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Antje Orgassa

Specific language impairment in a bilingual context

The acquisition of Dutch inflection
by Turkish-Dutch learners

With the aim of specifying the relationship between SLI and L2 acquisition, production data of various groups of L1 and L2 learners with and without SLI were compared. The experiments centered on the application of morphosyntactic rules in Dutch that were considered vulnerable in SLI and L2 acquisition. The results of systematic cross-group comparisons of error types and error frequencies contribute to the ongoing theoretical debate as to whether (L2-)SLI is caused by linguistic-representational deficits or by processing limitations. The issue of age dependencies on grammatical rule learning is also discussed in relation to L2 acquisition.

The central claim in this book is that the similarities in error patterns across the impaired and unimpaired child L1 and child L2 groups indicate that all children rely on the same linguistic resources to derive grammar. The persistent problems with inflectional morphology in the SLI groups are interpreted in terms of processing limitations that affect either the intake needed to derive rules or the degree of automaticity to apply rules once established. The present study also reveals how reduced intake affects typical child L2 acquisition. If a large amount of consistent input is needed to derive grammar, it is possible that both SLI and L2(-SLI) children may fossilize in immature stages resulting in incomplete structure-specific representations. Interestingly, then, processing accounts and representational accounts can be related.

This study is of interest to scholars working in the field of clinical linguistics, L1 and L2 acquisition, inflectional morphology and educators and therapists working with atypical language development in multilingual settings.

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Specific language impairment in a bilingual context

The acquisition of Dutch inflection by Turkish–Dutch learners

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Contents

Acknowledgments	ix
1 Introduction	1
1.1 Relating SLI and L2 acquisition	1
1.2 Theoretical value of this study	2
1.3 Paving the way for the present study	4
1.4 Practical value of this study	6
1.5 How the book is organized	7
2 Setting the scene: SLI and L2	9
2.1 Introduction	9
2.2 Understanding SLI	9
2.2.1 What is SLI?	9
2.2.2 Effects of SLI	12
2.2.3 Accounts of SLI	17
2.2.4 Summary	24
2.3 Understanding L2 acquisition	25
2.3.1 What is L2 acquisition?	25
2.3.2 Factors affecting the acquisition of L2 grammar	26
2.4 Understanding child L2-SLI	31
2.4.1 Effects of SLI and child L2	31
2.4.2 Effects of L2-SLI	33
2.4.3 Accounts of child L2-SLI	34
3 Placement and inflection of Dutch verbs	39
3.1 Introduction	39
3.2 System	39
3.2.1 Dutch verb placement	40
3.2.2 Dutch verb inflection	43
3.2.3 Contrasting Dutch and Turkish	44
3.3 Acquisition	45
3.3.1 Child L1 acquisition	46
3.3.2 Child L1-SLI acquisition	49
3.3.3 Child L2 acquisition	51
3.3.4 Adult L2 acquisition	53
3.3.5 Child L2-SLI acquisition	56

3.4	Expected relationships between SLI and L2	57
4	Agreement in Dutch determiners and adjectives	61
4.1	Introduction	61
4.2	System	61
4.2.1	Dutch determiner system	62
4.2.2	Dutch adjectival inflection	63
4.2.3	Contrasting Dutch and Turkish	65
4.3	Acquisition	66
4.3.1	Input and the acquisition of adjectival agreement	66
4.3.2	Child L1 acquisition	67
4.3.3	Child L1-SLI acquisition	69
4.3.4	Child L2 acquisition	69
4.3.5	Adult L2 acquisition	71
4.3.6	Child L2-SLI acquisition	74
4.4	Expected relationships between SLI and L2 acquisition	74
5	Methodology	79
5.1	Introduction	79
5.2	Subject populations	79
5.2.1	SLI and L2 selection criteria	80
5.2.2	Group comparisons	82
5.3	The experimental material	84
5.3.1	FlexiT material	84
5.3.2	Experimental procedure	86
5.3.3	Transcription and coding	87
5.3.4	Inter-rater reliability	88
5.3.5	Statistics	88
6	Production of verb placement and verb inflection	91
6.1	Introduction	91
6.2	Previous evidence and expectations	91
6.3	Method	93
6.3.1	Participants	94
6.3.2	Procedure	94
6.3.3	Reliability of the elicitation material	97
6.3.4	Analysis	98
6.4	Results: Verb placement	100
6.4.1	Selected data	100
6.4.2	Positioning finite lexical verbs: Error types	101
6.4.3	Acquiring V2: Error frequencies	102
6.4.4	Summary	106
6.5	Results: Verb inflection	108
6.5.1	Data selection	108
6.5.2	Inflecting finite lexical verbs: Error types	110
6.5.3	Inflecting finite lexical verbs: Error frequencies	111
6.5.4	Summary	113
6.6	Conclusion	115

7	Production of agreement in determiners and adjectives	119
7.1	Introduction	119
7.2	Previous evidence and expectations	119
7.3	Method	121
7.3.1	Participants	122
7.3.2	Procedure	122
7.3.3	Reliability of the elicitation material	125
7.3.4	Analysis	126
7.4	Results: Determiner agreement	129
7.4.1	Selected data	129
7.4.2	Determiner agreement: Error frequencies	132
7.4.3	Stability in determiner agreement	135
7.4.4	Summary	138
7.5	Results: Adjectival inflection	139
7.5.1	Selected data	139
7.5.2	Adjectival inflection: Error types	140
7.5.3	Adjectival inflection: Error frequencies	141
7.5.4	Summary	147
7.6	Conclusion	149
8	Conclusion	153
8.1	Introduction	153
8.2	Reduced intake rather than representational deficit	154
8.3	Reduced intake and domain differences	157
8.4	Reduced intake and reduced performance	160
8.5	Reduced intake and individual differences	162
8.6	Reduced intake and clinical implications	164
8.7	Reduced intake and future directions	166
	Appendices	171
	A Biodata subjects	171
	B Finite verb inflection per inflectional context	175
	C Determiners and adjectives per neuter noun type	177
	D Stability in adjectival inflection	179
	Bibliography	181
	Samenvatting (Summary in Dutch)	207
	Curriculum Vitae	211

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Dedicated to
the memory of
Marco Haverkort

Introduction

1.1 Relating SLI and L2 acquisition

Children learning a second language (henceforth L2) during the first years of life and who have been diagnosed with specific language impairment (henceforth SLI) often show difficulties in the acquisition of the L2 grammar. In fact, these children (henceforth L2-SLI children) form a significant share of the caseload of speech therapists and of the population attending schools for language-impaired children across the globe. It is, however, unresolved to what extent SLI and learning an L2, individually, affect the acquisition of grammar, and how both situations affect language acquisition in a single L2-SLI child. This is not only a problem for clinical practice, but it has also become an intriguing phenomenon for researchers. It gives rise to questions about the underlying nature of the difficulties and the relationships between SLI and L2 acquisition.

One of the main problems in teasing apart the respective effects of SLI and L2 is that the boundaries between typical L2 and SLI acquisition are not clear-cut. Studies implicitly and explicitly comparing SLI and early (or child) L2 acquisition suggest, on the one hand, that both conditions cause delay and that developmental errors in acquiring a language's grammar are, overall, remarkably similar regardless of whether a child is acquiring a first language (henceforth L1), an L2 or whether a child has been diagnosed with SLI (e.g., Damico, Oller, and Storey 1983; Bruck 1984; Håkansson and Nettelbladt 1993, 1996; Restrepo and Kruth 2000; Paradis and Crago 2000; Håkansson 2001; Paradis and Crago 2004; Grüter 2004; Paradis 2005). On the other hand, there are also studies reporting on linguistic characteristics in SLI (e.g., Clahsen 1991; Clahsen, Bartke, and Göllner 1997; Leonard 1998; Hamann, Penner, and Lindner 1998) and child L2 acquisition (e.g., Haberzettl 2005; Kroffke 2006; Meisel 2007; Rothweiler 2007) that conclude that there is more than a 'simple' developmental delay in L2 and SLI children. They suggest that developmental error profiles are qualitatively different from those seen in typical L1 acquisition. Whether SLI children are more severely affected in language acquisition than L2 children is

also subject of ongoing debate. Between-group differences usually indicate that, compared to typically developing L1 peers, SLI and L2 children need more time to acquire target structures, usually reflected in higher error rates in both populations. Studies vary, however, as to which of the two factors has more impact on language acquisition.

The variation across the findings is likely to be related to one of the major complications in this debate, namely the heterogeneity inherent in SLI and in L2 groups. When comparing typical and atypical (child) L1 acquisition and L2 acquisition, there may be various confounding factors: (i) the selection and matching of learner populations (e.g., knowledge and transfer of a previous L1, L2 proficiency and L2 input situation) and (ii) the variation in linguistic structures being investigated. These complicate the discussion of the relationship between SLI and L2 acquisition. The present study is an attempt to address this issue and in turn focuses on the following questions:

- What are the separate effects of SLI and L2 in language acquisition?
- What is the relative impact of the effects of SLI and L2 in language acquisition?
- What are the combined effects of SLI and L2 acquisition in L2-SLI acquisition?

1.2 Theoretical value of this study

Theoretical proposals for SLI are taken as a point of departure in order to specify the potential relationships between SLI and L2 acquisition. Language acquisition in children with SLI does not take place with the same ease, speed and (probably) ultimate success as typical L1 acquisition. The linguistic problems manifest themselves across languages, in particular, in the domain of inflectional morphology (see Leonard 1998, 2000, 2009 for an overview). The accounts that have been proposed to explain these problems in grammar have been formulated from two perspectives, as set out in (1) and (2): the first is derived from purely linguistic theories, and the second from general cognitive theories.

- (1) SLI is caused by missing or deficient knowledge to access the underlying representation of rules (i.e., Universal Grammar (UG)) (e.g., Clahsen 1989; Gopnik 1990a; Gopnik and Crago 1991; Clahsen 1992; Van der Lely 1998).
- (2) SLI is caused by a limited capacity to perceive and process language input (i.e., primary language data) (e.g., Leonard, Sabbadini, Leonard, and Volterra 1987; Leonard 1989; Kail 1994; Windsor and Hwang 1999; Dromi, Leonard, Adam, and Zadunaisky-Ehrlich 1999; Miller, Kail, Leonard, and Tomblin 2001).

These perspectives lead to hypotheses as to the relationships between SLI and L2 acquisition, schematically presented in Figure 1.1.

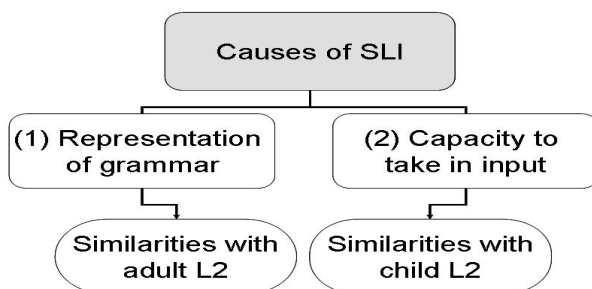


Figure 1.1: Relating SLI and L2 acquisition

Hypothesis I. A representational deficit as in (1) might constrain the availability of one or more principles of UG in SLI. Accordingly, children with SLI would have to rely on other learning mechanisms to build up grammar than their typically developing peers. Following the further assumption that the accessibility of UG is age-dependent - due to a critical period for language acquisition in the sense of Lenneberg (1967) - these learning mechanisms might be comparable to those used by late (or adult) L2 learners, who have passed the critical stages for language learning. From this perspective, similarities between (child L1- and L2-)SLI and adult L2 acquisition are predicted in terms of error patterns. Crucially, both learner groups should be different from typical child L1 and child L2 acquisition.

A similar specification of the relationship between SLI and late L2 acquisition can be derived by using Ullman's declarative/procedural (DP) model. This model posits differences between learner groups in terms of the mental routes for accessing and retrieving grammatical knowledge rather than assuming differences in grammatical representation itself (Ullman 2001a). More specifically, Ullman offers a neurobiological explanation for the lexicon-grammar distinction since two neural systems are posited to underly different linguistic functions. The declarative memory system underlies the mental lexicon, where idiosyncratic linguistic mappings are stored. The procedural memory system underlies the mental grammar necessary for the acquisition and use of rule-governed computations in language. According to Ullman and Pierpont (2005), SLI involves a deficit in procedural memory reducing the ability to learn grammatical rules, whereas declarative memory is relatively spared. With respect to L2 acquisition, Ullman (2001b, 2004, 2005) argues that access to procedural memory becomes more difficult with increasing age, which may lead to qualitative differences in the mental processing of grammatical information in older L2 learners. If procedural memory is vulnerable in both populations, SLI and late L2 acquisition should be similar to each other and, hence, different from typical child L1 and child L2 acquisition.

Hypothesis II. A different relationship between SLI and L2 acquisition is predicted if it is assumed that SLI is the result of reduced processing and perceptual capacities as in (2). The main problem underlying SLI in this approach is the analysis of input rather than having a lack or deficit in UG. Children with SLI have, in principle, access to the same type of knowledge as typically developing children; thus error patterns should be similar. They differ, however, from typically developing peers in the pace with which language is acquired. The result is a developmental delay due to the reduced capacity to take in input (i.e., intake) necessary for the ability to derive grammatical rules.¹ As with a deficit in the innate grammar, reduced input/intake could result in a lack of grammatical knowledge. However, problems in intake should occur, in particular, in those linguistic structures that require a relatively large amount of input in order to learn the rule. Inflectional morphology and functional elements have been shown to be such structures for SLI children (e.g., Leonard 1998, 2000, 2009 for an overview).

Looked at from this perspective, SLI is comparable to early or child L2 acquisition rather than adult L2 acquisition. L2 children whose initial exposure to the target language starts within a critical period are also assumed to have poorer intake compared to typical L1 children. That the actual cause for the reduced intake is different in SLI and child L2 is obvious. Unlike SLI, a reduced intake in early L2 acquisition is directly related to the fact that these children have had uneven exposure to the L2 and, hence, a reduced input in their L2.

Having less input does not necessarily result in a delay in L2 (and SLI), since some linguistic rules can be acquired relatively quickly without requiring a large input/intake (for L2 see e.g., Gathercole 2002a,b; Paradis et al. 2008, and for SLI see e.g., Leonard et al. 1992b, 1997). However, if the threshold for a particular linguistic phenomenon is not attained very easily - thus requiring a large input/intake - a delay in early L2 acquisition should be comparable to that seen in SLI.² Assuming that both conditions interact in a single child, L2-SLI children should then have a double delay indicating a cumulative L2-SLI effect.

This thesis aims to qualitatively and quantitatively identify the separate effects as well as the combined effects of SLI and L2 in Dutch grammatical rule learning by systematically examining error types and error quantities in various learner groups. §1.3 gives a brief preview on how this research goal will be achieved.

1.3 Paving the way for the present study

In order to test the different predictions relating SLI and L2, this study examines grammar in impaired and unimpaired learner populations acquiring Turkish as an L1 and Dutch (as spoken in the Netherlands) as an L2, and in Dutch impaired and unimpaired control populations. Turkish-Dutch children are present in

¹'Intake' is seen as that part of the input that can be used effectively for acquisition (Corder 1967).

²'Threshold' refers to the point in acquisition that must be exceeded to master rules.

considerable numbers in schools for speech and language impairments in the Netherlands.

A direct comparison of a group of L2-SLI children with groups of L1-SLI children, unimpaired L2 and L1 children and a group of late L2 learners should enable us to specify the relationships between SLI and L2 acquisition as discussed in the previous section. The predictions from the representational deficit, on the one hand, and the reduced input/intake, on the other hand, are repeated here in (3) and (4).

- (3) **Representational deficit:**
The error types produced in child L1-SLI and child L2-SLI acquisition should be similar to those in adult L2 acquisition, and different from typical child L1 and child L2 acquisition.
- (4) **Reduced input/intake:**
All child groups show a similar pattern of errors, which is different from adult L2 acquisition.

As hypothesized in (3), SLI and adult L2 groups should qualitatively differ from typical (child) acquisition with respect to the error types they produce. On the other hand, developmental error types should be the same across child groups following (4), but different from adult L2 acquisition. However, some of these child groups are expected to be delayed and, hence, produce higher error rates, as a result of reduced input/intake capacities. The extent to which SLI and child L2 groups are affected can be further determined by comparing the error quantities across the child groups, as Figure 1.2 indicates.

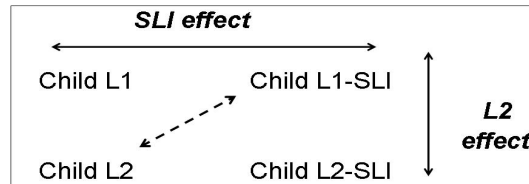


Figure 1.2: Specifying ‘delay’ in SLI and L2 acquisition

An effect of SLI should become visible if the SLI groups produce more errors than their respective unimpaired controls. On the other hand, an L2 effect is apparent if the child L2 groups produce more errors than the respective child L1 groups. If both effects play a role in child L2-SLI acquisition, substantially more errors are expected in that group than in any other child group. This can be seen as an indication of a cumulative L2-SLI effect. It is interesting to also address the question as to the relative impact of one condition compared to the other as indicated by the dotted line. This will be done by comparing the error rates in the child L1-SLI and typical child L2 groups.

In order to be able to make the comparisons as set out in Figure 1.2, selection criteria were applied in all participant groups to reduce the heterogeneity

inherent to SLI and L2 acquisition. For instance, the selected L2 groups in this study have the same L1, namely Turkish, in order to control for L1 transfer. All learner groups were, of course, tested using the same methodological design.

Two morpho-syntactic domains were selected for investigation: Firstly, the Dutch inflectional phrase where the focus is on the production of finite verb inflection and finite verb placement, secondly, the Dutch determiner phrase where the production of the assignment of gender as marked on definite determiners and attributive adjectival inflection was examined.

These structures constitute a good test case for studying the relationships between SLI and L2 acquisition since it is already known that acquisition can take some time. Morphology, in general, is known to be a vulnerable area in SLI. This has already been shown for verb inflection in Dutch SLI (e.g., Bol and Kuiken 1988; De Jong 1999) and Dutch L2-SLI (Steenge 2006). Verb placement, on the other hand, seems to be relatively spared in Dutch SLI (e.g., De Jong 1999; Bastiaanse and Bol 2001). Adjectives and determiners, on the other hand, have been shown to be particularly difficult in L2 acquisition (e.g., Blom, Poliřenská, and Weerman 2008b; Cornips and Hulk 2008; Unsworth 2008 for determiners, and e.g., Weerman 2002; Cornips et al. 2006; Weerman et al. 2006; Blom et al. 2007 for adjectives). Additionally, age-dependencies have been found in some of these structures resulting in the production of different error types in adult L2 acquisition (e.g., Cornips, Van der Hoek, and Verwer 2006; Weerman, Bisschop, and Punt 2006; Blom, Poliřenská, and Weerman 2007; Blom 2008). Qualitative and quantitative differences are thus to be expected.

1.4 Practical value of this study

As well as having a theoretical, linguistic goal, this cross-group comparison also has a more clinical purpose. This thesis is one of the first attempts to systematically tease apart the effects of SLI and L2 in L2-SLI acquisition. As such, it contributes to the diagnostic dilemma whether problems in L2-SLI acquisition are due to SLI or typical L2 delay. This dilemma originates from the lack of clinical assessment tools for children growing up in a multilingual context. Especially with respect to minority languages, only little is known about the acquisitional processes in typical and atypical acquisition. As a consequence, it is quite common that L2 children are diagnosed with SLI on the basis of their L2 performance, potentially leading to two types of misdiagnoses. *Mistaken identity* (e.g., Cummins 1984, 2000; Genesee, Paradis, and Crago 2004), on the one hand, refers to an L2 child that has wrongly been placed in special education on the basis of low performance scores in the L2. *Missed identity* (e.g., Roseberry-McKibbin 1995; Crutchley, Conti-Ramsden, and Botting 1997; Genesee, Paradis, and Crago 2004), on the other hand, refers to a misdiagnosis where problems of an L2-SLI child have been overlooked ('missed'), poor or slow performance in the L2 having been interpreted as a natural consequence of L2 development.

The outcomes of the present study should contribute to the search for diag-

nostic markers of SLI, L2 and L2-SLI acquisition when acquiring Dutch grammar. By determining the severity of the combined effects of SLI and L2 in language acquisition, this study also adds to the discussion of whether or not a language-impaired child should be exposed to an L2. This discussion is fuelled by the questionable claim that acquiring an L2 puts an additional burden on the language-impaired child.

1.5 How the book is organized

This book is organized into eight chapters: Chapter 2 provides the context for the remaining chapters. It introduces the concepts of SLI, early and late L2 and L2-SLI acquisition as used in the present study. It further discusses the current state of language-specific characteristics in each of these groups on the basis of empirical evidence and theoretical accounts. This discussion results in a number of expectations related to the theories discussed.

The following three chapters provide the background to the experiments conducted in this thesis on impaired and unimpaired Turkish-Dutch L2 and Dutch L1 acquisition. Chapter 3 and Chapter 4 focus on the linguistic structures (variables) under investigation: finite verb inflection and verb placement in Chapter 3, and attributive adjectival inflection and gender assignment as marked on definite determiners in Chapter 4. These chapters first provide the reader with a linguistic description of each structure, followed by a review of the relevant research carried out on the different learner groups. Both chapters conclude by presenting the expectations as to the relationship between SLI and L2 acquisition per research variable. Chapter 5, then, details the experimental design used and addresses the problems in the selection and matching of the participants.

Chapter 6 presents and discusses the results on verb placement and verb inflection and Chapter 7 for adjectival inflection and gender assignment. The results are tested against the predictions made about the relationships between SLI and L2 acquisition formulated in Chapters 2, 3 and 4, respectively. Finally, Chapter 8 brings all these findings together: First, the outcomes of both variables are related and discussed in theoretical, linguistic terms before relating them to the clinical practice. The chapter ends with some implications for future research.

Setting the scene: SLI and L2

2.1 Introduction

The goal of this thesis is to gain more understanding as to how SLI in L2 acquisition affects the development of morpho-syntactic properties of Dutch in a population of Turkish L2-SLI children resident in the Netherlands. This chapter is used to make the scope of this thesis more explicit to the reader by, firstly, defining the concepts of SLI (§2.2), child L2 and adult L2 acquisition (§2.3) and child L2-SLI acquisition (§2.4) and clarifying their relevance in this study. Secondly, the theoretical background is discussed resulting in predictions for potential relationships between SLI and L2 acquisition (§2.4.3).

2.2 Understanding SLI

This section familiarizes the reader with the concept of SLI. §2.2.1 starts with a description of the defining aspects of SLI followed by some notes on subtypes and linguistic profiles in SLI. In §2.2.2, an overview is given of empirical evidence comparing typical child L1 and child L1-SLI acquisition across languages. The main characteristics of SLI are described focusing on verb and noun morphology, as these domains constitute the heart of investigation in the present study. Proposals made to explain these findings in the context of cross-linguistic research on SLI are then reviewed in §2.2.3. This section ends with a summary.

2.2.1 What is SLI?

Traditionally, SLI is seen as a primary language disorder. It affects child language in approximately 5-7% of the general English-speaking US population (Tomblin, Records, Buckwalter, and Zhang et al. 1997; Leonard 1998). In the Netherlands, the number of children attending special schools for speech and language impairments amounts to almost 4% of Dutch primary school children

(see the website of the *Centraal Bureau voor de Statistiek* (Statistics Netherlands: www.cbs.nl)). Not all children that have a language-impairment attend special schools, however. The percentage of children with SLI is therefore probably higher (e.g., De Koning et al. 2004; Van Agt and De Koning 2006).¹ SLI is usually defined in terms of exclusionary criteria determined by medical and paramedical assessment (see Leonard 1998, for a detailed description of each criterion). These criteria are internationally accepted and are further detailed in Table 2.1.

Factor	Criterion
Language ability	Language test scores of -1.25 standard deviations or lower
Nonverbal IQ	Performance IQ of higher than 85
Hearing	Pass screening at conventional levels
Otitis media with effusion	No recent episodes
Neurological dysfunction	No signs or treatment of seizure disorders, cerebral palsy, brain lesions
Oral structure	No structural anomalies
Oral motor function	Pass screening using developmentally appropriate items
Physical and social interaction	No autism or autism spectrum disorders, which surfaces in social interaction or activities

Table 2.1: Criteria for SLI (adapted version of Leonard 1998: 10)

Children with SLI seem to develop normally except that they show significant limitations in language ability. This apparent language-specificity, also indicated by the term ‘specific’, raises important issues about the causes of the impairment, and the representation and acquisition of language.

There is a clear indication that SLI has a genetic component as shown in heritability studies such as family evaluations (e.g., Tallal, Ross, and Curtiss 1989; Tomblin 1989; Whitehurst, Arnold, Smith, and Fischel 1991), series of twin studies (e.g., Bishop, North, and Donlan 1995; Tomblin and Buckwalter 1998; Bishop, Adams, and Norbury 2006), and the identification of a chromosome that co-segregates with SLI (e.g., Fisher, Vargha-Kadhem, Watkins, and Monaco et al. 1998; Lai, Fisher, Hurst, and Vargha-Khadem et al. 2001; Vernes, Newbury, Abrahams, and Winchester et al. 2008). Additionally, SLI is more likely to be present in males than in females; the ratio is more than 2:1 (e.g., Tomblin et al. 1997; Leonard 1998).

Although SLI is defined as a primary language disorder, there is evidence that at least some children with SLI exhibit other types of limitations that go

¹While SLI is known to be a disorder that persists throughout childhood, relatively little is known yet about its effects in adolescents and adults. The few existing studies (e.g., Bishop and Edmundson 1987; Johnson, Beitchman, Young, and Escobar et al. 1999; Wetherell, Botting, and Conti-Ramsden 2007; Conti-Ramsden and Botting 2008; Miller, Leonard, and Finneran 2008) suggest that the consequences of this disorder can typically be found beyond child age, and often negatively affect educational outcomes. However, future research has to reveal the exact linguistic characteristics.

beyond the scope of language. These include, for instance, problems with working memory (e.g., Gathercole and Baddeley 1990; Montgomery 1995; Weismer and Evans 1999; Archibald and Gathercole 2006) and other general cognitive processes involving executive functioning (e.g., Windsor and Kohnert 2009 for an overview). Children with SLI are also known to have a relative high incidence of dyslexia and other more global writing and reading disabilities (e.g., Tager-Flusberg and Cooper 1999; Bishop and Snowling 2004). Since the diagnostic relevance of such other problems for SLI is still debated at this point in time, a more precise definition than the eight exclusion criteria in Table 2.1 cannot be formulated.²

It is widely recognized that children with SLI form a heterogeneous group with a wide range of profiles of language deficits. These can involve one or more linguistic domains such as phonology, morphosyntax, syntax, semantics and pragmatics. However, there is not yet agreement on the characteristics of SLI, even within one language, that could function as a well-defined set of inclusionary criteria in the expressive and receptive language abilities of these children.

There have been various attempts at further subclassification of SLI (e.g., Rapin and Allen 1983; Conti-Ramsden, Crutchley, and Botting 1997; Bishop 1998).³ One main distinction has been to separate deficits in morphosyntax and phonology from those in semantics and pragmatics, although this distinction is quite crude; for a more comprehensive overview, the reader is referred to Leonard (1998) and Schwartz (2009).

Scholars agree that morphosyntactic errors in language production (i.e., problems with free and bound morphemes in verb and noun morphology and related areas) comprise the most prevalent form (or subtype) of SLI. In fact, this subtype has been the most extensively studied in SLI research across languages (see §2.2.2). Because of its prevalence, this subtype has commonly been labeled ‘typical’ SLI (Bishop 2004) in the literature.⁴ Deficits of that type may be accompanied by phonological or praxic symptoms, whereas semantic and pragmatic skills are relatively spared (e.g., Leonard 1998; Bishop 2004).

Some researchers also report on deficits predominantly found in syntactic relations. For instance, Van der Lely (1998, 2004) identifies a group of grammatical SLI (G-SLI) children in English who have, in particular, difficulties with relative clauses or WH-questions. To date, there is, however, only a relatively small number of English children being researched that seem to fit this specific grammatical subtype. There is as yet only little evidence from other languages for the existence of G-SLI. Much more research is needed here.

Children with SLI whose impairments are primarily pragmatic have been

²With the help of more advanced neurocognitive techniques, there is a continuing search to refine the characteristics of SLI by determining the specific cognitive and linguistic implications of anatomical and functional differences between children with SLI and their typically developing peers (e.g., Shafer and Maxfield 2009; Tropper and Schwartz 2009 for a review).

³Official classifications with linguistic profiles of SLI can also be found on the websites of the DMV-IV (American Psychiatric Association) and the World Health Organization.

⁴Other labels given to this subgroup are the ‘phonological-syntactic’ type (Rapin and Allen 1983) or the ‘classic’ type (Hynes and Naidoo 1991).

identified as ‘semantic-pragmatic’ type (e.g., Conti-Ramsden et al. 1997; Bishop 2000b, 2003). Main characteristics of that type are, among many others, word finding difficulties, limitations in comprehension of figurative language and extended discourse, poor use of conversation context, irrelevant utterances and atypical social behavior. These symptoms are also found in autism spectrum disorders so that on the basis of the exclusion criteria in Table 2.1, such children could be excluded from research on SLI. There is a blurred boundary between the semantic-pragmatic type and children with autism spectrum disorders. Some researchers argue that some of the SLI children should be grouped within autism spectrum disorders (e.g., Bishop and Norbury 2002; Bishop 2003; Tager-Flusberg 2004).

The focus of the present study is on typical SLI as this type seems to be the most consistent indicator for this language impairment. The systematic investigation of morphosyntactic abilities, seen as a core symptom in SLI, should help to tease apart the effects of SLI when compared to typical L1 and L2 acquisition.⁵ Another advantage of investigating typical SLI is that the large body of research on morphosyntactic acquisition in SLI makes it possible to compare the outcomes of the present study with previous studies.

