Guide to Narrative Language* (pp. 1-12). Eau Claire, WI: Thinking Publications.
- Hughes, D. L. (1997b). Procedures for sampling and eliciting narrative language. In *Guide to Narrative Language* (pp. 13-36). Eau Claire, WI: Thinking Publications.
- Hutson-Nechkash, P. (2001). *Narrative toolbox: Blueprints for storybuilding*. Eau Claire, WI: Thinking Publications.
- Idol, L. (1987). Group story mapping: A comprehension strategy for both skilled and unskilled readers. *Journal of Learning Disabilities*, 20(4), 196-205.

- Idol, L., & Croll, V. J. (1987). Story-mapping training as a means of improving reading comprehension. *Learning Disability Quarterly, 10*, 214-229.
- James, D. (1999). Children's story telling skills in the age range of five to seven years. *Proceedings of the 1999 Speech Pathology Australia National Conference* (pp. 102-109).
- Jones, M. A., & Lodholz, C. (1999). Story Grammar Rubric. Madison Metropolitan School District and the Language Analysis Lab, Waisman Center, University of Wisconsin, Madison: Unpublished document created by the SALT working group, Jon Miller Chair.
- Joshi, R. M., Williams, K. A., & Wood, J. R. (1998). Predicting reading comprehension from listening comprehension: Is this the answer to the IQ debate? In C. Hulme & R. M. Joshi (Eds.), *Reading and spelling development and disorders* (pp. 319-327): Lawrence Erlbaum.
- Kaderavek, J. N., & Sulzby, E. (2000). Narrative production by children with and without specific language impairment: Oral narratives and emergent readings. *Journal of Speech, Language, and Hearing Research, 43*(1), 34-49.
- Kamhi, A. G., & Catts, H. W. (2005). Language and reading: Convergences and divergences. In H. W. Catts & A. G. Kamhi (Eds.), *Language and reading disabilities* (2nd ed., pp. 1 - 25). Boston, MA: Pearson Education.
- Keenan, J. M., & Betjemann, R. S. (2006). Comprehending the Gray oral reading test without reading it: Why comprehension tests should not include passage-independent items. *Scientific Studies of Reading, 10*(4), 363-380.
- Kintsch, W. (1988). The role of knowledge in discourse comprehension: A construction integration model. *Psychological Review, 95*(2), 163-182.

- Klecan-Aker, J. S., Flahive, L. K., & Fleming, S. (1997). Teaching storytelling to a group of children with learning disabilities: A look at treatment outcomes. *Contemporary Issues in Communication Science and Disorders*, 24, 23-32.
- Leadholm, B. J., & Miller, J. F. (1992). *Language sample analysis: The Wisconsin guide*. Madison, WI: Wisconsin Department of Public Instruction.
- Liles, B. Z. (1985). Cohesion in the narratives of normal and language-disordered children. *Journal of Speech and Hearing Research*, 28, 123-133.
- Liles, B. Z. (1987). Episode organization and cohesive conjunctives in narratives of children with and without language disorder. *Journal of Speech and Hearing Research*, 30, 185-196.
- Liles, B. Z., Duffy, R. J., Merritt, D. D., & Purcell, S. L. (1995). Measurement of narrative discourse ability in children with language disorders. *Journal of Speech and Hearing Research*, 38, 415-425.
- Loban, W. (1976). *Language development: Kindergarten through grade twelve*. Urbana, IL: National Council of Teachers of English.
- Lyon, G.R., Shaywitz, S.E., & Shaywitz, B.A. A definition of dyslexia. *Annals of Dyslexia*, 53, 1-14.
- MacLachlan, B. G., & Chapman, R. S. (1988). Communication breakdowns in normal and language learning-disabled children's conversation and narration. *Journal of Speech and Hearing Disorders*, 53, 2-7.
- Manhardt, J., & Rescorla, L. (2002). Oral narrative skills of late talkers at ages 8 and 9. *Applied Psycholinguistics*, 23(1), 1-21.
- Mar, R. A. (2004). The neuropsychology of narrative: Story comprehension, story production and their interrelation. *Neuropsychologia*, 42(10), 1414-1434.

- Marsh, E. J., & Fazio, L. K. (2006). Learning errors from fiction: Difficulties in reducing reliance on fictional stories. *Memory & Cognition, 34*(5), 1140-1149.
- Masterson, J. J., & Kamhi, A. G. (1991). The effects of sampling conditions on sentence production in normal, reading-disabled, and language-disabled children. *Journal of Speech and Hearing Research, 34*, 549-558.
- Mayer, M. (1967). *A boy, a dog and a frog*. New York: Penguin Putnam.
- Mayer, M. (1969). *Frog, where are you?* New York: Penguin Putnam.
- Mayer, M. (1974). *Frog goes to dinner*. New York: Penguin Young Readers Group.
- Mayer, M., & Mayer, M. (1975). *One frog too many*. NY: Penguin Young Readers Group.
- McArthur, G. M., Hogben, J. H., Edwards, V. T., Heath, S. M., & Mengler, E. D. (2000). On the "specifics" of specific reading disability and specific language impairment. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 41*(7), 869-874.
- McCabe, A., & Rollins, P. R. (1994). Assessment of preschool narrative skills. *American Journal of Speech-Language Pathology, 3*, 45-56.
- Merritt, D. D., & Liles, B. Z. (1989). Narrative analysis: Clinical applications of story generation and story retelling. *Journal of Speech and Hearing Disorders, 54*, 429-438.
- Miller, C. A. (2006). Developmental relationships between language and theory of mind. *American Journal of Speech-Language Pathology, 15*(2), 142-154.
- Miller, J. F. (1996). Progress in assessing, describing, and defining child language disorder. In K. N. Cole, P. S. Dale & D. J. Thal (Eds.), *Assessment of communication and language* (6th ed., pp. 309-324). Baltimore, MD: Paul H. Brookes.
- Miller, J. F., & Chapman, R. S. (2003). *SALT: Systematic Analysis of Language Transcripts*. Madison, WI: Language Analysis Laboratory, Waisman Center, University of Wisconsin.

- Milosky, L. M. (1987). Narratives in the classroom. *Seminars in Speech and Language*, 8(4), 329 - 343.
- Ministry of Education (1994). *English in the New Zealand curriculum*. Wellington, NZ: Learning Media.
- Miranda, A. E., McCabe, A., & Bliss, L. S. (1998). Jumping around and leaving things out: A profile of the narrative abilities of children with specific language impairment. *Applied Psycholinguistics*, 19(4), 647-667.
- Nation, K. (2005). Connections between language and reading in children with poor reading comprehension. In H. W. Catts & A. G. Kamhi (Eds.), *The Connections Between Language and Reading Disabilities* (pp. 41 - 54). Mahwah, NJ: Lawrence Erlbaum.
- Nation, K., Adams, J. W., Bowyer-Crane, C. A., & Snowling, M. J. (1999). Working memory deficits in poor comprehenders reflect underlying language impairments. *Journal of Experimental Child Psychology*, 73(2), 139-158.
- Nation, K., Clarke, P., Marshall, C. M., & Durand, M. (2004). Hidden language impairments in children: Parallels between poor reading comprehension and specific language impairment? *Journal of Speech, Language, and Hearing Research*, 47(1), 199-211.
- Nation, K., & Snowling, M. (1997). Assessing reading difficulties: the validity and utility of current measures of reading skill. *British Journal of Educational Psychology*, 67, 359-370.
- Nation, K., & Snowling, M. J. (1998). Individual differences in contextual facilitation: Evidence from dyslexia and poor reading comprehension. *Child Development*, 69(4), 996-1011.
- Nation, K., & Snowling, M. J. (2004). Beyond phonological skills: Broader language skills contribute to the development of reading. *Journal of Research in Reading*, 27(4), 342-356.

- National Reading Panel (2000). Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction (NIH Publication No. 00-4769): Washington, DC: U.S. Government Printing Office.
- Neale, M. D. (1988). Neale Analysis of Reading Ability-Revised. Hawthorn, Melbourne: Australian Council for Educational Research.
- Neale, M. D. (1999). *Neale Analysis of Reading Ability* (3rd ed.). Melbourne, VIC: Australian Council for Educational Research Ltd.
- NICHD. (2005). Pathways to reading: The role of oral language in the transition to reading. *Developmental Psychology, 41*(2), 428-442.
- Nicholson, T. (1998). Reading comprehension processes. In G. B. Thompson & T. Nicholson (Eds.), *Learning to read: Beyond phonics and whole language* (pp. 127-149). NY: Teachers College Press.
- Nippold, M. A. (1998). Later language development: An overview. In *Later language development: The school-age and adolescent years* (2nd ed., pp. 1 - 12). Austin, TX: Pro-ed.
- Nippold, M. A. (2002). Lexical learning in school-age children, adolescents, and adults: A process where language and literacy converge. *Journal of Child Language, 29*(2), 474-478.
- Norbury, C. F., & Bishop, D. V. (2002). Inferential processing and story recall in children with communication problems: A comparison of specific language impairment, pragmatic language impairment and high-functioning autism. *International Journal of Language and Communication Disorders, 37*(3), 227-251.
- Oakhill, J., Cain, K., & Yuill, N. (1998). Individual differences in children's comprehension skill: Toward an integrated model. In C. Hulme & R. M. Joshi (Eds.), *Reading and spelling development and disorders* (pp. 343-367). Mahwah, NJ: Lawrence Erlbaum.

- O'Brien, E. J., Rizzella, M. L., Albrecht, J. E., & Halleran, J. G. (1998). Updating a situation model: A memory-based text processing view. *Journal of Experimental Psychology-Learning Memory and Cognition, 24*(5), 1200-1210.
- Paul, R. (2007). *Language disorders from infancy through adolescence. Assessment and Intervention* (3rd ed.). Baltimore: Mosby Elsevier.
- Paul, R., Hernandez, R., Taylor, L., & Johnson, K. (1996). Narrative development in late talkers: Early school age. *Journal of Speech and Hearing Research, 39*(6), 1295-1303.
- Pearce, W. M., McCormack, P. F., & James, D. G. H. (2003). Exploring the boundaries of SLI: Findings from morphosyntactic and story grammar analyses. *Clinical Linguistics & Phonetics, 17*(4-5), 325-334.
- Penno, J. F., Wilkinson, I. A. G., & Moore, D. W. (2002). Vocabulary acquisition from teacher explanation and repeated listening to stories: Do they overcome the Matthew effect? *Journal of Educational Psychology, 94*(1), 23-33.
- Peterson, C., & McCabe, A. (1983). *Developmental psycholinguistics: Three ways of looking at a child's narrative*. New York: Plenum.
- Portney, L. G., & Watkins, M. P. (2000). *Foundations of clinical research: Applications to practice* (2nd ed.). Upper Saddle River, NJ: Prentice-Hall.
- Preece, A. (1987). The range of narrative forms conversationally produced by young children. *Journal of Child Language, 14*, 353-373.
- Rapp, D. N., & van den Broek, P. (2005). Dynamic text comprehension: An integrative view of reading. *Current Directions in Psychological Science, 14*(5), 276-279.
- Reed, V. A., & Spicer, L. (2003). The relative importance of selected communication skills for adolescents' interactions with their teachers: High school teachers' opinions. *Language, Speech, and Hearing Services in Schools, 34*(4), 343-357.

- Renfrew, C. E. (1969). The bus story: A test of continuous speech. Oxford, UK: Author.
- Ripich, D. N., & Griffith, P. L. (1988). Narrative abilities of children with learning disabilities and nondisabled children: Story structure, cohesion, and propositions. *Journal of Learning Disabilities, 21*, 165-173.
- Roberts, J. A., & Scott, K. A. (2006). The simple view of reading: Assessment and intervention. *Topics in Language Disorders, 26*(2), 127-143.
- Roth, F. P., Speece, D. L., & Cooper, D. H. (2002). A longitudinal analysis of the connection between oral language and early reading. *Journal of Educational Research, 95*(5), 259-272.
- Roth, F. P., & Spekman, N. J. (1986). Narrative discourse: Spontaneously generated stories of learning-disabled and normally achieving students. *Journal of Speech and Hearing Disorders, 51*(1), 8-23.
- Schneider, P. (1996). Effects of pictures versus orally presented stories on story retellings by children with language impairment. *American Journal of Speech-Language Pathology, 5*, 86-96.
- Schonell, F.J., & Goodacre, E. (1974). *The psychology and teaching of reading* (5th ed.) Edinburgh: Oliver & Boyd.
- Scott, C. M., & Windsor, J. (2000). General language performance measures in spoken and written narrative and expository discourse of school-age children with language learning disabilities. *Journal of Speech, Language, and Hearing Research, 43*(2), 324-339.
- Semel, E. M., Wiig, E. H., & Secord, W. (1995). *CELF: Clinical Evaluation of Language Fundamentals* (3rd ed.). San Antonio, TX: Psychological Corp., Harcourt Brace Jovanovich.

