

Table of Contents

General Introduction	1
1. Developmental Dyslexia and Specific Language Impairment. The same or different?	7
1.1. General characteristics of developmental dyslexia	8
1.2. Theories of developmental dyslexia	8
1.2.1. The phonological deficit theory	8
1.2.2. The temporal processing deficit	9
1.2.3. The cerebellar theory	10
1.2.4. The magnocellular theory	10
1.3. Theories of developmental dyslexia: critical comments	12
1.4. General characteristics of SLI	14
1.4.1. Overview of the grammatical errors in SLI	15
1.5. Theories of Specific Language Impairment	16
1.5.1. From the Extended Optional Infinitive Stage towards the Agreement and Tense Omission Model	16
1.5.2. The Missing feature hypothesis	18
1.5.3. The Missing agreement hypothesis	19
1.5.4. Representational deficit for dependency relations	20
1.5.5. The surface hypothesis	20
1.5.6. The limited processing account	22
1.6. Theories of SLI: critical comments	22
1.7. Aetiology	24
1.7.1. Genetics	24
1.7.2. Environmental factors	26
1.8. Linguistic precursors of developmental dyslexia	26
1.8.1. Phonological development	26
1.8.2. Syntactic development	27
1.9. Dyslexia and SLI: the same or different	28
1.10. General Research Questions	31
1.11. Research Methodology	31
1.11.1. Subjects	31
1.11.1.1. Number, age and selection criteria	31
1.11.1.2 Individual and demographical characteristics of the subjects	33
1.11.2. General procedure	35
1.11.3. General expectations	35
1.12. Summary of General Introduction and Chapter 1	36

2. Some notes on auxiliary verbs	37
2.1. Outline of this chapter	37
2.2. Some characteristics of auxiliary verbs	38
2.3. The role of auxiliaries in marking grammatical properties	39
2.3.1. Tense	39
2.3.2. Aspect	40
2.3.3. Modality	42
2.4. The acquisition of auxiliary verbs by children with SLI	43
2.4.1. Early studies in English	43
2.4.2. Later studies in English	44
2.4.3. Italian and French	45
2.4.4. Swedish	45
2.4.5. Dutch and German	46
2.4.6. Conclusion	47
2.5. Possible explanations for the findings	48
2.5.1. The extended optional infinitive stage hypothesis	48
2.5.2. The limited processing capacity hypothesis	48
2.5.3. The surface hypothesis	49
2.5.4. The Missing Agreement hypothesis & RDDR	50
2.5.5. An evaluation of the different theories based on the cross-linguistic data	50
2.6. Auxiliaries in morphosyntactic dependency relations	52
2.7. Some notes on (the construction of) the past participle	53
2.7.1. The past participle in English	53
2.7.2. The past participle in Dutch	54
2.7.3. Previous studies in English speaking children with SLI	56
2.8. Main Research Questions of this thesis	58
2.9. Summary	58
3. Perceptual sensitivity to morphosyntactic agreement in infants	61
3.1. Outline of this chapter	62
3.2. Perceptual sensitivity to syntactic categories and combinatorial principles in infants	62
3.3. Early language abilities in infants at risk for dyslexia	64
3.3.1. The Finnish study	64
3.3.2. The Dutch study	66
3.4. Research questions	67
3.5. Experiment 1	68
3.5.1. Method	68
3.5.1.1. Subjects	68
3.5.1.2. Stimuli	68
3.5.1.3. Design and apparatus	69
3.5.1.4. Procedure	70