2.2.2 Effects of SLI

As pointed out earlier, the extensive body of research on typical SLI in comparison to unimpaired chronological age peers and language age peers has shown that morphosyntax is a problematic area in typical SLI across languages (e.g., Leonard 1998; Fletcher 1999; Leonard 2000, 2009 for overviews). Specifically the SLI children have problems with morphosyntactic relations of sentence components as expressed in word order and clausal relations, and grammatical morphemes, such as gender, number, person, tense and case. Grammatical morphemes are the focus in the present study (see §1.3).

Children with SLI use fewer grammatical morphemes in obligatory contexts, and they frequently omit and/or substitute tense-marking morphemes, agreement morphemes and other functional elements, such as auxiliaries, copula, determiners (Leonard 2000: 125,126). The degree to which difficulties occur with grammatical morphemes may vary across languages resulting in language-specific profiles. That deficits in grammar vary per language has implications for the present study where two typologically different languages are being acquired by the same (SLI) child as set out in Chapter 1. The L1 of these children, Turkish, is a pro-drop (or null-subject) language and has a rich agglutinating inflectional system in contrast to Dutch, the L2, which is a non pro-drop language with a sparse inflectional system compared to Turkish. Symptoms in both

⁵There is, however, one caveat to be made about typical SLI. As previously discussed, phonological deficits (e.g., problems with phonological perception and awareness) as being a potential characteristic of typical SLI may also be an indicator of other disorders, such as dyslexia or other reading and writing disabilities (e.g., Catts, Adlof, Hogan, and Weismer 2005; Shaywitz, Gruen, Mody, and Shaywitz 2009). I will come back to that issue in Chapter 5.

languages may be different due to the typological differences.

Such typological differences are reflected in the types of errors occurring in tense and agreement marking in verb inflection: Omission of finiteness (i.e., tense and/or agreement) markers tends to be the predominant error in Germanic languages, whereas substitution errors are prominent in pro-drop languages (see Table 2.2).^{6,7}

Germanic languages			
Language	Incorrect form	Correct form	Omission of
English	*he play	he plays	3SG marker: <i>-s</i>
Dutch	*ouders kom aan 'parents arrive'	ouders komen aan	3PL marker: <i>-en</i>
Swedish	*klippa 'to cut'	klipper 'he/she cuts'	3SG marker: <i>-er</i>
Pro-drop languages			
Language	Incorrect form	Correct form	Substitution of
Hebrew	*hitgalsha 'she slid'	hitgalesh 'he slid'	3SG masculine marker
Hungarian	*tegnap ti fésülted 'yesterday you.2PL were combing.PAST.DEF.2SG'	tegnap ti fésültétek combing.PAST.DEF.2PL	2PL marker: <i>-tétek</i>
Italian	*dorme 'he/she sleeps'	dormono 'zij slapen'	3PL marker: <i>-ono</i>

Table 2.2: Error types in verb inflection in various Germanic languages and pro-drop languages (adapted version of Leonard 2000: 120)

Omission errors have been observed in pro-drop languages, however. For instance, Chilla and Babur (to appear) showed that four-to-six-year old bilingual Turkish-German children with SLI occasionally omit agreement markers and tense-aspect and modality markers in their spontaneous speech. Similar observations were made in a case study on typical child L1 development in Turkish by Aksu-Koç and Ketrez (2003), suggesting that children with rich inflectional systems pass through a very early stage (Aksu-Koç and Ketrez 2003) where morphemes are omitted. In the same vein, occasional occurrences of substitutions have been found in children learning Germanic languages, such as Dutch (De Jong 1999) and German (e.g., Clahsen 1991; Clahsen and Stoessel-Deschner 1993; Clahsen, Bartke, and Göllner 1997).

The language-specific errors in Table 2.2 have been subject to different interpretations. Substitution errors in pro-drop languages have been interpreted

⁶When focussing on tense and agreement marking, I will mainly consider examples with present tense inflections as these are also part of the examination of the present study (see §6.3.2).

⁷The examples on English, Hebrew, Hungarian, Italian and Swedish come from collaborative work by e.g. Leonard, Eyer, Bedore, and Grela (1997); Dromi, Leonard, Adam, and Zadunaisky-Ehrlich (1999); Bedore and Leonard (2001); Leonard, Hansson, Nettleblatt, and Deevy (2005) and Lukács, Leonard, Kas, and Pléh (2008). The examples for Dutch SLI are taken from De Jong (1999).

as near-miss errors (Leonard 2000) meaning that substitutions differ from the appropriate inflections by only one feature. If, for instance, an error is made in Italian or Hungarian in the 3PL or 2PL context, respectively, as shown in Table 2.2, it is most likely to be replaced by the singular form. In Hebrew, it is the gender feature that is replaced. In Germanic languages, on the other hand, omissions result in bare forms. This is in Dutch identical to the 1SG form. In this case, an omission error could also be seen as a substitution error: the 3PL marker is replaced by the 1SG form. In English SLI, the production of the bare form (*play* for *plays*) is a well-known error. Some researchers (e.g., Rice, Wexler, and Cleave 1995; Rice and Wexler 1996a,b; Rice, Wexler, and Hershberger 1998) have, however, interpreted this error as a selection of the infinitival (nonfinite) form and, hence, omission of tense and/of agreement marking.⁸ Support for that interpretation comes from Swedish where the infinitival form, carrying inflection (see *klippa* in Table 2.2), is used as a substitute by SLI children.

The omission of finiteness marking has been characterized by some scholars (e.g., Rice et al. 1995) as an extension of the Optional Infinitive (OI) stage representing an early stage in typical language development where children appear to use main clauses without a finite verb (see Chapter 3 for further details). Constructions of that kind are termed ‘optional’ or root infinitives (henceforth RIs). Examples of RIs are given in (1) in various languages. Note that these examples have been produced by children before the age of three.

- (1) a. He bite me
 He bite.INF me
 ‘He is biting me.’ (English, Harris and Wexler 1996)
- b. Papa schoenen wassen
 Daddy shoes wash.INF
 ‘Daddy is washing shoes.’ (Dutch, Verrips and Wijnen 1998)
- c. Ich der Fos haben
 I the frog have.INF
 ‘I have a frog.’ (German, Poeppel and Wexler 1993)

Children with SLI acquiring Germanic languages like English, Dutch, Swedish, German and Norwegian have been frequently reported to produce constructions as in (1) (e.g., for Dutch: e.g., De Jong 1999; Wexler et al. 2004; for English: e.g., Rice et al. 1995; Rice and Wexler 1996a,b; for German: e.g., Rice, Noll, and Grimm 1997; Roberts and Leonard 1997; for Norwegian: Meyer Bjerkan 1999, and for Swedish: Hansson 1997; Håkansson 1998).⁹ The difference between SLI and typical acquisition is only the age at which children stop producing RIs: unimpaired children are said to have left the OI stage by around the age of three (Blom 2003), whereas some SLI children have been observed to still be in the RI stage at age 8 (e.g., Rice et al. 1998; Wexler et al. 2004). Because of the

⁸Whether tense and/or agreement markers are assumed to be omitted depends on the theoretical account being applied as will be shown in §2.2.3.

⁹There are mixed results about an (E)OI stage in pro-drop languages (see Paradis and Crago 2001; Leonard 2009 for a discussion).

prolonged time-period of producing RIs, SLI children are claimed to show an extended (E) OI stage.

Cross-linguistic comparisons have revealed that morphological richness or sparseness not only affects the quality but also the quantity of errors. More specifically, verb inflection is, overall, more vulnerable in Germanic languages causing higher error rates than in pro-drop languages. In Table 2.3, the percentage accuracy scores on 3SG present tense inflections in SLI vary between English, German, Hebrew, and Italian at the same MLU level.¹⁰

Contexts	English	German	Italian	Hebrew
3SG	21	53	94	–
SG masculine				93
SG feminine				88

Table 2.3: Percentage accuracy in 3SG present tense contexts by children with SLI in English, German, Italian and Hebrew with a similar MLU range (in words): 3.02–3.77 and similar age range: 4;9–5;2 (Leonard 2000: 121)

The Italian- and Hebrew-speaking SLI children perform as proficiently as their younger unimpaired peers at the same MLU in 3SG agreement marking. In contrast, SLI children acquiring morphologically more sparse languages (here English and German) perform far below their (younger) unimpaired controls (see Leonard 2000 for details). The relatively high accuracy rates in Italian and Hebrew in Table 2.3 suggest that difficulties in verb morphology are not always a good indicator for SLI in pro-drop languages. A more detailed look at a diverse set of inflections revealed, however, that problems do arise in pro-drop languages, if the inflections themselves reflect a complex combination of grammatical features such as tense, number, person and gender. In other words, the more features a child has to deal with at the same time, the lower the accuracy rates in certain inflectional contexts. Leonard (2000: 122) proposed that rich inflection becomes a cognitive burden when four different dimensions of features must be considered simultaneously. Hebrew-speaking SLI children (e.g., Dromi et al. 1999), for instance, score rather low in past tense inflections, where some paradigms require a distinction for tense, number, person and gender. Leonard’s proposal received support from a recent study on tense and agreement morphology in Hungarian SLI (Lukács et al. 2008; Lukács p.c.), where children had to simultaneously distinguish between tense, person, number and definiteness. Hungarian children with SLI scored 90% accurately in an experimental setting eliciting 3SG present tense indefinite and definite contexts, whereas past tense inflections turned out to be more difficult in both the 3SG indefinite contexts (79.3%) and the 3SG definite contexts (78.3%).

¹⁰The data on English, Hebrew and Italian come from a collaborative work by Bortolini, Caselli, and Leonard (1997); Leonard, Eyer, Bedore, and Grela (1997); Dromi, Leonard, Adam, and Zadunaisky-Ehrlich (1999); the German data come from Roberts and Leonard (1997) and are taken from the Clahsen and Rothweiler (1992)-Corpus. These data come from children with similar MLUs in words and a similar research design.

Although agreement and tense morphology have been shown to be particularly vulnerable in SLI children acquiring Germanic languages, English-speaking SLI children have even more difficulties than German-, and Dutch-speaking children with SLI (Roberts and Leonard 1997; Leonard and Deevy 2006) or Swedish-speaking children with SLI (Leonard et al. 2005). In all these studies, children were matched for age and overall severity of the language disorder. A plausible explanation lies possibly in morphological richness: English has fewer inflections than the other three languages (see §2.2.3).

Although there is typological variation, deficits in verb agreement are core symptoms in SLI across languages. The status of noun agreement is less clear. Research involving noun agreement and related areas is limited compared to the amount of research on verb morphology. Since verb agreement has been shown to be vulnerable in SLI, certain areas in noun morphology are also expected to be affected such as gender marking on determiners and adjectives, the two related areas that will be examined in the present study.

Crosslinguistic evidence indicates that gender as marked on determiners is vulnerable in SLI. In comparison to unimpaired age controls and younger unimpaired controls, SLI children have been shown to produce higher error rates with determiners in, for instance, German (e.g., Clahsen 1989, 1992; Roberts and Leonard 1997), Italian (e.g., Leonard et al. 1992a; Bortolini et al. 1997), Spanish (e.g., Restrepo and Gutiérrez-Clellen 2001) and Swedish (e.g., Leonard et al. 2001; Hansson et al. 2003). The predominant errors are determiner omissions, the use of gender-neutral determiners such as, in German, *de* ‘the’ for the definite form instead of *der*, *die* or *das* and *ein* ‘a’ for all indefinite determiners (Clahsen 1992: 12). An alternative error was the substitution of the definite determiner. An example from German would be the incorrect application of feminine gender to the German masculine noun *Stuhl* ‘chair’: **die Stuhl* ‘the chair-feminine instead of *der Stuhl* ‘the chair-masculine (Clahsen 1989: 904). Notably, such errors represent an earlier stage of typical L1 acquisition (see e.g., Mills 1986 for German).

The empirical facts on adjective-noun agreement are less conclusive though. Observations from German-speaking SLI (e.g., Clahsen 1992, for an overview) and Swedish-speaking SLI children (Leonard et al. 2001; Hansson et al. 2003), for instance, reveal clear difficulties with adjectival inflection. As was the case in verb agreement, omissions of inflectional markers on the adjective seem to be the predominant error. Research on morphologically rich languages, on the other hand, has produced conflicting results. For instance, Bedore and Leonard (2001) and Bedore and Leonard (2005) claim that noun-adjective agreement is a particularly vulnerable area in Spanish-speaking SLI children, whereas Grinstead and Cantú-Sánchez (2004) found barely any problems in this area, the children scoring higher than 90%. Studies by Roberts and Leonard (1990) and Leonard et al. (1992a) reveal no major problems in adjective-noun agreement in Hebrew-speaking and Italian-speaking children with SLI, respectively. The tested children performed at the same level as age-matched controls, with errors involving mainly substitution.

It is not entirely clear what these data imply. The high error frequencies with

determiners point to difficulties with gender marking in SLI. On the other hand, adjective-noun agreement seems to pose barely any problems in rich inflectional languages.

In conclusion, it emerges from cross-linguistic studies of the production of grammatical morphemes that these are not equally affected per language in qualitative as well as in quantitative terms. There is an association with language type in verb agreement, but the results from noun agreement are not clear. These two areas will be studied here for Dutch.

2.2.3 Accounts of SLI

On the basis of evidence discussed in the previous section, much research is directed at the question of why children with SLI are typically less successful in the acquisition of grammatical morphemes than their peers. As already briefly discussed in Chapter 1, there are two main explanations discussed in the literature: (i) representational accounts claiming that SLI is the result of missing or deficient knowledge in the underlying representation of grammar itself and (ii) processing accounts claiming that SLI is the result of reduced capacities in the processes involved in the perception and intake of the linguistic input that is needed to derive grammatical knowledge.

One of the crucial differences between the two approaches concerns the resources children with SLI may or may not rely on in order to build up grammatical systems. On the basis of the assumption that the locus of the deficit in SLI is in the representation of linguistic knowledge (some form of deficit in UG), the resources to construct grammar should be different from typical child acquisition. In contrast, within the processing accounts, the ability to access UG is, in principle, intact but reduced intake capacities are claimed to cause the problems in constructing grammar. The following section reviews accounts within both explanations to SLI to create the theoretical background.

Representational accounts all basically have the same underlying idea that SLI constitutes a modular deficit. These are based on Chomskyan theory of generative grammar. Researchers have employed concepts and notions from the various versions of Chomskyan theory (Chomsky 1957, 1965, 1981, 1995, 2000) in their study of SLI to capture the various difficulties these children experience in morphosyntax. Relevant concepts and notions from this theory will therefore briefly be mentioned, but for more detailed background information, the reader is referred to one of the many introductions of Chomsky's work (e.g., Haegeman 1991; Radford 2004).

The representational accounts all have in common that there is some sort of impairment in components of the innate language faculty. They differ, however, as to the range of impairments they aim to cover. Some accounts have attempted to identify specific linguistic markers of SLI, whereas others have aimed to provide a complete grammatical characterization of a relatively broad class of impairments in the underlying syntactic representations of individuals with SLI.

The *Agreement Deficit (AD) Account* (e.g., Clahsen 1989, 1991, 1992; Clahsen et al. 1997; Clahsen 2008) is one of the most explicit representational accounts addressing deficits in agreement, as indicated by its name.¹¹ This account has been modified over the years and I will briefly outline its basic assumptions and describe the most notable changes.

The earliest version of AD (Clahsen 1989, 1991, 1992) was called *Missing Agreement Account* and offered an explanation for a relatively broad range of morphosyntactic difficulties (e.g., subject-verb agreement, object-verb agreement, finite auxiliary forms, gender and number agreement on determiners and adjectives, structural case marking and the like) in SLI children. The claim was that the Control-Agreement Principle (Gazdar, Klein, Pullum, and Sag 1985) is impaired.¹²

In a later version, then called AD account, Clahsen et al. (1997) redefined the difficulty in SLI as a problem with ‘uninterpretable features’ in the sense of Chomsky’s (1995) theory of formal features.¹³ Agreement features of verbs (and adjectives) are a case in point as they form a natural class in Chomsky’s system of formal features (Clahsen 2008: 176). Since the features are uninterpretable, they need to be checked against the interpretable feature of the noun phrase. In contrast, problems with interpretable feature such as tense or gender should be fewer.

In his latest version of the AD account, Clahsen (2008) assumes that abstract (computational) knowledge of agreement is not completely absent in children with SLI. Rather, he posits that SLI can be described in terms of an impairment of agreement that affects the lexicon in such a way that the morphological paradigm of subject-verb agreement is not completely acquired. As a consequence, features on verbs taken from the lexicon are not always fully specified. On the basis of this assumption, productions of non-finite forms or incorrect agreement markings are to be expected (Clahsen 2008: 177).

Clahsen’s AD account is, overall, consistent with the major difficulties found with verb agreement in various Germanic languages, whereas it is less applicable in pro-drop languages where these errors are much less apparent (see §2.2.2). Furthermore, the AD account explicitly predicts verb agreement errors and fails

¹¹Clahsen’s account was inspired by the ideas of Gopnik (Gopnik 1990a,b; Gopnik and Crago 1991). In one of the earliest linguistic proposals to SLI, Gopnik argued that agreement deficits can be accounted for by *feature blindness*, which is caused by a genetically-based deficit in the linguistic mechanisms for constructing morphological inflections. As such, the ability to use grammatical features, such as number, person, tense and aspect is assumed to be absent.

¹²Although covering a broad range of problems in SLI, the impairment is selective in nature. The Control Agreement Principle, which establishes an asymmetrical relationship between two categories (one of the categories is the functor, while the other one is an argument controlling the functor) is claimed to be selectively impaired in SLI grammar, causing the problems in agreement but not tense (Clahsen 1992: 6). This claim was tested by comparing results on agreement marking and tense marking in the same German and English SLI children.

¹³In the formal feature theory, Chomsky distinguishes between interpretable features and uninterpretable ones. Interpretable features are relevant for semantic interpretation, whereas uninterpretable features are not. Uninterpretable features play, however, a role in syntactic operations.

therefore to cover for the variety of symptoms found in other functional domains. With his latest proposal, however, Clahsen (2008: 176) did not intend to provide a complete characterization of the wide range of grammatical difficulties in SLI that have been found by other researchers (see §2.2.2).

With the *Representational Deficit of Dependency Relations (RDDR)*, Van der Lely (1996, 1998) focuses on a particular group of children with SLI, namely Grammatical-SLI (G-SLI) children. She assumes that the language difficulties in that particular subgroup of SLI children stems from deficits in the computational syntactic system. More specifically, these children are assumed to have grammars in which movement is optional rather than obligatory due to a selective impairment in establishing the structural relationship between dependent constituents. Accordingly, these children often fail to move constituents to the correct syntactic domain for checking purposes, resulting in apparently optional phonological realizations of morphosyntactic markers.

More recently, Van der Lely (2004, 2005) has reformulated and expanded the RDDR account as a deficit in *Computational Grammatical Complexity (CGC)* covering a wide range of symptoms affecting the comprehension and production of all elements that mark syntactic dependency involved in syntax, morphology, and phonology (i.e., most morphological markings such as tense, case, agreement, number etc, and, unlike Clahsen's earliest account, movement). Support for her claim comes from her own work on English G-SLI involving a series of comprehension and production studies. It is suggested that these G-SLI children have deviant grammars and never reach the target state with respect to the implementation of morphosyntactic rules. Van der Lely's makes an interesting claim to account for a wide range of grammatical difficulties in a specific subgroup of SLI. In order to substantiate this claim and its generalizability, the CGC hypothesis should preferably be tested in SLI children acquiring various languages and not only English.

The *Extended Optional Infinitive (EOI) Account* (e.g., Rice et al. 1995; Rice and Wexler 1996a,b) addresses optionality. As already mentioned in §2.2.2, Rice and colleagues claim that the developmental stage, during which obligatory marking of tense (finiteness) is not yet apparent - but optional - in typical L1 acquisition, lasts longer or is 'extended' in SLI. These children have a problem with tense marking, not agreement. More specifically, Rice and colleagues stated that the absence of surface tense markers can be attributed to the non-occurrence of the functional category tense in a given derivation, which explains the optional character of missing tense marking alongside the production of correct forms. Initial evidence for their claim is based on studies in English showing, on the one hand, frequent omissions of the 3SG *-s* in the present tense and, on the other hand, the absence of overgeneralization of *-s* in overtly nonfinite contexts (e.g., 3PL in the present tense).

The account was later revised into the *Agreement Tense Omission Model (ATOM)* claiming that tense and agreement features are expressed optionally due to the immature grammar (i.e., Extended Universal Checking constraint (EUCC); Wexler, Schütze, and Rice 1998) of the SLI children: Wexler et al. (1998) assume that feature checking is a required linguistic operation in order

to be able to correctly produce functional elements. Following the EUCC (and ATOM), children with SLI pass through an extended period in which they are limited in their ability to check features within a single functional category. Agreement and/or tense features are a case in point. This limitation has been used to explain the persistent and prolonged use of RIs in SLI. In addition, ATOM allows agreement errors under very limited conditions (see Wexler et al. 2004, for details), whereas the EOI account does not.

Given the maturational basis of both accounts, an SLI child's grammar is actually expected to be very similar to that of unimpaired children – rules are in place and intact – with the exception of extended developmental stages and, hence, delay. Wexler et al. (2004) point out, though, that it is questionable whether all children with SLI will ever leave the EOI stage given the persistence of certain errors, i.e., nonfinite spell-outs, seen in older children.

As illustrated in §2.2.2, support for both accounts comes from several Germanic languages reporting on higher rates of RIs in SLI than in younger unimpaired controls. Nevertheless, both accounts have certain limitations. First, the EOI account predicts accuracy with agreement marking and problems with tense marking, a claim that cannot clearly be substantiated by crosslinguistic evidence. For instance, in German and Greek, tense and agreement marking can be separated, unlike English. Studies of SLI in German and Greek showed tense marking to be almost error-free in children with SLI, whereas the same children produced significantly higher error rates in subject-verb agreement (e.g., Clahsen et al. 1997; Clahsen and Dalalakis 1999). Crucially, agreement errors should be absent according to the EOI account. Although agreement errors are allowed within ATOM (Wexler et al. 2004), no prediction is made as to their quantity making it difficult to falsify this hypothesis. Second, I explored the Bol and Kuiken-Corpus (Bol and Kuiken 1988) on Dutch SLI used in the study of Wexler et al. (2004). A closer look at these data revealed that only a subset of Dutch SLI children was responsible for a substantial amount of the productions of all RIs documented.¹⁴ This brings the generalizability of the account into question.

The *Procedural Deficit (PD) Account* proposed by Ullman and Pierpont (2005) has a different basis. At first sight, this account seems to be remarkably different from the accounts to SLI discussed thus far. Rather than assuming that differences between SLI and typical L1 acquisition are based on a deficiency in grammatical representation, the PD account is founded on the *Declarative/Procedural (DP) model* by Ullman (2001a,b). This model describes the mental routes for accessing and retrieving grammatical knowledge, focussing on the application rather than representation of linguistic knowledge. Two associated but different types of linguistic knowledge are crucial in the DP model: on the one hand, knowledge that is being applied attentively and consciously, and, on the other hand, knowledge that is being applied automatically and unconsciously. This distinction is referred to as declarative versus procedural knowledge, respectively (e.g., Ullman 2001a,b). With respect to linguistic functions,

¹⁴See <http://childes.psy.cmu.edu/data/Clinical/BolKuiken/> for a closer look at these data.

the declarative system is involved in lexical storage and encompasses explicit and (some) implicit knowledge, and the procedural system underlies rule-governed (hierarchical) computations, such as grammatical morphology and relies on implicit knowledge only.

As pointed out before, the DP model aims to address the processes involved in language rather than linguistic representation itself. Accordingly, it is unclear how the two memory systems in the DP model may exactly be related to grammatical theory. Following, however, Ullman and Pierpont's (2005), the procedural system is deficient in SLI. Since in this view the underlying grammar of these children can be interpreted as not being intact, it can, in principle, be related to the idea of a representational deficit in SLI.¹⁵ Following this line of thinking, the consequence of having a deficit in the procedural system is that it affects aspects of language typically generated by rules. In contrast, the declarative system is largely unaffected in SLI. Since children with SLI are only able to rely on declarative knowledge, storage of certain grammatical forms and chunks are the only way to compensate for the deficiency of the procedural system. Hence, severe shortcomings may be expected with those grammatical domains where rule learning is required such as in agreement inflection.

Numerous researchers have suggested that SLI is the result of deficits in basic cognitive and perceptual processes essential for learning and producing language as well as for certain other cognitive operations. These deficits are usually summarized as process-based deficits or limitations in processing capacity.¹⁶ Processing accounts are usually not formulated in terms of modularity and, crucially, the underlying representation of grammar is, in principle, assumed to be intact. They thus contrast with the previously discussed representational accounts.

Limited processing capacity has been made specific in terms of (i) a restriction on the size of computational memory, (ii) insufficient energy to complete a cognitive task, and (iii) a limitation in the rate at which information is processed and perceived (Kail and Salthouse 1994). These aspects are not mutually exclusive and overlap to a certain extent. The present study will not explore these individual aspects of processing limitations (see Miller et al. 2001; Leonard et al. 2007; Windsor and Kohnert 2009 for an overview), but will treat them as a whole.

Leonard and colleagues developed two related accounts, the *Surface Account (SA)* and *Morphological Richness (MR) Account*, that specifically address problems in acquiring inflectional morphology. With the SA, Leonard (1989) emphasizes the auditory perceptual aspects of processing capacities by assuming that problems in SLI are the result of neglecting less salient information from the input language in combination with the processing demands required to de-

¹⁵The PD account has also been used to explain deficits in other language-impaired populations (e.g., agrammatic aphasia, Parkinson's disease) (Ullman and Pierpont 2005).

¹⁶Limitations in speech perception are usually treated separately from general processing limitations (e.g., working memory, processing speed, general auditory perception, etc.), as they are specific to language. Despite that distinction, they are all classified as limitation in processing capacity.

rive grammatical representation. Depending on the language that is acquired, input may consist of strong and/or weak surface characteristics (e.g., frequency, (non-)syllabicity, duration of syllables/ morphemes). Appropriate perception and processing of these elements is necessary to acquire the target grammar. A language with more weak surface characteristics slows down acquisition more than a language with strong surface characteristics. An unstable grammatical representation in SLI children is then seen as the result of poor perception and processing ability of these ‘weak’ characteristics. Much more frequent exposure to these weak elements is assumed to be required to incorporate them into their grammar (Leonard 1998: 252). Evidence for the SA comes from systematic comparisons between languages where morphosyntactic markers vary in phonetic substance; the morphemes examined are grammatically similar. Take, for instance, the 3SG present tense marker *-s* in English, which is non-syllabic and lacks stress. A correct agreement marking on the verb (*he*) *walks*.3SG can only be accomplished by simultaneously perceiving and morphologically processing the morpheme *-s*. The dual nature of that process is assumed to be very demanding for an SLI child resulting in prolonged omission of that morphological marker. On the other hand, verb agreement markers in pro-drop languages (e.g., *caminamos* ‘we walk.1PL’ in Spanish) are usually longer, stressed and may constitute an entire syllable. These are the cues that speed up language acquisition. Apart from the crosslinguistic implications of the SA, the account also allows for language-specific predictions. English children with SLI have, for instance, more difficulties with the 3SG agreement *-s* on the verb than with plural *-s* on the noun (e.g., Leonard et al. 1992b; Oetting and Rice 1993). This observation indicates that the extent to which an inflection has semantic correlates also influences inflectional rule learning.

The *Morphological Richness (MR) Account* (e.g., Leonard et al. 1987; Leonard 1989; Leonard et al. 1992b; Dromi et al. 1999) is closely related to the SA, but explicitly addresses the particular properties of types of languages in terms of morphological richness (or sparseness). Leonard and colleagues argue that languages with a morphologically rich system provide more frequent and consistent input – all nouns, verbs and adjectives are inflected – and are therefore easier to learn for SLI children. The availability of salient morphological cues is crucial.¹⁷ The MR account is based on the early findings of Leonard and collaborators showing that SLI children acquire their native grammar faster if it has a relatively rich inflectional system. These findings have been substantiated by the wealth of cross-linguistic research partially discussed in §2.2.2.

The *Generalized Slowing Hypothesis (GSH)* (e.g., Kail 1994; Windsor and Hwang 1999; Miller et al. 2001) was a first attempt to specify processing limitations in SLI. As indicated by its name, GSH claims that the key deficit in SLI is a ‘generalized limitation in processing capacity’ resulting in low performance in both linguistic and nonlinguistic tasks when compared to unimpaired controls.

¹⁷This account builds upon the Competition Model (e.g., MacWhinney 1987; Bates and MacWhinney 1989) by incorporating the views that languages differ in the details of grammar that have the greatest cue validity, that the discovery and use of these cues are probabilistic in nature, and that some cues have greater processing cost than others.

More specifically, the SLI child's general ability to take in linguistic input, store it in memory, and, in turn, access appropriate structures in language production is assumed to be reduced causing a general delay in language development. The slower and incomplete intake thus results in underspecified representations in the lexicon. Crucially, GSH predicts a delay rather than a deviant profile in SLI since the intake processes just operate more slowly. The effects of this kind of delay caused by GSH should in principle be easily testable on the basis of outcomes in off-line tasks. Children with SLI should exhibit delay across the range of tested linguistic abilities when compared to unimpaired peers resulting in (i) higher error rates as well as (ii) errors normally seen in much younger children. At first glance, GSH offers a conceivable explanation for the general delay found in SLI across languages. It was, however, argued that GSH is not precise enough to explain the observed profile differences as well as the cross-linguistic differences seen in §2.2.2.

Following the SA, MR and GSH, difficulties in inflection learning in SLI can be interpreted in terms of a reduced intake system that slows down the derivation of grammatical representations. Together, these accounts have succeeded in accounting for a wide range of cross-linguistic and language-specific differences seen in SLI such as those discussed in §2.2.2. Consistent input should, in principle, be enough to provide these children with the information necessary to overcome their intake problem. Nevertheless, SLI children usually have persistent difficulties, even if there is evidence that inflectional rules have been established (e.g., Bishop and Edmundson 1987; Leonard 1998, 2000; Schwartz 2009).