- Snyder, L. S., & Downey, D. M. (1991). The language-reading relationship in normal and reading-disabled children. *Journal of Speech and Hearing Research, 34*, 129-140.
- Stahl, S. A., & Fairbanks, M. M. (1986). The effects of vocabulary instruction: A model-based meta-analysis. *Review of Educational Research, 56*(1), 72-110.
- Stanovich, K. E. (1986). Matthew Effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 21*(4), 360-407.
- Stanovich, K. E., & Siegel, L. S. (1994). Phenotypic performance profile of children with reading disabilities - A regression-based test of the phonological-core variable-difference model. *Journal of Educational Psychology, 86*(1), 24-53.
- Stein, N., & Glenn, C. (1979). An analysis of story comprehension in elementary school children. In R. O. Freedle (Ed.), *New directions in discourse processing* (Vol. 2, pp. 53-120). Norwood, NJ: Ablex.
- Stein, N. L., & Albro, E. R. (1996). The emergence of narrative understanding: Evidence from rapid learning in personally relevant contexts. *Issues in Education, 2*(1), 83 - 98.
- Sternberg, R. J., & Powell, J. S. (1983). Comprehending verbal comprehension. *American Psychologist (38)*, 878-893.
- Storch, S. A., & Whitehurst, G. J. (2002). Oral language and code-related precursors to reading: Evidence from a longitudinal structural model. *Developmental Psychology, 38*(6), 934-947.
- Stothard, S. E., Snowling, M. J., Bishop, D. M., Chipchase, B. B., & Kaplan, C. A. (1998). Language-impaired preschoolers: A follow-up into adolescence. *Journal of Speech, Language, and Hearing Research, 41*(2), 407-418.
- Swan, E. (1992). *Ko au na galo (Ana gets lost)*. Wellington, NZ: Learning Media, Ministry of Education.

- Tabachnick, B.G., & Fidell, L.S. (1989). *Using multivariate statistics* (2nd. ed.). Cambridge, MA: Harper & Row.
- Torgesen, J., Wagner, R., Rashotte, C., Lindamood, P., Rose, E., Conway, T., et al. (1999). Preventing reading failure in young children with phonological processing disabilities: Group and individual responses to instruction. *Journal of Educational Psychology, 91*, 579-593.
- Torgesen, J. K. (2000). Individual differences in response to early interventions in reading: The lingering problem of treatment resisters. *Learning Disabilities Research and Practice, 15*(1), 55-64.
- Ukrainetz, T. A., Justice, L. M., Kaderavek, J., Eisenerg, S. L., Gillam, R. B., & Harm, H. M. (2005). The development of expressive elaboration in fictional narratives. *Journal of Speech Language and Hearing Research, 48*(6), 1363-1377.
- Vellutino, F. R., Fletcher, J. M., Snowling, M. J., & Scanlon, D. M. (2004). Specific reading disability (dyslexia): What have we learned in the past four decades? *Journal of Child Psychology and Psychiatry, 45*(1), 2-40.
- Velthuijs, M. (1995). *Frog is a hero*. London: Andersen Press.
- Velthuijs, M. (2002). *Frog and the treasure*. London: Anderson Press.
- Wagner, C. R., Sahlen, B., & Nettelbladt, U. (1999). What's the story? Narration and comprehension in Swedish preschool children with language impairment. *Child Language Teaching & Therapy, 15*(2), 113-137.
- Wagner, R. K., & Torgesen, J. K. (1987). The nature of phonological processing and its causal role in the acquisition of reading skills. *Psychological Bulletin, 101*, 192-212.
- Wagner, R. K., Torgesen, J. K., & Rashotte, C. A. (1999). *The Comprehensive Test of Phonological Processing*. Austin, TX: Pro-ed.

- Walsh, R. (2005). Meaning and purpose: A conceptual model for speech pathology terminology. *Advances in Speech Language Pathology, 7*(2), 65 - 76.
- Watkins, R. V., Kelly, D. J., Harbers, H. M., & Hollis, W. (1995). Measuring children's lexical diversity: Differentiating typical and impaired language learners. *Journal of Speech and Hearing Research, 38*(6), 1349-1355.
- Watson, J. (1993). *Grandpa's cardigan*. Auckland, New Zealand: Scholastic.
- Westby, C. (2002). Beyond decoding: Critical and dynamic literacy for students with dyslexia, language learning disabilities (LLD), or attention deficit-hyperactivity disorder (ADHD). In K. G. Butler & E. R. Silliman (Eds.), *Speaking, reading, and writing in children with language learning disabilities. New paradigms in research and practice*. (pp. 73-107). Mahwah, NJ: Lawrence Erlbaum.
- Westby, C. E. (2005). Assessing and remediating text comprehension problems. In H. W. Catts & A. G. Kamhi (Eds.), *Language and reading disabilities* (2nd ed., pp. 157-232). Boston, MA: Pearson Education.
- Westerveld, M., & Gillon, G. (1999/2000). Narrative language sampling in young school-age children. *New Zealand Journal of Speech-Language Therapy, 53/54*, 34-41.
- Westerveld, M., & Gillon, G. (2001). Oral language sampling in 6-year-old New Zealand children from different cultural backgrounds. *New Zealand Journal of Speech - Language Therapy, 56*, 5-17.
- Westerveld, M., & Gillon, G. (2002). A New Zealand Spontaneous Language Sampling Protocol. Christchurch, New Zealand: University of Canterbury: Department of Speech and Language Therapy.
- Westerveld, M. F., Gillon, G. T., & Miller, J. F. (2004). Spoken language samples of New Zealand children in conversation and narration. *Advances in Speech Language Pathology, 6*(4), 195-208.

- Wiederholt, J. L., & Bryant, B. R. (2001). *GORT 4: Gray Oral Reading Tests* (4th ed.). Austin, TX: Pro-ed.
- Williams, J. P. (2002). Using the theme scheme to improve story comprehension. In C. C. Block & M. Pressley (Eds.), *Comprehension instruction: Research-based best practices* (pp. 126-139). New York: The Guilford Press.
- Woodcock, R.W. (1978). *Development and standardization of the Woodcock-Johnson Psychol-Educational Battery*. Allen, TX: DLM Teaching Resources.
- Woodcock, R. W. (1998). *Woodcock Reading Mastery Tests - Revised*. Circle Pines, MN: American Guidance Service.
- Wright, H. H., & Newhoff, M. (2001). Narration abilities of children with language-learning disabilities in response to oral and written stimuli. *American Journal of Speech-Language Pathology, 10*(3), 308-319.
- Young, G.A., James, D.G.H., Brown, K., Giles, F., Hemmings, L., Hollis, J., Keagan, S., & Newton, M. (1997). The narrative skills of primary school children with a unilateral hearing impairment. *Clinical Linguistics & Phonetics, 11*(2), 115-138.

APPENDIX A

PERSONAL NARRATIVE LANGUAGE SAMPLING PROTOCOLS AND PHOTO-PROMPTS

The aim is to elicit at least 3 narratives and 50 C&I utterances. Introduce the task by: “I also brought some photos to show you.” Talk about the photos as outlined below. If the child responds “No,” go to the next photo. If the child says “Yes,” ask him/her “Can you tell me about it?”

Assessment 1

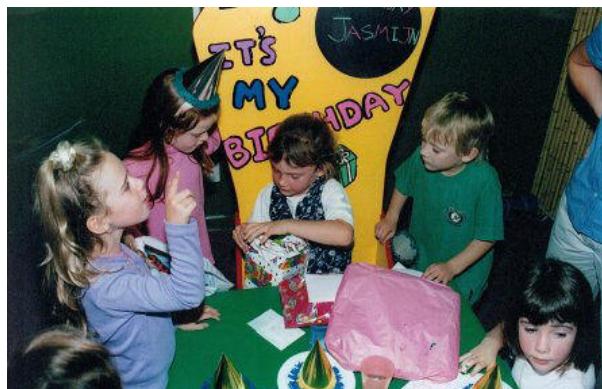
No.	Prompts
1	Oh look. Who's this? (Ronald McDonald). I went to a birthday party at McDonald's last year. Have you ever been to McDonald's?
2	We went to the beach in the holidays. These children dug a big hole in the sand and waited for the sea to fill it up. Have you been to the beach? What happened last time you went to the beach?
3	This little girl had to go to the doctor, because she had a bad cough. Have you ever been to the doctor's?
4	These friends are watching somebody arriving on a big plane. Have you ever been on a plane? Have you ever been out to the airport to watch the planes?
5	Oh look, this girl fell off the bars and hurt her knee. She had to go to the sick bay, and they put a plaster on. Have you ever broken anything? Did you ever hurt yourself in the playground?
6	These children went on a school trip. They all went on a bus to Motat (a museum with lots of old cars). Have you ever been on a school trip?
7	Can you see the bee on the flower? I got stung by a bee once. On my big toe! Did a bee ever sting you?
8	Look, this is Santa. He visited my daughter's school in a fire engine. Has Santa ever been to your school? Have you ever seen Santa anywhere?
9	The dental nurse visited my daughter's school last year. All the children had to go for a check-up. Have you ever had a toothache? Have you ever been to the dental nurse?
10	Look, there's my daughter/niece/nephewHe/ she was in a play at her school. They did the pied piper. All the children had to dress up and perform in the school hall. Have you ever been in a play? Have you ever seen a play?
11	We went to the movies in the holidays. Have you ever been to the movies? Which one did you go to?





Assessment 2

No.	Prompts
1	My daughter had her birthday party at Lollypops this year. She invited all her friends and got lots of presents. Have you been to a birthday party?
2	This is our dog Staffy. She ran away one day. We spent all evening looking for her without finding her. And then she just came home the next day. Do you have any pets? Has anything like that ever happened to your pet?
3	We went to Rainbow's End in the summer holidays. My children thought the rollercoaster was their favourite ride. Have you ever been to Rainbow's End or another fun-park? What was your favourite ride?
4	These children play netball. They practise during the week and then play games in the weekend. Do you play any sports? What happened last time you played.....
5	I had a small accident with my car. Someone bumped into me and made a huge dent in my bonnet. I've had to get it fixed. Have you ever been in /seen an accident? What happened?
6	These children went on camp. They all slept in bunks and did activities during the day. They went for a bush-walk and had a mud fight. Have you ever been on camp? What is the last school trip you've been on?
7	We went to the South Island in the holidays. We all went on a plane to Nelson. Did you go on holidays over summer? Where did you go? Can you tell me what happened?
8	These children had a party at school. It was Halloween. They all dressed up as witches and wizards and played games. Have you ever had a dress-up party anywhere?
9	I went to the hospital last week to visit my niece. She broke both her arms in a horse riding accident. Have you ever broken anything? Have you ever been to the hospital?
10	We went to the movies in the holidays. Did you go to the movies? Which one did you go to?





Assessment 3

No.	Prompts
1	We went to Golden Bay in the holidays. We stayed in a bach and played lots of cricket on the front lawn. Did you go on holidays over summer? Where did you go? Or: what's the best thing you did in the holidays? Can you tell me what happened?
2	We went on a beach walk in the holidays and saw this cave. We went in to explore, but it was very dark and quite scary. Have you ever done anything scary?
3	When we went to Muriwai beach we saw people fishing on the rocks. It's very dangerous as they can easily slip, fall into the water, and drown. Have you ever done anything dangerous?
4	I saw this accident last week. A car had crashed into the barrier on the motorway. The fire fighters had to come and rescue the driver. Have you ever seen an accident?
5	Can you see the bumble bee on the flower? I got stung by a bumble bee this summer under my foot! Did an insect ever sting you?
6	Oh look, this girl fell off the bars and hurt her knee. She had to go to the sick bay and they put a plaster on. Did you ever hurt yourself in the playground? Have you ever broken anything?
7	My daughter went to Waiwera Hot-pools for her birthday. They watched a movie in the pool and had lots of fun. Have you been to a birthday party? Which one did you like best?
8	My daughters were doing the dishes and they broke one of my plates. I'm not sure who did it, because they blamed each other! So they had to pay for a new plate together. Have you ever been blamed for something you didn't do?
9	I had to go to the doctor's in the holidays because I had a really bad headache. Have you ever been to the doctor's?
10	We went to the movies in the holidays. Did you go to them ovies? Which one did you go to?