3.5.1.5. Data analysis	71
3.5.2. Results	72
3.5.2.1. Control group	72
3.5.2.2 At-risk group	72
3.6. Experiment 2	73
3.6.1. Method	73
3.6.1.1. Subjects	73
3.6.1.2. Stimuli, Design, Apparatus, Procedure	73
3.6.1.3. Data analysis	73
3.6.2. Results	73
3.7. Experiment 3	74
3.7.1. Method	74
3.7.1.1. Subjects	74
3.7.1.2. Stimuli	74
3.7.1.3. Design, Apparatus, Procedure	75
3.7.1.4. Data analyzes	75
3.7.2. Results	75
3.8. Discussion	76
3.9. Summary	80
4. The production of the past participle	81
4.1. Outline of this chapter	81
4.2. The acquisition of the past participle in Dutch	82
4.2.1. What children need to learn	82
4.2.2. Corpus data on past participle production	82
4.3. The production of grammatical morphemes in complex structures	83
4.4. Research questions	85
4.5. Method	85
4.5.1. Subjects	85
4.5.2. Stimuli and Procedure	85
4.5.3. Data Analysis	86
4.6. Results	88
4.6.1. Sentence Type A (Intransitives)	88
4.6.2. Sentence Type B (Transitives)	89
4.6.3. Form of the Verb	90
4.6.4. Violation of morphosyntactic agreement	94
4.7. Discussion	96
4.8. Summary	101
5. The role of argument structure and working memory in the production of closed class items	103
5.1. Outline of this chapter	103
Part One	103

5.2. Some background notes on verb argument structure	103
5.3. The acquisition of argument structure	105
5.4. Argument structure in sentence processing and production	106
5.5. Argument structure in Specific Language Impairment	109
5.6. Intermediate summary	111
5.7. Research questions (i) - (ii): part one	112
Experiment 1	112
5.8. Method	112
5.8.1. Subjects	112
5.8.2. Stimulus Material	113
5.8.3. Design and procedure	114
5.8.4. Scoring and reliability	114
5.8.5. Data analysis	115
5.9. Results	115
5.9.1. Auxiliary verb omission	115
5.9.2. ge- omission	117
5.9.3. Determiner omission	117
5.9.4. Subject omission	118
Part two	119
5.10. Structural complexity versus length: the role of short-term memory capacity	119
5.11. The role of short-term memory in language development	119
5.11.1. The working memory model	119
5.11.2. Working memory in children with dyslexia	121
5.11.3. Working memory in children with SLI	122
5.12. Research questions (iii) and (iv) : part two	122
Experiment 2	123
5.13. Method	123
5.13.1. Subjects	123
5.13.2. Design and Procedure	123
5.13.3. Scoring and Reliability	124
5.13.4. Data Analysis	124
5.14. Results	124
5.14.1. Phonological working memory	124
5.14.2. Phonological working memory and the omission of closed class items	126
5.15. Discussion	128
5.16. Summary	134
6. Sensitivity to morphosyntactic agreement in school-going children at risk for developing dyslexia	135
6.1. Outline of this chapter	136
6.2. Syntactic processing in developmental dyslexia	136

6.3. Research questions	138
6.4. Method	139
6.4.1. Subjects	139
6.4.2. Stimuli	139
6.4.3. Design and Apparatus	141
6.4.4. Procedure	141
6.4.5. Scoring and Reliability	142
6.4.6. Data Analysis	142
6.5. Results	143
6.5.1. The relation between 'heeft' and the past participle	143
6.5.2. The relation between 'kan' and the infinitive	145
6.6. Discussion	147
6.7. Summary	152
7. Summary and Conclusions	153
7.1. Summary of the experimental work	153
7.2. Theoretical implications	155
7.3. Clinical implications	157
7.4. General conclusion	158
Appendices	161
Appendix A: Stimulus material: chapter 3, experiment 1.	161
Appendix B: Stimulus material: chapter 3, experiment 3.	164
Appendix C: Stimulus material used in sentence completion task, chapter 4	167
Appendix D: Stimulus material used in sentence imitation task, chapter 5	168
Appendix E: Digit Span Test, chapter 5.	169
Appendix F: Discrimination Task, Version A, chapter 6	171
Bibliography	173
Samenvatting in het Nederlands	191