With the vulnerable markers hypothesis, Bishop (1994, 2000a) offers an explanation for the inconsistencies in the application of rules once established; that is the SLI child may produce the same inflection correctly in an obligatory context on one occasion but not on another. Bishop posits that the SLI children's slowed processing in a limited capacity system (Bishop 1994: 526) causes performance limitations although the grammatical representations are, in principle, intact.¹⁸ Crucially, the performance limitations occur only if the cognitive load of the linguistic task is too high so that children fail to apply their grammatical knowledge consistently. In her own study, Bishop operationalized complexity or cognitive load in terms of phonological complexity, complexity and length of clause structure, task complexity and time to complete an operation. Bishop (1994) compared story retelling samples from eight to twelve year old SLI children where inconsistency of performance was common for the uses of past tense forms and case in pronouns. Although the data sample was too small, as she posits herself, there was a correlation between utterance length and error rates, the longer the utterance the more errors were produced.

The results of more recent studies using controlled experimental techniques support this hypothesis. For instance, Leonard, Miller, Deevy, Rauf, Gerber,

¹⁸A 'limited capacity system' relates to limitations in the individual perceptual and cognitive abilities that determine the amount of information that an individual can process (or integrate) during any given period of time. Accordingly, these limitations can influence and limit the resources that the child has available to perform a task (Snyder et al. 2002: 6,7).

and Charest (2002) report that children with SLI use nonfinite clauses e.g., *The mouse eating cheese* more often than finite clauses e.g., *The mouse is eating the cheese* as the processing demands of the task increased. As predicted by Bishop, SLI children preferred the less costly operation of not marking the clause for tense and agreement. Other studies by Leonard and collaborators (e.g., Leonard 2000; Lukács et al. 2008) revealed that SLI children acquiring languages with a morphologically rich system made more errors when they had to simultaneously process a complex combination of inflections involving, for instance, tense, agreement, case, definiteness. The same children had, however, no problems in producing the individual inflections or operations involving less inflections (see §2.2.2).

Obviously, the accounts by Leonard and colleagues and Bishop focus on different (probably related) aspects of processing limitations that affect language development in different ways in SLI. Leonard and colleagues see SLI as limitations in processing and perceiving input (i.e., intake) necessary to derive grammatical rules, and Bishop emphasises the problems of applying rules once established as a consequence of limitations in dealing with the cognitive demands of the linguistic tasks. A more elaborate discussion of this issue is given in Chapter 8.

2.2.4 Summary

The previous sections have shown how morphosyntactic abilities differ in impaired L1 acquisition and typical L1 acquisition, and how these impairments vary across languages. There is convincing evidence that deficits in verb agreement comprise one of the core symptoms of SLI across languages. The degree to which other morphosyntactic abilities, such as noun agreement, are affected in SLI is not yet clear due to limited cross-linguistic research. There are several explanations proposed for the underlying nature of the persisting difficulties in grammar. These can basically be divided in two contrasting perspectives, namely representational accounts and processing accounts. The crucial distinction between the representational accounts and the processing accounts relates to the question as to whether children with SLI rely on the same or different resources underlying grammar as unimpaired children. So far, no single account within the two perspectives seems to be able to fully explain, on the one hand, the (cross-linguistic) variation in SLI and, on the other hand, the inconsistencies and variability in the accuracy of morphological markings seen among SLI children. Obviously, it is possible that the various explanations may be involved either in the same child or in different children. Nonetheless, the discussed perspectives provide valuable ideas that allow for a specification of the relationships between SLI and L2 acquisition, as already briefly pointed out in §1.2. As a logical next step, §2.3 discusses the concept of L2 acquisition as far as relevant for the present study before the relationships between SLI and L2 are explored.

2.3 Understanding L2 acquisition

As briefly pointed out in Chapter 1, two groups of unimpaired L2 learners have been included in the present study with the aim of specifying the relationship between SLI and L2 acquisition: a group of child L2 learners and a group of adult L2 learners will be compared to two groups of children with SLI. Before these relationships can be specified though, it is necessary to first address the crucial differences between child L2 and adult L2 acquisition as these differences are important for investigating certain theoretical ideas (§1.2). The focus here is on the influence of age at which systematic L2 exposure begins on the acquisition of an L2 grammar. §2.3.1 starts with a specification of L2 acquisition relevant for this study. §2.3.2 then discusses the issue of critical period effects in L2 acquisition and discusses some empirical differences in morphosyntactic abilities between child (L1 and L2) and adult L2 acquisition.

2.3.1 What is L2 acquisition?

The term ‘second’ in L2 acquisition can relate to any language that is acquired subsequent to the native language. For the present study, two types of L2 acquisition are of interest: child (or early) L2 acquisition and adult (or late) L2 acquisition, the difference being the age at which systematic L2 exposure begins. In adult L2 acquisition, initial exposure to the L2 starts after an L1 has been acquired, whereas child L2 acquisition starts while still acquiring an L1. More specifically, the L2 children being examined in the present study have systematically been exposed to Dutch between the ages of one and four. Child L2 acquisition is sometimes also referred to as successive bilingualism. This type of bilingualism must be distinguished from simultaneous bilingualism (also referred to as 2L1 acquisition), where the child is – in conservative terms – exposed to both languages from birth (Li Wei 2000: 6).

In ongoing debate, scholars argue where exactly the line should be drawn between child L2 and 2L1 acquisition. Usually, the term child L2 acquisition refers to children being systematically exposed to the L2 between the ages three or four up to seven. Fundamental parts of L1 grammar are then assumed to be in place (e.g., McLaughlin 1978; Schwartz 2003; Unsworth 2005) allowing for the search for differences and similarities between child L1 and child L2 acquisition. According to Meisel and colleagues (e.g., Meisel 2004; Kroffke 2006; Rothweiler 2006; Meisel 2007), it is at around the ages of three or four that maturational changes take place in the brain so that age effects become visible in the acquisition of an L2 grammar. In their view, children being exposed to an L2 before that age are similar to simultaneous bilingual or 2L1 children. Only very little research has, however, systematically addressed this interesting issue and it is therefore difficult to establish a clear age boundary. I will refer to the children tested in this study as L2 children, although in some cases it appeared that some children had systematic exposure to Dutch before the age of three/four (see Appendix A). As we will see in Chapter 5, the choice of age range was also due to some practical considerations.

2.3.2 Factors affecting the acquisition of L2 grammar

This thesis adopts the view that the factor of age of systematic L2 exposure plays a crucial role for both parallels in grammatical development with L1 acquisition and ultimate success in the L2. It is, however, recognized that differences between L1 and L2 acquisition may not directly be a reflection of age effects as other factors may also be relevant and in interaction with maturational constraints. Alongside the factor of age, two of these factors are further addressed here, namely amount of L2 input and L1 transfer.¹⁹

Age

The aspect of age can be linked to the debate of whether there is a critical period for language acquisition. Generally, a ‘critical period’ is considered to be a period of time, typically early in life, during which an organism displays a heightened sensitivity to certain environmental stimuli. This sensitivity can be used to acquire certain abilities. After this period, there is a non-linear decline in sensitivity hence reducing the chances to develop the same abilities (Birdsong 1999). Penfield and Roberts (1959) and a little later Lenneberg (1967) were the first to propose the idea of a critical period for language acquisition in order to account for the contrasts seen in speed, ease and success between typical and atypical L1 acquisition.²⁰ In recent years, the debate around the notion critical period has been further fuelled by the fact that adult L2 learners are in many respects different from child (L1 and L2) learners (e.g., Hyltenstam and Abrahamsson 2003; Birdsong 2006 for extensive reviews). The ideas on the critical period in L2 acquisition discussed here are taken from Clahsen and Muysken (1986) and Bley-Vroman (1989, 1990), among others.²¹ They argue that one or more principles of UG have become inaccessible at a certain point, which explains the differences between child and adult L2 learners in acquiring grammatical L2 phenomena constrained by UG. Accordingly, adult L2 learners have to rely on other general learning mechanisms, unlike child learners.

Ullman proposed the Declarative and Procedural (DP) model (e.g., Ullman 2001a,b, 2004, 2005) and applied it to adult L2 acquisition. The DP model suggests a neurobiological explanation on the basis of two memory systems. In linguistic terms, the declarative memory underlies knowledge relating to the lexicon associated with the meaning and use of words. The procedural memory, on the other hand, is thought to support rule-governed computations in language (Ullman 2001a: 107). According to Ullman (2004), both systems interact and overlap in L1 acquisition, whereas neurophysiological changes as the result of

¹⁹Scholars agree that L2 learners form a heterogeneous group in which the success of L2 acquisition is determined by various factors. For extensive reviews of these internal and external factors, the reader is referred to e.g., Li Wei 2000; Doughty and Long 2003; Bhatia and Ritchie 2004; Kroll and De Groot 2005.

²⁰Atypical L1 acquisition relates in this respect to deprived children without available linguistic input during early childhood (see Curtiss 1988 for a review) as well as congenitally deaf children, who were exposed to sign languages later in life (e.g., Mayberry and Lock 2003).

²¹See for different approaches to this issue, e.g., Schwartz and Sprouse 1996; Prévost and White 2000.

a critical period diminish the ability to use the procedural memory to perform computational operations in L2 acquisition.²² Due to the inefficiency of the procedural system, adult L2 learners are forced to rely predominantly on declarative memory: i.e., storing chunks and formula. It is thus questionable whether adult L2 learners eventually master grammatical phenomena exclusively relying on the procedural memory in the same way as child learners.²³

There has been cross-linguistic evidence that age influences L2 acquisition in terms of ultimate attainment (e.g., Johnson and Newport 1989, 1991; DeKeyser 2000; McDonald 2000) as well as developmental sequences (e.g., Clahsen and Rothweiler 1993; Clahsen et al. 1993; Weerman et al. 2006; Blom et al. 2007; Dimroth 2008).²⁴ Given that this study focuses on development and not ultimate attainment (§1.2), developmental patterns as reflected in error types will further be investigated. Following Schwartz (2003, 2004), the rationale behind this approach is straightforward: On the basis of the assumption that child L2 acquisition is guided by UG – like child L1 – but that adult L2 acquisition is not, there should be an asymmetry seen in developmental errors of the two learner groups. An additional advantage of this comparative approach is that it is possible to control for L1 transfer by comparing L2 groups with the same native language to the L1 groups (e.g., Schwartz 2003, 2004).

The difference in developmental patterns between child (L1 and L2) and adult L2 learners can be illustrated by considering the acquisition of finiteness and verb placement of German, which is an Object-Verb (OV) language with Verb Second (V2) (see §3.2 for details). During acquisition, German L1 children pass through a stage from roughly two to four years of age during which they alternate between the uses of finite (2a) and nonfinite verb forms (2b) in main clauses. This is referred to as the Optional Infinitive stage or Root Infinitive stage (see Chapter 3). It is evident from German child L1 data (e.g., Clahsen 1982; Poeppel and Wexler 1993; Clahsen, Eisenbeiß, and Penke 1996) and German child L2 data (e.g., Prévost 2003; Rothweiler 2006; Kroffke 2008) that children know the position-form contingency from very early on: finite verbs occur in V2

²²It should be added here that the notion of ‘reduced or diminishing availability’ leaves open whether the procedural memory is partially deficient or non-existing in adult L2 acquisition or whether it is fully instantiated, yet operating at reduced capacity (see also Clahsen and Felser 2006 for a discussion on that issue).

²³Although Ullman attributes a key role to the age of systematic exposure, his model posits that L2 usage, L2 proficiency, general cognitive capacities, sex and hormone levels (e.g., Hartshorne and Ullman 2006; Ullman 2001b, 2004, 2005) also modulate and contribute to the access of the procedural memory system in adult L2 acquisition. It is therefore possible that more advanced L2 adults acquire much or perhaps even all of the grammatical knowledge of the target language (see Van Boxtel 2005 and Hopp 2007 for evidence that high proficient L2 adults may perform at L1 levels). As will be clear from Chapter 5, the L2 adults in this study are not advanced learners, but low to medium proficient learners of Dutch and errors are expected.

²⁴There are also studies reporting similar paths of development in child L1, child L2 and adult L2 learners (e.g., for Dutch: Unsworth 2005 and English: Schwartz 2003, 2004). The only difference is that both L2 populations initially go through a stage of L1 transfer. This would be evidence against age effects. However, it is likely that the data on which these results are based are simply incomparable. Studies often differ in nearly all relevant aspects such as method, L1/L2 of the participants and linguistic variables.

position and nonfinite verbs occur in verb final position.²⁵

- (2) a. Thorsten Ball haben
 Thorsten ball have.INF
 ‘Thorsten has a ball.’ (Poeppel and Wexler 1993: 16)
- b. Ich hab ein dossen Ball
 I have.FIN a big ball
 ‘I have a big ball.’ (Poeppel and Wexler 1993: 5)

This is in contrast to adult L2 learners of German who fail to distinguish between finite and non-finite verbs (e.g., Clahsen 1990; Prévost and White 2000), which means that they produce nonfinite forms in finite V2 contexts and finite forms in nonfinite contexts. Compared to (2), adult L2 errors would then look like in (3).

- (3) a. *Thorsten haben einen Ball
 Thorsten have.INF a ball
 ‘Thorsten has a ball.’
- b. *Ich einen grossen Ball hab
 I a big ball have.FIN
 ‘I have a big ball.’

There is more divergence in word order patterns between child and adult L2 learners as revealed by the comparison of natural speech data in 15 to 65 year-old L2 adults (Meisel et al. 1981; Clahsen and Muysken 1986) and three-to-four year old L2 children (e.g., Rothweiler 2006; Kroffke 2006, 2008). Unlike child learners, adult L2 learners were shown to overuse, in particular, two developmental sequences in German word order for a considerable period of time, namely overuse of a Subject-Verb-Complement (SVX) order (4a) and a XSVX order (4b) (i.e., adverbials are optionally moved into sentence-initial position, but the obligatory subject-verb inversion does not take place). Some of the adult learners were even reported to fossilize in these stages. These observations are in line with studies on child L2 and adult L2 acquisition in Dutch (e.g., Blom et al. 2007; Blom 2008; Blom and De Korte 2008) to be further discussed in §3.3.²⁶

²⁵Similar observations on the child L2 acquisition of finiteness and word order properties were also made for other languages such as English (e.g., Paradis 2007 for an overview), French (e.g., Grondin and White 1996; Paradis et al. 1998) and Dutch (e.g., Blom 2008; Blom and De Korte 2008).

²⁶Interestingly, older L2 children acquiring German (Haberzettl 2005; Tran 2005; Kroffke 2006) exhibit the same errors in the application of word order rules as adult L2 learners, i.e., nonfinite forms are treated as finite forms. Some unique differences between child L1 and child L2 learners were also found in English (Paradis 2007 for an overview) and French (e.g., Meisel 2007). Systematic L2 exposure in most of these children started from six years onwards. The findings give rise to the question as to whether there is an earlier boundary for age effects in inflection learning than previously proposed (see §2.3.1). This is related to the discussion of multiple critical periods in language acquisition (e.g., Scovel 1988; Long 1990; Hyltenstam and Abrahamsson 2003; Long 2005; Singleton 2005).

- (4) a. *dass er kauft auf der Strasse
 that he buy.FIN on the street
 ‘that he is buying on the street.’
 [Correct form: dass er auf der Strasse kauft.]
- b. *Dann wir gehen weiter.
 Then we walk.FIN on
 ‘Then we walk on.’
 [Correct form: Dann gehen wir weiter.]

Despite the similarities seen in the developmental error types produced by L1 and L2 children, there is one clear difference. Most of the experimental studies cited so far report a slower pace in child L2 development as determined by the differences in error rates between age-matched L1 and L2 children. Two potential factors are considered here, namely the L2 input situation of the child and L1 transfer. These factors may, of course, also influence adult L2 acquisition.

Amount of input

Obviously, L2 learners who learn two languages, usually, have quantitatively less exposure to each language than L1 children acquiring each language separately (Paradis and Genesee 1996). It can be predicted that these learners will lag behind their L1 peers in achieving acquisition milestones because of the reduced L2 exposure and, hence, reduced opportunity to take in input to derive grammar. The question as to which of the exact properties of the L2 input (e.g., length, intensity and/or quality (or richness)) determine pace and ultimate success of L2 acquisition is still subject to much debate. A number of studies correlating morphosyntactic accuracy and input (e.g., Jia 2003; Jia and Aaronson 2003; Sorace 2005; Hulk and Cornips 2006a; Cornips and Hulk 2008; Unsworth 2008) suggest that length as well as richness of input positively affect the acquisition of the L2 grammar.

Obviously, the input situation of the individual learner is likely to vary depending on the quantity and quality of (L1 and) L2 contacts in day-to-day activities as involved in family, status of the L1, peer-group and working situations as well as the amount of formal L2 training an L2 learner has been exposed to. In §5.2.1, the issue of how the present study deals with the potential differences in a learner’s input situation is briefly discussed. It will be clear that, for practical reasons, this study only considers the length and not the intensity or consistency of L2 exposure.

It is possible that less input and, hence, limited intake will not necessarily cause a substantial developmental delay since the acquisition of some grammatical structures may not require a lengthy and intensive input (e.g., Gathercole 2002a,b; Paradis et al. 2008). It is thus also important to consider the properties of the target structure in terms of the critical mass or threshold that must be attained for acquisition as proposed by, among others, Marchman and Bates (1994) and Gathercole (2002a,b). Verb agreement and adjectival agreement in Dutch are potentially useful structures to indicate a contrast in the

amount of input required for acquisition as will be made explicit in §3.3 and §4.3, respectively.

L1 transfer

Scholars question to what extent the native language itself influences the pace and success of L2 acquisition. This phenomenon is known as L1 interference (or L1 transfer) referring to the automatic transfer of the structure of the L1 (due to habit) to the structure of the L2, especially in the very initial stages of L2 acquisition. There is a substantial amount of evidence for L1 transfer in the domain of syntax, showing that initial development in L2 learners differs according to their L1 background. A well-known example is the adult L2 acquisition of word order in Dutch (e.g., Jansen et al. 1981; Blom 2008) and German (e.g., Meisel et al. 1981; Clahsen and Muysken 1986; Vainikka and Young-Scholten 1994): learners with an underlying OV language as L1, such as Turkish, Korean or Japanese, were shown to initially overuse OV orders (for similar observations, see Haznedar 1997 for Turkish-English, and Haberzettl 2005 for Russian-German and Turkish-German child L2 acquisition). In contrast, L2 adults of Moroccan-Arabic, Italian and Spanish background, all VO languages, show an initial use of the VO orders.²⁷ Additional evidence for L1 transfer in L2 syntax is based on the acquisition of scrambling in Dutch. Unsworth (2005) showed that child L2 and adult L2 learners, both with English as their L1, go initially through a stage of L1 transfer.

That some grammatical structures are less affected by L1 transfer can be shown based on the acquisition of German nominals in untutored learners of Spanish, Italian, Korean and Turkish, languages with and without definite determiners (Parodi, Schwartz, and Clahsen 2004), for instance. Omission of determiners could be seen as result of L1 transfer. Cross-group comparisons revealed, however, that the determiner omission rates for early stages of German L1 acquisition were the same as those of the Korean and Turkish L2 learners. Crucially, the L2 learners with a Romance background also omit determiners, albeit to a lesser extent. This suggests that there is positive rather than negative transfer in this domain. This is in line with a widely accepted assumption that L2's that are structurally closer to the L1 appear to be acquired by an L2 learner with more ease than an L2 that is more distant from the target language (e.g., Schachter 1996; Hulk and Müller 2000; McDonald 2000; Müller and Hulk 2001; Sabourin 2001; Sabourin and Stowe 2008).

Some scholars argue alternatively that L1 transfer has no, or barely any influence on the acquisition of inflectional morphology. Dulay and Burt (1973, 1974), for instance, examined Spanish and Chinese child L2 learners of English. The results of both studies revealed two major findings, namely that (i) the main source of difficulty is grammatical morphology and that (ii) the grammatical errors are similar in both child L2 groups suggesting that L1 transfer cannot be the source of these errors. Both groups were also shown to pattern similar to

²⁷See for a different interpretation: e.g., DuPlessis et al. (1987) and Tomaselli and Schwartz (1990).

English L1 children (Dulay, Burt, and Krashen 1982). All children regardless of being L1 or L2 had more trouble acquiring, for instance, the past tense form *-ed* and the present tense 3SG marker *-s* than the progressive marker *-ing* and the plural marker *-s*. A variety of recent studies on the acquisition of inflectional morphology in child L2 English have confirmed these findings (e.g., Ionin and Wexler 2002; Jia 2003; Genesee et al. 2004; Paradis 2005; Paradis, Tremblay, and Crago 2008).

In sum, the structure of the L1 has a certain influence on L2 acquisition, especially in the initial stages and in some structures more than others. The selected L2 groups in this study have the same L1, namely Turkish, to control for effects of L1 transfer.

2.4 Understanding child L2-SLI

This section familiarizes the reader with the concept of L2-SLI acquisition. Based on the discussions in §2.2.1 and §2.3.1, L2-SLI children should be diagnosed with SLI on the basis of his/her L1 following the criteria for SLI in Table 2.1. Systematic L2 exposure in these children should have started between the ages one and four. Overviews of relevant studies relating SLI and L2 acquisition using different methodological approaches are given in §2.4.1 and §2.4.2. Finally, §2.4.3 first introduces Paradis and colleagues (Paradis et al. 2005/2006; Paradis 2007) attempt to theoretically address L2-SLI acquisition before incorporating it in the framework used here to specify the potential relationships between SLI and L2 acquisition.

2.4.1 Effects of SLI and child L2

From the discussion of SLI (§2.2.2) and child L2 (§2.3.2) acquisition, similarities in developmental patterns between both groups are apparent.

- SLI and L2 children are delayed in acquiring inflectional morphology when compared to unimpaired L1 children.
- SLI and L2 children tend to follow the same developmental patterns in terms of error types. These error types, overall, resemble those used by unimpaired L1 children.

Some studies have directly compared both groups in order to further examine the relative effects of SLI and child L2 acquisition. The first studies directly comparing L1-SLI and child L2 acquisition were conducted by Håkansson and Nettelbladt (1993, 1996) and Håkansson (2001), examining the acquisition of verb placement and tense morphology in Swedish. The studies compared experimental production data in Swedish L1-SLI children and Arabic-Swedish L2 children. The L2 children had been exposed to Swedish for approximately 1;6 years (range: 1;2 to 2;0 years) in a preschool setting. The studies revealed two major findings: (i) the child L1-SLI and child L2 child groups produced the

same developmental errors when acquiring Swedish word order (i.e., production of ungrammatical V3 utterances (instead of grammatical V2) and tense morphology and (ii) these errors resemble those seen in younger typically developing Swedish L1 children.

More recently, Paradis and Crago (2000, 2001, 2004) compared spontaneous production data in French (as spoken in Montréal, Canada) L1-SLI children (N=10; aged 7) and unimpaired English-French L2 children (N=10; aged 7). Both groups were reported to have difficulties with marking of finiteness, tense and subject-verb agreement as well as the production of object clitics in French. Paradis (2005) extended this comparison by also including L2 learners of English (N=24, aged 4;4-7;10) with various minority L1 backgrounds (Arabic, Cantonese, Dari, Farsi, Japanese, Korean, Mandarin, Romanian, Spanish and Ukrainian). The L2 children had been exposed to English for less than two years (mean: 0;10 years). As with the English-French L2 children, error patterns and accuracy rates resembled those of the English L1-SLI children.²⁸

Grüter (2004, 2005) added another component to this comparison by eliciting comprehension data alongside production data. She examined the acquisition of accusative object clitics in French comparing three child groups: a group of French L1 children (N=12, aged 6;2-7;1), a group of French L1-SLI children (N=6, aged 6;6-9;2) and a group of English-French L2 children (N=7, 6;5-7;1). The L2 children were exposed to French for 1;5 years in an immersion school setting in Montréal, Canada. The results are in line with those in the previously discussed studies: No significant differences were detected between the L2 and the SLI group in either task. Both groups performed significantly worse in the production task than their typical L1 peers. In the comprehension task, all three groups performed at ceiling. At first sight, this observation suggests that comprehension is not useful in separating out L2 and SLI acquisition. It is possible, however, that a different choice in age range would have shown differences.

The results point unmistakably in the direction already indicated above: L1-SLI children and L2 children appear to make the same developmental errors and in similar amounts. The observed similarities make it thus difficult, if not impossible, to tease apart the linguistic markers that specify SLI and child L2 acquisition. This can result in diagnostic confound (see the notion of ‘mistaken identity’ in §1.4). In fact, comparing L1-SLI and unimpaired child L2 acquisition can be considered as being ineffective or indirect when aiming to make implications about L2-SLI acquisition: The linguistic characteristics found in L1-SLI acquisition cannot be taken as markers of SLI in L2 children exclusively on the basis of the children’s L2 output due to the chance of diagnostic confound. Furthermore, it is also unclear to what extent length and intensity of L2 exposure and the children’s L1 influence the group comparisons.

²⁸It should be pointed out that Paradis reports on a substantial variation in the individual results as became evident from the sizable standard deviations and ranges in accuracy rates. These individual differences appeared not to be caused by the variation in length of exposure (2 to 18 months) or age. Such heterogeneous performance in the early stages of learning English has also been found by other researchers.

2.4.2 Effects of L2-SLI

The investigation of L2-SLI acquisition requires a specific methodology in order to be able to, on the one hand, carefully differentiate between the respective effects of SLI and L2 acquisition and, on the other hand, address the question as to whether L2-SLI causes an additional burden for the child. One way is a cross-sectional comparison of L2-SLI children, L1-SLI children and, ideally, unimpaired L1 and L2 children. Although research on L2-SLI acquisition is as yet extremely limited in scope, some of these comparisons have been made.²⁹

Salameh and colleagues (Salameh, Nettelbladt, and Gullberg 2002; Salameh, Nettelbladt, and Norlin 2003; Håkansson, Salameh, and Nettelbladt 2003; Salameh 2003; Salameh, Håkansson, and Nettelbladt 2004) longitudinally followed the acquisition of word order and inflectional morphology of four-to-seven year old Swedish-Arabic children with and without SLI. The children were matched on age, gender, exposure to Swedish, residential area, Arabic dialect and parental education. As such, this study is one of the few examples comparing two languages within the same L2(-SLI) children. There were three major findings: (i) The same developmental sequences were found across all Swedish-Arabic children; (ii) the developmental sequences resembled those seen in Swedish L1(-SLI) acquisition and (iii) L2-SLI children were developing at a much slower pace than their unimpaired L2 peers. Unlike most of the L2-SLI children, the unimpaired L2 children reached a high level in Swedish grammar after approximately 1;6 years of exposure to Swedish in preschool (range: 1;2-2;0).

In another study, Kroffke (2006) longitudinally followed the acquisition of German finiteness, word order and subject-verb agreement in Turkish-German children with and without SLI (N=3/per group; range: 3;0 to 6;5).³⁰ As well as producing higher error rates compared to the unimpaired L2 children, L2-SLI children also tended to make errors that were unlike those in typical child L1 and child L2 acquisition in German, but similar to adult L2 acquisition of German (compare the examples in (2) and (3) in §2.3.2). Comparing the L2-SLI data with existing data on German L1-SLI (e.g., Clahsen 1992; Clahsen and Stoessel-Deschner 1993; Clahsen et al. 1997) revealed parallels between the two SLI groups and differences from the typical child L1 and L2 groups.³¹

The empirical evidence regarding the relationship between SLI and L2 acquisition is not conclusive: both similarities and differences have been found between child L2-SLI, L1-SLI and unimpaired L2 acquisition, making it diffi-

²⁹As briefly addressed in Chapter 1, the selection criteria for L2-SLI children are problematic. In most of the studies presented here, children were selected as L2-SLI on the basis of very low outcomes on an L2 assessment battery in comparison with unimpaired L2 peers. Only in a very limited number of these L2-SLI studies, material was available to also screen or assess the L2(-SLI) children's L1.

³⁰The native language, Turkish, was also studied in the L2 children revealing effects of SLI in the L2-SLI children (see e.g., Rothweiler et al. 2007, 2008 for details of the Turkish results).

³¹Jacobson and Schwartz (2005) also reported on differences in error types between seven-to-nine year old Spanish-English L2 children with (N=12) and without (N=15) SLI acquiring English irregular and regular past tense.

cult to tease apart the effects of SLI and L2. Although some studies suggest separate effects of SLI in terms of different error types and higher error frequencies, it is difficult to draw firm conclusions. The studies conducted differ in many respects such as methodology, linguistic phenomena, languages (L1 and L2) and L2 input situation, all factors, which are likely to have caused some divergence in the results. In the following section, two theoretical approaches will be discussed that result in different expectations and predictions specifying error types and error frequencies in L2, SLI and L2-SLI acquisition.

2.4.3 Accounts of child L2-SLI

To my knowledge, there are no separate theories that result in predictions for L2-SLI acquisition. In fact, such a theory might not even be necessary if it is assumed that the underlying cause of SLI is the same for all impaired children irrespective of the number of language(s) they are exposed to. Elaborating on that idea, Paradis and colleagues (Paradis et al. 2005/2006; Paradis 2007) were the first to formulate predictions for 2L1-SLI acquisition on the basis of the two prevalent perspectives on the causes of SLI (see §2.2.3). As discussed earlier, the two perspectives differ as to whether children with SLI rely on different grammatical representations as unimpaired children (i.e., representational deficit perspective (see 5)) or whether the resources are the same (i.e., reduced intake perspective (see 6)).³²

- (5) Assuming that SLI is caused by a deficit in linguistic knowledge, bilingual SLI children are expected to resemble their L1-SLI peers in each language.
- (6) Assuming that SLI is caused by limited processing resources, bilingual SLI children are expected to show a delay compared to (i) their unimpaired bilingual peers and (ii) their L1-SLI peers in each language.