Assessment 4

No.	Prompts
1	We went skiing one weekend. We all hired some skis and spent a day on the mountain. Have you ever gone skiing? If no: Have you been on holidays this winter? Can you tell me what happened?
2	We went to Rainbow's End in the holidays. My children thought the rollercoaster was their favourite ride, but I thought it was quite scary. Have you ever done anything scary?
3	We also went to the zoo, where we saw this crocodile show. That's actually quite dangerous as the crocodile can easily grab that zookeeper and hurt him. Have you ever seen or done anything dangerous?
4	I had a small accident with my car. Someone bumped into me and made a huge dent in my bonnet. I've had to get it fixed. Have you ever been/seen an accident? What happened?
5	The dental nurse visited my daughter's school last year. All the children had to go for a check-up. Have you ever had a tooth-ache? Have you ever been to the dental nurse?
6	My Nana had a fall recently. She fractured her arm and nearly broke her nose. Did you ever hurt yourself? Have you ever broken anything?
7	My daughter went horse riding for her birthday. She invited three of her best friends, and they went for a ride at Waiwera. Have you been to a birthday party? Which one did you like best?
8	This is our cat Lizzie. She ran away one day. We spent four days looking for her without finding her. And then our neighbour found her in his shed. He had accidentally locked her in. Do you have any pets? Has anything like that ever happened to your pet?
9	These children went on a school trip. They all went on a bus to Motat (a museum with lots of old cars). Have you ever been on a school trip?
10	We went to the movies in the weekend. Have you been to the movies? Which one did you go to?





APPENDIX B

FICTIONAL STORIES USED IN THE STORY RETELLING

CONDITION

Assessment 1: “Ana Gets Lost” (Swan, 1992)

One Saturday morning Ana's mum and dad went fishing on the beach.

Ana had been sick all week.

So she had to stay at home with her big brother Tom.

She asked Tom if he wanted to play with her.

“No thanks,” he said.

“I want to read a sports magazine.”

Ana got bored.

So when Tom fell asleep, she decided to go looking for her mum and dad.

She quietly opened the front door and went outside.

Ana walked towards the beach, but she got lost.

She kept walking until it got dark.

Ana got very scared, and she started to cry.

She stopped outside a dairy.

She was still crying and didn't know what to do.

Then Ana felt a pat on her shoulder.

She looked around and saw a Policeman.

“Hello,” he said, “are you Ana?”

“Yes,” said Ana, giving him a big smile.

The policeman took Ana home in the police car.

Mum and dad were very happy to see Ana.

They thanked the policeman for finding her and bringing her home safely.

The policeman told Ana not to get lost again.

Then he smiled and drove away.

Number of communication units: 25

Word count: 192

Number of different words: 113

MLCU in words: 7.68

Assessment 2: “Frog is aH ero” (Velthuijs, 1995)

Dark clouds were gathering in the sky.

The sun disappeared behind the clouds.

“It's starting to rain,” thought Frog happily.

The first drops were already falling on his bare skin.

Frog loved the rain.

He danced for joy as the raindrops fell thick and fast.

The sky got darker and darker.

“Now it's raining cats and dogs.”

This was a bit too much even for Frog.

He ran home dripping wet.

Frog made himself a nice hot cup of tea.

It was cozy inside.

After three days of rain however, Frog began to feel restless.

He wondered how Duck and Pig and Hare were.

He hadn't seen them since the rain started.

On the fifth day, the river began to rise.

It wasn't long before water came streaming into Frog's house.

At first Frog thought it was funny but then he began to worry.

He hurried over to Duck's house.

It was flooded there as well.

“Where is all this water coming from?,” asked Duck desperately.

“The river has burst its banks,” shouted Frog.

“Let's go to Pig's house.”

Together they waded through the watery landscape.

Pig was leaning out of his attic window.

“All my things are wet,” he cried.

It was true.

Tables and chairs were floating around the room.

Everything was in a mess.

They couldn't stay there.

“Let's go and see Hare,” suggested Frog.

Hare's house was on an island in the middle of the water.

“Come inside,” he shouted.

“It's dry in here.”

It was warm inside.

They told Hare how their houses had been flooded.

“You must all stay here,” said Hare.

“There's plenty of room, and I've got plenty of food.”

So they all sat down to a big pot of stew Hare had made.

They stayed as Hare's guests for days.

They were happy together, while outside it rained and rained.

Then, one day, they found they were down to their last loaf of bread.

“We have no more food left,” declared Hare gravely.

“We'll die if we don't get help,” said Duck.

“I don't want to die,” said Frog, “ever!”

The next day, only the last crumbs of bread were left.

Nobody knew what to do.

Outside it had stopped raining, but the water was still very high.

“I know,” shouted Frog suddenly.

"I'll swim across to those hills and fetch help."

Hare looked concerned.

"It's such a long way," he said.

"It's too dangerous."

"But I can manage it," cried Frog enthusiastically.

"I'm the best swimmer of us all."

So Frog stepped into the water.

His friends watched nervously.

Soon, he disappeared into the distance.

The water was ice cold, but Frog didn't think about it.

He thought of Duck and Hare and Pig who were hungry.

The further Frog swam, the stronger the current became.

Frog felt tired.

Suddenly the current carried him away.

Frog began to sink.

"I'll drown."

"I'm going to die, and I'll never see my friends again."

Just then a familiar voice said, "Hello, what have we here?"

Two strong arms pulled Frog out of the water and into a boat.

It was Rat.

Frog told Rat all about the rain, the flood, and the hunger, and how he had set out to get help.

"Don't worry," said Rat.

"My boat is full of food for my travels."

"There's plenty here for everyone."

And he set sail for Hare's house, where the three friends were waiting for help to arrive.

Pig, Duck and Hare cheered when they saw Frog return in a boat.

But who was that with him?

Of course, it was their good friend Rat!

They could hardly believe their eyes.

And Rat had so much food on board bread, honey, jam, peanutbutter, vegetables, potatoes, and much more besides.

“Rat, you've saved us,” said Hare.

“No,” said Rat, “you have Frog to thank for that.”

“It was Frog who swam through the treacherous flood, risking his life to reach me.”

From then on things got better.

The friends celebrated their rescue, and Frog was the hero.

The sun was shining again, and the water was beginning to go down.

After a couple of days, the water had gone.

Frog, Duck and Pig were able to return to their homes.

But everything was dirty and muddy.

“No problem,” said Rat.

And with his help, they fixed things up, just as they had been before.

Number of communication units: 100

Word count: 730

Number of different words: 319

MLCU in words: 7.30

Assessment 3: “A Boy, a Dog and a Frog” (Mayer, 1967)

One day, a boy and his dog decided to go to the woods to search for a pet frog.

The boy took a bucket and a net with him.

Once they got to the woods, the boy looked in a tree for a frog.

But he didn't find one.

Then, when the boy looked toward the pond, he saw a frog sitting on a lily pad.

The boy was very excited to find a frog.

The boy and the dog started running toward the pond.

The boy thought he would catch the frog with his net.

All of a sudden the boy and the dog tripped on a tree branch and went flying into the pond.

The frog was afraid that they were going to land right on top of him!

The boy and the dog landed head first in the pond and splashed the frog.

The frog was now getting annoyed because the boy and the dog were disturbing him.

When the boy came to the surface, he had a bucket on his head and was face to face with the frog.

But when the boy tried to grab the frog, the frog jumped off the lily pad.

He landed on a branch and was happy to have escaped from the boy.

The boy then planned to trap the frog on the tree branch.

He told the dog to go around to the other side of the branch.

The frog was now getting scared.

He didn't want the boy and the dog to catch him.

The boy and the dog were closing in on the frog.

The dog growled at the frog while the boy got his net ready.

The frog was scared of the dog.

The boy slammed his net down.

But he caught the dog instead of the frog!

The dog was stuck in the boy's net.

Meanwhile the frog climbed onto a rock.

He didn't understand why the boy and the dog were trying to catch him.

Why wouldn't they leave him alone?

The boy was frustrated.

He yelled at the frog, "Fine!"

I don't want you as my new pet anyway!

Now the frog felt sad because the boy was so upset with him.

The boy gave up on catching the frog and walked away with his dog.

This made the frog even sadder because he was left all alone in the pond with no one to play with.

The boy and the dog left the woods to go back home.

They left footprints because their feet were covered with mud.

Now the frog was really lonely.

He didn't like being the only one in the pond.

He wondered where the boy and the dog had gone.

So the frog followed their footprints through the woods and into the boy's house.

The boy and the dog were taking a bath because they had gotten so dirty in the woods.

The frog hopped all the way to the bathroom door.

He saw the boy and the dog in the bathtub.

It looked like they were having fun.

The frog asked if he could play with them.

The boy said, "Sure, you can play with us."

"Hop in!"

So the frog jumped in the bathtub and landed on the dog's head.

The boy, the dog, and the frog were happy that they were all going to be friends.

Number of communication units: 49

Word count: 561

Number of different words: 181

MLCU in words: 11.45

Assessment 4: “One Frog too Many” (Mayer, 1975)

There was a boy who had three pets, a dog, a frog and a turtle.

One day he saw a large box with a bow on it.

The card on the box said that the present was for him.

So he opened the box and was very excited when he saw what was in it.

Inside the box was a little frog.

The boy, the dog, and the turtle liked the little frog.

But the big frog didn't.

He was used to being the boy's favourite frog.

The boy set the little frog down next to his pets and said “This is my new little frog.”

“Say hello everyone.”

The big frog said, “I am the oldest and biggest frog here.”

“I don't like you.”

Then the big frog bit the little frog's leg.

The little frog cried, “Ouch, ouch!

The boy couldn't believe that the big frog would do something so mean.

Everyone was angry at the big frog.

The boy picked up the little frog and told the big frog off.

“That was a very mean thing to do frog.”

You had better be nice to my new little frog.

The boy's pets followed him outside to play.

The two frogs rode together on the turtle's back.

But the big frog still didn't like the little frog.

The boy, who was dressed up like a pirate, led the way.

The big frog thought nobody was looking.

So he kicked the little frog off of the turtle's back.

But when the others heard the little frog crying, they knew what had happened.

They were all angry at the big frog for being mean to the little frog again.

The boy led them all to a pond where he had a raft.

He wouldn't let the big frog get on the raft with them.

He told the frog that he wasn't welcome because he was being mean to the little frog.

The big frog didn't like being told off, and he didn't want to be left behind.

So he ignored what the boy told him and jumped on the raft, just as it was leaving the shore.

The little frog was the only one who noticed that the big frog had jumped on the raft.

The big frog glared at the little frog.

Then he kicked the little frog off the raft and stuck out his tongue at him.

"That will teach him," he thought.

The turtle saw what had happened and was scared for the little frog!

The big frog was happy with himself.

Now he was the only frog.

Just the way it used to be.

Meanwhile, the turtle tapped the boy on the leg to get his attention.

When the boy turned around, he was shocked at what he saw.

"How did the big frog get there?"

"And where was the little frog?"

The dog was worried about the little frog too.

The turtle looked so angry at the mean frog, that the frog got scared.

He thought the turtle might bite him.

The boy and his pets got off the raft and searched for the little frog.

They looked all around the pond and called, "Little frog, where are you?"

They couldn't find the little frog anywhere.

The boy was so sad, he began to cry as he walked home.

The dog growled at the frog because it was his fault that they lost the boy's new pet.

The frog felt sorry for what he had done.

When the boy got home, he went to his room and cried some more.

His pets were sad too.

Even the big frog was sad.

Then they heard a noise out the window "Ribbit, ribbit".

It sounded like a frog.

All of a sudden the little frog jumped through the open window.

Everyone was excited to see the little frog.

They had thought they would never see him again.

But there he was.

The little frog landed right on the big frog's head and laughed.

The big frog decided to be nice to the little frog from now on.

Everyone was happy.

Number of communication units: 63

Word count: 683

Number of different words: 204

MLCU in words: 10.84

Assessment 5: “Frog, Where are you?” (Mayer, 1967)

There once was a boy who had a dog and a pet frog.

He kept the frog in a large jar in his bedroom.