Paradis and colleagues formulated the prediction in (5) on the basis of the Disruption-within-Delay account (Rice 2003, 2004). This account argues that certain grammatical morphemes in a language are much more ‘disrupted’ than others in children with SLI. As a consequence, SLI (L1-SLI and 2L1) children will have much more trouble acquiring those morphemes, thus, causing a delay that is disproportionate to their overall language development. It is exactly this unique uneven morphosyntactic profile that distinguishes children with SLI from younger unimpaired peers.

The prediction in (6), on the other hand, has its basis in the ‘Generalized Slowing hypothesis’ (§2.2.3). This hypothesis predicts a general delay in language development due to limitations in the speed with which the linguistic input necessary to derive grammar can be processed. Crucially, error types should be the same across impaired and unimpaired children. L2-SLI children

³²Paradis and colleagues (2005/2006: 33) refer to the two opposing perspectives on the nature of the deficit in SLI as the domain-general view (i.e., cognitive/perceptual processing accounts) and the domain-specific view (i.e., linguistic representational accounts).

should, however, have a more severe delay when compared to L1-SLI children and unimpaired L2 children. The L2-SLI children need not only more time to process input but, crucially, the input is also divided between two languages. Paradis and colleagues recognize that differences in certain perceptual aspects of language (i.e., strong versus weak surface characteristics) may cause certain target structures to be more affected than others. The prediction in (6) has therefore been extended by incorporating Leonard's (1989) Surface account (see §2.2.3) that specifically addresses the perceptual aspect of processing capacities. It is important to note here that a combination of the Generalized Slowing hypothesis and the Surface account would still result in the same predictions as formulated in (6).

Paradis and colleagues tested the predictions in French-English 2L1-SLI acquisition (see Paradis et al. 2005/2006; Paradis 2007 for reviews) on the basis of spontaneous speech samples. A comparison of the acquisition of object clitics and articles in French and pronouns in English in age-matched and younger MLU-matched children in both languages showed that 2L1-SLI children resembled the younger typically developing 2L1 and L1-SLI groups. The results have been interpreted as evidence that bilingualism is not a 'risk factor' in 2L1-SLI acquisition, that is no double delay was found. The present study examines child L2(-SLI) acquisition, however, and not 2L1 acquisition. A somewhat different relationship between SLI and L2 acquisition can be expected here. Compared to 2L1 children, L2 children are expected to have had less exposure to the L2 causing a more severe delay in acquisition. The delay might in fact be similar to that seen in SLI following the assumption in (6). As already discussed in Chapter 1, the delay should, however, only be visible with those linguistic phenomena for which the threshold for acquisition is not passed very easily, that is acquisition requires a relative large input/intake.

For the present study, I will begin with the two theoretical proposals to SLI as did Paradis and colleagues. Unlike Paradis and colleagues, however, I will attempt to be more explicit about the linguistic resources available to derive inflectional rules in the various groups. This results in relationships expected between, on the one hand, SLI and child L2 acquisition and, on the other hand, SLI and adult L2 acquisition (see Figure 2.1).

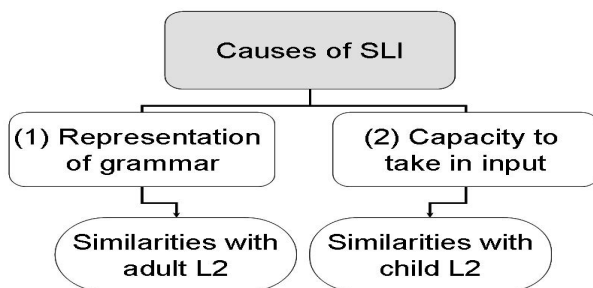


Figure 2.1: Relating SLI and L2 acquisition

Assuming that the locus of the deficit in SLI is in the innate representation of linguistic knowledge (see §2.2.3), the resources to construct grammar are different from typical child (L1 and L2) acquisition. In order to derive the target grammar, children with SLI have to rely on other learning mechanisms. These mechanisms are similar to those used by adult L2 learners who have been shown to also diverge from child (L1 and L2) learners due to critical period effects (see §2.3.2). For SLI, Ullman and Pierpont (2005) claim that the procedural system necessary for rule-governed computations is deficient (see §2.2.3). In the same vein, Ullman (2001a,b, 2004, 2005) proposes that the ability of procedural memory diminishes in L2 learners with increasing age (see §2.3.2). That explains why both groups are reduced in their ability to build up grammar. Given the inefficiency of the procedural system, they are forced to rely predominantly on the declarative memory which is responsible for the storage of lexical chunks and frames. Following this line of thinking, it is reasonable to expect similarities between SLI children and adult L2 learners and, crucially, these should differ from unimpaired child acquisition.

Assuming on the other hand that SLI is caused by a limited capacity to perceive and process the language input, a rather different relationship between SLI and L2 acquisition follows: SLI is assumed to be comparable to child L2 acquisition and not to adult L2 acquisition. Following the reduced intake approach, children with SLI can in principle construct the same rules as their unimpaired peers, since the same innate linguistic knowledge is available. The crucial difference lies in the analysis of input causing a developmental delay. The linguistic problems will be most evident in those linguistic aspects that require a relatively large and finegrained input in order to establish rules. As seen in §2.2.2, inflectional morphology and functional elements are a case in point. L2 children, whose initial L2 exposure starts within a critical period, can also be assumed to have a poorer intake compared to typical L1 children. Obviously, the actual cause for the reduced intake is different in SLI children and unimpaired L2 children: Unlike SLI, a reduced intake in child L2 acquisition is directly related to the uneven exposure to the two language (see §2.3.2).³³ L2 children should be able to acquire relatively easily these grammatical rules that are acquired quickly in L1, that is where relatively little input/intake is necessary. Accordingly, little input does not necessarily result in a delay. If, however, a large amount of input is needed to master a particular linguistic phenomenon in L1, a delay in L2 children might then become comparable to that seen in children with SLI. L2-SLI children are then expected to show a double delay marking an L2-SLI effect because both factors are assumed to affect grammatical aspects of the target language.

The representational deficit hypothesis and the processing hypothesis result in two distinct predictions as to the relationship between SLI and L2 (repeated here in (7) and (8) from §1.3).

(7) Representational deficit:

³³Note that this line of thinking is, in essence, the same as formulated by Paradis and colleagues in (6).

Child L1-SLI and child L2-SLI acquisition shows a similar pattern in terms of error types to adult L2 acquisition, which is different from typical child L1 and child L2 acquisition.

- (8) Reduced input/intake:
All child groups show a similar pattern in terms of error types, which is different from adult L2 acquisition.

A comparison of a group of L2-SLI children with groups of L1-SLI children, unimpaired L2 and L1 children and a group of adult L2 learners should indicate which prediction is correct.

As a result of the reduced intake capacity in (8), it is also expected that some child groups are more delayed than others in development and, hence, produce more errors. The questions formulated in (9) can also be answered from comparing the different child groups.

- (9) a. What are the separate effects of SLI and child L2?
b. What are the combined effects of SLI and child L2 in L2-SLI?
c. What is the relative impact of the effects of SLI and child L2?

The group comparisons will be carried out by examining the productions of several structures: within the Dutch inflectional phrase, finite verb inflection and finite verb placement, and within the Dutch determiner phrase, attributive adjectival inflection and gender assignment as marked on determiners. These will be described in Chapters 3 and 4, respectively.

Placement and inflection of Dutch verbs

3.1 Introduction

The review of the relevant literature in Chapter 2 indicated that the acquisition of morphosyntactic structures can be problematic in SLI and L2 learners compared to unimpaired L1 learners. In Dutch, there are rules of verb placement (syntax) and the verbs are marked for inflection (morphology). Accordingly, both domains are expected to pose problems for SLI and L2 acquisition and these variables will be examined here.

This chapter discusses the typological properties and development of verb placement and verb inflection in §3.2 and §3.3, respectively. The two accounts of SLI discussed in §2.4.3 have different implications for the relationship between L2 and SLI. In §3.4, the expectations with respect to both variables in cross-group comparisons are presented.

3.2 System

The generative framework (Chomsky 1981, 1993) is used to present the grammatical properties of Dutch verb placement in the domain of syntax, and Dutch verb inflection in the domain of inflectional morphology. This description is important in order to understand the methodological choices that have been made for the data elicitation in Chapter 5. It will be shown that there is a clear position-form contingency for verb forms. More specifically, §3.2.1 shows how word order affects the morphology (and finiteness) of the verb. The inflectional paradigm of Dutch verbs is then discussed in §3.2.2. In §3.2.3, Dutch and Turkish are compared being the two languages spoken by the L2 participants in this study.

3.2.1 Dutch verb placement

The position of Dutch verbs depends on whether the clause is a main clause or a subordinate (embedded) clause. In main clauses, the finite verb is placed in second position (1a) or fronted position (1b), whereas the non-finite lexical verb is in sentence-final position in a complex verb phrase consisting of an auxiliary verb and a lexical verb (1c).¹

- (1) a. Ulla gelooft in buitenaardse wezens
Ulla believes.FIN in aliens
'Ulla believes in aliens.'
- b. Gelooft Ulli in buitenaardse wezens?
Believes.FIN Ulli in aliens
'Does Ulli believe in aliens?'
- c. Ulli gaat in buitenaardse wezens geloven
Ulli goes.FIN in aliens believe.INF
'Ulli is going to believe in aliens.'

In Dutch embedded clauses, the finite verb appears in final position as in (2). This position is always to the right of the verb's object.

- (2) (Ulla wil) dat Ulli in buitenaardse wezens gelooft
(Ulla wants) that Ulli in aliens believes.FIN
'Ulla wants Ulli to believe in aliens.'

On the basis of the asymmetry in the placement of the finite verb compared to the non-finite verb, it has been argued that Dutch is an Object-Verb language (OV) with V2 in main clauses (Koster 1975; Den Besten 1983).² This means, in principle, that the subordinate clause order (see 2) reflects the base order in Dutch. In Dutch main clauses (1), the so-called V2-position is a derived position, where the finite verb moves up from final position within the verb phrase to the head of the Complementizer Phrase (CP).³ Irrespective of the exact nature of the movement operations in V2 structures, the sentence-initial constituent is also assumed to undergo a movement operation to the Spec(ifier) position of the CP. That can either be the subject as in (1a) or any other topicalized constituent such as the adverb 'suddenly' in (3), causing subject-verb inversion. Subject-verb inversion also occurs if the Spec position of CP stays empty since no constituent (i.e., subject or otherwise) has been moved.

¹'Finiteness' refers to morphological marking of tense and agreement. As for the non-finite forms, Dutch distinguishes between three forms: the infinitive, the perfective/passive participle, and the present participle (Booij 2002). For the purpose of this work, only the infinitival forms will be discussed in more detail since they are expected to be frequently represented in some of the elicited data.

²There is no overall agreement concerning the base order of Dutch. Zwart (1993), for instance, following Kayne (1994), argues that all languages are VO. That would imply for Dutch that object shift must apply in embedded clauses to grant the verb is in final position.

³More recently, it has been proposed that the verb can also move to a subordinate head (AgrS of Infl) under particular conditions (Zwart 1993). These refinements are irrelevant for this study.

This is the case in yes-no questions as in (1b).

- (3) Plotseling gelooft Ulli in buitenaardse wezens
 Suddenly believes.FIN Ulli in aliens
 ‘Suddenly, Ulli is going to believe in aliens.’

To sum up, the order differences between embedded and main clauses are the consequence of V-raising to a V2 or fronted position. In subordinate clauses, there is no movement of the finite verb since the complementizer position is filled with a complementizer, for instance, *dat* as in (2).

Two constructions need to be discussed in more detail here, namely the use of RI structures (henceforth RIs; these are marked as INF in (4) and (5)) and the use of auxiliary constructions as in (1c). These structures may lead to specific expectations with regard to the sequence of development of finiteness and V2. These will be discussed further in §3.3.

RIs are main clauses without a finite verb. They usually have a modal (e.g., Lasser 1997; Wijnen 1997; Mastop 2005) or aspectual meaning (e.g., Lasser 1997), which has to be derived from the contextual information. The verb has an infinitival form, which takes the sentence-final position in languages such as Dutch and German. In colloquial adult Dutch (4), RIs are acceptable in specific contexts such as exclamations, interrogatives or feelings/ assertions (e.g., Blom et al. 1998; Blom 2002; Mastop 2005) (the examples in (4b) and (4c) are taken from Blom 2002: 1).

- (4) a. Ik in buitenaardse wezens geloven? Echt niet!
 I in aliens believe.INF, really not
 ‘Me believe in aliens? No way!’
 b. Ook wat drinken?
 Also something drink.INF
 ‘Do you want something to drink too?’
 c. Ik de hele tijd wakker liggen en jij gewoon slapen
 I the whole time awake lie.INF and you just sleep.INF
 ‘I lay awake the whole time and you just slept.’

In child speech, on the other hand, RIs mark an early developmental stage (§3.3.1), where their usage has a mainly modal function: the intention is to express wishes, desires and needs. RIs in child speech can therefore best be described in terms of as ‘I want +INF’ or ‘You must +INF’ as has been claimed for Dutch (e.g., Wijnen 1997; Blom 2003) and German (e.g., Behrens 1993; Lasser 1997). Examples of Dutch RIs are given in (5).⁴

- (5) a. vrachtwagen emmer doen
 truck bucket doen.INF
 ‘Put the truck in the bucket.’ (Matthijs 2;04)

⁴The examples in (5) are part of the Groningen Corpus, which is available through CHILDES (MacWhinney 2000).

- b. ik ook opschrijven
I also down.write.INF
'I also want to write something down.' (Abel 2;01)
- c. jij de walvis maken
you the whale make.INF
'(I want) you to draw the whale.' (Daan 2;04)

As will be shown in §3.3.1, another construction frequently used in child speech is a complex verb phrase containing an auxiliary and a lexical verb as in (1c). More specifically, if an auxiliary is used in main clauses, it takes the V2 position, whereas the lexical verb remains in the sentence-final position.

In standard Dutch, auxiliary verbs are functional items that mark the grammatical properties tense, aspect and modality associated with the lexical verb in Dutch. There are several different auxiliary verbs in Standard Dutch (see Barbiers and Sybesma 2004 for an overview). Of importance for this thesis is the discussion of the auxiliary constructions with *gaan* en *doen* (see 6 and 7). These constructions are used differently in adult speech and child speech. In child speech, auxiliaries as in (6) are semantically empty and are therefore referred to as dummy auxiliaries: they do not add to the meaning of a sentence and refer to an event that takes place at the moment of speaking. They are assumed to form a stage in the development of the V2 rule (§3.3.1).

- (6) a. koe gaat rijden
Cow goes ride
'Cow is driving.' (Matthijs 2;04)
- b. ik doe ook verven
I do also paint
'I am also painting.' (Niek 3;10)

In Standard adult Dutch, on the other hand, the auxiliary *gaan* may express inchoative aspect 'is about to' (7a) and/or it has a future modal reading 'is going to' (7b) (ANS; Haeseryn, Romijn, Geerts, De Rooij, and Van Den Toorn 1997).⁵ The use of *doen*, on the other hand, is described by ANS as an auxiliary belonging to 'regional or 'informal' variants of Standard Dutch, and is restricted to questions (7c) and habitual sentences (7d). In some dialects, *doen* may thus be used as a dummy auxiliary. Unlike child speech, however, these forms do not usually refer to an event that takes place at the moment of speaking. For *doen*, Zuckerman (2001) argues that children are not able to distinguish standard Dutch from dialect. To children exposed to one of these dialects, constructions with *doen* as dummy auxiliary would thus be grammatical. The use of *gaan* as a dummy auxiliary, on the other hand, stems from the inability of children to recognize the obligatory inchoative/future reading of the auxiliary *gaan* (7b and 7a). Children seem to interpret *gaan* as an auxiliary denoting ongoing aspect. I will return to this issue in §3.3.

⁵See for an electronic version: <http://www.let.ru.nl/ans/e-ans/>

- (7) a. Het gaat sneeuwen
It goes snow
'It is about to snow.'
- b. Het gaat morgen sneeuwen
It goes tomorrow snow
'It is going to snow tomorrow.'
- c. Wat doe je zeggen?
What do you say
'What are you saying?'
- d. Ze doen altijd kaarten
They do always cards
'They always play cards.'

3.2.2 Dutch verb inflection

Finite verbs in Dutch are overtly marked for tense, number and person, whereas this is not the case in infinitival verb forms. A bound morpheme can be added as an affix to the stem (8) of a Dutch verb resulting in a present tense form. Dutch infinitival forms have an overt morphological marking expressed by the suffix *-en* as in (9).

- (8) drink-
verb stem
'drink'
- (9) drink-en
infinitive-citation form
'to drink'

The Dutch paradigm overtly distinguishes two tense forms: present tense and past tense. Since the verb forms to be used in the elicitation material in this study (§6.3.2) are all regular lexical verbs and the target tense is present, further specification of irregular verb forms and the past tense is unnecessary here.⁶

Finite forms have to agree in person and number with the subject of the clause. This agreement is realized through overt inflection on the verb involving three contrastive forms: $-\emptyset$, $-t$ and $-en$. The present tense paradigm of Dutch is presented in Table 3.1.⁷

As can be seen in the table, Dutch regular verb forms are distinctive in the singular and plural, but only the singular forms distinguish person: 1SG on the one hand ($-\emptyset$), and 2SG/3SG on the other hand ($-t$). In inverted subject-verb

⁶'Tense' is the grammatical expression of a relation between speech time and event time with present tense (e.g., speech time) as the unmarked tense. Tense is a case of inherent inflection, which means that the correct tense form is not determined by the syntactic structure in which it appears (Booij 2002: 55).

⁷Finite auxiliary forms as in (1c) are high frequency verbs. As such, they are likely to be stored in memory as unanalyzed vocabulary items. Since this study addresses the acquisition of regular verb inflection, it is not necessary to further discuss the inflectional properties of auxiliary verbs.

Person	Suffix	drinken (stem.INF)	‘to drink’
1SG	stem- \emptyset	Ik drink	‘I drink’
2SG	stem- t	Jij drinkt	‘You drink’
3SG	stem- t	Hij/zij drinkt	‘He/she drinks’
1-3PL	stem- en	Wij/jullie/zij drinken	‘We/ you/ they drink’

Table 3.1: Paradigm of Dutch finite verb inflection in regular verbs exemplified with the verb *drinken* ‘to drink’

order, however, the 2SG form does not have the $-t$, but ($-\emptyset$) as shown in (10).

- (10) Vandaag drink- \emptyset jij water
 Today drink-2SG.INV you water
 ‘Today you drink water.’

The Dutch verb paradigm has a number of syncretisms. This may result in more difficulty acquiring verb inflection as discussed in §2.2.2. Zero marking on the verb ($-\emptyset$) is not only the stem form, but also the 1SG, and 2SG in clauses with inversion (see 10). The $-t$ suffix marks both the 2SG (in non-inverted order) and 3SG. Note further that affixation in singular contexts is auditorily indistinguishable if a verb stem ends in $-t$ or $-d$ as in, for instance, *worden* ‘to become’ (Booij 2002): *word.1SG* and *wordt.3SG* are both pronounced as /wɔrt/. The plural forms are all marked by $-en$ and are therefore not specified for person. In addition to plural marking, the $-en$ suffix also marks the infinitival form as was already illustrated in (9).

3.2.3 Contrasting Dutch and Turkish

Although Dutch and Turkish are from entirely different language families, there are similar in verb position. As mentioned above, following Koster (1975) and Den Besten (1983), Dutch is an OV language with V2 surface order. SOV is also the unmarked order in Turkish, but unlike Dutch, the verb occurs in final sentence position also in main clauses as in (11).

- (11) (Biz) Ankara-ya gid-iyor-uz
 (We) Ankara-DATIVE go-PRES.PROG-1PL
 ‘We are going to Ankara.’

However, Turkish is a so-called free constituent order language, which implies that the SOV order can change in a fairly free fashion (Kornfilt 1997: 91) depending on information structure. Turkish is a pro-drop language and the morphology on the verb indicates the person and number of the subject (Kornfilt 1997). Turkish is an agglutinative language, unlike Dutch, where every affix typically represents one feature in verb formation. There are important exceptions: e.g., subject-verb agreement markers combine person and number features and

nominalization markers combine nominalization and tense features.⁸

Table 3.2 sets out the Turkish verb paradigm in the present progressive. The progressive marker *-yor* is followed by the person and number marker. This paradigm has been chosen to illustrate subject-verb agreement in Turkish since it is similar in function to the present tense paradigm of Dutch shown in Table 3.1, the paradigm tested here (§6.3.2). Note that the personal pronouns (in brackets) are usually omitted given the pro-drop character of the language.

Person	Suffix	uyu-mak (stem.INF)	‘to sleep’
1SG	(ben) stem-yor- um	uyuyorum	‘I sleep’
2SG	(sen) stem-yor- sun	uyuyorsun	‘You sleep’
3SG	(o) stem-yor- \emptyset	uyuyor	‘He/she sleeps’
1PL	(biz) stem-yor- uz	uyuyoruz	‘We sleep’
2PL	(siz) stem-yor- sunuz	uyuyorsunuz	‘You sleep’
3PL	(onlar) stem-yor- lar	uyuyorlar	‘They sleep’

Table 3.2: Paradigm of Turkish verb inflection in the present progressive exemplified with the verb *uyumak* ‘to sleep’

As Table 3.2 indicates, the inflectional morphology of Turkish verbs is highly transparent. Unlike Dutch, there is no syncretism in the Turkish paradigm: each person, in the singular and plural, has a distinctive agreement morpheme.⁹ It is the richness of the inflectional systems that distinguishes Turkish and Dutch. The Dutch verb paradigm (Table 3.1) is clearly less rich since there are syncretisms involving all three inflectional morphemes (\emptyset , *-t* and *-en*).

3.3 Acquisition

This section provides an overview of the relevant literature on impaired and unimpaired L1 and L2 acquisition of the syntactic and morphological properties of Dutch verb forms. The developmental properties of verb placement and verb inflection of Dutch are discussed in typical child L1 acquisition (§3.3.1), child L1-SLI acquisition (§3.3.2), typical child L2 acquisition (§3.3.3), adult L2 acquisition (§3.3.4) and child L2-SLI acquisition (§3.3.5). In addition, effects of age of first L2 onset, the related effects of L2 input (i.e., length of exposure to Dutch) and knowledge and transfer of a previous L1 are addressed as these factors have also been shown to be relevant for acquisition (§2.3.2).

⁸The inflectional affixes on verbs mark (voice), negation, tense, aspect, modality and number+person usually in that order (Kornfilt 1997).

⁹There is one exception: When the subject is <human> and overtly present in the same clause as the predicate, the expression of 3PL marking (*-lar/-ler*) is usually optional. In the cases when (*-lar/-ler*) is absent, 3PL marking and 3SG marking become identical (Kornfilt 1997) allowing for some minimal syncretism.

3.3.1 Child L1 acquisition

Verb placement

Acquisition of the V2 rule (§3.2.1) in typical L1 acquisition is mastered before age three/four as confirmed by evidence from experimental speech data (Zuckerman 2001) and spontaneous speech data (e.g., De Haan and Tuinman 1988; Van Kampen 1997).

The acquisition of Dutch finiteness (i.e., placement of the lexical verb in V2 or fronted position) can be divided into three major stages before the child produces target-like structures (e.g., Wijnen 1999; Blom 2003): (i) Infinitive stage, (ii) Lexical-finite stage and (iii) Optional infinitive (OI) stage.¹⁰ The exact age at which a certain stage begins or ends is dependent on a child's individual pace of development. In the infinitive stage, children combine an infinitival verb with (at least) one other constituent (two- or three-word stage). The infinitives are typically produced in final position (12a). In the lexical-finite stage children produce inflected forms of only a limited number of verbs, mainly modal auxiliaries and some (stative) lexical verbs (Jordens 1990). These verbs are placed in the correct, second (or fronted) position of the sentence (12b). In the subsequent OI stage, children produce both RIs and finite forms of the same lexical verbs, reflecting optionality in the marking of finiteness on lexical verbs (compare 12c and 12d).

- (12) a. ik zelf doen
I myself do.INF
'I want to do it myself.' (Jasmijn 2;0)
- b. Zit vuilniswagen in
Sits.FIN garbage-truck in
'There is a garbage truck in it.' (Peter 2;07)
- c. Peter bal vangen
Peter ball catch.INF
'Peter catches the ball.' (Peter 2;07)
- d. Peter vangt bal
Peter catches.FIN ball
'Peter catches the ball.' (Peter 2;07)
- e. koe gaat rijden
Cow goes drive
'Cow is driving.' (Matthijs 2;04 same as in 6)
- f. ik doe ook verven
I do also paint
'I am also painting.' (Niek 3;10 same as in 6)

Children between (approximately) the ages two and three also produce auxiliary constructions as in (12e) and (12f) (e.g., Jordens 1990; Schlichting 1996; Wijnen

¹⁰As pointed out in §2.2.3, evidence for an optional infinitive stage has been found in various languages (but see e.g., Croker et al. (2000) and Pine et al. (2004) for a different interpretation).

1999; Zuckerman 2001; Blom 2003). As already mentioned in §3.2.1, these constructions are used differently in child speech and adult speech. Unlike adults, children produce utterances like (12e) and (12f) with the same function as the equivalent sentence with a single finite verb as in (12d). These dummy auxiliaries add no meaning to the sentence in child speech. Why do children produce these constructions if they are not productive in Standard Dutch?

According to Van Kampen (1997: 49), the appearance of dummy verbs (i.e., *gaan* and *doen*) in typical L1 Dutch is related to the acquisition of the V2 structure. As seen above, children prefer the underlying OV order at very early age: lexical verbs stay in final position. Van Kampen (1997) has suggested that children directly insert the dummy auxiliaries into the V2 position and, hence, avoid movement of the finite lexical verb. The use of dummy auxiliaries decreases when the V2 rule starts to be used for lexical finite verbs. Accordingly, there should be a correlation between the use of dummy auxiliaries and V2. Auxiliary forms should disappear once the V2 rule is established and should not be produced in subordinate clauses (Van Kampen 1997).

In general, scholars agree that there is a gradual decrease of the dummy auxiliaries constructions in (12e and 12f) with increasing age (up to the ages three/four) (e.g., Jordens 1990; Schlichting 1996; Wijnen 1999; Zuckerman 2001; Blom 2003; Hulk and Cornips 2005). Zuckerman (2001) used an experimental setting to elicit verb forms in the two different clause order conditions. He tested a group of younger (N=10; aged 3;0 to 3;11) and older (N=14; aged 4;8 to 5;0) Dutch-speaking children. His results are in line with Van Kampen's claims that there is a correlation between the use of dummy auxiliaries and V2. More specifically, his results showed that the three year old children produce higher rates of dummy auxiliaries instead of finite lexical verbs (22.8%; n=33/145) in V2 structures than the older ones (2.9%;n=6/210). The corpus of Van Kampen (1997) consisting of spontaneous speech data of two Dutch-speaking children contains only marginal numbers of embedded clauses. It is therefore difficult to substantiate the assumption about a possible dissociation of dummy auxiliaries in main and subordinate clauses. Zuckerman, however, confirms the dissociation: only marginal numbers of these auxiliary forms were produced in subordination (for the younger child group: 2.8%; n=4/141 and for the older child group 0%; n=0/210). Zuckerman interprets these empirical facts as evidence that high frequencies of dummy auxiliaries in early child Dutch are the result of the role of Economy in language (Chomsky 1995), meaning that children prefer cognitively less costly operations over more costly operations. As discussed in 3.2.1, V2 is the result of verb movement of the finite verb to second position in main clauses. Two syntactic operations are therefore involved according to the minimalist framework: Move (i.e., movement of the verb) and Merge (i.e. adjunction of the moved verb to the left side of the clause). According to Zuckerman's analysis (2001), insertion of a dummy auxiliary in V2 only requires Merge, but not Move. Consequently, using dummy auxiliaries requires less cognitive effort and is therefore preferred in early child speech.

Verb inflection

The child has to learn that a certain set of inflectional endings can be attached to the verb stem in Dutch (see §3.2.2). According to Pinker and Prince (1988) and Pinker (1991, 1998), regular inflectional morphology is computed by grammatical rule. The child should then be able, at a certain point in acquisition, to compute the rule necessary for finite verb inflection. The underlying rules for finite verb inflection quickly become productive as has been shown with spontaneous speech data from two and three-year-old Dutch normally developing children (e.g., Bol and Kuiken 1988; De Haan 1996; Schlichting 1996; Van Kampen 1997; Blom 2003). An experimental study testing the productive acquisition of Dutch verb inflection in three-to-six year olds (N=46) (Polišenská in preparation) confirms these findings since the majority of the tested children performed target-like at the age of three.

During acquisition of verb inflection, Dutch children produce two types of errors: they overgeneralize the singular markers $-\emptyset$ and $-t$ to plural contexts (13a and 13b), they omit $-t$ in 2SG and 3SG (13c and 13d) and substitute $-t$ in 1SG contexts (13e) (the examples are taken from Polišenská in preparation). The same data set contained hardly any evidence for substitution of the finite $-en$ plural marker in finite singular contexts (14).

- (13) a. *De meisjes drink- \emptyset sap
The girls drink-SG juice
'The girls drink juice.' (girl 3;3)
- b. *De ouders drink- t koffie
The parents drink-SG coffee
'The parents drink coffee.' (boy 3;5)
- c. *Jij drink- \emptyset thee
2SG drink-1SG tea
'You drink tea.' (boy 3;8)
- d. *Hij drink- \emptyset thee
He drink-1SG tea
'He drinks tea.' (boy 3;5)
- e. *Ik drink- t sap
I drink-2/3SG juice
'I drink juice.' (girl 4;3)
- (14) a. *Ik drink-en koffie
I drink-PL coffee
'I drink coffee.'
- b. *Jij drink-en koffie
2SG drink-PL coffee
'You drink coffee.'
- c. *Het meisje drink-en sap
The girl drink-PL juice
'The girl drinks juice.'