One night, while he and his dog were sleeping, the frog climbed out of the jar and jumped out of an open window.

When the boy and the dog woke up the next morning, they saw that the jar was empty.

Where was the frog?

The boy and the dog looked everywhere for the frog.

The boy even looked inside his boots.

When the dog tried to look in the jar, he got his head stuck.

The boy called out the open window, “Frog, where are you?”

The dog leaned out the window with the jar still stuck on his head.

The jar was so heavy that the dog fell out of the window head first!

The boy picked up the dog to make sure he was ok.

The dog wasn't hurt, but the jar was smashed.

The dog knew he was in trouble for breaking the jar, so he licked the boy to say he was sorry.

The boy and the dog looked outside for the frog.

The boy called for the frog.

He called down a hole in the ground while the dog barked at some bees in a beehive.

A mole popped out of the hole and bit the boy right on his nose for disturbing him.

The boy yelled “Ouch, that hurt!”

Meanwhile, the dog was still bothering the bees, jumping up on the tree and barking at them.

The beehive fell down, and all of the bees flew out.

The bees were very angry at the dog for ruining their home.

The boy wasn't paying any attention to the dog.

He had noticed a large hole in a tree and wanted to see if his frog was hiding in it.

So he climbed up the tree and called down the hole, "Frog, are you in there?"

All of a sudden an owl swooped out of the hole and knocked the boy to the ground.

The owl was angry.

He told the boy off and told him to go away.

The dog ran past the boy as fast as he could because the swarm of bees was chasing him.

He was afraid he would get stung by all those bees.

Meanwhile, the angry owl chased the boy all the way to a large rock.

The boy climbed up on the rock and called again for his frog.

He held onto some branches so he wouldn't fall.

But the branches weren't really branches!

They were deer antlers.

The deer picked up the boy on his head and started running.

The dog ran along too, barking at the deer to put the boy down.

They were getting close to a cliff.

The deer stopped suddenly, and the boy and the dog fell over the edge of the cliff.

Luckily, there was a pond below the cliff.

The boy and the dog landed with a splash right on top of one another.

Then they heard a familiar sound, "Ribbit, ribbit."

The boy told the dog to be very quiet.

They crept up and looked behind a big log to find out who was making that sound.

There they found the boy's pet frog.

He had a mother frog with him.

They had lots of baby frogs, and one of them jumped towards the boy.

The baby frog liked the boy and wanted to be his new pet.

The boy and the dog were happy to have a new pet frog to take home.

As they walked away the boy waved and said “Goodbye” to his old frog and his family.

Number of communication units: 54

Word count: 615

Number of different words: 205

MLCU in words: 11.39

Assessment 6: “Frog Goes to Dinner” (Mayer, 1974)

A boy was getting dressed in his bedroom.

His pet dog, frog, and turtle watched as he put on his best clothes.

They were sad because they knew he was going somewhere without them.

While the boy was petting the dog, the frog jumped into his coat pocket.

The boy didn't know he was there.

As the boy left with his family, he waved and said “Goodbye” to his pets.

The frog waved goodbye too.

When the boy and his family arrived at a fancy restaurant, the doorman helped them out of the car.

The frog peeked out of the boy's pocket.

But no one noticed him.

The boy and his family sat down at a table in the restaurant.

While they were looking at menus, the frog jumped out of the boy's pocket towards the band.

The frog landed right in the man's saxophone!

“Squeak,” went the saxophone.

The man looked inside the saxophone to see why it made that awful noise.

The other members of the band were confused too.

Then the frog fell out of the horn and landed right on the saxophone player's face!

The saxophone player was so surprised by the frog, that he fell backwards into the drum.

The drummer was angry because his drum was ruined!

The drummer yelled at the saxophone player, “Look what you did to my drum.”

“It's broken!”

“Now what am I supposed to play?”

While they were arguing, the frog jumped away on a plate of lettuce salad.

The waiter didn't notice the frog.

He served the salad to a woman.

Just as she was about to take a bite, the frog popped out of the lettuce.

The woman was shocked to see the frog.

She screamed and fell back on her chair.

The frog was frightened, and he jumped away.

There was a man at the next table who was having a glass of wine with his wife.

The frog landed right in his glass.

The woman complained to the waiter about getting a salad with a frog in it.

She was very angry!

Meanwhile, when the man went to take a sip of his drink, the frog kissed him right on the nose.

The angry waiter was about to grab the frog, who was waving goodbye to the man and his wife.

The man and his wife were leaving the restaurant because they didn't feel like eating anymore.

The waiter, who had caught the frog, was going to throw him out of the restaurant.

But the boy saw the waiter carrying his frog and shouted, "Hey, that's my frog!"

The boy's mother told him to be quiet because he was making a scene.

The boy was worried that the waiter was going to hurt his frog.

He asked the waiter to give him back his frog.

The angry waiter told the boy and his family, "Take your frog and get out of this restaurant at once."

"Don't you ever bring that frog in here again!"

On the way home the boy's family was angry with him.

The frog had ruined their dinner!

When they got home the boy's father scolded him, "You go to your room and stay there."

"That frog ruined our evening!"

His family was still very upset.

The dog and the turtle peeked around the corner to see what was going on.

When they got in his room, the boy and the frog laughed about everything that had happened at the restaurant.

The more they thought about it, the more they laughed.

Number of communication units: 52

Word count: 589

Number of different words: 209

MLCU in words: 11.33

APPENDIX C

ORAL NARRATIVE COMPREHENSION QUESTIONS AND SCORING PROCEDURES

Assessment 1: “Ana Gets Lost” (Swan, 1992)

Assessment 2: “Frog is a Hero” (Velthuijs, 1995)

Assessment 3: “A Boy, a Dog and a Frog” (Mayer, 1967)

Assessment 4: “One Frog too many” (Mayer, 1975)

Assessment 5: “Frog, Where are you?” (Mayer, 1969)

Assessment 6: “Frog Goes to Dinner” (Mayer, 1974)

General guidelines:

- Questions are asked following the first exposure to the story.
- All correct answers receive one point.

If the child does not respond or the answer given is clearly incorrect, the child is provided with the correct answer, except for the last question (theme-related).

Assessment 1: “Ana Gets Lost” (Swan, 1992)

If the child’s answer is unclear, ask for clarification / elaboration, e.g., “why?” or “is there any other reason?”

Questions	Story Grammar	Prompt	Correct	Incorrect
Who is the story about?	Character	If child says: “a little girl,” ask: “What’s her name?”	Ana	
Why did Ana have to stay at home?	Setting	If child says: “Her mum and dad went fishing,” ask: “Why couldn’t she come?”	because she is sick	too dangerous / too young wasn’t allowed so she didn’t get lost
Why did Ana get bored?	Problem		nothing to do, brother wouldn’t play with her, no one to play with	had to stay home because she wanted to play boring inside brother was reading a comic brother fell asleep
Where did Ana go to find her parents?	Attempt	Prompt: “Where did her parents go?”	beach	dairy
Why did Ana get scared?	Attempt		<u>it was</u> getting dark/night time, got lost, couldn’t find them, all alone	she was scared at night
Who found Ana?	Resolution		Police/policeman/cop	
What did the policeman do?	Ending	If child says: “Told her not to get lost again,” ask “What else did he do?”	bring/took her home	

Why were Ana's parents happy to see her?	Theme	Ask for clarification if necessary	because they thought they had lost her, because she (had) got lost/ because they might have never seen her again, because she was safe, because they didn't know where she was	because the policeman found her because she was back / back home again she came back
------------------------------------------	-------	------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------

Assessment 2: “Frog is a Hero” (Velthuijs, 1995)

If the child’s answer is unclear, ask for clarification / elaboration, e.g., “why?” or “Can you tell me more?”

Questions	Story Grammar	Prompts	Correct	Incorrect
Who is the story about?	Character/s	One prompt allowed: “Who else?” “One more?”	names all 5 animals: Frog, Hare/Rabbit (not kangaroo), Rat/Mouse, Pig, Duck/Goose	Names 4 characters or less Frog and his friends
What happened to Frog’s house after 5 days of rain?	Setting	Not allowed, unless clarification is needed.	flooded all the water came in	not flooded anymore, all the things broke, started to sink, muddy/yucky
Why did Frog, Duck and Pig go to Hare’s house?	Setting	When child responds: “He lives on an island,” ask: “Why is that important?”	it was / to see if it was dry in hare’s house all their houses were flooded to see how hare was, to see if it was ok	he lives on an island he had lots of food
Why was it dry in Hare’s house?**	Setting	Child may have provided the answer in the preceding question, which is fine.	it was on an island / hill / mountain / high / up on a bank	in the middle of the river / ocean there was no water

Why did Frog have to go and get help when the food ran out?	Problem		starve they would die	to get more food they ate it all
What did Frog do to get help?	Attempt	If child says: "Get help (over the hills)," ask: "How?"	swam / swam across the river / the flood swam to the hills / though the current	going to get some more food found Rat
Why did Frog think he was going to die?	Attempt	Child may have provided answer in the preceding question and therefore respond: "no food," which can then be scored as correct.	drowning, current too strong, too far to swim and got tired, sinking	he had no food (unless: see prompt) it was getting deeper
Who rescued Frog?	Resolution		Rat/Mouse	sail man
Why was Frog a hero?	Theme		risked his life to save his friends saved his friends tried to swim and get food / help went out and got help through the water swam out in the cold water	going out to get food found the mouse with food swam went and got help
What did the friends do at the end of the story?	Ending	If the child says "painted / re-decorated their houses," ask "Why?" answer: dirty, muddy, yucky). If the child says: "made it all better," ask "How?"	cleaned up their / each other's houses fix up their houses	celebrated survived cleaned Frog's house

** Ask all the questions (except "Why was it dry in hare's house?"), even if the child has already provided the answer in the preceding question.

Assessment 3: “A Boy, a Dog and a Frog” (Mayer, 1967)

Questions	Prompt/s	Story Grammar	Answers	incorrect
Who was the story about?	None	Characters	the boy, the dog, (the frog)	the dog , the frog
Were there any other important people/ characters in the story? Who?	Anyone else?	Characters	no Or frog if answer above is boy and dog. or dog and frog, if answer above is boy	
Where did this story start?	Ask “where” if the child responds “ <u>when</u> the boy.....	Setting	the woods, outside	the pond, his house, a tree
What were the boy and the dog going to do?		Setting	catch a frog find a new pet / playmate	
How did the frog feel about getting caught? Why?		Problem	upset, annoyed, sad, bad the frog did not want to get caught/ wanted to be free he thought they would kill him they were disturbing him	because he was getting annoyed he might be lonely
How did the boy plan on catching a frog?		Plan	go into the woods and use a net and/or a bucket use the dog. or specific reference to <u>trapping</u> the frog on the branch	

Did the boy have trouble catching the frog? Explain.		Attempts	yes. the frog kept jumping away The boy fell into the pond the boy caught the dog in the net by accident he tripped over a log, and the frog went away	because he didn't catch it the frog did not want to get caught it was hard non-specific answers, such as he tripped
Did the boy get what he wanted? Explain.		Resolution	yes, the frog followed the boy / their tracks/footprints to his house/bath. reference to going to boy's house	he made his way there the frog jumped into the bath
What happened at the end of the story?		Ending	Frog jumped onto dog's head / in the bath they had a bath they all became friends they all played happily they had lots of fun the frog is his pet now	the frog wanted to be with them the frog came they were really happy the frog went to find them Frog found the boy and the dog asked if he wanted to play they lived happily ever after
What would be a good name for this story?		Theme	the boy/frog found/made a new friend/s the frog who felt lonely some title referring to "making (new) friends"	

Assessment 4: “One Frog too Many” (Mayer, 1975)

Questions	Story Grammar	Correct	incorrect
Who was the story about?	Characters	the boy, the frog, the dog, turtle, little frog OR <u>two</u> frogs OR a boy and a frog OR a little frog.	person a boy or the frog as only main character the frogs, i.e., does not specify 2 frogs or little/big, or old/new
Were there any other important people/characters in the story? Who?	Characters	no a boy, a dog, and a turtle if answer above is 2 frogs a frog, dog, turtle if answer above is a boy and a frog <i>Give one point if child gets all characters when the Character questions</i>	
Where did this story start?	Setting	at the boy's house	
What was in the box the boy got as a present?	Setting	a little (pet) frog a baby frog	
How did the big frog feel about the boy's present? Explain.	Problem	angry/sad/jealous the big frog was jealous of the little frog he was used to being the boy's favourite frog he wanted to be the only frog the boy said I have a new frog now he doesn't like the little frog the boy had a new pet.	