We can conclude that there is a strong relationship between verb placement and verb form in early child Dutch: non-finite verb forms are nearly always placed in sentence final position whereas morphologically finite forms are either placed in fronted or second sentence position in main clauses. In acquiring finiteness, Dutch children go through stages where they produce RIs, dummy auxiliaries and two types of inflectional errors. Do we find the same patterns in SLI and L2 populations acquiring Dutch?

3.3.2 Child L1-SLI acquisition

In §2.2, it was argued that the acquisition of verb morphology is one of the core problems in SLI. Consequently, difficulties are expected with verb inflection in Dutch SLI. On the other hand, it will be shown that verb placement seems to be relatively spared in Dutch SLI, suggesting a clear dissociation between both domains, unlike in unimpaired child L1 acquisition.

Verb placement

Group comparisons showed that Dutch SLI children hardly ever seem to violate the V2 rule (De Jong 1999). That is, they hardly use infinitival verb forms in finite positions and vice versa. De Jong (1999) analyzed narratives in Dutch SLI children aged six to nine ($n=35$, mean age: 7;8). The same strong contingency between verb placement and verb form was found as in younger unimpaired Dutch children (§3.3.1). That the placement rules are certainly acquired by Dutch SLI children has also been shown by studies of Bastiaanse and Bol (2001) ($N=8$; mean age 6;2) and Wexler et al. (2004) ($N=20$; aged 4;2 to 8;9), two studies using a subset of the SLI data of the Bol and Kuiken Corpus (Bol and Kuiken 1988). Here, SLI children studied from four years onwards showed correct placement of finite and non-finite verbs. However, several scholars report a prolonged use of RIs (De Jong 1999; Wexler et al. 2004) in (some of) the Dutch SLI children compared to typical L1 acquisition in Dutch and infer that the developmental stages in the acquisition of finiteness last longer in Dutch SLI, leading to an extended optional infinitive stage (see §3.3.2). Wexler et al. (2004) even question whether such Dutch SLI children will actually be able to leave this stage.¹¹

To date, systematic studies on the use and function of auxiliary constructions in Dutch SLI have been limited. De Jong (1999) reported on the overuse of auxiliary constructions as in (12e and 12f) in older SLI children (six-to-nine years) and suggested that they avoid movement of the finite lexical verb. His interpretation is in line with the proposal previously discussed for typical L1 acquisition in Dutch (Van Kampen 1997; Zuckerman 2001) since he assumes

¹¹Problems with finiteness marking were also reported in German SLI (e.g., Clahsen 1989, 1992; Grimm and Weinert 1990), a language that has similar word order properties as Dutch. Clahsen and colleagues claimed that the verb cannot move without adequate agreement marking. The extensive production of RIs would then be compatible with this claim.

that the use of the auxiliary constructions marks an earlier stage in language acquisition.

Verb inflection

Empirical evidence on the acquisition of Dutch verb inflection generally suggests that L1-SLI children are delayed when compared to chronological age controls and language-age controls. Errors in SLI children resemble those seen in much younger unimpaired children. De Jong (1999) reports on three error types in Dutch SLI: Omission of overt inflection (i.e., $-\emptyset$) as in (15a and 15b), substitution errors of the suffix $-t$ as in (15c), and missing finiteness marking (i.e., RIs) as in (15d) (The examples are taken from De Jong 1999: 68-70).

- (15) a. *dan ga- \emptyset mama nog zwaaien
 then go-1SG mother after+all wave
 ‘Then mom is going to wave after all.’ (boy 6;5)
- b. *toen kom- \emptyset papa en mama aan
 then come-SG father and mother part
 ‘then mom and dad arrive.’ (girl 7;5)
- c. *dat doe-t altijd mijn vader en moeder
 that does-SG always my father and mother
 ‘my father and mother always do that.’ (boy 6;11)
- d. *eerst’t kleine zusje in bed springen
 first the little sister in bed jump.INF
 ‘First does the little sister jump in the bed.’ (boy 6;5)

The error types in (15) resemble those seen in typical L1 acquisition at much younger ages as shown in §3.3.1 suggesting a delay rather than a deficit due to potentially missing linguistic resources in Dutch SLI. To my knowledge, there is no evidence of error types as in (16) in Dutch SLI, where the finite $-en$ plural form is substituted for finite singular contexts.

- (16) a. *Nu et-en papa koekjes
 Now eat-PL Dad cookies
 ‘Now Dad is going to eat some cookies.’
- b. *Cem fiets-en nu naar sportschool
 Cem bike-PL now to gym
 ‘Cem is now biking to the gym.’

Occurrences of omission errors such as in (15a) and (15b) have also been found in other studies on Dutch SLI (e.g., Bol and Kuiken 1988, 1990; Steenge 2006). Bol and Kuiken (1988) collected a corpus of spontaneous speech data of four-to-eight year old SLI children (N=18; mean age 5;11). Unfortunately, the produced verb forms covered only a subset of inflectional contexts, so that it was not possible to generalize over the paradigm and to carry out systematic error analyses.

In a more recent study, Steenge (2006) compared narrative speech data of Dutch SLI children (N=24 aged seven and nine) to data of different L2 groups

to be discussed in §3.3.5. Steenge's (2006: 51) child L1-SLI data reflect the error patterns illustrated in (15) with $-\emptyset$ substitutions being the most frequent error in the SLI groups (8.6% in the seven-year-olds; 4.0% in the nine-year-olds) compared to the unimpaired child L1 groups (1.7% in the seven-year-olds; 0.4% in the nine-year-olds). Substitutions of $-t$ were produced to a smaller amount in the SLI groups (3.6% in the seven-year-olds; 3.4% in the nine-year-olds). The forms in (16) were not reported to occur.¹²

To sum up, the evidence suggests that omission (15a and 15b) in 3SG and plural contexts is the most prominent error type in Dutch SLI, whereas results differ as to substitution of the finite form (15c) and occurrences of RIs (15d). It is likely that these differences are due to age differences in the children studied, the elicitation procedure being conducted and, possibly, even the models used for analyses in the different studies.

As already discussed in §2.2.1, many of the studies discussed report a heterogeneity in SLI and variation in individual children. For instance, Clahsen (1992: 9) refers to one child in his data that succeeded in acquiring the correct finite verb paradigm of German by age four, whereas the other children still showed a remarkable diversity in error types and error frequencies. De Jong (1999: 180) reports on a nine-year-old SLI child who frequently produced RIs, something normally seen in two-year-old unimpaired children. He also identified subsets of SLI children who showed either a clear preference for the omission errors as in (15a and 15b) or for particular error combinations, including omission as well as producing RIs. The majority of children in De Jong's (1999) study appeared to produce mixed error patterns. Given that individual variation, we have to be careful in generalizing about groups of SLI children. Although this study also discusses group results, some comments will be made on individual patterns (see §8.5).

3.3.3 Child L2 acquisition

The cross-linguistic literature on the acquisition of verb placement and verb inflection (§2.3.2) indicates differences between child L1 and child L2 groups in terms of error frequencies due to differing exposure to Dutch in the L2 children. In an extensive study also involving L2 adult groups (§3.3.4), Blom (2008) cross-sectionally compared a Turkish child L2 group (N=23; aged 4;8 to 8;0) and a Moroccan child L2 group (N=33; aged 4;2 to 8;4) by conducting experimental production tasks eliciting verb placement and verb inflection. The Moroccan

¹²Even though German has a somewhat richer present tense verb paradigm as Dutch, the two inflectional systems are similar. Accordingly, it is worth considering some of the results in German SLI. At first sight, German data provide a similar picture to that of SLI in Dutch. Several studies examining subject-verb agreement in German-speaking SLI children (Clahsen 1989, 1992; Clahsen and Stoessel-Deschner 1993) also report on omissions and the use of RIs irrespective of the person and number of the subject. Children's age ranged from 3;2 to 9;6 in these studies, and data was either collected longitudinally or cross-sectionally. Unlike in Dutch SLI, there are studies on German SLI (e.g., Clahsen 1991; Clahsen et al. 1997; Grimm and Weinert 1990; Hamann et al. 1998) that report on error types as in (16) suggesting that plural inflections are overgeneralized to singular contexts.

children have either Moroccan-Arabic or Tarifit as their L1. Systematic exposure to Dutch started around age four in all L2 children.

Verb placement

In both groups, verb placement was tested in (i) embedded clause order and main clause order (ii) with and (iii) without subject-verb inversion. Nearly all the children had acquired the Dutch verb placement rules irrespective of their L1.¹³ Note that in Blom's (2008, Blom p.c.) study even L2 children who were tested at the ages four and five, that is with one to two years of exposure to Dutch, already performed well on the verb placement task. The L2 children seem to have passed through the L1 transfer stage since studies investigating L2 acquisition (see §2.3.2) do report L1 transfer effects in verb placement during the very initial stages. There were differences in accuracies in the three tested word order conditions: accuracy rates in main clauses were higher (>90%) than accuracy rates in inverted and embedded clause orders (around 80%).

Omission of finiteness marking (i.e., RIs) barely occurred in the two child L2 groups (<10%). As pointed out before, RIs reflect a very early stage in language development. On the basis of the high accuracy scores in verb placement, it is likely that these children have already passed that stage. That L2 children with an L1 that does not have RIs pass through an OI stage in Dutch is suggested in a study (Steenge 2006) on L2-SLI acquisition to be discussed in §3.3.5.

Experimental data (Blom and De Korte 2008) also confirmed that the relation between the uses of auxiliaries and V2 in L2 acquisition is the same as in L1 acquisition (see §3.3.1). The L2 participants tested were the same as the ones in Blom (2008). All children had good knowledge of placement rules (see above), and nearly all of the Turkish and Moroccan children used the auxiliary constructions in Dutch main clauses (with and without inversion), but marginally in subordinate clauses that involve no movement of the finite verb. In addition, there was a clear correlation with age: the number of auxiliaries was lower in older children, resembling the developmental pattern of Dutch L1 acquisition (e.g., Van Kampen 1997; Zuckerman 2001; Blom 2003). Individual analyses revealed substantial variation, however, between the L2 children, something also found in L1 acquisition.

Hulk and Cornips (2005) had obtained different results in an earlier study. They replicated Zuckerman's 2001 study in nine children acquiring Dutch aged 3;0-5;2. The children had various L1 backgrounds, i.e., Akan/Ewe (N=2), Moroccan-Arabic/Berber (N=2), French (N=1), Russian-Sranan (N=1) and Sranan (N=3). All the languages have no V2. Furthermore, the groups consisted of 2L1 and L2 children and it is therefore likely that length of exposure to Dutch differed between the children. With the exception of one child (who was excluded from the counts given here), it was found that the L2 and 2L1 children

¹³As discussed in §3.2.3, the canonical order of Turkish is head-final (i.e., with the verb following its complement). Turkish does not have V2 and no subject-verb inversion. Moroccan-Arabic and Tarifit are both head initial languages (i.e., the verb precedes its complement). Inverted structures are allowed in the two latter languages but marked (Hoogland 1996).

produced very few dummy auxiliaries constructions in both main clause (2.9%; $n=7/244$) and embedded clauses (1.4%; $n=4/281$). They did not show the clear asymmetry as seen in Blom and De Korte (2008). What is similar about the two studies is the correlation with age: there is a decrease in dummy auxiliaries with increasing age.¹⁴

Verb inflection

The acquisition of inflectional rules of the regular verb paradigm is similar to L1 acquisition (e.g., Blom et al. 2007; Blom 2008). L2 children catch up quickly with L1 children, even though they only started to learn Dutch around age four. The L2 children tested in Blom et al. (2007) performed marginally worse than the L1 peers, but they scored at around 90% accuracy after being exposed to Dutch for three to four years. When L1 and L2 children are matched for length of exposure, the younger L1 children and older L2 children appeared to perform similarly (>94% accuracy). Experimental items with novel verbs confirmed productivity of inflectional rules in the child L2 groups. All L2 children used the same error types in verb inflection as the L1 controls, namely substitutions of $-\emptyset$ and $-t$. As in L1(-SLI) acquisition, substitution of the finite form $-en$ in singular contexts (see 16) was barely found.

In sum, Turkish, Moroccan-Arabic and Tarifit child L2 learners of Dutch who have been exposed to Dutch around age four are as good in verb inflection and verb placement as their L1 peers who have been exposed to Dutch for a similar length of time.

3.3.4 Adult L2 acquisition

Cross-linguistic studies on verb placement and verb inflection with adult L2 learners have shown that they, overall, pattern qualitatively differently from typical L1 and L2 children. These differences have generally been interpreted as an effect of age and have been linked to the critical period hypothesis (§2.3.2). In the large study on Dutch verb placement and verb inflection previously mentioned, Blom (2008) also compared four groups of adult L2 learners: a group of less proficient Turkish adults ($N=13$; mean age: 30;7) and more proficient Turkish adults ($N=2$; mean age: 28;5), a group of less proficient Moroccan adults ($N=10$; mean age: 31;7) and a group of more proficient Moroccan adults ($N=10$, mean age: 28;1).¹⁵ Language proficiency was determined on the basis of the subtest ‘sentence repetition’ of the TAK (Verhoeven and Vermeer 2002).

¹⁴Hulk and Cornips (2005) report that one (French) child performed differently by producing very high frequencies of dummy auxiliaries in both order conditions ($n=15/18$ tokens in embedded clauses and $n=10/16$ tokens in main clauses) (Hulk and Cornips 2005: 171). One possible explanation, as argued by the authors, is L1 interference. Unlike Arabic, Berber and Sranan, French allows for aux+infinitive constructions. More specifically, the French equivalent to the Dutch construction (i.e., *gaan* ‘to go’+INF) is *aller* ‘to go’ +INF. It is difficult, however, to draw firm conclusions on the basis of the results given the relatively small subject numbers per language group and the general heterogeneity in the 2L1/L2 children.

¹⁵The Moroccan L2 learners have either Moroccan-Arabic or Tarifit as L1 background.

Systematic exposure to Dutch started after puberty (>age 15). The two variables were tested in three word order conditions using a controlled elicitation technique: main clause order with and without inversion and embedded clause order.

Verb placement

The adult learners tested by Blom (2008) extensively overused the main clause order without inversion (17a) suggesting that Dutch verb placement rules were not mastered. Overuse occurred in embedded clause order (17b) and in inverted order (17c) (the examples are taken from the data set (Blom p.c.)).

- (17) a. De man leest een krant
The man reads.FIN a newspaper
'The man is reading a newspaper.'
- b. *Dat is de man die leest een krant
This is the man, who reads.FIN a newspaper
'This is the man, who is reading a newspaper.'
- c. *Daar hij leest een krant
There he reads.FIN a newspaper
'There he is reading a newspaper.'

Accuracy scores are low in both adult L2 groups in embedded (Turkish adult L2: 58%; Moroccan adult L2: 26%) and in inverted clauses (Turkish adult L2: 18%; Moroccan adult L2: 11%) compared to the main clauses (Turkish adult L2: 90%; Moroccan adult L2: 86%). Not surprisingly, more proficient adult learners outperformed the less proficient learner groups. Individual analyses revealed that only three of the 35 adult learners seem to have acquired Dutch placement rules. As already pointed out in §2.3.2, the overuse of the main clause order without inversion in late L2 learners is substantiated by other studies on the acquisition of developmental sequences in German and Dutch word order (e.g., Meisel et al. 1981; Clahsen and Muysken 1986). This finding has resulted in the proposal that late L2 learners use an S(ubject)-V(erb)-O(bject) (or SVX template irrespective of the L1 or tested word order conditions. This proposal is related to the claim that clear effects of age are found in the (late) L2 acquisition of grammar.

Another explanation for word order errors that has to be considered is L1 transfer. Blom's (2008) results show that Turkish adults are more accurate than the Moroccan adults with embedded clauses. That finding could be interpreted in terms of L1 transfer. As pointed out in §3.2.3, Turkish is a language with an underlying OV order and, hence, the overuse of that order might be the result of L1 transfer. The fact that the majority of the Turkish adult L2 learners had low proficiency in Dutch (see above) would support that assumption. The Moroccan-Arabic and Tarifit L2 learners, on the other hand, perform relatively well in V2 order without inversion. This is the word order of their L1 (Blom

2008).^{16,17}

Blom and De Korte (2008) investigated whether missing placement rules (and thus overuse of the SVX template) can be related to the absence of dummy auxiliaries in adult L2 speech. In their study, the same adult L2 data as in Blom (2008) were analyzed. The data showed that, overall, adult L2 learners make no use of these constructions irrespective of their L1 providing additional support for the effects of age on L2 acquisition.

Verb inflection

Alongside verb placement, Blom (2008) also examined proficiency of verb inflection rules in the Turkish and Moroccan adult L2 learners. Firstly, data revealed that most of the L2 adults lack the syntactic information to differentiate between finite and non-finite verb forms resulting in the substitution of *-en* in finite positions as in (18); an error not so frequently seen in child language acquisition (see §3.3.1 to §3.3.3).

- (18) a. *Ik drink-en koffie
 I drink.PL coffee
 ‘I drink coffee.’
 b. *De vrouw drink-en koffie
 The woman drink.PL coffee
 ‘the woman drinks coffee.’

Furthermore, adult L2 learners have difficulty with 2SG and 3SG forms that require the *-t* suffix irrespective of their L1. Accuracy in items requiring \emptyset (1SG) and *-en* (i.e., plural contexts) was higher. The influence of L1 phonology might be one factor explaining that specific error in both adult L2 groups as discussed by Blom (2008). Note, however, that the same error was not found in the Turkish and Moroccan child L2 groups (see §3.3.3), and that both adult L2 group have (phonologically) very different L1s involving complex phonological clusters (e.g., Kornfilt 1997 for Turkish, and Van Pel 2005 and McClelland 2008 for Moroccan Arabic and Tarifit). Interpretation of that error in terms of age effects rather than L1 properties seems therefore to be more straightforward (Blom 2008: 292).

Blom (2008) also points out that three L2 adults in her data set show relatively high accuracy scores in verb placement (67%-100%) and verb inflection (67%-89%) compared to the other adult L2 learners, performing at low accuracy (<50%). This finding indicates a clear association between accuracies in verb position and verb form. Interestingly, *-en* suffix was not used as a substitute in

¹⁶The observation of L1 transfer is in line with findings discussed in §2.3.2 showing that, in the initial stages, L2 speakers with an underlying OV language as L1, such as Turkish, Korean or Japanese, do start out with OV orders, whereas speakers of Moroccan-Arabic, Italian and Spanish show initial use of the VO orders in L2 Dutch (e.g., Jansen et al. 1981) and L2 German (e.g., Meisel et al. 1981; Vainikka and Young-Scholten 1994)

¹⁷See for a different interpretation: e.g., DuPlessis et al. (1987) and Tomaselli and Schwartz (1990).

finite position in the proficient L2 learners, just as in the L1 and L2 children. This suggests that only these three L2 learners are able to use the syntactic cue to distinguish between finite and nonfinite verb forms in Dutch (Blom et al. 2007; Blom 2008). More specifically, they have learned that a verb in V2 position is specified for tense and agreement. Most of the L2 learners in Blom's study were reported to have a low to moderate proficiency level in Dutch (see above). This observation raises the question as to the extent L2 proficiency level is accountable for the differences in error types found between adult and child L2 learners. It could be argued that these errors just reflect an early developmental stage. In order to control the factor of L2 proficiency, Blom et al. (2007) and Blom (2008) compared groups of child L2 and adult L2 learners with the same low to moderate levels of L2 proficiency. The results revealed that only low and moderate proficient adult L2 learners substitute *-en* in finite position. This can be taken as additional evidence that adult and child learners have a different morphosyntactic specification of *-en*.

3.3.5 Child L2-SLI acquisition

The acquisition of Dutch has scarcely been researched in child L2-SLI learners. In a first study, Steenge (2006) examined various linguistic aspects in Moroccan, Turkish and Surinamese L2-SLI children acquiring Dutch. In a subset of these children, she investigated verb morphology comparing L2-SLI children, L1-SLI children and unimpaired L1 and L2 children aged seven and nine (N=12 per age group). The L1 background of all L2 groups was Turkish and Moroccan-Arabic/ Berber and first systematic exposure to Dutch started at around age four. Data analyses took place on the bases of narrative speech using the Frog story (Mayer 1969). Note that Steenge presents the collapsed results of the L2 groups without considering the L2 children's L1 background.

Steenge did not analyze verb placement. In analyzing subject-verb agreement, she differentiated between three types of errors that are relevant here: (i) omission of agreement resulting in the verb stem, (ii) substitution of the plural marker by singular inflection and (iii) production of RIs.¹⁸ First of all, analyses revealed no increased difficulties in the child L2-SLI group, that is Steenge did not find significantly higher error rates in the L2-SLI children compared to the L1-SLI children and the unimpaired L2 children.

Clear effects of SLI were found in terms of the rates of omission errors as in (15a). The SLI groups produced significantly more omissions in 3SG contexts than their unimpaired child L1 and L2 peers (Steenge 2006: 51). This finding corresponds to the results found in other studies on Dutch L1-SLI acquisition (§3.3.2). The substitution rates of *-t* in plural contexts were significantly higher in the SLI groups and L2 groups than in the corresponding unimpaired groups and L1 groups. This outcome is in contrast to the results from Blom et al. (2007) and Blom (2008) who found no significant difference in the use of substitution

¹⁸The grammaticality of the child responses were determined on the basis of the types of grammatical errors, as described by Van den Dungen and Verbeek (1994).

of *-t* between unimpaired L1 and L2 children. One possible explanation for this divergence is a test effect as proposed by Blom (2008) who also reports that children, irrespective of the L1 background, tend to substitute the 3SG *-t* in 3PL contexts, but less often in 1PL. It is likely that children focused on only one of the two agents in eliciting subject-verb agreement in 3PL subjects. For instance by using the subject *ouders* ‘parents’, children either focussed on mother or father. Hence, the use of the 3SG suffix *-t* would be the correct response. This explanation might also account for the narrative data elicited by Steenge (2006). There were no apparent differences across the child groups in the omission of finiteness marking (i.e., use of RIs). This is an surprising outcome given that RIs have been shown to be an SLI marker not only in Dutch SLI (§3.3.2), but also in SLI in various other languages (§2.2.2).

Despite the fact that this study should be applauded for using the same procedure to collect data from the various learner groups, it suffers from several methodological problems. Firstly, it is difficult to interpret Steenge’s (2006) results in terms of underlying representation of verb agreement rules since her study does not allow for precise error analyses. She collected narrative data based on the Frog Story and this context elicits only a subset of inflections: in particular 3SG and 3PL contexts. A systematic elicitation procedure for all forms would have provided more insight. Also, more detailed results on verb placement would have provided a more complete picture on the acquisition of finiteness. There was a considerable within-group variation in the data considering as shown by the high standard deviations especially in the child L2-SLI groups (Steenge 2006: 51). A closer look at the different L1 groups would have been useful to gain more insight into L2 factors in SLI. Differences in the L2 children’s exact input situation were also not considered. Furthermore, there is also a lack of information on the L2 children’s L1 performance so that the diagnosis of SLI in the L2 children is not clear.

3.4 Expected relationships between SLI and L2

In §2.4.3, two theories of SLI have been discussed that in different ways specify the relationship between SLI and L2 acquisition: (i) SLI is caused by a deficit in representation and (ii) SLI is caused by limitations in processing capacity. They generate different hypotheses predicting differences in types of errors in SLI and L2 acquisition, which are further expanded here in terms of cross-group comparisons for verb placement and verb inflection (compare 19 and 20).

- (19) On the basis of the representational deficit hypothesis:
The error types in verb placement and verb inflection produced in child L1-SLI and child L2-SLI acquisition should be similar to those in adult L2 acquisition, and different from typical child L1 and child L2 acquisition.
- (20) On the basis of the reduced intake hypothesis:
All child groups show a similar pattern of errors in verb placement and

verb inflection, which is different from adult L2 acquisition.

The hypothesis in (19) is based on the assumption that morphosyntactic problems in SLI are caused by a lack of or deficit in one or more principles of UG. Accordingly, children with SLI have to rely on other learning mechanisms such as the declarative memory as proposed by Ullman and Pierpont (2005) (see §2.2.3) to construct the target grammar. Adult L2 learners, too, are assumed to rely on other learning mechanisms due to age dependencies as discussed in §2.3.2. Similarities in error types in the two variables between SLI and adult L2 acquisition could therefore be expected. These should be different from typical child acquisition.

According to the reduced intake hypothesis in (20), on the other hand, SLI children should pattern like their unimpaired L1 and L2 peers. No differences in error types as used in verb placement and verb inflection are thus expected. This hypothesis is based on the assumption that the language difficulties underlying SLI originate from limitations in general cognitive abilities rather than a deficit that constrains access to UG. According to the hypothesis in (20), the SLI children should, in principle, have access to the same linguistic resources as the unimpaired children.

The empirical facts discussed in the previous sections showed that adult L2 learners (see §3.3.4) produce error types during development in verb placement and verb inflection that are qualitatively different from impaired and unimpaired child L1 acquisition making it possible to test the predictions in (19) and (20). The differences in error types are illustrated in Table 3.3. The results to date appear to be more in line with the hypothesis in (20). Little research has been done yet in Dutch child L2-SLI acquisition on verb placement or verb inflection.

Group	Error types	
	Verb placement	Verb inflection
Child L1	daux and RIs	-∅ and - <i>t</i>
Child L1-SLI	daux and RIs	-∅ and - <i>t</i>
Child L2	daux and RIs	-∅ and - <i>t</i>
Child L2-SLI	n\ a	-∅ and - <i>t</i>
Adult L2	SVX template	-∅, - <i>t</i> and - <i>en</i>

Table 3.3: Error types in verb placement and finite verb inflection across learner groups in Dutch (dummy auxiliaries are indicated as ‘daux’)

The hypotheses in (19) and (20) predict qualitative differences in error types, but not differences in error frequencies. On the basis of the reduced intake hypothesis, it is possible to formulate expectations with regard to the error quantities across the child groups. Limitations in the ability to perceive and process input are assumed to be considerable in SLI children compared to unimpaired child groups. As a consequence, SLI children need more exposure to Dutch in order to derive the inflectional rules, and hence are delayed. The child L2 groups also have a different intake but for a different reason. It is mainly a consequence of reduced exposure to the L2 (compared to L1 groups). Following this line of

thinking, the effects of SLI and L2 can be made more explicit by systematically comparing certain child groups as schematically shown in Figure 3.1.

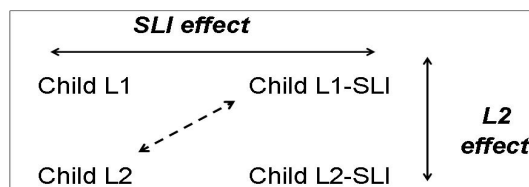


Figure 3.1: Specifying ‘delay’ in SLI and L2 acquisition

If the L1-SLI children and L2-SLI children produce more errors in verb placement (i.e., dummy auxiliaries and RIs) and verb inflection (i.e., $-\emptyset$ and $-t$) than their corresponding unimpaired L1 and L2 peers, then SLI effects can be determined (see 21). If the placement and inflectional errors in the child L2 groups outnumber those in the corresponding child L1 groups, then L2 effects can be determined (see 22).

- (21) SLI effects:
- a. The error rate in child L1-SLI > child L1
 - b. The error rate in child L2-SLI > child L2
- (22) L2 effects:
- a. The error rate in child L2 > child L1
 - b. The error rate in child L2-SLI > child L1-SLI

If both L2 and SLI effects are found, they may both play a role in L2-SLI acquisition. Then a combined or cumulative effect should be found in the child L2-SLI group leading to a ‘double delay’.¹⁹ The rates of errors should then be substantially higher in that group compared to any other child group as formulated in (23).

- (23) The error rate in child L2-SLI > child L1-SLI, child L2 and child L1

The results from previous research from §3.3 indicated that the delaying effect of SLI seems to be more severe than the delaying effect of L2. More specifically, almost all L2 children with two-to-four years of Dutch exposure performed almost target-like in positioning and inflecting finite verbs, whereas inflectional errors and/or absence of finiteness marking was still evident in (most of) the SLI children. Note that the SLI children had been exposed to Dutch for a much longer period (up to age nine).

One way of specifying the impact of one effect compared to the other is by comparing a child L1-SLI group with a child L2 group. On the basis of evidence from previous research, the SLI effect has a greater delaying effect than the L2 effect. The frequencies of verb placement errors and agreement errors should

¹⁹A cumulative effect is determined on the basis of effect sizes as shown in §5.3.5.

therefore be higher in SLI children as formulated in (24).

- (24) The relative impact of SLI and L2:
The error rate in child L1-SLI > child L2

Following the line of the reduced intake hypothesis (see 20), we thus expect that the different child groups make the same error types and that the difference found in positioning and inflecting the finite verb are quantitative rather than qualitative in nature (see 21-24) due to reduced intake effects of SLI, on the one hand, and the reduced input to Dutch in the child L2 groups, on the other hand. Previous results suggest that the threshold – the critical mass that is necessary to acquire rules for verb placement and verb inflection – is low: adult-like performance is achieved after two-to-four years of exposure to Dutch in typical child L1 and child L2 acquisition. At least some SLI children, on the other hand, appear not to reach the threshold for both domains by the age of eight/nine. It can thus be expected that the SLI effects will be greater than the L2 effects.

Obviously, input plays a crucial role in testing the predictions in (21) to (24). As has been pointed out in §2.3.2, there is a natural variation between L2 children as to the length of exposure to Dutch input (depending on the age of initial exposure to Dutch). This factor must therefore be considered in the analysis.

Agreement in Dutch determiners and adjectives

4.1 Introduction

The second morphosyntactic domain to be examined here is the production of agreement in determiners and adjectives. From the survey of the literature it is clear that far less is known about the acquisition of agreement in the determiner phrase, cross-linguistically, in SLI (§2.2.2) compared to verb agreement. Agreement in the determiner phrase is a potential SLI marker since morphological rules are involved. Age effects are also visible in this domain marking a contrast between child and adult learners (see §4.3.5). Exactly these two properties are necessary to establish the relationship between SLI and L2 acquisition in terms of the two hypothesis being tested. First, the system of determiners and adjectival inflection (§4.2) is briefly described followed by a literature survey of acquisition in the different learner populations (§4.3). On the basis of these sections, the expectations are formulated for the cross-group comparisons according to, on the one hand, the representational deficit hypothesis, and, on the other hand the reduced intake hypothesis (§4.4).

4.2 System

Since a noun's gender plays a crucial role in adjectival agreement, I will first describe the gender system of Dutch. Dutch has a two-way gender system that distinguishes neuter and common gender. The distinction surfaces in several ways, two of which are relevant in this thesis: the system of definite articles (or determiners) (see §4.2.1) and the system of adjectival inflection (see §4.2.2). §4.2.3 sketches the differences between Dutch and Turkish, the first language of the L2 learners in this study to provide a background for any interpretation of the results as due to L1 interference.

4.2.1 Dutch determiner system

In the determiner system, gender is visible on definite determiners in singular condition: a common gender noun combines with the definite determiner *de* as in (1a); the determiner *het* combines with a neuter gender noun as in (1b).

- (1) a. *de*/**het* appel
 the apple.COM
 b. *het*/**de* glas
 the glass.NEUT

Gender is neutralized in indefinite and plural contexts, as shown in (2) and (3), respectively.

- (2) a. *een* appel
 an apple.COM.SG
 b. *een* glas
 a glass.NEUT.SG
 (3) a. *de*/**het* apples
 the apples.COM.PL
 b. *de*/**het* glazen
 the glasses.NEUT.PL

Whether a root noun is common or neuter gender is unpredictable in most cases. There are some semantic classes for which gender may be predicted. For instance, the names of sports are neuter gender (e.g., *het golf* ‘(the) golf’, *het tennis* ‘(the) tennis’, *het hockey* ‘(the) hockey’) as well as metals (e.g., *het goud* ‘the gold’, *het zilver* ‘the silver’, *het brons* ‘the bronze’). The names of plants are common gender (e.g., *de roos* ‘the rose’, *de eik* ‘the oak’) like the seasons (*de lente* ‘the spring’, *de zomer* ‘the summer’, etc.) (e.g., Haeseryn et al. 1997; Booij 2002). These categories form a very small part of the lexicon and exceptions can be found for most of these instances. Unlike other languages, the gender of root nouns cannot clearly be predicted on the basis of phonological form either (see for some attempts Trommelen and Zonneveld 1986).

Derivational morphology does, however, provide cues (e.g., Booij 2002; Haeseryn et al. 1997). For instance, all nominalized verbs formed with the prefix *ge-* and nouns ending with the suffix *-isme* are neuter (*het gezag* ‘the power’, *het geding* ‘the case’, *het vandalisme* ‘the vandalism’, *het egosme* ‘the egoism’), whereas nouns ending with the suffixes *-heid* and *-ine* (*de waarheid* ‘the truth’, *de schoonheid* ‘the beauty’, *de latrine* ‘the latrine’, *de discipline* ‘the discipline’) are common gender. For a detailed discussion of all different formal categories that mark gender, see Haeseryn et al. (1997) and Booij (2002).

One large and productive subcategory within the derivational suffixes is that of diminutive nouns (marked in (4) with DIM). As will be shown in Chapter 6, diminutives are included in the test material to examine whether such structural cues facilitate the acquisition of gender. Diminutives are morphologically marked for gender by adding the suffix *-tje* or one of its various phonologically

conditioned allomorphs to a noun (e.g., Haeseryn et al. 1997) and become neuter gender by definition.¹ The nouns in (4) illustrate how derivational morphology overrules the gender class of root nouns. The neuter gender diminutive nouns *appeltje* ‘small apple’ (4a) and *autootje* ‘small car’ (4b) are both derived from common gender nouns. As is the case with neuter root nouns, diminutive nouns are neutralized for gender in plural contexts (see 4c and 4d).

- (4) a. het/*de appeltje
 the apple.DIM
 b. het/*de autootje
 the car.DIM
 c. de/*het appeltjes
 the apples.DIM
 d. de/*het autootjes
 the cars.DIM

From a perspective of acquisition, information about the input distribution in the adult system of both determiners should be considered as it might influence the sequence of acquisition. I will elaborate on that issue in §4.3.1.

4.2.2 Dutch adjectival inflection

Adjectives in Dutch appear in two syntactic positions: they are either in a prenominal attributive position (see 5a) and are part of a determiner phrase and modify the noun with which they occur or they are in a predicative position, which is post-verbal (see 5b).

- (5) a. De kleine bal
 the small ball
 b. De bal is klein
 the bal is small

Attributive adjectives agree with the noun with respect to number, gender and definiteness of the determiner phrase (Broekhuis 1999; Booij 2002).²

The Dutch paradigm of adjectival attributive inflection follows a predictable inflectional pattern. The suffix *-e* has to be added, but there is one exception: if

¹The phonologically conditioned allomorphs of *-tje* are as follows:

- boek ‘book.NEUT’ + *-je* → boekje ‘book.DIM’
- raam ‘window.NEUT’ + *-pje* → raampje ‘window.DIM’
- bal ‘ball.COM’ + *-etje* → balletje ‘ball.DIM’
- koning ‘king.COM’ + *-kje* → koninkje ‘king.DIM’

²Broekhuis (1999) demonstrates that specific phonological and lexical properties may influence the inflectional pattern of Dutch attributive adjectives. There are some phonological constraints, where no *-e* suffix is added to the adjective. For instance, with adjectives that end in schwa or *-en*: *de stupide-∅/beige-∅/oranje-∅ ballon* ‘the stupid/beige/orange balloon’; *de open-∅/gesloten-∅ deur* ‘the open/closed door’.

the determiner is indefinite and the adjective modifies a singular, neuter noun, then the adjective is not overtly inflected.³ Compare therefore the examples in Table 4.1, where the exceptional case is highlighted for clarity. The table gives examples for every feature combination; the features being <definiteness>, <gender> and <number>. Note that the bare form in attributive adjectives ($-\emptyset$) is identical to the predicative form (see 5b). The system underlying adjectival inflection is rather complex in Dutch and as such may be difficult to acquire.

[DEF]	DET	ADJ	N	[INDEF]	DET	ADJ	N
[COM/SG]	de	kleine	bal	[COM/SG]	een	kleine	bal
	‘the	little	bal’		‘a	little	bal’
[NEUT/SG]	het	kleine	huis	[NEUT/SG]	een	klein \emptyset	huis
	‘the	little	house’		‘a	little	house’
[COM/PL]	de	kleine	ballen	[COM/PL]	\emptyset	kleine	ballen
	‘the	little	balls’		‘	little	balls’
[NEUT/PL]	de	kleine	huizen	[NEUT/PL]	\emptyset	kleine	huizen
	‘the	little	houses’		‘	little	houses’

Table 4.1: Paradigm of attributive adjectival inflection exemplified with the adjective *klein* ‘small’

There are basically two possible analyses of adjectival inflection in Dutch in terms of default versus non-default forms (the schematic representations of both analyses are taken from Weerman 2002). The first analysis shown in Table 4.2 is basically in line with Kester’s (1996) interpretation of Dutch adjectives. She assumes that the absence of inflection in a subclass of predicative adjectives is comparable to the absence of inflection in a subclass of attributive adjectives. That is to say, the morphological similarity in inflected form is crucial in spite of syntactic differences. Based on this analysis, the bare adjective ($-\emptyset$) would be the default, whereas the overt spell-out would be the unmarked form.

If attributive, indefinite, singular and neuter	Otherwise
$-\emptyset$	$-e$

Table 4.2: Analysis I of adjectival inflection according to Kester (1996)

Broekhuis (1999), on the other hand, follows the analysis presented in Table 4.3. There, it is assumed that the two syntactic environments have to be kept apart through separately analyzing the inflectional pattern of predicative and attributive adjectives. In his view, the homophony of bare attributive and

³There are cases where the head of the determiner phrase is not overtly expressed causing N-ellipsis (Broekhuis 1999 for details). In such cases, gender is neutralized and the attributive adjective is then usually inflected with $-e$: e.g., *Kijk een rode fiets. Ik heb net een groene \emptyset gekocht.* ‘Look, a red bike.COM. I just have bought a green (one).’ and *Kijk, een schoon varken. Ik heb net een vieze \emptyset gezien.* ‘Look, a clean pig.NEUT. I just have seen a clean (one).’ Note, however, that not all speakers would agree that N-ellipsis is allowed in contexts where the determiner is indefinite and the adjective modifies a singular, neuter noun (thus, the latter example) (Broekhuis 1999).

predicative adjectives in Dutch would be accidental and $-e$ would therefore be the default for attributive adjectives.

Attributive		Predicative
If indefinite, singular and neuter	Otherwise	
$-\emptyset$	$-e$	$-\emptyset$

Table 4.3: Analysis II of adjectival inflection according to Broekhuis (1999)

Both analyses seem plausible from a language descriptive point of view and it is therefore difficult to choose one over the other. As is clear from both tables, it is possible to derive different predictions for acquisition on the basis of the definition of the exceptional patterns. Following the analysis in Table 4.2, learners are expected to use $-\emptyset$ as the default, in contrast to the analysis in Table 4.3 where $-e$ is assumed to be the default for attributives. On the basis of previous results on the acquisition of adjectival inflection in Dutch (e.g., Weerman 2002; Cornips et al. 2006; Weerman et al. 2006; Blom et al. 2007, 2008b), the analysis in Table 4.3 is supported. Predicative adjectives are correctly formed at an early developmental stage and are not confused with attributive adjectives. In addition, the overt spell-out $-e$ in attributive adjectives is overgeneralized and therefore appears to be the default in Dutch. In contrast, $-\emptyset$ in attributives is acquired later and appears to be the marked form. A detailed discussion of the acquisition data on adjectival inflection will be provided in §4.3.

4.2.3 Contrasting Dutch and Turkish

Unlike Dutch, Turkish has no gender system, neither does it have definite determiners or adjectival inflection. Indefiniteness of a noun is signaled by *bir* (Underhill 1976; Kornfilt 1997). Kornfilt (1997) argues that *bir* is used either as the numeral ‘one’ or as the only (indefinite) article Turkish has depending on its syntactic position: the numeral is phrase-initial as in (6a), whereas the indefinite article follows any adjective in the noun phrase but immediately precedes the noun as in (6b).

- (6) a. Bir güzel, yeşil elma, lütfen.
 one nice green apple please
 b. Bu güzel, yeşil bir elma.
 this nice green indef.art apple
 ‘This is a nice, green apple.’

It is possible that the absence of a determiner system in Turkish might lead to the omission of Dutch determiners in Turkish L2 learners due to L1 transfer. I will return to this issue in §4.3.

4.3 Acquisition

Acquiring adjectival agreement in Dutch is a drawn-out learning process as will be seen from the discussion of production data in unimpaired and impaired L1 and L2 acquisition of Dutch. Most of the data discussed in the subsequent sections for child L1 (§4.3.2), child L2 (§4.3.4) and adult L2 (4.3.5) acquisition come from the same studies referred to in the discussion of verb placement and verb inflection (§3.3). As already noted, there is considerably less evidence in the literature on the acquisition of agreement in adjectives than on Dutch verbs, especially with respect to the acquisition in SLI populations (§4.3.3 and §4.3.6).

Before focussing on the acquisitional properties in the various learner groups, §4.3.1 addresses the input distribution of Dutch gender as far as relevant for this study. In Dutch, the gender system is morphophonologically relatively non-transparent which makes it difficult to learn both for child and adult learners. This knowledge is necessary to be able to derive the rules underlying adjectival inflection.

4.3.1 Input and the acquisition of adjectival agreement

Scholars have argued that correct assignment of common or neuter gender to a (root) noun requires stable and sufficient input of Dutch on an item by item basis (Deutsch and Wijnen 1985; Van Berkum 1996). There is, however, a distributional difference between the two determiners (i.e., *de* and *het*) as confirmed by an analysis of the CELEX database (Van Berkum 1996), compiled on the basis of two dictionaries and the most frequent lemmata from the text corpus of the Institute for Dutch Lexicology (160,000 lemmata). Common nouns (*de*) outnumber neuter nouns (*het*) by a ratio of about 2:1 in terms of type frequencies and by a ratio 3:1 in terms of token frequencies. Neuter gender is therefore likely to be underrepresented in the input.⁴ It is then probable that the neuter gender determiner *het* is more difficult to acquire and that the common gender determiner *de* is overgeneralized. This, in turn, is directly related to the process of acquiring the marked (or special) rule of adjectival inflection (Table 4.3) as this requires knowledge of neuter gender. Acquisition of this aspect will also take longer.

It is widely accepted that Dutch diminutives occur early in child speech and are very frequent (e.g., Bol and Kuiken 1987, 1988; Gillis 1997; Gillis and Schaeerlaekens 2000). Gillis (1997) investigated child-directed speech in (Flemish) Dutch to one child (aged 1;5 to 2;5) and found that diminutive nouns were used with high frequencies. Young children may well receive an additional cue

⁴A similar analysis focussing on the token frequencies of *de* and *het* in the ‘Corpus of Spoken Dutch’ (*Corpus Gesproken Nederlands (CGN)*), carried out by Nivja de Jong, revealed that the difference between the two forms is less evident: the strings of *de* (260.000) only slightly outnumber *het* (221.000). A closer look at the distribution showed that around half of the *het*-strings were occurrences of the resumptive pronoun *het* as in *het regent* ‘it rains’. This suggests that the determiner *de* is indeed more frequent than the determiner *het*. The ambiguous character of *het* (as having the function of a definite determiner as well as a personal pronoun) possibly adds to the enduring process in acquiring neuter gender (De Jong p.c.).

for acquiring neuter gender in combination with this morphological marking (see 4). Systematic research on the effect of input distributions of diminutive nouns and neuter gender assignment in Dutch child language acquisition has, however, not yet been carried out. Future research has to confirm whether a frequent use of diminutives is a typical phenomenon for child-directed speech in Dutch that indeed facilitates the activation of neuter gender.

The distribution of inflectional suffixes *-e* and $-\emptyset$ in attributive adjectives in the input is also likely to be uneven. Blom et al. (2008b) analyzed adult and child-directed speech data taken from various CHILDES corpora (MacWhinney 2000): the Groningen corpus, the Van Kampen corpus and the Bol and Kuiken corpus. Token counts were based on 20 high frequent adjectives in attributive position. The analysis revealed that *-e* outnumbers $-\emptyset$ by a ratio of 1.8:1. When predicative adjectives (also ending with $-\emptyset$) were also taken into account, the distribution was skewed towards the bare adjective; 3.4 times as many $-\emptyset$ were used than *-e* (Blom et al. submitted). This input frequency makes it plausible that both inflectional endings are used during acquisition.

4.3.2 Child L1 acquisition

Determiner agreement

Spontaneous language analyses (e.g., Bol and Kuiken 1988, 1990; Wijnen et al. 1994; Taelman 2005; Pannemann 2007; Rozendaal and Baker 2008) of the L1 acquisition of Dutch determiners have shown that children tend to use bare nouns in the initial stages. The two-word stage (around 18 months) is marked by the production of so-called proto-determiners that are phonetically realized as a schwa. Between ages two and three, children begin to produce the full form of determiners (e.g., the definite articles *de/het* and demonstratives *dat* ‘that’ *dit* ‘this’) with higher frequencies. Analyses of spontaneous speech data, albeit in a few children (e.g., De Houwer 1987; Schaerlaekens and Gillis 1987; Rozendaal and Baker 2008), have also revealed that the definite determiner *het* appears later than the common gender determiner *de*.

In recent work, Van der Velde (2003) and Poliřenská (in preparation) have used controlled elicitation techniques to study the acquisition of gender assignment in Dutch. Poliřenská (in preparation) cross-sectionally investigated L1 children (N=85; aged three to eight) by eliciting gender assignment in common gender nouns and neuter gender nouns (root and derived forms) in an experimental production task. The L1 children learn the neuter gender determiner *het* relatively late. Whereas the percentage of correct use of common determiners is above or around 90% from 3 years onwards, correct use of neuter determiners, though increasing, only reaches 75% at age 7. The children overgeneralize common determiners *de* to neuter nouns; substitutions in the other direction occur much less frequently.

Morphological cues, i.e., diminutives facilitate the acquisition of neuter gender (Poliřenská p.c.). Children are faster in assigning the neuter determiner *het* to a diminutive noun than to neuter root nouns (Poliřenská p.c.). That observa-

tion is in line with observations made by Gillis (1997) and recent experimental work by Van Ginkel (2006) and Cornips and Hulk (2007).

Polišenská confirms findings of Van der Velde's (2003) earlier, but smaller study of 38 Dutch children aged three, four and six. There, gender was also elicited in isolated contexts. Not surprisingly, the children performed slightly better in the isolated contexts than in sentences. This result could be interpreted as showing that gender assignment is sensitive to cognitive load, which is in Van der Velde's study the length of the stimulus sentence. Van der Velde only tested each noun once for gender assignment, unlike Polišenská. It is therefore unclear whether the children showed stable gender assignment.

Adjectival inflection

Children produce the first adjective-noun combinations around age two, though without a determiner (e.g., Bol and Kuiken 1987). It is around the age of three that the first complex adjectival phrases (i.e. determiner-adjective-noun) occur (e.g., De Houwer 1990). Based on natural speech data, De Houwer also reports that children tend to use the target-like word order in attributive adjectives from early on: adjectives and determiners precede the noun.

Polišenská (in preparation) also investigated adjectival inflection in the same child group discussed above. The children showed an overuse of *-e* when a bare adjective is required in attributive position. In contrast, bare adjectives were rarely produced as a substitute.⁵ By the age of seven, L1 children produce the adjectival bare form in 70% of the cases where it is required. This observation on its own does not, however, reveal whether children have in fact acquired the underlying agreement rule since the gender assignment needs to be consistent. If, for instance, a child incorrectly inflects the adjective in **een grote glas* 'a big glass' (the correct form being *een groot glas*), the error can be explained in several ways. One option is that the child has not yet acquired the underlying inflectional rule for adjectival inflection. It might also be the case, however, that the child has classified *glas* 'glass' as a common gender noun, and this information has to be obtained from the child's use of the definite determiner. If the child sees the noun as common gender, then the inflection of the adjective is correct, although, of course, not in accordance with the Dutch target form. In order to determine which of these options is correct, the results on gender assignment in determiners and adjectives have to be related. Polišenská (in preparation) did this by determining per tested noun to what extent gender assignment was consistent (see Chapter 7 for a detailed description of the methodology). This analysis revealed that children are consistent from an early age; if they use the common gender determiner *de* with a noun, then the adjective is inflected with *-e* in the indefinite context. If the neuter gender determiner *het* is used, then the

⁵Note that predicative adjectives *De laptop is klein* 'The laptop is small' do not pose any problems in L1 acquisition. Weerman (2002) and Weerman et al. (2006) used experimental elicitation techniques in three-to-seven-year old children (N=20). Their data revealed that the inflection of predicative adjectives with \emptyset does not pose any problems. This result is in line with the analysis set out in Table 4.3.

child produces a bare adjective in the indefinite context. However, it is important to remember that at young ages (three-to-five), children rarely assign *het* to Dutch nouns, but overuse the common gender determiner *de* and the overtly inflected adjective. This could well follow from the greater frequency of these forms in the input (see §4.3.1). With age, the child's lexicon grows and correct neuter gender assignment increases in determiners and adjectival inflection. The data thus suggest that children have already acquired the rule underlying attributive adjectival inflection, but they need to stabilize their gender assignment with neuter nouns.

4.3.3 Child L1-SLI acquisition

As already pointed out in §2.2.2, there is barely any systematic research on gender agreement in SLI, and equally so on Dutch SLI, but there is some evidence that determiner agreement is affected. Analyses of spontaneous speech data (Bol and Kuiken 1988) in four-to-eight-year old SLI children and narrative data (De Jong 1999) of six-to-nine-year old SLI children revealed that these children frequently omit definite determiners. This can be interpreted as the result of a delay since much younger unimpaired L1 children also omit determiners.⁶ De Jong (1999: 84) observed that the SLI children in his study were not able to distinguish between neuter and common gender. Unfortunately, no systematic error analysis was provided in either study since the number of noun types in the data material was limited. No firm conclusions about the acquisition of determiner and adjectival agreement can therefore be drawn.⁷

4.3.4 Child L2 acquisition

From the discussion of cross-linguistic studies in §2.3.2, we can predict that L2 children should be delayed in acquiring adjectival agreement compared to L1 children. Possible suggestions to explain for the delay were, on the one hand, L1 interference effects and, on the other hand, reduced intake (on the basis of the assumption that children have had limited exposure to the L2 compared to L1 children).⁸

⁶There is ongoing discussion as to the underlying causes of determiner omission. Various factors are assumed to be responsible for determiner omissions such as (i) discourse factors, e.g., the incapacity to properly use functional categories to connect lexical categories with discourse entities, or (ii) lexical or syntactic factors, e.g., underspecification of the representation of determiners (see e.g., Pannemann 2007; Rozendaal 2008 for discussion). This matter is, however, not the topic of the present study.

⁷That SLI children tend to omit determiners has also been found in various other languages (§2.2.2). There is, however, only limited evidence on the acquisition of adjectival inflection in SLI. Observations from German SLI (e.g., Clahsen 1992) and Swedish SLI (e.g., Leonard et al. 2001; Hansson et al. 2003) report on frequent omissions of the inflectional markers on adjectives. Whether this observation can also be made for Dutch SLI is discussed in Chapter 7.

⁸I would like to point out that most of the data discussed in §2.3.2 on adjectival agreement come from children acquiring two languages simultaneously (2L1 acquisition). These data are not further considered here as this thesis focuses on child L2 acquisition.

Determiner agreement

The cross-sectional study by Blom et al. (2007) comparing Dutch acquisition data in two groups of L2 children (Turkish: N=17; aged 4;2 to 8;3; Moroccan-Arabic and Tarifit: N=16; aged 6;2 to 8;4) confirms a delay in acquiring neuter gender. Basically, the same types of errors are found in the L2 children as in L1 acquisition. That is for gender assignment to determiners, the common determiner *de* is overgeneralized in both child L2 groups, the neuter determiner *het* is not. Furthermore, all children tend to omit determiners in the first stages of acquisition.⁹ These findings are similar to those of other studies with L2 children L2 acquiring Dutch with different L1 backgrounds (e.g., Hulk and Cornips 2006a,b; Cornips and Hulk 2008; Unsworth 2008). Both Cornips and Hulk (2008) and Unsworth (2008) emphasize the importance of lengthy and consistent exposure to Dutch in order to be able to acquire neuter gender.¹⁰

Very little research has been done on the acquisition of gender in diminutives in child L2 acquisition. The studies of Van Ginkel (2006) and Unsworth (2008) on Turkish-Dutch and English-Dutch L2 children, respectively, suggest that gender acquisition was not better in the morphologically marked diminutive nouns. This is in clear contrast to the findings in Dutch L1 acquisition (§4.3.2). For instance, the Turkish-Dutch L2 children (Van Ginkel 2006) aged 10;0 to 11;10 still overgeneralized *de* to neuter diminutive contexts in 34% of the time compared to 9% in L1 peers of the same age. Systematic L2 exposure in the L2 children started at around age four.

In sum, the cause of differences between L2 and L1 children in this area seems mainly to be linked to the amount of input to the target language.

Adjectival inflection

Although both L1 and L2 children overgeneralize the schwa ending in adjectives, there is a difference between these two groups in development. Poliřenská's data discussed in §4.3.2 showed that L1 children reach a level of 70% correct use of the non-default case (see Table 4.3) around the age of 7, whereas the L2 children at age eight and after four years of Dutch exposure are still performing at low levels: 20% correct (Blom et al. 2007, 2008b). Laloi et al. (2005) tested Moroccan adolescents (N=9; aged 15 to 16) using the same experimental elicitation

⁹Omission of determiners in the Turkish child L2 group could be seen as evidence for L1 interference given the lack of a determiner system in that language (see §4.2.3). Moroccan-Arabic and the Berber language Tarifit have both a masculine-feminine gender system (e.g., Hoogland 1996; Hawkins and Franceschina 2004). According to Hawkins and Franceschina (2004), both languages have the underlying feature <feminine>. This feature does, however, not map on the feature <gender> in Dutch, making positive transfer improbable. The data from Blom et al. (2007) confirm this: L1 Moroccan children omit determiners to the same extent as Turkish children. This suggests that determiner omission is the result of limited input to the target language.

¹⁰Cornips and Hulk (2008) and Unsworth (2008) discuss the effects of qualitatively different input these L2 children receive, that is overgeneralisation of *de* in 'ethnic Dutch' input from adult L2 learners from ethnic communities (e.g., Cornips and Hulk 2005; Hulk and Cornips 2006b).

task. Their data revealed that all nine adolescents had not acquired the rule underlying adjectival inflection even after more than ten years of exposure to Dutch. In other words, for these L2 learners the stage in which the schwa is overgeneralized to all attributive adjectives seems to be the end state, that is fossilization has taken place. Further research in (much) older L2 participants with more input to Dutch has to establish to what extent this is the case.

In order to be able to draw firm conclusions about the acquisition of the marked case in adjectival inflection, Blom et al. (2007) performed the same consistency analysis as Polišenská (in preparation) for typical L1 acquisition. These analyses showed that the L2 children's adjectival errors are the result of overgeneralizations of common gender. There is an increase in accurate neuter gender assignment in determiners as the L2 child gets older (e.g., *het boek* instead of **de boek* 'the book.NEUT'), but increasing age does not result in higher accuracy with the marked case in attributive inflection. L2 children tend to persist in using the default **een grote boek* 'a big book' instead of correctly applying the special case *een groot boek*. This is evidence that L2 children fossilize in the stage where *-e* is overgeneralized. Here an age-dependency seems to be evident. In other words, the child L2 learners seem to end up with an incomplete grammatical system because not enough input was available early enough to extract that rule, say before age three/four as in L1 acquisition.

4.3.5 Adult L2 acquisition

Differences in error patterns between child and adult L2 learners are to be expected in the acquisition of agreement relations on the basis of the discussion in §2.3.2, and are taken as evidence for the existence of age effects. Support for effects of age in acquiring adjectival agreement has been provided by various studies (e.g., Sabourin and Haverkort 2003; Weerman et al. 2006; Blom et al. 2007, 2008b). Blom et al. (2007), for instance, compared data of Turkish and Moroccan (N=18) adult L2 learners to (subsets of) data of the child L1 and child L2 groups, respectively, discussed in §4.3.2 and §4.3.4. Note that all adult learners had systematic exposure of Dutch after the age of 15.

Determiner agreement

Adult L2 learners and children pattern alike in learning determiner assignment. They omit determiners and they overgeneralize the common determiner, but do not overuse the neuter determiner. It is possible that any omissions of determiners are due to L1 transfer in the Turkish L2 adults since Turkish has no determiner system. L1 transfer does not seem to be the general explanation, however, since the Moroccan L2 learners tested also omit determiners in a similar way despite having an L1 background with determiners (see §4.3.4, footnote 9).

Adjectival inflection

Clear differences are found in adjectival inflection in Blom's et al. (2007; 2008b) studies. Adults typically make two kinds of errors, unlike the L1 and L2 children: they overgeneralize adjectives with *-e* as in (7a), but they also overgeneralize bare adjectives as in (7b).

- (7) a. *een grote book
 a big book.NEUT
 b. *een groot appel
 a big appel.COM

The consistency analysis in the two adult L2 groups revealed that the adjectival rule has not been acquired: A noun that consistently appears with the definite article *de* is also used in combination with the bare adjectival form. This pattern was not seen in typical child L1 and child L2 acquisition. Age of onset to the L2 may be an explanation.¹¹ Interestingly as in the L2 children, correct assignment of neuter gender to determiners increases with growing input of the target language, whereas this is not the case for the application of the marked case in adjectival inflection.

One may wonder why age of exposure to Dutch influences the acquisition of adjectival inflection but not that of determiners. All learner groups overused the common determiner *de*, but only the L2 adults showed a dual error pattern with attributive adjectives (i.e., *-e* and $-\emptyset$). Both domains are instances of agreement. One explanation is given by Blom et al. (2007, 2008b).

According to Blom and colleagues, age effects are not apparent in the acquisition and use of determiners since determiners can be acquired quite successfully via distributional learning techniques based on co-occurrence patterns in the input (e.g. frame-based learning). Adjectival inflection is computationally more complex, however, and requires more abstract information that is very hard, if not impossible, to directly formulate on the basis of such co-occurrence patterns. Assuming that frame-based learning is typically lexical learning and that more abstract representations are part of the grammar, the observed difference between children and adults could be related to Ullman's procedural and declarative model (Ullman 2001a,b, 2004, 2005) (see §2.3.2), which offers an explanation for differences between child L2 and adult L2 learners.

Assuming that lexical learning plays a role in explaining the difference between the acquisition of agreement in definite determiners and in attributive adjectives, input frequency must also be important. Since the distribution in the input of both determiners is so unequal (§4.3.1), the common gender deter-

¹¹One may wonder whether a difference in the L2 proficiency level between the child and adult L2 learners is accountable for the differences in error types. Most of the L2 adults in Blom's et al (2007: 323) study were reported to have a low to moderate proficiency level in Dutch. In order to control for that factor, Blom and collaborators compared groups of child L2 and adult L2 learners with the same low to moderate levels of L2 proficiency. The results revealed that only low and moderate proficient adult L2 learners show the dual error pattern in attributive adjectival inflection. This can be taken as additional evidence for age effects in this domain.

miner *de* being more frequent than the neuter determiner *het*, a learner could thus initially assume that Dutch nouns are always preceded by *de* resulting in the frame in (8a). Evidence for neuter gender nouns, on the other hand, if provided in the input has to be memorized and listed as exceptions as in (8b) (a similar notation convention of frames is used here to that in Blom et al. 2008b: 302). If the input is large and varied enough, neuter nouns will, eventually, be acquired. This idea of frames is in line with the acquisition data discussed earlier: All learner groups tend to overuse *de*, and the groups with the longest input to Dutch have the highest accuracies with neuter gender assignment.

- (8) a. [de N]
 b. [het boek ‘the book’], [het mes ‘the knife’], etc.