How did the big frog try to get rid of the little frog?	Plan	by being mean kicking him off, biting him, pushing him	
Did the big frog have trouble getting rid of the little frog? Explain.	Attempts	yes the little frog kept coming back the boy kept telling him off	
Did the big frog get what he wanted? Explain.	Resolution	no, the little frog kept coming back / came back at the end the little frog went missing, the boy got very upset, the other pets were angry with the big frog Or <u>yes</u> if the child makes specific reference about the part where the big frog wanted the little frog back at the end	
What happened at the end of the story?	Ending	the <u>little</u> frog jumped through the window / came back./jumped on to the big frog's head everyone was happy, even big frog big frog and little frog became friends big frog decided to be nice to little frog	frog came back the frog liked the little frog the frogs liked each other
What would be another good name for this story?	Theme	the jealous/mean/naughty frog	

Note: Only prompt for more information if the child's answer is not clear.

Assessment 5: “Frog, Where are you?” (Mayer, 1969)

Questions	Story Grammar	Answers	Incorrect
Who was the story about?	Character	the boy, the dog, the frog <i>Give one point if child gets boy, dog, and frog when combining q1+q2</i>	
Were there any other important characters in the story? Who?	Characters	little frog or and/or frog's family other characters are optional i.e., bees, mole, owl, deer <i>Give one point if child gets boy, dog, and frog when combining q1+q2</i>	little frogs without mentioning the mother frog
Where did this story start?	Setting	the boy's house / bedroom	
Where did the boy keep his pet frog?	Setting	in a jar (in his bedroom)	
What happened to the frog at the beginning of the story?	Problem	the boy's pet frog had gone missing / had run away / had escaped he jumped out of the window	he jumped out of the jar
What did the boy do to try and get his frog back?	Plan	The boy and the dog went searching for the frog. They called for him. Find it.	
Did the boy have trouble finding the frog? Explain.	Events	yes, they looked everywhere. there were lots of mean animals he kept getting hurt one example of mishap	yes because it was hard yes he didn't know where it was yes because it was lost

Did the boy get what he wanted? Explain.	Resolution	yes, he found his frog no, he got a different frog or reasonable explanation	yes because he got a new frog no because frog ran away
What happened at the end of the story?	Conclusion	he went home with another frog the boy took another frog home he got a new baby frog	he took <u>the</u> frog home i.e., not clear this is a different frog
What would be another good name for this story?	Theme	frog finds his family frog goes back to the pond to find a family the boy gets a new pet frog	

Note: Only prompt for more information if the child's answer is not clear.

Assessment 6: "Frog Goes to Dinner" (Mayer, 1974)

Questions	Story Grammar	Answers	incorrect
Who was the story about?	Characters	the frog or the frog and the boy or frog, boy and boy's family	person a boy as the only main character dog or turtle included as main characters
Were there any other important people/characters in the story? Who?	Characters	yes, the little boy, his family, the waiter other characters are optional, i.e., the diners and musicians at the restaurant, the other pet animals	
Where did this story start?	Setting	In the boy's bedroom	

Where was the little boy going?	Setting / Initiating Event	to a restaurant	
How did the people who were playing music or dining at the restaurant feel about seeing a frog in the restaurant?	Problem	they were angry, upset, disgusted, shocked, frightened, surprised (amazed)	sad
How did the waiter try to get rid of the frog?	Plan	by catching him and throwing him out of the restaurant	by trying to grab him
Did the waiter have trouble getting rid of the frog?	Events / Attempts	yes the frog wasn't easy to catch or no – the waiter just caught him	
Did the waiter get what he wanted?	Resolution	Yes, the little boy took the frog home. And/or NO – he had lots of angry customers.	yes because he caught it
What happened at the end of the story?	Conclusion	his family was angry with him the boy got sent to his room the boy and the animals thought it was funny – or they laughed	
What would be another good name for this story?	Theme	Frog ruins the evening/night/dinner	

Note: Only prompt for more information if the child's answer is not clear.

APPENDIX D

STORY QUALITY RUBRICS

Assessment 1: “Ana Gets Lost” (Swan, 1992)

Assessment 2: “Frog is a Hero” (Velthuijs, 1995)

Assessment 3: “A Boy, a Dog and a Frog” (Mayer, 1967)

Assessment 4: “One Frog too Many” (Mayer, 1975)

Assessment 5: “Frog, Where are you?” (Mayer, 1969)

Assessment 6: “Frog Goes to Dinner” (Mayer, 1974)

General guidelines:

- Performance on the oral narrative production (fictional story retelling) task is scored on the rubric.
- Each characteristic receives a score: minimum score is 1; maximum score is 5.
- *Content* examples are provided for each story for ease of scoring.
- When in doubt, listen to what the child actually said, not what can be inferred.
- Total score: minimum score is 8; maximum score is 40.

Assessment 1				
Characteristic	Proficient	Content	Emerging	Minimal / immature
Introduction	Setting stated; at least 3 setting info points are mentioned.	<i>Stay at home Parents go out Ana sick Brother looks after her</i>	Setting stated minimally, i.e., no more than 2 setting info points are provided.	Only 1 info point provided. Launches into the story with no attempt to provide setting or story theme.
Theme	Story theme stated.	<i>Gets lost</i>	Mentions “lost” in title or first sentence, not in story retell. Says “can’t find them” or mentions at the end “don’t get lost again”.	No story theme stated.
Main Character/s	Main character/s introduced to listener by name.	<i>Ana</i>	“Ana” in title, later just “her” or a different name. Story does not start with Ana. E.g., “ <u>her</u> parents go out. Ana is not allowed to go.....”	Main character <u>predominantly</u> referred to by pronoun.
Supporting Character/s	Supporting characters introduced appropriately by name and/or relationship.	<i>Mum and dad big brother <u>or</u> (big) Brother Tom Policeman</i>	No name for brother. Or just “Tom” and no explanation. Policeman introduced with: <u>the</u> policeman. Parents introduced with “them”, later “mum and dad.”	See above. No mention of brother. Consistent use of <u>The</u> mum and dad. only 1 parent mentioned.
Conflict	Includes <u>rationale</u> for character’s behaviour. Provides the relationship connecting events and actions.	<i>Bored.</i> This can be implied: “There was nothing to do/ no one to play with.” Or “she waited for him to fall asleep before going out to look for mum and dad.”	Vague rationale or statement for the character’s behaviour. E.g., “asked brother to play, brother said no.” Or “Ana <u>wants</u> to go out.” Provides a series of unconnected events	No rationale for character’s behaviours. No attempt to provide a relationship connecting events and actions. E.g., “Asked her brother if he wanted to play. When he fell asleep she went out looking for mum and dad.”
Coherence	Events follow a logical order. Critical events are included and minor events ignored. Smooth transitions provided between events.	Critical Events: <ul style="list-style-type: none">○ <i>Parents have gone out.</i>○ <i>Leaves the house/goes off to look for mum and dad.</i>○ <i>Gets lost / not know what to do and cry</i>○ <i>Policeman finds her</i>○ <i>Pm takes her home</i>	Events follow a logical order. Both critical and minor events are given equal importance. Does not mention (where) parents have gone. Inconsistent provisions of transitions between events. 1 event missing.	Story is missing 2 or more critical events. Events are provided in random order. Minimal or no connection between events. Transitions between events are lacking.

Resolution	Clear resolution regarding characters, conflicts and events. Both resolutions are mentioned.	Resolutions: <i>Home (safely)</i> <i>Parents happy OR</i> <i>Parents thank the police</i>	Some resolution provided for characters, conflicts or events. Only one mentioned. Or not clear. Or out of sequence.	No resolution provided.
Conclusion	Smooth transition to conclusion. At least one “ending” is mentioned. Might provide insight into the character’s feeling or effects of the ending.	Endings: <i>PM told her not to get lost again and/or</i> <i>PM drove away</i> OR good alternative, e.g., “mother said she wouldn’t get lost again.”	Abruptly states: “the end – that’s all.” Story <u>finishes</u> with parents are happy or PM took her home (i.e., the resolution/s) without mentioning one of the endings.	Stops talking and listener may need to ask if that is the end.
TOTAL	X 5 =		X 3 =	X 1 =

Assessment 2

Characteristic	Proficient	Content	Emerging	Minimal / Immature
Introduction	Setting stated.	<i>Raining</i> <i>(Likes rain/play, dance)</i> <i>Rains really hard /continues to rain/rain gets harder</i> <i>Flooding</i>	Setting stated minimally, i.e. no more than 2 setting info points are provided.	Only 1 info point provided. Launches into the story with no attempt to provide setting or story theme.
Theme	Story theme stated.	<i>Frog is a hero</i> <i>Frog risked his life to save his friends</i>	“Hero” In title, not in story retell. Vague or incomplete mention of heroism: “brave”, “celebrated for Frog”. “risked his life to get help”	No story theme stated.
Main Character/s	Main character/s introduced to listener by name; physical description optional.	<i>Frog</i> or consistently <i>the Frog</i> AND <i>story starts with (the) Frog(in the 1st few sentences)</i>	Main character referred to by the Frog (inconsistent). Story does not start with Frog. Referred to by “he” later in the story, not clear if this is Frog.	Main character predominantly referred to by pronoun. No attempt to refer to character by name, relationship, or description.
Supporting Character/s	See above + are introduced by relationship to others (i.e., friends of main character)	<i>Hare, Pig, Duck, Rat</i>	See above, e.g., <i>the hare, pig etc.</i> One character missing. No explanation about them being friends.	See above. Only 3 are mentioned. Consistent use of <u>The</u>

Conflict	Includes <u>rationale</u> for character's behaviour. Provides the relationship connecting events and actions.	<u>Starve</u> "They will die without food".	Vague or incomplete rationale or statement for the character's behaviour. E.g., "last food – go for help. No more food – so frog swam." Provides a series of unconnected events.	No rationale for character's behaviours. No attempt to provide a relationship connecting events and actions.
Coherence	Events follow a logical order. Critical events are included and minor events ignored. Smooth transitions provided between events.	Critical Events: <i>Houses flood; Hare's house is on a hill/ dry; food runs out; Frog goes for help; Frog nearly drowns, Rat saves/finds him; plenty of food for everyone.</i>	Events follow a logical order. Does not mention that frog nearly drowned or had to swim or went for help. Inconsistent provisions of transitions between events. 1 critical event missing.	Story is missing 2 or more critical events. Events are provided in random order. Minimal or no connection between events. Transitions between events are lacking.
Resolution	Clear resolution regarding characters, conflicts, and events. Both resolutions are mentioned.	Resolutions: <i>Rat has enough food for everyone</i> <i>Frog is a hero/ celebrate Frog/ they thank Frog</i>	Some resolution provided for characters, conflicts or events. Only one mentioned. Or not clear.	No resolution provided.
Conclusion	Smooth transition to conclusion. Both "endings" are mentioned. Might provide insight into the character's feeling or effects of the ending.	Endings: <i>Water goes down</i> <i>Everyone helps to clean up the/ir / each other's / everybody's houses.</i>	Abruptly states: the end – that's all. Not clear if it is the end, although it could be. Examiner asks: anything else? Story ends with "They all clean up the houses." Or possible alternative end.	Stops talking and listener may need to ask if that is the end. Story finishes halfway.
TOTAL	X 5 =		X 3 =	X 1 =

Assessment 3				
Characteristic	Proficient	Content	Emerging	Minimal / Immature
Introduction	Setting stated: Where & why & a frog is spotted.	<ul style="list-style-type: none"> ▪ <i>go into the forest/ woods/to pond</i> ▪ <i>to catch/find a frog</i> ▪ <i>spot a frog (in the pond)</i> 	Setting stated incompletely, i.e., no more than 2 setting info points are provided. Or setting info points not provided at the beginning.	Only 1 info point provided. OR Launches into the story with no attempt to provide setting or story theme.
Theme	Story theme stated.	<i>Frog is sad when boy leaves, because he is lonely; Frog is lonely in the pond.</i> <i>Frog <u>does not want to be (left) alone in the pond.</u></i> <i>Frog does not have anyone to play with.</i>	Mentions that the frog is sad, but not why. OR Says that frog <u>is</u> alone (not lonely).	No story theme stated.
Main Character/s	Boy and Dog Main characters correctly introduced to listener. <u>All further references appropriate and clear.</u>	Story starts with “a” boy and “his” or “a” dog in the first few sentences. Later <u>referred to as the boy, the dog.</u> OR consistent use of <i>the boy, the dog.</i>	Main character/s referred to by a boy or a dog after initial mention. OR Boy or Dog referred to by ‘he’ or “they” later in the story; not clear if this is the boy, dog etc.	No mention about the dog. OR the dog is mentioned much later. OR main characters predominantly referred to by pronoun.
Supporting Character/s	frog. See above.	Introduced by “A” frog, later “the” frog	Frog introduced by “the” too soon. Consistent use of “the” frog. Not clear if referred to frog or dog.	Inconsistent use of “a” and “the”. See above.
Conflict	Includes <u>rationale</u> for character’s behaviour. Provides the relationship connecting events and actions.	<i>The boy wanted (to catch) a frog as his pet. Decided to get a pet frog.</i>	Vague or incomplete rationale or statement for the character’s behaviour. E.g., “ <u>going to</u> catch a frog” (no explanation). Or “are looking for a frog,” not <u>why</u> . Or “looking for pet frog,” not “catch”. Or mentioned later that he “doesn’t want him as a pet”.	No rationale for character’s behaviours. OR <u>only</u> mentioned later: giving up on catching a frog; “you’re hard to catch.” OR No attempt to provide a relationship connecting events and actions.