The result of using frames as in (8) that specify the type of determiner (*de* or *het*) in combination with a noun is, in fact, exactly the same as an agreement relation between the noun and the determiner with rules that spell out the neuter determiner as *het* and the common determiner as *de*: *de* is inserted in all definite contexts, unless the noun is neuter and singular; in that case, *het* must be inserted (see Blom et al. 2007, 2008b for discussion building upon the framework of Hawkins and Franceschina 2004).¹²

The acquisition of adjectival inflection in terms of lexical frames would result in an alternating use of the two inflectional endings *-e* and \emptyset following the evidence from input analyses in §4.3.1. This could be represented as frames as in (9) (this is a similar notation form as used in Blom et al. 2008b: 304).

- (9) a. [ADJ-e N]
 b. [ADJ N]

Although a frame as in (9a) could be used successfully for a large number of inflectional contexts, it would lead to errors in indefinite contexts with singular neuter nouns (**een grote mes* ‘a big knife’) (§4.2.2). Even more errors would occur on the basis of a frame such as (9b). For instance, in order to correctly produce *een groot mes* ‘a big knife’, it is not enough to learn that the adjective is uninflected if it is preceded by the indefinite determiner *een* ‘a’, [a ADJ N], since common gender nouns like ‘apple’ require *-e* in this context. It would also not suffice to learn that *mes* ‘knife’ is always preceded by an uninflected adjective since the adjective is inflected in *het grote mes* ‘the big knife’. Thus, in a frame-based analysis, only separate frames per noun will result in correct

¹²It is not possible to decide which strategy child learners use when acquiring gender in determiners since grammatical rule learning and frame learning seem empirically indistinguishable. Blom et al. (2008b) argue that children may start with frames and via these acquire the rule system based on features. Cornips and Hulk (2008) tentatively assume, also following Hawkins and Franceschina (2004), that children initially do not have any specification of gender in their grammars, but that they rely on a definiteness feature only. The two assumptions are difficult to test for determiner-noun agreement since they would both predict the overuse of *de* during acquisition. As will be shown next, use of the feature system becomes empirically visible when acquiring adjectival inflection.

use of the bare adjective. This is illustrated in 10.¹³

(10) [een ADJ boek], [een ADJ mes], etc.

The use of separate frames would require not only extensive input, but also extensive storage. The acquisition of adjectival agreement in terms of a rule system that spell out adjectives with features as $-e$ and $-\emptyset$ (features that are present on adjectives as a result of agreement; see Table 4.3 and Blom et al. (2008b)) seems therefore less demanding and, hence, more successful.

To sum up, the difference between the acquisition of agreement in determiners and attributive adjectives can be accounted for by grammatical rule and lexical frame learning, respectively, and linked to the distinction between procedural and declarative memory (Ullman 2001a,b, 2004, 2005): Ullman argues that the availability of the system supporting the acquisition of grammar is more limited with increasing age, unlike the system supporting lexical knowledge. In other words, L2 adults pattern like child learners with determiners, but they pattern differently with adjectives.

4.3.6 Child L2-SLI acquisition

To my knowledge, no research has been carried out yet on the acquisition of Dutch adjectival agreement in L2-SLI children.

4.4 Expected relationships between SLI and L2 acquisition

The results of previous research indicate that child and adult learners only differ in their error types in attributive adjectival inflection, which is an indication of age effects. All learner groups studied pattern alike with determiners. Adult L2 learners use both $-e$ and $-\emptyset$ forms erroneously in attributive adjectives, unlike child learners who only overgeneralize $-e$. L2 children seem to fossilize though in the default stage overusing schwa, although their use of correct determiners with neuter gender nouns is increasing. The developmental patterns of the various learner groups examined are summarized in Table 4.4.

As discussed in §4.3.5, the observed contrast between child learners and adult L2 learners in adjectival inflection can best be understood in terms of Ullman's (2001a; 2001b; 2004; 2005) distinction between the declarative and procedural memory laid out in §2.3.2. The acquisition and use of determiners can be accomplished quite successfully by relying on declarative memory (i.e., lexicon), whereas the acquisition and use of gender in adjectives can only be successful by using a grammatical rule (i.e., procedural memory). Since the

¹³In fact, even a frame as [a ADJ knife] would not be completely successful since other indefinite contexts also require an uninflected adjective: e.g., *groot mes heb je daar!* 'you have got a big knife there!', *enig groot mes* 'any big knife', *zo'n groot mes* 'such a big knife', etc..

Group	Error types	
	Determiners	Adjectival inflection
Child L1	bare nouns, overuse <i>de</i>	overuse <i>-e</i>
Child L1-SLI	bare nouns, overuse <i>de</i>	n\ a
Child L2	bare nouns, overuse <i>de</i>	overuse <i>-e</i>
Child L2-SLI	n\ a	n\ a
Adult L2	bare nouns, overuse <i>de</i>	overuse <i>-e</i> and $-\emptyset$

Table 4.4: Error types in determiner agreement and adjectival agreement across learner groups in Dutch

system supporting procedural memory is not as accessible after a certain critical period in contrast to declarative memory, age effects are to be expected with adjectives, but not with determiners. This distinction has implications for the discussion of the two theories on SLI and their relationship to L2 acquisition.

As argued in §2.4.3, the representational deficit hypothesis is based on the assumption that children with SLI and adult L2 learners do not rely on the same linguistic resources for the acquisition of grammar as typical L1 and L2 children, albeit for different reasons: in the SLI children, it is because of a lack or deficit in grammar (i.e., the procedural memory), whereas for the L2 adults, it is the late onset (age) to the L2. In the framework of Ullman (2004) and Ullman and Pierpont (2005), both groups then share the dependency on declarative memory, and, hence, must use other learning mechanisms (e.g., lexical frames) to acquire grammar. Similar error types are expected in the L1-SLI, L2-SLI and adult L2 groups, but should be different from those seen in typical L1 and child L2 acquisition (see 11). As discussed, the difference in error types should be visible with adjectives and not determiners since only in the latter case is it possible to distinguish between learning by lexical frames and grammatical rules. Following the prediction in (11), adult L2 learners and (L2-)SLI children are then expected to use both inflectional forms as errors, whereas the unimpaired L1 and L2 children should only overgeneralize inflections with *-e* (see Table 4.4).¹⁴

- (11) On the basis of the representational deficit hypothesis:
 The error types produced in child L1-SLI and child L2-SLI acquisition should be similar to those in adult L2 acquisition in adjectival inflection, and different from typical child L1 and child L2 acquisition.

The reduced intake hypothesis (12) leads to a different argumentation. SLI children are, in principle, able to construct the grammatical rules because access to UG is assumed to be intact. Following this line of thinking, all child groups (with or without SLI) should produce the same error types, namely overuse of *-e* in adjectives.

¹⁴Note, however, that the overuse of *-e* inflections does not necessarily mean that L2 children will acquire the marked case. As discussed in §4.3.4, L2 children may fossilize in a stage where they overgeneralize *-e* since the rule system is not fully acquired within the critical period. I will return to this issue in Chapter 7.

- (12) On the basis of the reduced intake hypothesis:
All child groups show a similar pattern of errors in adjectival inflection, which is different from adult L2 acquisition.

The reduced intake hypothesis generates further predictions on the acquisition of agreement in determiners and attributive adjectives in terms of error frequency. As proposed in §2.4.3, SLI and child L2 are both factors causing delay in acquisition due to problems with the intake, albeit for different reasons. Compared to typically developing children, much more input is needed in SLI to overcome the intake problem due limited capacities in perceiving and processing the input (§2.2.2). L2 children, on the other hand, have received more limited input in Dutch compared to L1 peers. Systematic group comparisons (see Figure 4.1) as already discussed in Chapter 3 will make the effects of SLI and L2 more explicit.

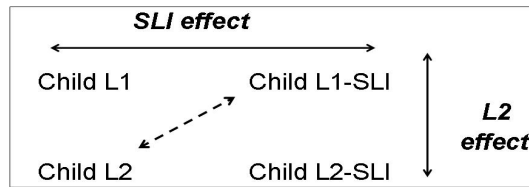


Figure 4.1: Specifying ‘delay’ in SLI and L2 acquisition

First of all, SLI and child L2 groups are expected to show higher error rates in omitting definite determiners, overgeneralizing the common gender determiner *de* in neuter contexts and overgeneralizing *-e* in adjectives than their corresponding peer groups (see (13) for the effect of SLI and (14) for the effect of L2).

- (13) SLI effects:
- a. The error rate in child L1-SLI > child L1
 - b. The error rate in child L2-SLI > child L2
- (14) L2 effects:
- a. The error rate in child L2 > child L1
 - b. The error rate in child L2-SLI > child L1-SLI

It is further assumed that both effects will be present in the L2-SLI group causing a combined or cumulative L2-SLI effect.¹⁵ In other words, the L2-SLI groups should in principle produce substantially more errors than any other child group (see 15).

- (15) The error rate in child L2-SLI > child L1-SLI, child L2 and child L1

Previous research discussed in §4.3 has not indicated what the relative impact of both effects is. As discussed in §4.3.4, L2 children seem not to be able to acquire the agreement rules underlying adjectival agreement even after being

¹⁵A cumulative effect is determined on the basis of effect sizes as shown in §5.3.5.

exposed to Dutch for more than 10 years. Input in Dutch seems to be (one of) the determining factors. For L1-SLI children, it is unclear what the situation is. This question is addressed by comparing the error frequencies in both groups (see 16).

- (16) Relative impact of SLI and L2:
Is the error rate in child L2 > child L1-SLI or is child L1-SLI > child L2?

Knowledge of gender is essential for determiner assignment as well as for deducing the inflectional rule for adjectival inflection. Obviously, input plays a major role in testing the predictions in (13) to (16). The input factor must therefore be included in the analyses (see Chapter 5 for details) to determine the extent to which they affect the acquisition of agreement in determiners and adjectives.

Methodology

5.1 Introduction

This chapter presents general information on the methodology used to explore the relationship between SLI and L2 in acquiring various morphosyntactic phenomena in Dutch. §5.2 presents the different learner populations in terms of their selection and grouping. The test material used for all participant groups is described in §5.3 followed by a discussion on transcription and coding, inter-rater reliability and the (statistical) tools used for analysis. The specific details on the analysis methods used per variable will be presented in the relevant sections of Chapter 6 (verb placement and verb inflection) and Chapter 7 (agreement in determiners and adjectival inflection).

5.2 Subject populations

Data from five different learner populations were necessary to explore the expectations set out in §3.4 and §4.4.¹ These populations were selected from the western part of the Netherlands (Randstad) in order to restrict dialect variation of Dutch.

- A group of Turkish-Dutch L2-SLI children
- A group of Turkish-Dutch L2 children
- A group of Dutch L1-SLI children

¹The data pool for this study comes from two closely collaborating research programmes carried out at the University of Amsterdam. The child L2, L2-SLI and L1-SLI data are part of the project Disentangling Bilingualism and SLI ‘BISLI’ (NWO grant: 254-70-010) and were collected, coded and analyzed by the author. Part of the child L2 data were collected by Jan de Jong also a member of the BISLI project. Subsets of the child L1 data and adult L2 data were taken from the project Variation in Inflection ‘Variflex’ (NWO grant: 360-70-110). I thank Elma Blom and Daniela Polišenská for allowing me to use these data sets for comparison.

- A group of Dutch L1 children (Polišenská in preparation)
- A group of Turkish-Dutch L2 adults (Blom 2008)

The full details of these groups are given in Table 5.2.2. It was important to first make clear decisions on selection criteria (§5.2.1) and to identify the basis of comparison between the groups (§5.2.2) as indicated in Chapter 2.

5.2.1 SLI and L2 selection criteria

Two sources of background information were used. In order to trace the history of (L2-)SLI, (para-)medical files located at the schools for language and speech impairment were consulted if accessible. In some cases, a speech therapist was asked to fill in the missing (para-)medical information. A modified version of the parental questionnaire *Anamnese Meertaligheid* ‘Questionnaire on the child’s multilingual context’ (Blumenthal and Julien 2000) was used to provide background information on the bilingual situation of the children.² It consists of two parts. Questions in the first part focus on the history of speech and language development of the (L2-SLI) child and the closest family members. The second part covers the L2 situation including questions about the L2 learner’s L1, age of arrival in the Netherlands and the input situation. The questionnaire was administered by a Turkish-Dutch research assistant. She contacted a senior family member by phone (in most cases the mother) and guided her through the questionnaire using either Turkish or Dutch as appropriate.³ Unfortunately, it was not possible to administer the questionnaire to all L2 children, resulting in missing information on one L2-SLI child and three L2 children. The adult L2 participants were also questioned about their bilingual situation, but not using a formal questionnaire. Instead, there were a number of questions on age of systematic L2 exposure, length and quality of L2 exposure, and type and intensity of instruction in Dutch they have received (Blom p.c.).

SLI criteria

All L1-SLI children and L2-SLI children taking part in the present study were enrolled in schools for language and speech disorders (so-called ‘Cluster 2’ schools). Admission to these schools takes place on the basis of a standardized indication protocol for speech and language disorders used by certificated clinicians in the Netherlands.⁴ This indication protocol has adopted most of the international exclusionary criteria for the diagnosis of SLI as set out in Table 2.1 in §2.2.1. The criteria are applied on the basis of medical and paramedical standardized measurements in interdisciplinary health care centers or diagnostic centres for

²Complementary research material such as the questionnaire (in Dutch) can be found at <http://home.medewerker.uva.nl/a.orgassa/>; link: Research material.

³The research assistant is a linguist and a certificated speech and language therapist specialized in assessing multilingual children (in Dutch).

⁴More detailed information about the ‘Cluster 2’ protocol can be found at <http://www.ambulante-begeleiding.nl/cor-emous>; link: logopedie.

speech and hearing disorders. The SLI children have thus been identified as not having a clear neurological disorder, hearing impairment, socio-emotional problems or anomalies in oral structure or oral motor function. They should not have a non-verbal IQ score lower than 85 on the SON-R (Snijders-Oomen non-verbal intelligence test; Snijders et al. 1989), a standardized Dutch non-verbal intelligence test. Children with severe phonological deficits were also excluded for two reasons, namely (i) to reduce the potential interference of phonological problems on the production of morphological forms to be tested here, and (ii) to limit the chances of diagnostic confound with other disorders, such as dyslexia or other reading and writing disabilities (see §2.2.1).⁵

Besides these exclusionary criteria, the children must have been diagnosed as having SLI on the basis of their language level as established by qualified speech therapists. Following the indication protocol, the expressive language proficiency of these children should fall below age expectations as measured by standardized Dutch language tests. That is to say, children scored at least 2 standard deviations below the norm on articulatory and productive language subtests. The following two test batteries are usually used for assessment: *Taaltoets Alle Kinderen (TAK)* ‘Children language assessment’ (Verhoeven and Vermeer 2002) and/or the *Taaltest voor Kinderen (TvK)* ‘Language Assessment for Children’ (Van Bon 1982). The TAK has standardized norms not only for Dutch monolingual children, but also for children belonging to the three biggest immigrant populations in the Netherlands, namely Moroccan Arabic-, Surinamese-, and Turkish-Dutch (see Verhoeven and Vermeer 2002 for details). These norms were used as a global indication of difficulties in the productive language performance in Dutch in all selected Turkish-Dutch L2-SLI children. The test scores were compared to the norms of, on the one hand, Dutch L1 acquisition and, on the other hand, Turkish-Dutch L2 acquisition. As discussed in §1.4, there is a lack of standardized assessment of the children’s L1. One screening instrument, a Turkish vocabulary measure (Schlichting 2006), is regularly used with the L2-SLI children as part of the admission procedure to special schools for language and speech disorders. For the present study, additional information on Turkish was obtained from the parental questionnaire *Anamnese Meertaligheid* as described above. The questionnaire could for example indicate whether L2-SLI children have had speech and/or language problems during development, which should not be the case in typically developing L2 children.

L2 criteria

The L1 of all L2 learners had to be Turkish. The Turkish-Dutch groups belong to one of the largest immigrant populations in the Netherlands (2.2% of the population as determined by the Dutch Census Bureau in 2006). It was a requirement that no other (foreign) language than Turkish was spoken at home in order to control for linguistic variation. It is well-known, for instance, that many of the Turkish immigrants in the Netherlands are of Kurdish descent. Kurdish is

⁵The severity of phonological deficits was also determined by the speech therapists on the basis of the criteria in the indication protocol.

one of the major languages spoken in the south-east regions of Turkey. Keeping the L2 learner's L1 background constant controls for effects of L1 transfer as pointed out in §2.3.2.

Unlike the L2-SLI children (see above), the unimpaired L2 children were selected from regular elementary schools, where they were reported by their teachers to be developing typically. This was also confirmed by the parental questionnaire. The participating L2(-SLI) children were all born in the Netherlands to former Turkish immigrant families (second or third generation). That means that both parents are of Turkish descent. The home language was Turkish as spoken in the Netherlands. Although Turkish as spoken in Turkey is different from that spoken in the Netherlands (see e.g., Dogruoz 2007 for details), these differences are not expected to interfere with the variables being tested here. These criteria ensure that initial systematic exposure to both languages starts within the critical period for inflection learning (see §2.3.2), which is here between the ages of one and four (see Table 5.1). As the questionnaire data indicated, there was a large range in the onset and amount of systematic exposure to Dutch, and it is not possible to reduce that range in this study. In Chapters 6 and 7, the influence of the length of L2 exposure on the acquisition of Dutch grammar will be explored.⁶

The adult L2 learners constitute a group of recent migrants to the Netherlands. They were all born in Turkey and came to the Netherlands after puberty (>20 years). There was no contact with Dutch prior to immigration. It can thus be assumed that systematic onset to Dutch started beyond the critical period for L2. The L2 adults were all selected from a regional centre for education, where they learned Dutch in a formal teaching setting. Most of them have attended Dutch classes 12 hours a week/4days a week for a period between five and 12 months. The L2 adults were tested while still attending classes. As with the child L2 groups, there was quite a degree of variation in the L2 adults' exposure to Dutch (Blom 2008, Blom p.c.).

5.2.2 Group comparisons

In total, six different learner groups were compared in the present study. Table 5.1 presents the most relevant details of the selected learner populations (more detailed information on the individual participants is given in Appendix A).

As can be seen, all child groups except for one were selected from within a similar age range, namely six to eight years. That specific age range was chosen to be sure of SLI diagnosis since identifying SLI is difficult in early childhood. Children can vary in their onset of language development. There is a category of children referred to as late talkers (e.g., Rescorla 1989; Kauschke

⁶The questionnaire was intended to also provide information about the quality of the L2 input as well as the language dominance patterns (i.e., distribution of input between the L1 and L2) of the L2 children. However, these particular questionnaire data turned out not to be reliable enough and they were therefore not included in the analysis. Another questionnaire is thus needed assessing the qualitative aspects of an L2 learners's input situation more profoundly and in a more reliable way.

	N	Age			*AoE Dutch	**LoE Dutch		
		range	\bar{x}	sd		range	\bar{x}	sd
Child L1-I	20	4;0-5;11	4;10	0.6	0	4;0-5;11	4;10	0.6
Child L1-II	24	6;2-7;11	7;1	0.5	0	6;2-7;11	7;1	0.5
Child L1-SLI	25	6;1-8;0	7;3	0.7	0	6;1-8;0	7;3	0.7
Child L2	20	6;3-8;5	7;3	0.6	<1;0-4;0	3;3-8;5	5;3	1.3
Child L2-SLI	20	6;0-8;3	7;5	0.6	<1;0-4;0	3;4-7;7	5;2	1.2
Adult L2	9	22-36	27.9	4.5	>20	0.8-12;0	3;2	3.5

Table 5.1: Details of the participant groups (*AoE: age of systematic exposure to Dutch; **LoE: length of systematic exposure to Dutch)

2008) in both child L1 and child L2 acquisition. They begin late with language development but achieve a normal level of language proficiency within a few years. In selecting younger children it is difficult to distinguish this category from SLI. Furthermore, between the age of six and eight, acquisition of both languages is relatively advanced allowing the study of more complex linguistic features.⁷

Matching impaired and unimpaired child groups on the basis of chronological age is usual in SLI research to determine the extent to which SLI children are impaired on a particular linguistic structure. This comparison usually indicates a delay, a principal characteristic of SLI (§2.2.2). A chronological age group was included here that is referred to as child L1-II in Table 5.1.⁸ Although matching by age is a good way to detect potential problem areas in SLI, it fails, however, to determine whether the linguistic aspect being studied is specifically affected or part of a general delay. It is therefore a common procedure to include a younger unimpaired comparison group matched on general language ability. MLU matching (counted either in words or morphemes) is most often used, especially when investigating morpho-syntactic abilities. There are, however, several concerns about MLU matching when examining morpho-syntactic skills (e.g., Leonard 1998; Unsworth 2005, among many others). Firstly, a child's MLU (in either words or morphemes) is determined on the basis of grammatical morphemes and function words and, as such, is strongly related to the morphosyntactic variable under investigation. Secondly, it is generally accepted that MLU becomes a less accurate measure as children get older and produce longer utterances (MLU > 3 or 4) (e.g., Klee and Fitzgerald 1985; Bol 2003). Most of the children in this study both SLI and L2 had greater MLU than this. For these reasons, MLU was not used as a tool for matching here. In many studies, it appears that language age match groups are usually two years younger than

⁷The L2(-SLI) children examined here have also been tested for their L1 Turkish. I will discuss some of the major findings in Turkish in Chapters 6 and 8.

⁸Chronological age matching does, however, not control for potential effects in terms of differences in mental age as determined by nonverbal IQ. Some researchers therefore prefer comparing groups on the basis of mental age (e.g., Kamhi et al. 1995). Problematic, however, from a practical perspective in applying this matching tool is that the information about nonverbal IQ is not always as accessible in, particularly, the unaffected child groups.

the SLI children regardless of being matched for MLU (e.g., Leonard 2000; De Jong 2003; Rice et al. 2006) or not (e.g., Johnston et al. 1993; Oetting and Rice 1993). It was therefore decided to include four-to-six year old unimpaired L1 children (child L1-I in Table 5.1). Younger L2 children were not included since these children would probably have had too little exposure to Dutch.

The learner groups differ with respect to the onset of exposure to Dutch (see Table 5.1). There is variation from birth to later than 20 years of age, making it possible to establish age effects in L2 acquisition in terms of error types. Obviously, it would have been ideal to also compare learner groups who had been exposed to Dutch for a similar length of time. This was not possible. The younger child L1-I group, child L2 and child L2-SLI groups had been exposed to Dutch for a fairly similar amount of time, but the older child L1-II and child L1-SLI groups had a longer exposure. Any SLI effects found cannot be due to length of exposure. The adult L2 group had the shortest exposure and are most comparable in this respect to the youngest child L1 group. The effects of differences in length of exposure will be further discussed in Chapters 6 and 7.

In L2 research, it is common to match learner groups on a general L2 proficiency level. Matching on L2 proficiency is not a suitable tool here, though, since differences in proficiency level in the tested L2 groups are simply inevitable. The L2-SLI children, by definition, should be less proficient than their unimpaired peers due to the language impairment. In fact, they should by definition score at least 2 standard deviations below the mean (see §5.2.1). The L2 adults, on the other hand, were selected from a group of low to medium proficient learners so that errors can be expected (see Table A.3 in Appendix A for details).

5.3 The experimental material

This section introduces the material. §5.3.1 gives an overview of the test design and motivates the choices made in the construction of the various test items. The order of the test procedure is discussed in §5.3.2 followed by some brief remarks on transcription and coding (§5.3.3), inter-rater reliability (§5.3.4) and the statistical methods used (§5.3.5). Since the material designed to examine the inflectional rules for verbs and determiners and adjectives was quite distinct, the full details of the experimental procedure are presented in the relevant sections in Chapters 6 and 7.

5.3.1 FlexiT material

The FlexiT ‘Inflection in language production’ material (Blom, Orgassa, and Polišenská 2008a) was developed for collecting data on verb placement, verb inflection, and agreement in determiners and attributive adjectives.⁹ FlexiT is a controlled elicitation off-line technique aimed at tapping the learner’s knowledge

⁹The FlexiT material was developed within the BISLI and Variflex programmes at the University of Amsterdam.

of the Dutch rule system on the basis of well-determined contexts.¹⁰ The contexts impose restrictions on the possible responses thus making quantifications easier. The same material was used for all participant groups which facilitates cross-group comparisons. The younger unimpaired child L1 group was, however, tested with a shortened version of the FlexiT material (see Poliřenská in preparation for details) due to a shorter attention span in these quite young children. Table 5.2 details the task types that were used in the various learner groups.¹¹

Type of test	Dependent variable
Picture description task	Subject-verb agreement
Picture description task	Verb placement
Picture description task	Determiner-adjective-noun agreement
Picture description task	Determiner-noun agreement
Activity description task	Subject-verb agreement

Table 5.2: FlexiT: Types of tasks

As can be seen in the table, both a picture description task and an activity description task were used to elicit subject-verb agreement. This was necessary because the picture description task only allowed for the elicitation of non-discourse related subjects, i.e., 3sg and 3pl, and their related agreeing verbs. By including the activity description task, it was also possible to test the discourse-related contexts, i.e., 1sg, 2sg and 1pl. The exact procedure is further detailed in §6.3.2. In all inflectional contexts, existing and non-existing (novel) verbs were elicited to test knowledge of verb inflection rules (see §6.3.2 for a list of the verbs). The rationale of including novel verbs was to eliminate the possible use of fully inflected, stored forms (Berko 1958; Pinker 1999). Correct responses in these verbs are a better reflection of knowledge of the rule.

The grammatical structures shown in Table 5.2 were elicited using the form of obligatory context probes, namely a sentence completion design. This task form has been widely used to assess the use of morpho-syntactic rules in impaired and unimpaired language acquisition (e.g., Thornton 1998; Seiger-Gardner 2009). The experimenter prompts the response by giving a stimulus (in italics) such as in (1) for the elicitation of determiner-noun agreement. The participant is asked to complete the sentence using the target morpheme in combination with the previously introduced noun, in this case *het glas* ‘the glass’ (in capitals). The obligatory contexts are accompanied by pictures that illustrate for the learner the context of the appropriate response as shown in Figure 5.1.

¹⁰Off-line tasks are best thought of as methods for testing linguistic competence, such as the absence or presence of grammatical rules. This is exactly one of the main purposes in this study, namely investigating *if* and *how* certain morphosyntactic phenomena are acquired across different learner populations. They measure the end-points of a whole series of processes. This is in contrast to on-line methods that examine the linguistic system, as the name implies, directly tapping into the elements of the process as they unfold over time (Seiger-Gardner 2009: 465).

¹¹In addition to the experimental data, narrative data were also elicited using the Frog Story (Mayer 1969). These data are, however, not presented in this study.



Figure 5.1: Example of the sentence completion procedure: Determiner-noun agreement with the neuter noun *het glas* ‘the glass’

- (1) *Daar is Kroko. Kijk, een glas. Kroko staat in* HET GLAS.
 ‘There is Kroko. Look, a glass. Kroko is standing in THE GLASS’

As mentioned above, using this type of systematic elicitation procedure increases the chances of obtaining the target response. Many of the difficulties that often arise in the interpretation of spontaneous speech data are reduced since there learners have the choice of what to say and how. A learner might simply choose not to produce a particular grammatical structure in spontaneous speech, hence, making it difficult to determine whether absence of a particular structure is due to a lack of linguistic ability.

As various different learner groups were involved in the present study (see Table 5.1), extra care was taken to reduce the chance of task effects. The material was therefore piloted with Dutch adults and typically developing Dutch L1 and Turkish-Dutch L2 children. Only high frequency words were included as determined by the *Streeflijst woordenschat zesjarigen* ‘Lexical achievement list for six-year olds’ (Schaerlaekens, Kohnstamm, and Lejaegere 1999), in order to increase the chance that all participants knew the test items irrespective of being L2 or SLI. Some participants may have a limited attention span and/or working memory capacity. The experiment was therefore constructed so that it could be completed within 15 to 20 minutes.

5.3.2 Experimental procedure

Table 5.3 presents the sequential order in which the experiment was conducted.¹² The tasks were ordered in such a way that the participants were less likely to get bored or loose concentration: The more demanding tasks preceded the less demanding and less structured tasks.

The items in the picture description task were distributed over two books, in pseudo-randomized order. The items testing verb, determiner and adjectival agreement were mixed in both books. However, the book used for picture description task I contained the existing verbs, whereas the book used for picture

¹²A complete overview of all training and stimulus sentences can be downloaded from <http://home.medewerker.uva.nl/a.orgassa>; link: Research material.

Session	Contents
1.	Training session for picture description task
2.	Picture description task I
3.	Introductory session for novel verbs
4.	Training session for activity description task
5.	Activity description task
6.	Picture description task II

Table 5.3: Overview of the experimental session

description task II contained the novel verbs. The first training session (Table 5.3) was used to familiarize subjects with the experimental set-up of the picture description task, which was then carried out using book I. The novel verbs and novel objects were taught in the introductory session (see §6.3 for details on the procedure). The second training session was used to introduce the interactive character of the activity description task.

The experimenter was allowed to give a certain amount of feedback during the experiment. When the participants, for instance, failed to provide a target-like response during the training sessions, the experimenter helped them and that item was repeated with an extra training item. It was possible to repeat an entire training session, but only once. Per experimental task, it was possible to repeat three items, in total. In that case, the individual picture books and the activity description task counted as separate tasks. If an extra cue was necessary, it was reported on the transcription sheet.

The data were collected in one session per child in a specially allocated room in their school. For the SLI children, this was usually a room in which the SLI children were used to meet with their speech therapists. Each session was digitally audio-taped using an Olympus DM-20 digital voice recorder with a high quality built-in microphone. Before starting the first training session (Table 5.3), the experimenter had a short chat with the child explaining what was going to happen. As mentioned before, the experiment was usually finished within 15 to 20 minutes. The child received a small present (such as stickers or a pen) at the end of the experiment.