Coherence	Events follow a logical order. Critical events are included and minor events ignored. Smooth transitions provided between events.	Smooth transitions between events AND Critical Events: <i>boy wants(to catch) frog; This proves difficult; boy gives up / yells I don't want (to catch) you; and goes home/away /leaves; frog feels sad/lonely; follows the prints; gets to the boy's house; boy and dog in the bath/having fun; asks if he can have a play/hop in; hops in the bath/onto dog's head/boy says sure.</i>	Events follow a logical order. BUT Inconsistent provisions of transitions between events. AND/OR 1 critical event missing.	Story is missing 2 or more critical events. OR Events are provided in random order. OR Minimal or no connection between events. OR Transitions between events are lacking.
Resolution	Clear resolution regarding characters, conflicts and events. Both resolutions are mentioned.	Resolutions: <i>The frog wants to join in their play / come in / play with them.</i> <i>They become friends.</i>	<u>Some</u> resolution provided for characters, conflicts or events – e.g., “all having fun.” Or “Then the boy had a frog.” Only one mentioned.	No resolution provided.
Conclusion	Smooth transition to conclusion. Both “endings” are mentioned. Might provide insight into the character’s feeling or effects of the ending.	Endings: <i>Frog leaps/jumps into the bath/ Frog lands on the dog’s head.</i> AND <i>They all have fun/play happily</i> OR <i>(boy was happy) they were all friends</i>	Abruptly states: “The end – that’s all.” Not clear if it is the end, although it could be. Examiner asks: anything else? Story just ends with “the frog lands on the dog’s head” or different plausible ending- e.g., “you can play/join in”; “they lived happily ever after.”	Stops talking and listener may need to ask if that is the end. Story finishes halfway.
TOTAL	X 5 =		X 3 =	X 1 =

Assessment 4				
CHARACTERISTIC	PROFICIENT	Content	EMERGING	MINIMAL / IMMATURE
Introduction to story	Setting stated: what arrives and what's inside	<ul style="list-style-type: none"> ▪ <i>A parcel/package/box for the boy OR a present</i> ▪ <i>Opens the box</i> ▪ <i>A little/baby frog; another frog; a frog</i> 	Setting stated incompletely, i.e., no more than 2 setting info points are provided. Or setting info points not provided at the beginning.	Only 1 info point provided. OR Launches into the story with no attempt to provide setting or story theme.
Story Theme	Story theme stated. Big frog is mean because he's jealous, but later changes his mind and promises to be nice.	<i>Big frog is mean to little frog/boys calls him mean or naughty, but feels sad for the little frog later and decides to be nice at the end / sorry for what he did later or ashamed of himself.</i>	Mentions that the frog does mean things (e.g., biting, kicking) or that the frog is naughty and then that he's sad later, but not clear that the frog is repentant.	No story theme stated. Or only states at the end that the big frog will be nice from now on.
Main Character (s)	Boy and big frog and little frog. Main characters correctly introduced to listener. <u>All further references appropriate and clear.</u>	Story starts with “a” boy and “a frog” in the first few sentences. Later referred to as the boy, the big frog and the little frog. OR consistent use of the boy, the dog.	Main character/s referred to by a boy or a frog after initial mention. OR big frog and little frog referred to by “frog” later in the story, not clear if this is the big frog or the little frog.	OR main characters often referred to by pronoun, which makes it confusing to understand. Or lots of referencing errors with regards to the main characters (e.g., wrong labels).
Supporting Character /s	Turtle and dog.	Introduced by “A” turtle and “a” dog at the beginning of the story. Later “the” turtle and “the” dog. Or just ‘turtle’	Turtle or dog introduced by “the” too soon. Not clear if referred to turtle, or dog. Or introduced too late in the story. Or both characters only referred to in the beginning of the story.	Inconsistent use of “a” and “the”. See above. Or introduced very late and not sure who they are. No mention of turtle and/or dog.
Conflict	Includes rationale for character's behaviour. Provides the relationship connecting events and actions.	<i>The big frog doesn't like the little frog because he is the boy's favourite/best frog / because he used to be the boy's only frog.</i>	Vague or incomplete rationale or statement for the character's behaviour. E.g., “doesn't like the little frog” (no explanation). Or “is angry” (no explanation). Or explanation not clear.	No rationale for character's behaviours. No attempt to provide a relationship connecting events and actions.

Coherence	Events follow a logical order. Critical events are included and minor events ignored. Smooth transitions provided between events.	smooth transitions between events AND Critical Events: <i>Boy gets a present/box; Inside is a frog; they all go out to play; big frog is mean to little frog / kicks or bites him; All except big frog go on a boat/raft; Big frog kicks little frog off the raft/boat; little frog is gone/ they look for little frog but can't find him/little frog is scared/hides as he might get kicked/bitten again; boy is sad/cries and goes home; they hear a noise; little frog jumps through the window/comes back.</i>	Events follow a logical order. BUT Inconsistent provisions of transitions between events. AND/OR 1 critical event missing.	Story is missing 2 or more critical events. OR Events are provided in random order. OR Minimal or no connection between events. OR Transitions between events are lacking.
Resolution	Clear resolution regarding characters, conflicts and events. Both resolutions are mentioned.	Resolutions: <i>The (little) frog comes back/jumps in through the window AND Big frog decides to be nice to little frog/ big frog and little frog are friends now / big frog says I'm sorry.</i>	<u>Some</u> resolution provided for characters, conflicts or events "They were all nice together." Only one mentioned.	No resolution provided.
Conclusion	Smooth transition to conclusion. Both "endings" are mentioned. Might provide insight into the character's feeling or effects of the ending.	Endings: <i>Little frog lands on the big frog('s head) and/or little frog laughs AND They are all happy/ Everyone is happy/ everyone laughed</i>	Abruptly states "The end – that's all." Not clear if it is the end, although it could be. Examiner asks: anything else? Story just ends with "The frog lands on the frog's head," or different plausible ending.	Stops talking and listener may need to ask if that is the end. Story finishes halfway.
TOTAL	X 5 =		X 3 =	X 1 =

Assessment 5				
CHARACTERISTIC	PROFICIENT	Content	EMERGING	MINIMAL / IMMATURE
Introduction to story	Setting stated: what happens to the frog at the start of the story	<ul style="list-style-type: none"> ▪ Boy has a (pet) frog (or kept the frog...) ▪ One night/when boy is asleep frog climbs out/jumps out of open window/ runs off ▪ Next day Frog is gone (can be implied, e.g., they go looking for him) 	Setting stated incompletely, i.e., no more than 2 setting info points are provided. Or setting info points not provided at the beginning.	Only 1 info point provided. OR Launches into the story with no attempt to provide setting or story theme.
Story Theme	Story theme stated, i.e., frog returns to his family.	<i>Frog returns to his family/his wife (in the pond). Frog misses his family.</i>	Mentions that the frog is with a girl frog and <u>their</u> babies/ <u>his</u> family/ his brothers and sisters/ his mum.	No story theme stated. Just states that frog is with another frog and a lot of baby frogs. Or right at the end: “goodbye to frog and his family.”
Main Character (s)	Boy and Dog and Frog Main characters correctly introduced to listener. <u>All further references appropriate and clear.</u>	Story starts with “a” boy and “his” or “a” dog and “a” frog” or “his” frog in the first few sentences. Later referred to as <i>the boy, the dog, the frog</i> . OR consistent use of <i>the boy, the dog, the frog</i>	Main character/s referred to by a boy or <u>a</u> dog after initial mention. OR Boy or dog referred to by “he” or “they” later in the story, not clear if this is the boy, dog etc.	No mention about the dog. OR the dog is mentioned much later. OR main characters predominantly referred to by pronoun.
Supporting Character /s	Mole/Owl/bees + Deer Mother frog, baby frog/s. All further references appropriate and clear.	Introduced correctly. <i>All are mentioned (at least one of mole/owl/bees).</i>	Unclear who’s who. Use of “the” too soon. One character missing. .	Inconsistent use of “a” and “the”. <u>Predominant</u> use of pronoun.
Conflict	Includes <u>rationale</u> for character’s behaviour. Provides the relationship connecting events and actions.	<i>The frog had gone. So they went looking everywhere for the frog – implies that boy really wants his frog back or that the boy was worried. They went searching for the frog....</i>	Vague or incomplete rationale or statement for the character’s behaviour. E.g., “They looked in a hole, and then they looked...”	No rationale for character’s behaviours.

Coherence	Events follow a logical order. Critical events are included and minor events ignored. Smooth transitions provided between events.	Smooth transitions between events AND inclusion of all Critical Events: <i>Frog crawls out of jar/jumps out the window/disappears while boy and dog are asleep; They start looking for the frog, (first inside) then outside. This proves difficult, e.g. mole bites him/owl knocks him over; Boy gets chased/pushed; boy ends up on a rock and holds on to branches. Branches are deer's antlers; deer drops them in a pond. They hear a frog sound; Spot their frog with other frogs; a (baby) frog jumps up to the boy; Boy takes baby frog home (and leaves old frog behind)/waves bye to old frog.</i>	Events follow a logical order. BUT Inconsistent provisions of transitions between events. OR transition not clear (e.g., not clear that the frog had gone away, or how the dog got the jar on his head or that the boy ended up on the deer's head) AND/OR 1 critical event missing.	Story is <u>missing</u> 2 or more critical events. OR Events are provided in random order. OR Minimal or no connection between events. OR Transitions between events are lacking.
Resolution	Clear resolution regarding characters, conflicts and events. Both resolutions are mentioned.	Resolutions: <ul style="list-style-type: none"> • <i>They find their pet frog</i> • <i>Baby frog likes the boy/wants to be the new pet/jumps up to boy who wants/keeps him/goes home with him.</i> 	<u>Some</u> resolution provided for characters, conflicts or events – e.g., “Then the boy had a new frog.” Only one mentioned.	No resolution provided.
Conclusion	Smooth transition to conclusion. Both “endings” are mentioned. Might provide insight into the character’s feeling or effects of the ending.	Endings: <i>Boy (and dog) is / are happy with new frog.</i> <i>AND They walk away /say goodbye to old frog and his family</i>	Abruptly states: “The end – that’s all.” Not clear if it is the end, although it could be. Examiner asks: anything else? Story just ends with “They got a new little pet” or a different plausible ending.	Stops talking and listener may need to ask if that is the end. Story finishes halfway.
TOTAL	X 5 =		X 3 =	X 1 =

Assessment 6				
CHARACTERISTIC	PROFICIENT	Content	EMERGING	MINIMAL / IMMATURE
Introduction to story	Setting stated: what happens to the frog at the start of the story	<ul style="list-style-type: none"> ▪ <i>Boy is (getting dressed) to go out</i> ▪ <i>Animals/frog (are sad – they) are/is not allowed to come</i> ▪ <i>Frog jumps into boy's pocket</i> 	Setting stated incompletely, i.e., no more than 2 setting info points are provided. Or setting info points not provided at the beginning.	Only 1 info point provided. OR Launches into the story with no attempt to provide setting or story theme.
Story Theme	Story theme stated, i.e., frog ruined the night / dinner.	<i>Frog ruins the night.</i>	Mentions that the family is angry with the boy and/or the frog.	No story theme stated.
Main Character (s)	Frog and Boy Main characters correctly introduced to listener.	Story starts with “a” boy and “his” or “a” frog in the first few sentences. Later referred to as the boy, the frog. OR consistent use of the boy, the frog or ‘frog’	Main character/s referred to by a boy or a frog after initial mention. OR Boy or frog referred to by “he” or “they” later in the story, not clear if this is the frog, boy etc.	No mention about the boy or the frog. Or main characters predominantly referred to by pronoun.
Supporting Character /s	Waiter, boy’s family (mum, dad, sister). Saxophone player, other diners	<i>Characters are introduced when appropriate.</i> <i>Boy's family, waiter.</i> <i>saxophone player, lady or man/wife,</i> <i>turtle and dog.</i>	Characters are introduced too late or inappropriately i.e., “They were going to” (referring to the boy’s family). Unclear who’s who. Use of “the” too soon. One character missing. Or turtle and dog mentioned only at the end.	No mention of boy’s family or the waiter. Or pronouns used for all supporting characters.
Conflict	Includes rationale for character’s behaviour. Provides the relationship connecting events and actions.	<i>Frog is upsetting people, man/woman are leaving, waiter is angry, is going to throw him out of the restaurant + tells the boy never to come back</i>	Vague or incomplete rationale or statement for the character’s behaviour. E.g., “waiter is going to chuck him out.” Does not mention people are upset, angry or leaving.	No rationale for character’s behaviours.

Coherence	Events follow a logical order. Critical events are included and minor events ignored. Smooth transitions provided between events.	Smooth transitions between events AND inclusion of all Critical Events: <i>Boy goes out for dinner, animals (have to) stay home; Frog hides in boy's jacket; Family goes to restaurant; Frog hops out and upsets people, e.g., saxophone player, lady eating salad, man drinking wine; Waiter grabs frog and wants to throw him out; Boy says he's mine; Waiter gives frog to boy and tells him to get out; Family goes home, and is upset/ Boy gets sent to room; In room, boy and frog laugh about everything that had happened.</i>	Events follow a logical order. BUT Inconsistent provisions of transitions between events. OR transition not clear (e.g., not clear how the frog got to the restaurant AND/OR 1 critical event missing.	Story is <u>missing</u> 2 or more critical events. OR Events are provided in random order. OR Minimal or no connection between events. OR Transitions between events are lacking.
Resolution	Clear resolution regarding characters, conflicts and events. Both resolutions are mentioned.	Resolutions: • <i>Boy takes frog home</i> • <i>Parents/family is angry</i>	<u>Some</u> resolution provided for characters, conflicts or events – e.g., all go home. Only one mentioned.	No resolution provided.
Conclusion	Smooth transition to conclusion. Both “endings” are mentioned. Might provide insight into the character’s feeling or effects of the ending.	Endings: <i>Boy gets sent to his room</i> <i>AND Boy and frog laugh about everything that had happened</i>	Abruptly states: the end – that’s all. Not clear if it is the end, although it could be. Examiner asks: anything else? Story just ends with “He got sent to his room,” or a different plausible ending.	Stops talking and listener may need to ask if that is the end. Story finishes halfway.
TOTAL	X 5 =		X 3 =	X 1 =

APPENDIX E

AN OVERVIEW OF THE ORAL NARRATIVE INTERVENTION

PROGRAMME

Goals:	A) Increase knowledge of text structure in fictional stories.
	B) Apply this knowledge to re/telling fictional stories.

Week 1:

The story map is introduced (see Appendix I). One familiar story (The Three Little Pigs, see Table 19) is used to identify the story grammar elements displayed on the story map. During this week's sessions the emphasis is on the story grammar elements Characters and Setting. It is explained that a story contains main characters and supporting characters; the Setting informs the listener *where* and *when* the story started and *what happened* right at the beginning of the story.

Week 2:

The story map is reviewed, and the children are asked to list all seven story grammar elements. The emphasis this week is on the story grammar elements Problem and Goal/Plan. Picture cards and story books are used to help identify the problem. Goals and plans are devised to help fix the problems. For example in “Grandpa’s Cardigan” (Watson, 1993), the problem is that grandpa’s old cardigan has worn out, and grandma has decided to get rid of it. The goal is for grandpa to get a new cardigan. The plan is to go shopping and find one that is just as comfortable as his old one.

Week 3:

The story map is reviewed again. In Week 3 the emphasis is on Attempts. It is explained to the children that once you have a plan to try to solve the problem, you need to *attempt* to solve it. Children are asked to make up attempts using picture cards depicting problems and to identify attempts in fictional story books.

Week 4:

After reviewing the story map and its story grammar elements, it is explained to the children that most stories have a Resolution (to tell you if the problem has been solved) and an Ending (to tell you how the story ends). Children are asked to identify resolutions and endings in several fictional story books. In addition, the children are asked to make up complete stories using picture cards depicting problems.

Week 5 and Week 6:

Children are asked to identify all seven story grammar elements in a fictional story. For example, “Frog and the Treasure” (Velthuijs, 2002). Children take turns retelling the story. In addition, children make up complete stories using either picture cards or title prompts.

APPENDIX F

ORAL NARRATIVE INTERVENTION

TREATMENT PLANS

Week 1: Sessions 1 and 2

Week 2: Sessions 3 and 4

Week 3: Sessions 5 and 6

Week 4: Sessions 7 and 8

Week 5: Sessions 9 and 10

Week 6: Sessions 11 and 12

Note. A complete list of story books is included in Appendix H; Appendix I provides examples of intervention materials. SLT: Speech Language Therapist.

WEEK 1: SESSIONS 1 AND 2			
Goal	Activity & Description	Materials	Done
Session 1 Goal A: Teach the labels of the seven story grammar elements: setting, characters, problem, goal & plan, attempts, resolution, and ending.	1. The characters are introduced in the beginning of the story. We often have main characters and supporting characters. 2. The setting begins the story. It tells us two things: where the story takes place, and when the story happens/starts. 3. The setting usually also tells us what happened right at the beginning of the story. Sometimes this is part of the problem. 4. The problem is what the story is all about. And it usually needs to be fixed. 5. The goal is what the character wants to happen. Sometimes the goal is obvious. Sometimes you have to figure it out. The plan is how the character tries to reach the goal. The plan might be very easy to identify, or we may have to figure it out, based on the actions in the story. 6. The attempt/s is/are the character's actions to complete the plan. This is how the character tries to achieve the goal. 7. The resolution tells us if the attempt/s to reach the goal (and carry out the plan) has worked. The resolution is usually linked to the first event in the story. 8. The ending tells us what happened last in the story. When a story has all seven parts we can call it a COMPLETE story!	Story grammar element headings	
Goal B: Group the story grammar elements into the following categories: beginning, things that happen (middle), ending.	Group the story parts into the following categories: beginning: characters & setting things that happen: ending: resolution, ending	Story Map Story grammar elements headings	

Session 2 Goals A and B:	Break up one very familiar story into the story grammar elements. Point them out or write them on the laminated story map. Main: three little pigs and wolf Support: perhaps the mum Setting: once upon a time; Mum's house, Pigs decide to leave home and build their own homes Problem: the wolf wants to eat them, but he needs to catch the little pigs first! Plan: he's going to blow their houses down. Attempts: straw house, house of sticks, house of bricks, chimney. Resolution: pot of boiling water – end of the wolf Ending: lived happily ever after in their house of bricks.	The Three Little Pigs (Table 19) Laminated story map (white-board marker)		
Goal C: Identify the characters in a story: Main and supporting	Child / SLT reads the first page of a book. Main character is identified. Supporting characters are identified when mentioned. Children choose the books from the list.	Books (Appendix H) Jack and the Beanstalk Cinderella The Earnslaw Dragon Little Red Riding Hood The Lighthouse Keeper's Lunch Grandpa's Slippers		
Goal D: Provide character descriptions	Each child provides at least three descriptions.	<ul style="list-style-type: none"> • Looks • Likes • Family • What is s/he like • Age • Name 	Books, see above Character cards Game	

Session 2:	Review story grammar elements Review character descriptions		
Goal E: Identify and describe the components of the setting story grammar element of a story: time, place & situation when, where, & what happened	Child/Slt reads first few pages of a book. Sometimes info needs to be derived from pictures! Identify: Time - When Place - Where Situation – What happened right at the beginning of the story?	Jack and the Beanstalk: Once upon a time Lived in a small cottage (from pictures) They were poor; Jack went to sell the cow.	Books: Little Red Riding Hood The Earnslaw Dragon (not time) Cinderella Grandpa's Cardigan (not time) Sydney & the Whalebird Lighthouse Keeper's Lunch
Goal F: Child relates the beginning of a story using Character and setting cards.	Three stacks of cards: Time, Place, Character. Child picks a card from each pile and identifies correct story grammar element and sub-element. Child makes up the beginning of a story using the three cards. Child makes up a situation/what happened.	Example: Yesterday, a little girl called Emily went to her nana's bach. Use the pirate game to motivate the children if necessary. Example: Emily loved going for walks on the beach.	Story Grammar elements headings: Character/s, Setting: where, when, what happened. Place Cards Character Cards

WEEK 2: SESSIONS 3 AND 4			
Goal	Activity & Description	Materials	Done
Session 3 Goal A: Goal B: Review character and setting Story Grammar elements from last week	Children identify all 7 story grammar parts Give each child a turn: SLT reads out the first page of a book – child identifies main character, setting – time, place, situation. Record performance on progress tracking sheet.	Story grammar labels Record performance Story Map Progress tracking sheet Books: Little Red Riding Hood Are you my Mother? Donkey Grandpa's Cardigan	
Goal C: Identify the problem in a picture card	Introduction: explain most stories have a problem/s. E.g., the three little pigs – problem? Children take turns picking up a picture card. Discuss the problem. Forgot your house keys; boys vandalising phone booth; girls bullying a little girl; finding a handbag; spotting a burglar in action; a little boy falling into the creek; at home alone when a stranger rings the doorbell; dropping a box full of eggs.	Story Map Three Little Pigs Story grammar elements headings. LDA cards: “what would you do” (Living and Learning Cambridge Ltd)	
Goal D: Identify the main character’s response to a problem	Provide an example: Boy dropping eggs. starts to cry; feels embarrassed, feels angry.	LDA card: “what would you do” Laminated problem cards. (game)	
Goal C and D: Identify the problem and the character’s response in a story.	SLT reads the appropriate section of a book, preferably from Goal B. Children take turns identifying the problem + character’s response. Write at least 1 story down on the laminated story map!	books: Are you my Mother? Donkey Grandpa's Cardigan Little Red Riding Hood Sydney & the Whale Bird	

Goal E: Child relates part of a story using character / setting (time, place) / problem cards.	Child retells the story using the laminated story map from Goal B, C, and D.	Same book as Goal B, C, and D.	
Session 4	Review session 3: Review story grammar parts Problem and character's response: Read Donkey story.	laminated labels	
Goal E: Identify the type of problem	1. A change in nature or the environment 2. An action by another character 3. A change in what the character hears, sees, feels, thinks or remembers.	Books: Jack and the Beanstalk (type 2) Goldilocks (type 3) Frog is a Hero (type 1) Little Red Riding Hood (type 2)	
Goal F: Identify a goal and then devise a plan to 'fix' the problem in the picture cards.	Provide one example – show the boy dropping the eggs. Goal: needs to get rid of the mess Plan: he decided to tell the shopkeeper. (use the little cards – play as a game - the children have to guess)	LDA: "what would you do" Prompt: He thought: "How....."	
Goal G: Identify the goal and the plan in a story	Child / SLT reads the appropriate pages of a book. Child identifies the goal and the plan. (These can be written down on a story map).	Books: Are you my Mother? Donkey Grandpa's Cardigan Three Little Pigs	
Goal H: Devise a response and a plan based on a problem card	Child picks up a card with a problem stated. (Identifies a possible response) Devises a possible plan	Laminated problem cards (game)	
If time allows - Goal I: Child relates part of a story using character / setting (time, place) / problem cards.	4 stacks of cards: time, place, character, problem. Child picks a card from each pile. Child makes up part of a story using these cards.	Laminated cards game	

WEEK 3: SESSIONS 5 AND 6			
Goal	Activity & Description	Materials	Done
Session 5	<p>Review:</p> <p>Children identify all 7 story grammar parts</p> <p>Children identify story grammar parts that belong in the beginning of a story</p> <p>Children identify 5 ways to describe characters</p> <p>Children identify 3 components of the setting.</p>	<p>Story grammar labels</p> <p>Record performance on tracking sheet</p>	
Goal A: Identify (character, setting), problem, goal & plan in a story	<p>SLT reads the appropriate pages in a book – child identifies main character, setting – time, place, situation, problem, goal and plan.</p> <p>Record performance on progress tracking sheet.</p>	<p>Story Map A3 laminated</p> <p>Progress tracking sheet</p> <p>Book: Sydney and the Whalebird</p>	
Goal B: Identify the attempts in a story.	<p>Once you have a goal and a plan, you need to attempt/try to achieve this goal / put your plan into action!</p> <p>Then finish the book Sydney and the Whalebird</p>	<p>Story Map, see goal A.</p> <p>Fill in the details using white board marker</p>	
Goal C: Retell story from Goals A&B including attempts	All children have a turn record performance	Story Map, Goal A&B	
Goal D: Make up a plan with 2 or 3 attempts to go with the LDA problem cards.	<p>Provide an example: Forgot his house keys</p> <p>Identify the goal – get inside!</p> <ul style="list-style-type: none"> - First he tried all the doors and windows.... - Then he checked if his neighbour was at home - Then he rang his mum from a phone booth. <p>Other problems include:</p> <ol style="list-style-type: none"> 1. Sister fell into the river 2. Watched some boys vandalising phone booth. 3. Noticed some big girls bullying a little girl. 	<p>LDA: “what would you do” game</p> <p>+ problem cards if needed</p>	

Session 6	Review the above	Label progress chart	
Goal E: Identify setting, character, problem, goal & plan, attempts in a story	SLT reads one or two books: Grandpa's Cardigan / Donkey. Children identify story grammar parts – write on laminated A3 sheet.	Laminated story map	
Goal F: retell a story from Goal E, using the story map, including the attempts.	1 or 2 Children retell story from goal E at the beginning of the session	record performance	
Goal G: Identify setting, character, problem, goal & plan, attempts in a story.	SLT reads a story starter – no picture cues. Children fill in the gaps - orally	4 story starters	
Goal H: Devise a goal / plan and attempts based on a problem card	Child picks up a card with a problem stated. Devises a possible plan, with at least 2 actions for solving the problem / acting out the plan	Laminated problem cards Board game	
If time allows: Goal I: Make up a story using the LDA problem cards – including: characters, setting, problem, plan, 2 actions	Children choose one card each and take turns Record performance	Problem cards LDA story map story grammar headings and subheadings.	

WEEK 4: SESSIONS 7 AND 8			
Goal	Activity & Description	Materials	Done
Session 7	Review: Children identify story grammar parts that belong to the beginning / middle / end of a story. Children identify 3 components of the setting.	Story grammar labels Record performance on tracking sheet	
Goal A: Identify (character, setting), problem, goal & plan, and attempts in a story	SLT reads the appropriate pages in a book – child identifies main character, setting – time, place, situation, problem, goal and plan, and attempts. Write down on laminated story map	1 x Story Map A3 laminated Book: Are You my Mother?	
Goal B: Identify the resolution and the ending in a story	The resolution will tell you if the problem has been solved! The ending tells us how the story ends. Read the book until the end: Are you my Mother?	Story Map, see goal A. Fill in the details using white board marker	
Goal C: Retell a story including all elements discussed so far.	All children have a turn, or 2 children have a turn.	Record performance on tracking sheet.	
Goal D: Think of problem, goal (& plan), attempt, and resolution to a problem.	For example: Little brother fell into the river, goal is to save him, how: dive in, resolution: rescued him.	LDA cards Game	

Session 8	Review the above	Label progress chart	
Goal F: Identify problem, resolution/s and ending/s in very familiar stories	All children choose a book and have a turn. (optional: Write them down on laminated story maps)	Books: Cinderella Three Little Pigs Donkey Little Red Riding Hood	
Goal G: Make up a story using 4 photos depicting problems. Include: Character/s, setting, problem, goal/plan, 1 or 2 actions, resolution and ending.	Children choose one photo each and take turns Record performance on progress tracking sheet. Problems include: Child stuck in a tree Hat fallen into the creek Torn dress / T-shirt Hurt knee (fallen off bike)	Photos Story map Story grammar headings and subheadings.	
Goal H: Think of a resolution to a problem using the problem cards	Children take turns picking up a card. Problems include: Kicking your rugby ball through your neighbour's window. Your house gets flooded during heavy rain Want to catch a bird for a new pet.	laminated problem cards, Game	
If time allows: Goal I: Make up a setting and characters using the problem cards.		Laminated problem cards Game	

WEEK 5: SESSIONS 9 AND 10			
Goal	Activity & Description	Materials	Done
Session 9	Review story grammar labels etc.	Story grammar labels Record performance on tracking sheet	
Goal A: Identify all 7 story grammar parts in a story.	SLT reads the appropriate pages in a book – children identify main character, setting – time, place, situation, problem, goal and plan, attempts, resolution, and ending. Fill in laminated story map	Story Map A3 laminated Progress tracking sheet Book: Frog and the Treasure	
Goal B: Theme	Identify the theme in Frog and the Treasure – never break a promise!		
Goal C: Retell a story including all elements	All children have a turn, if time allows	Record performance on tracking sheet.	
Goal D: Fill in a story map with setting – where, when, what happened, character/s – include description, problem, goal & plan, attempt, resolution, ending.	Story titles: The accident The bee sting My day in hospital Why I didn't go to school on Monday. Choose one title – Children make up all parts of a story. One child tells the story at the end.	Story titles (Game) A3 Story Map	

Session 10	Review the above	Label progress chart	
Goal E: Make up a story using the WP cards depicting problems. Including: Character/s, setting, problem, goal & plan, 1 or 2 actions, resolution, and ending.	Children choose one photo each and take turns. Go through all the parts before telling the story. Record performance. Problems include: Untidy bedroom Missing the bus Accident: man has fallen on the ground Forgotten purse Car breakdown	WP Problem-solving Sequences (Winslow Press, UK) Story map Story grammar headings and subheadings. Record performance	
Goal F: Fill in a story map with: setting – where, when, what happened, character/s – include description, problem, goal & plan, attempt, resolution, ending.	(Theme-related) Story titles: Sam is jealous Why ___ is my best friend The rescue Elephant is lonely Choose one title – Think of the problem first. Children make up all parts of a story. One child tells the story at the end.	Story titles (Game) A3 Story Map	
If time allows	Identify parts of the story using WP cards. I.e., character/s, problem & plan, attempt, resolution, ending.	game	

WEEK 6: SESSIONS 11 AND 12			
Goal	Activity & Description	Materials	Done
Session 11	Review story grammar labels etc.	Story grammar labels Record performance on tracking sheet	
Goal A: Identify all 7 story grammar parts in a story.	SLT reads the appropriate pages in a book – children identify main character, setting – time, place, situation, problem, goal and plan, attempts, resolution, and ending. Do not write on the Story Map. Record performance on progress tracking sheet.	Story Map A3 , laminated Progress tracking sheet Book: Sydney and the Sea Monster	
Goal B: Retell a story including all elements	At least one child has a turn.	Record performance on tracking sheet. Only use story grammar labels to prompt	
Goal C: Theme	Identify the theme in Sydney and the Sea Monster. E.g., How the animals stayed safe. Or how the small animals defeated the intruders by using their brains.		
Goal D: Fill in a story map with: setting – where, when, what happened character/s – include description, problem, goal & plan, attempt, resolution, ending.	Story titles: The accident The bee sting My day in hospital Why I didn't go to school on Monday. Sam is jealous Why ___ is my best friend The rescue Elephant is lonely Choose one title – Children make up all parts of a story. One child tells the story at the end.	Story titles A3 Story Map (Game)	
If time allows	Make up parts of a story using WP or LDA cards	Game	

Session 12 Review the above		Label progress chart	
Goal E: Make up a story using the WP cards depicting problems. Including: Character/s, setting, problem, goal & plan, 1 or 2 actions, resolution and ending.	Children choose one photo each and take turns telling a story. Record performance. Problems include: Untidy bedroom Missing the bus Accident: man has fallen on the ground Forgotten purse Car breakdown Hat fell into the water Ripped dress	Use story grammar labels	
Goal F: Retell a story using all 7 story grammar parts	SLT reads a familiar story. At least one child retells the story – having a blank story map in front of them.	Blank Story Map Story Grammar labels Books: Frog and the Treasure A Piece of Cake Grandpa's Shorts	

APPENDIX G**ORAL NARRATIVE INTERVENTION****PROGRESS TRACKING SHEETS**

- 1) Progress tracking sheet - story grammar labels
- 2) Progress tracking sheet - story re/telling

Progress Tracking Sheet Story Grammar Labels

Group: _____

Progress Tracking Sheet Story Re/telling

Task: _____ **Date:** _____

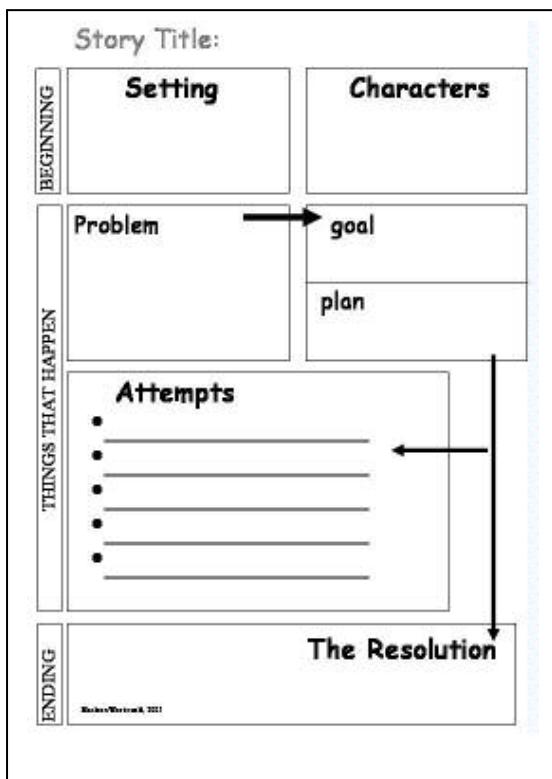
APPENDIX H

STORY BOOKS USED IN THE ORAL NARRATIVE INTERVENTION PROGRAMME

- Armitage, R., & Armitage, D. (1977). *The lighthouse keeper's lunch*. London, England: Penguin Group.
- Eastman, P. D. (1960). *Are you my mother?* New York: Random House.
- Elliot, D. (1999). *Sydney and the sea monster*. Auckland, New Zealand: Random House.
- Elliot, D. (2000). *Sydney and the whalebird*. Auckland, New Zealand: Random House.
- High, B. (1988). *The Earnslaw dragon*. Timaru, New Zealand: Pope Print Timaru.
- Moore, M. (2001a). *Jack and the beanstalk*. London: Franklin Watts.
- Moore, M. (2001b). *Little red riding hood*. London: Franklin Watts.
- Moore, M. (2001c). *The three little pigs*. London: Franklin Watts.
- Root, B. (1989). *Donkey*. Essex: Jolly Learning.
- Velthuijs, M. (1995). *Frog is a hero*. London: Andersen Press.
- Velthuijs, M. (2002). *Frog and the treasure*. London: Anderson Press.
- Wade, B. (2001a). *Cinderella*. London: Franklin Watts.
- Wade, B. (2001b). *Goldilocks and the three bears*. London: Franklin Watts.
- Watson, J. (1989). *Grandpa's slippers*. Auckland, New Zealand: Ashton Scholastic.
- Watson, J. (1993). *Grandpa's cardigan*. Auckland, New Zealand: Scholastic.
- Watson, J. (2001). *Grandpa's shorts*. Auckland, New Zealand: Scholastic.

APPENDIX I

EXAMPLES OF INTERVENTION MATERIALS



Story Map

broke an arm	built a shed and forgot to give it a door
found a ring worth one thousand dollars	saw a house on fire across the road
crashed a bike into a parked car	saw a dog chasing a little girl
found an alien space ship	broke my sister's favourite toy

“Problem” Cards



Story Grammar Labels



**Photo depicting the problem:
“Hat fallen into the creek”**