5.3.3 Transcription and coding

All responses, either by the participant or the experimenter, were transcribed according to the conventions of CHAT (Codes for the Human Analysis of Transcripts), the coding system of CHILDES (Child Language Data Exchange System, see MacWhinney 2000). In transcribing the controlled speech production data, the orthographic conventions of Standard Dutch was included as spoken in the Netherlands. Many speakers of Dutch only pronounce schwa instead of *-en* in the plural contexts of verb inflection. This suffix was transcribed according to the Dutch spelling since there is no possibility of a confound with another verbal suffix. No prosodic information was provided.

Coding systems were developed for the two linguistic domains under study:

subject-verb agreement in various word order conditions and the inflectional and gender properties of determiners and adjectives. The coding forms globally distinguish between two categories, namely the degree of analyzability and the degree of correctness. The specific coding categories are specified per inflectional domain in §6.3.4 and §7.3.4 respectively.

5.3.4 Inter-rater reliability

The transcription and coding of the individual sample files was completed by the author. In addition, three linguistics graduate students also transcribed and coded a part of the data strictly following the same transcription and coding conventions. 20% of the coding of every child group was checked for inter-rater reliability. Files of five L1-SLI children and of four L2 children and L2-SLI children were used to calculate the coding reliability for the grammatical domains under investigation. Inter-rater reliability was high for the child L1-SLI and child L2 groups, namely 0.89. The L2-SLI children were more difficult to code, so that decision was taken to code more files. 10 of the 20 files of that group were first coded by the author and one rater, independently, and then checked and compared. The remaining 10 L2-SLI children were then coded by the author according to the judgments made during that coding and correction process.

5.3.5 Statistics

A number of different statistical methods were used to test the predictions on the use of error types and error frequencies in the various grammatical structures (see §3.4 and §4.4, respectively). The Mann-Whitney U test was used to determine significant differences in outcomes between test conditions and different participant groups (e.g., child L1 with child L1-SLI), and the Wilcoxon Rank-Sum test was used to test significant differences between test conditions in the same participant groups.¹³ Non-parametric measurements were used since the samples of the L2 and SLI groups in this study do not have a normal distribution (Shapiro-Wilk, $p < 0.05$). Where differences were significant, effect sizes (Cohen's d) were reported.¹⁴ The effect sizes were used to determine whether there is an indication of a 'double delay' or cumulative effect of L2 and SLI in the L2-SLI group, meaning that the L2-SLI group produced substantially more errors than any other child group. More specifically, if the observed effects were around medium (0.5) to large (0.8 or higher) between the child L2-SLI group, on the one hand, and the child L2 and L1-SLI groups, on the other

¹³One-tailed tests have been performed if the expectations in §6.2 and §7.2 have a predictive character and two-tailed tests have been performed in cases when the expectations have an explorative character.

¹⁴An effect size is an objective and standardized measure of the magnitude of the observed effect (Cohen 1988). Effect sizes were computed by finding the difference between two groups on the outcome measure, and dividing this value by the pooled standard deviation. For Cohen's d an effect size of less than 0.2 to 0.3 means 'small', around 0.5 a 'medium' effect and 0.8 to infinity, a 'large' effect (Note that the d might be larger than one).

hand, they would indicate a cumulative L2-SLI effect. To explore how length of exposure to Dutch affect the error rates in verb placement and verb inflection, and agreement in determiners and attributive adjectives, a univariate ANOVA of variance was used to determine main and interaction effects. If effects were to be found, Pearson product-moment correlations were used to specify these effects separately for each child group.¹⁵

¹⁵The results of the factor and correlation analysis should be interpreted with caution given the non-normal distributions of most of the samples used in this study.

Production of verb placement and verb inflection

6.1 Introduction

This chapter explores the relationship between SLI and L2 by testing Dutch finite verb placement and finite verb inflection. The experiment (see §5.3) examined how impaired and unimpaired Dutch child L1, Turkish-Dutch child L2 and Turkish-Dutch adult L2 groups compare on language production tasks in terms of error types and error quantities. The chapter is structured as follows: First, §6.2 briefly summarizes the predictions to be tested here. §6.3 details the experimental procedure and the model of analysis used with the different learner groups. The results of experiments on verb placement are presented in §6.4 and on verb inflection in §6.5. In the same sections, the influence of length of exposure to Dutch is discussed per research variable. The chapter concludes by discussing the predictions in the light of the findings.

6.2 Previous evidence and expectations

Previous research has revealed that there is a strong contingency between verb position and verb form in early child Dutch: non-finite verb forms are nearly always correctly placed in sentence-final position, whereas morphologically finite forms are either placed in fronted or second sentence position in main clauses (see §3.3.1). As was argued by Blom et al. (2007), among others, Dutch child learners are able to use syntactic information to distinguish between finite and non-finite verb forms, unlike adult L2 learners. In fact, the acquisition of verb position and verb form only requires a relatively short period of input in Dutch (i.e., between two to four years) in unimpaired L1 and L2 children (see §3.3). In contrast, Dutch SLI children appear to be severely delayed, although most of them make the same errors as younger unimpaired children: Instead of applying

the V2 rule, L1-SLI children tend to overuse RIs and dummy auxiliaries, and two errors are made in inflecting the verb, namely substitution of *-t* and $-\emptyset$ (see §3.3 for examples). There is scarcely any information on L2-SLI acquisition (see §3.3.5). More evidence is needed to specify the relationship between SLI and L2 acquisition in this area. Difficulties in adult L2 speech, on the other hand, are interpreted as the result of age effects. These learners start learning the L2, Dutch, apparently too late, so that accessing the inflectional rules is problematic. This is especially the case in low to medium proficient learners. They usually fail to use morphosyntactic information the way typically developing child learners do, which results in persistent and qualitatively different error patterns. In particular, incomplete acquisition of verb placement rules in adult L2 learners is reflected in the frequent use of the Subject-Verb-Complement (SVX) template. Poor performance in verb placement goes hand in hand with poor performance in applying the verb inflection rules. This is apparent in the use of *-en* in finite sentence position, an error not so frequently seen among child L1, child L2 and child L1-SLI learners (see Table 3.3 in §3.4 for an overview of the error patterns across the learner groups).

Focus of the present study is the issue if and how SLI and L2, together, affect the acquisition of verb position and verb form in a Turkish-Dutch child L2-SLI group. As has been argued in §3.4, two perspectives on SLI and L2 acquisition will be considered: L2-SLI children can either be compared with adult L2 learners or with child (L2) learners. The qualitatively different error patterns predicted by the two accounts make it possible to distinguish them. This distinction is repeated here as in (1) and (2).

- (1) On the basis of the representational deficit hypothesis:
Child L2-SLI acquisition can be expected to show a similar error pattern to adult L2 acquisition, i.e., overusing the SVX template and *-en* suffix in finite inflectional contexts, which is different from typical child L1, child L1-SLI and child L2 acquisition.
- (2) On the basis of the reduced intake hypothesis:
All child groups should show a similar error pattern, i.e., overusing RIs and dummy auxiliaries and substituting *-t* and $-\emptyset$ in contrast to adult L2 acquisition.

As discussed in §3.4, the reduced intake hypothesis allows for further predictions in terms of delay in the SLI and child L2 groups. The comparisons in (3) and in (4) summarize the potential effects SLI and L2 have in the two domains in terms of error frequencies in verb placement (i.e., RIs, dummy auxiliaries) and in verb inflection (i.e., $-\emptyset$ and *-t*); > means higher error rates.

- (3) SLI effects:
 - a. The error rate in child L1-SLI > child L1
 - b. The error rate in child L2-SLI > child L2
- (4) L2 effects:

- a. The error rate in child L2 > child L1
- b. The error rate in child L2-SLI > child L1-SLI

If both effects play a role in L2-SLI acquisition, a combined effect should be found in the child L2-SLI group causing a ‘double delay’ (see §5.3.5). The rates of RIs, dummy auxiliaries and agreement errors should then be substantially higher in that group compared to any other child group as formulated in (5).

- (5) The error rate in child L2-SLI > child L1-SLI, child L2 and child L1

Based on previous research, it is also expected that having SLI has a stronger impact on acquiring the inflectional rules underlying verbs than being L2. More specifically, SLI children with much more exposure to Dutch perform worse than the L2 children with a much shorter period of Dutch exposure (see §3.3). This expectation is repeated in (6).

- (6) Relative impact of SLI and L2:
The error rate in child L1-SLI > child L2

As we have seen in Chapter 3, two to four years of exposure to Dutch is enough for unimpaired L1 and L2 children to reach the threshold for the acquisition of the morpho-syntactic system underlying Dutch verbs. Although much more input is required for children with SLI, it is expected that more input results in higher accuracy scores, that is that SLI children make fewer errors as they get older. The expectation regarding length of exposure and the acquisition of verb placement rules and inflectional rules is made explicit in (7):

- (7) The effect of input:
The longer the length of exposure to Dutch the higher the accuracy on verb position and verb form in the various child L1(-SLI) and child L2(-SLI) groups

6.3 Method

In order to obtain insights into an L2-SLI child’s underlying representation of verb placement rules and inflectional rules in Dutch, a systematic elicitation procedure was required that also allowed for error analyses in terms of qualitative and quantitative differences. The FlexiT material was constructed for exactly this purpose and was described in §5.3.1. Reliable data comparison was assured by using the same experiments with all learner populations as well as applying the same model of analysis to the data. In addition, information about the bilingual input situation was collected using a questionnaire. Details on the participants (§6.3.1), the experimental procedure (§6.3.2), its reliability (§6.3.3) and the analysis (§6.3.4) are presented before the results.

6.3.1 Participants

The learner groups studied here were already described in §5.2.2 and Table 5.1. All groups were used with the exception of the older child L1-II group (see Table 6.1). This was considered not necessary since typically developing Dutch children have mastered the rules underlying verb placement and verb inflection by age four.¹

	N	Age			*AoE	**LoE		
		range	\bar{x}	sd		range	\bar{x}	sd
Child L1-I	20	4;0-5;11	4;10	0.6	0	4;0-5;11	4;10	0.6
Child L1-SLI	25	6;1-8;0	7;3	0.7	0	6;1-8;0	7;3	0.7
Child L2	20	6;3-8;5	7;3	0.6	<1;0-4;0	3;3-8;5	5;3	1.3
Child L2-SLI	20	6;0-8;3	7;5	0.6	<1;0-4;0	3;4-7;7	5;2	1.2
Adult L2	9	22-36	27.9	4.5	>20	0.8-12;0	3;2	3.5

Table 6.1: Details of the participant groups (*AoE: age of systematic exposure to Dutch; **LoE: length of systematic exposure to Dutch)

The results of the adult L2 controls are presented only when analyzing the error types to test the predictions in (1) and (2). As briefly described in §5.3.1, a shortened version of the FlexiT material was used with the younger L1 children taken from Poliřenská’s study due to a shorter attention span in these children. As a consequence, one particular verb placement condition, namely the embedded (SXV) order condition, and certain inflectional contexts, namely 1PL and 3SG inverted contexts, were not tested. In order to partly fill this gap, relevant child L1 data on verb placement from Zuckerman’s (2001) study (N=10; age range 3;0-3;11) were taken for comparison. The design of Zuckerman’s study is comparable to that used here ensuring a valid comparison.

6.3.2 Procedure

As briefly described in §5.3.1, a controlled elicitation procedure in the form of a picture description task and activity description task was used to examine knowledge of verb placement rules and inflectional rules. The picture description task involved elicitation of knowledge of finite verb inflection in the present tense in main clause order without inversion (SVX) and with inversion (XVS) to test knowledge of the V2 rule. The Dutch embedded clause order (SXV) was also elicited as a control condition to test whether the finite verb remains in final sentence position. Table 6.2 summarizes the elicitation of the different agreement forms per word order condition. Given the nature of the picture description task, discourse-related subjects such as 1sg, 2SG and 1PL contexts and, hence, the corresponding agreeing verbs, could not be elicited. For this reason, an activity description task was designed. The elicitation of these contexts involved three existing high frequency verbs: *poetsen* ‘to brush’; *drinken*

¹Recall that the child L1 and adult L2 data presented here are subsets of data taken from the data sets of Poliřenská (in preparation) and Blom (2008), respectively.

‘to drink’; *tekenen* ‘to draw’ and two novel verbs: *spollen* and *pieren*.² The two novel verbs were included to control for productivity in applying inflectional rules (see §5.3.1).

Verb inflection → Verb placement ↓	1SG	2SG	3SG	1PL	3PL
SVX	+	+	+	+	+
XVS	-	+	+	-	-
SXV	-	-	+	-	-

Table 6.2: Test conditions for the elicitation of verb placement and verb inflection (‘+’ refers to the inflection contexts tested in each placement condition)

Picture Description Task. In Figure 6.1, the picture material for one item with the verb *tekenen* ‘to draw’ illustrates the elicitation of subject-verb agreement in the three order conditions. As can be seen, the pictures were presented in pairs, with minimally contrasting images. The minimal contrasts were located in the subject and direct object referents, here ‘woman draws sun’ versus ‘man draws tree’ (see the FlexiT manual (Blom et al. 2008a) for the various combinations). The items were presented in pseudo-randomized order together with the items eliciting agreement with adjectives and determiners (see 5.3.1). The experimenter prompted a sentence by giving the stimulus (in italics) and the participant was expected to complete the sentence; the correct subject responses are given in capitals (see 8).



Figure 6.1: Elicitation material for 3SG contexts in the three verb order conditions SVX, SXV and XVS exemplified by the items ‘to draw a sun’ and ‘to draw a tree’

- (8) a. SVX condition
De vrouw TEKENT EEN ZON en de man TEKENT EEN BOOM
 ‘The woman DRAWS A SUN and the man DRAWS A TREE’
- b. SXV condition
Dat is de vrouw die EEN ZON TEKENT en dat is de man die EEN BOOM
 TEKENT

²All existing verbs chosen were likely to be known by Dutch children at the age of three as determined on the basis of *Streeflijst woordenschat zesjarigen* ‘Lexical achievement list for six-year olds’ (Schaerlaekens, Kohnstamm, and Lejaegere 1999), and are easy to depict through images.

- ‘That’s the woman who DRAWS A SUN and that’s the man who DRAWS A TREE’
- c. XVS condition
Hier TEKEN JIJ EEN ZON *en daar* TEKENT HIJ EEN BOOM
 ‘Here YOU ARE DRAWING A SUN *en there* HE IS DRAWING A TREE’

Crucial for the elicitation of the SVX order in (8a) and the embedded SXV order in (8b) was the elicitation of the direct object (here represented by X) to ensure that the production of finite and nonfinite verb forms can be distinguished. As discussed in §3.2, Dutch finite verbs precede objects, whereas Dutch infinitives follow objects. Position of the verb also helps distinguish between the syncretic finite plural forms and the infinitival verb form: in main clauses, finite verbs are placed in V2 position, whereas infinitives are placed in sentence-final position. In the inverted XVS order in (8c), 2SG subjects were contrasted with 3SG subjects in order to elicit the corresponding verb forms. Recall that verb forms in 2SG are bare in sentences with inversion (i.e. if the first constituent in a sentence is not a subject). As the 2SG context relates to the role of the experimenter ‘you’, it was necessary to include a picture of the experimenter.

The elicitation of novel verbs required an introductory session to familiarize the participant with the new verbs. Two novel objects, a *pierder* and a *spoller*, were introduced to the child by the experimenter who also performed the corresponding actions *lepel pieren* ‘to pier(en) a spoon’ and *stoel spollen* ‘to spoll(en) a chair’. These are illustrated in Figure 6.2. To avoid the child’s imitation of finite verb forms in the present tense, the novel verbs were introduced in past participle forms. The child was then stimulated to also perform similar actions with the novel objects and to tell the experimenter what he was doing. During that session, the novel words were introduced up to 10 times by the experimenter. If children had difficulties retrieving the novel verbs, the experimenter was allowed to again use the novel objects as a prompting cue. When this cue did not help, it was possible to repeat that introduction session, but only once. The exact introductory procedure can be found in the FlexiT manual (Blom et al. 2008a).

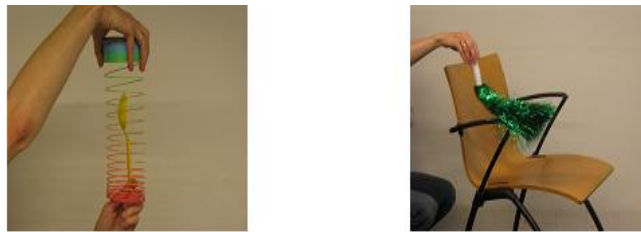


Figure 6.2: Examples of the novel verbs *pieren* and *spollen*

Activity description task. To obtain the responses for 1SG, 2SG and 1PL SVX order (see Table 6.2), an activity description task was designed in the

form of a game. In this task, the experimenter as well as the child had to pick up a card (which is turned upside down) from a strictly ordered pile. These cards depicted ongoing actions of the three existing verbs and the two novel verbs. After having turned over the cards at the same time, the participant and the experimenter first performed the actions with various attributes before the participant was asked to describe the actions. There were two possible options: (i) Both cards depicted different actions triggering the 1SG and 2SG contexts, e.g., *ik drink koffie en jij poetst een schoen* ‘I am drinking coffee and you are cleaning a shoe’ or (ii) the cards depicted the same action prompting the 1PL context, e.g., *wij poetsen de schoenen* ‘we are cleaning shoes’. If necessary, the experimenter prompted the sentence by producing the subject (in italics). The expected response is given in capitals: *Wat doen we?* *We* KNIPPEN PAPIER. ‘*What are we doing?* *We* ARE CUTTING PAPER’, *Wat doe jij?* *Ik* KNIP PAPIER ‘*What are you doing?* *I* AM CUTTING PAPER’ or *Wat doe ik?* *Jij* KNIPT PAPIER ‘*What am I doing?* *You* ARE CUTTING PAPER’. Two training items were used, *tekenen* ‘to draw’ and *knippen* ‘to cut’ to familiarize participants with the task.

6.3.3 Reliability of the elicitation material

The reliability of the test instrument was estimated using Cronbach’s α (alpha), a homogeneity index. Cronbach’s α was determined for every test condition in verb placement and verb inflection separately as shown in Table 6.3 (‘k’ denotes the number of items per context).³ A value of 0.7-0.8 is a generally accepted value for Cronbach’s α indicating high scale reliability.

Verb placement	k	α	Verb inflection	k	α
SVX context	35	0.92	– \emptyset contexts	10	0.69
XVS context	10	0.86	–t contexts	30	0.91
SXV context	10	0.84	–en context	15	0.87

Table 6.3: Estimated reliability of the different tasks on verb placement and verb inflection

As can be seen from Table 6.3, almost all contexts eliciting verb placement and verb inflection turned out to be homogeneous ($\alpha > 0.7$) meaning that the tasks consistently reflect the construct they are measuring, namely productive knowledge of these rules. The α is substantially smaller in the verb inflection items eliciting – \emptyset inflections (0.69) (i.e., 1SG SVX order and 2SG inverted XSV order) compared to the other inflection contexts. A closer look at the specific items in these contexts revealed that most of the 2SG inverted order items had a ‘corrected item-total correlation’ lower than 0.3 indicating that these items did not highly correlate with the overall scale. The separate values for the item-total correlates in the 2SG inverted contexts are the following for ‘to draw’:

³The scores of Poliřenska’s child L1 group are not included in the calculation on construct reliability since a slightly adapted version of the FlexiT material was used to elicit data in the younger L1 children (see Poliřenska in preparation for details).

0.32, ‘to clean’: 0.22, ‘to drink’: 0.12, ‘to spill(en)’: 0.26 and ‘to pier(en)’: 0.16. Exclusion of these items resulted in a Cronbach’s α value of 0.75.

One possible explanation for this difference is a task effect. A closer look at the 2SG inverted order contexts revealed that the participants produced only small token numbers of inflected lexical verbs across the groups. Instead they used many dummy auxiliaries and RIs. In eliciting the 2SG inverted SVX context, the participant had to establish that the person on the stimulus picture was actually the experimenter. Not all learners were immediately able to make this connection. It is therefore reasonable to suggest that the difficulty of that particular item resulted in simplified constructions, i.e., RIs and dummy auxiliaries. On the basis of that outcome, the five items eliciting 2SG inflection in inverted order were excluded from the analysis of verb inflection, but not from verb placement.

6.3.4 Analysis

Each item eliciting verb placement and verb inflection was coded for first analyzability and then correctness. The following responses were excluded for both variables: imitations, repetitions, unintelligible or missing responses and investigator failure (i.e., the stimulus offered by the investigator did not follow the conventions set by the test manual). The error patterns were then analyzed for both variables separately in two steps in order to be able to assess the predictions repeated in §6.2. First, the error types were compared in positioning and inflecting finite lexical verbs across all learner populations to specifically address the predictions in (1) and (2). Second, error quantities were compared in all child groups to determine the severity of delay in development in terms of the predictions in (3) to (7).

Verb placement. Application of the verb placement rules was analyzed for correctness with the three existing verbs in the three different order positions, i.e., SVX, XVS and SXV (see Table 6.2). The position of finite lexical was analyzed irrespective of whether the inflection was correct or not. Examples of correctly and incorrectly placed finite lexical verbs are given in Table 6.4 with the verb *drinken* ‘to drink’.

Condition	Correct	*Incorrect
SVX	De man drinkt melk The man drinks milk	De man melk drinkt The man milk drinks
XVS	Hier drinkt de man Here drinks the man	Hier de man drinkt Here the man drinks
SXV	Dat is de man die melk drinkt That is the man who milk drinks	Dat is de man die drinkt melk That is the man who drinks milk

Table 6.4: Examples of correct and incorrect responses in positioning finite verb placement in the three order conditions SVX, XVS and SXV

As discussed above, crucial for the elicitation of the SVX order and the

embedded SXV order is the elicitation of a verbal complement (e.g., direct object or particle, here represented by X) to ensure that the production of a finite or nonfinite verb form can be distinguished. Clauses without a verbal complement were therefore excluded in SVX order, since the position of *drinkt* in *Hij drinkt* ‘he drinks’ is ambiguous as to verb second or verb final position. Equally, in embedded SXV order, e.g., *dat is de man die drinkt* ‘That is the man who drinks’, the verb *drinkt* could be in second or final position. For the same reasons, verbs ending with *-en* suffix in SVX order as in *De meisjes drinken* ‘The girls drink’ with no overt object are ambiguous as to their finiteness and were excluded, as they were in SXV order, e.g., *Dat is de man die koffie drinken* ‘That is the man who coffee drink’. In inverted XVS clauses, the production of a subject was necessary to distinguish between finite and nonfinite verb forms. If the subject was missing as in *Hier drinkt* ‘Here drink’, such responses were also excluded.

In order to establish whether there was a delay in acquiring V2, it is important to count the frequency of RIs (e.g., *De meisjes water drinken* ‘The girls water drink.INF), dummy auxiliaries (e.g., *Papa gaat boekje lezen* ‘Dad goes book read’) and correctly placed instances of finite lexical verbs. Higher rates of RIs and dummy auxiliaries and the production of lower rates of lexical finite verbs can be interpreted as indicators of early stages of acquiring V2 (see §3.3.1). A correlation between the use of dummy auxiliaries and the acquisition of V2 has been posited by Van Kampen (1997) and Zuckerman (2001). They argue that children prefer the underlying (S)XV representation at very early ages and so lexical verbs stay in final positions. The use of dummy auxiliaries decreases when the V2 rule starts to apply to lexical finite verbs. Empirically, this relation can be tested as follows: (i) auxiliary forms should disappear once the V2 rule is established and (ii) auxiliary forms should not be produced in subordinate clauses (Van Kampen 1997). These claims are tested in an additional analysis of error frequencies in acquiring V2 for the different child groups.

Verb inflection. Knowledge of finite verb inflection was tested only in the V2 contexts, i.e., SVX and XSV condition, including three existing verbs and two novel verbs (see §6.3.2). First, the types of inflectional errors were compared in the learner groups. Next, the amount of correct use of finite verb inflections was determined to assess the severity of delay across the child learner groups. Table 6.5 gives examples of all possible correct and incorrect response types in the tested inflectional contexts.

Responses with a missing verbal complement were excluded for the same reasons as discussed above for verb placement. Furthermore, responses with dummy auxiliaries and RIs were not considered in the analysis. Dummy auxiliaries are highly frequent verbs and may as such be stored as unanalyzed vocabulary items (§3.2.2). RIs do not provide any information on agreement in the lexical verb.

⁴As discussed in §6.3.4, inflections in the 2SG inverted order were not analyzed in the SLI and L2 groups given the low scores on construct reliability (§6.3.3).

Condition	Correct	*Incorrect			
1SG SVX	ik	drink- \emptyset	melk	- <i>t</i>	or - <i>en</i>
	I	drink	milk		
2SG SVX	jjj	drink- <i>t</i>	melk	- \emptyset	or - <i>en</i>
	you	drink	milk		
3SG SVX	hij	drink- <i>t</i>	melk	- \emptyset	or - <i>en</i>
	he	drinks	milk		
3SG XVS ⁴	hier drink- <i>t</i>	hij	melk	- \emptyset	or - <i>en</i>
	here drinks	he	milk		
1-3PL SVX	wij/jullie/zij	drink- <i>en</i>	melk	- \emptyset	or - <i>t</i>
	we/you/they	drink	milk		

Table 6.5: Examples of correct and incorrect responses in finite verb inflection in the inflectional contexts tested

6.4 Results: Verb placement

This section discusses the results on verb placement in the five different learner populations acquiring Dutch. The adults are included for the analysis of error types. Data selection is described in §6.4.1. The error types in finite verb placement are discussed in §6.4.2, and error frequencies in §6.4.3 followed by a discussion of the uses of dummy auxiliaries and RIs. Factor and correlation analyses were done to see to what extent length of input to Dutch influences the pace of acquisition of the V2 rule in the different child groups. The results are summarized in §6.4.4.

6.4.1 Selected data

Table 6.6 presents the distribution of the response types in verb placement, that is analyzed finite lexical verbs, dummy auxiliaries and RIs, and excluded responses. The mean use (absolute numbers), standard deviation and range of occurrence is provided per response category. In total, the three placement conditions provided a maximum of 33 contexts per participant in the child L1-SLI, child L2, child L2-SLI and adult L2 groups. Given the shorter experiment in the child L1-I group (§5.3.1), a maximum of 10 contexts per participant could be analyzed. As discussed in §6.3.4, the analysis of the finite lexical verbs will indicate the types and frequencies of errors in the application of rules underlying finite verb placement (see §6.4.2). The category ‘dummy auxiliaries and RIs’ will indicate any delay in acquiring V2 across the child groups (see §6.4.3).

As is clear from the table, overall use of finite lexical verbs is relatively higher in the child L1-I group (on average: 87% (8.65/10)) than in the SLI and L2 groups (61-73%). This difference is possibly due to the difference in length of the experimental procedure: the shorter the experiment (used with the younger unimpaired L1 children), the more responses for analysis are available. In the SLI and L2 groups, the use of finite lexical verbs is highest in the unimpaired child L2 and adult L2 group and lowest in the L1-SLI and L2-SLI groups, but the

	max	Finite lexical verb			daux and RIs			Excluded		
		\bar{x}	sd	range	\bar{x}	sd	range	\bar{x}	sd	range
Child L1-I	10	8.7	1.8	3-10	0.5	1.0	0-3	0.9	1.3	0-4
Child L2	33	24.3	6.6	11-32	4.1	5.0	1-18	4.7	3.3	0-13
Child L1-SLI	33	22.6	8.4	3-31	7.2	7.2	0-29	3.2	2.8	0-9
Child L2-SLI	33	20.1	8.7	2-33	8.5	6.3	1-19	4.5	4.2	0-14
Adult L2	33	23.4	5.9	10-29	2.2	3.1	0-9	7.3	3.0	4-14

Table 6.6: Response types in verb placement (the word order conditions SVX, XVS and SXV are pooled here); due to rounding of figures, some totals do not add up to the exact maximum of contexts per participant.

standard deviations are quite high in all groups. The L2-SLI group makes the most use of dummy auxiliaries and RIs and the adult L2 group the least. The L2 adults, on the other hand, have the most excluded responses.⁵ These data indicate, on the one hand, differences between child and adult learners, and, on the other hand, the delaying effects SLI and L2 have on the acquisition of finite verb placement. This is addressed further in the following sections. The child L2, child L1-SLI and child L2-SLI groups are known for their heterogeneity, so that the considerable (individual) variation in these groups does not come as a surprise.

6.4.2 Positioning finite lexical verbs: Error types

Placement of the finite lexical verbs (Table 6.6) was first analyzed in terms of error types to address the question whether L2-SLI children pattern like adult L2 learners or child learners. On the basis of evidence discussed in §3.3, it was predicted that L1-SLI children and unimpaired L2 children would follow the placement rules, whereas adult L2 learners would tend to overuse an SVX template. Table 6.7 present the placement errors in percentages per word order condition.

As can be seen, few errors are produced in the SVX condition across the learner groups. Only the adult L2 group performs particularly badly in the inverted XVS and embedded SXV orders, whereas all child groups perform relatively well in verb placement.⁶ The adult pattern is consistent with the absence of the V2 rule in the L2 grammar (see §3.3.4) and resembles earlier findings for L2 German, for instance, which led Meisel et al. (1981) to propose

⁵Imitations, repetitions and unintelligible responses are the biggest category of exclusion in the SLI and L2 groups: L2-SLI group (n=50/89), L1-SLI group (n=56/81), unimpaired child L2 group (n=58/93) and the adult L2 group (n=64/66). In addition, cases of missing constituents (i.e., omission of either the subject or object) were noticeable in the L2-SLI group (n=32/89), the L1-SLI group (n=22/81) and the child L2 group (n=19/93).

⁶As discussed in §6.3.4, inflections with *-en* in SXV order, e.g., *dat is de man die koffie drinken* ‘That is the man who coffee drink’ were excluded from the analyses because it is not possible to empirically distinguish between finite and nonfinite forms in sentence-final position. These forms were quite rare across the child learner groups: child L2: 2.8% (n=3/109); child L1-SLI: 0.8% (n=1/126); child L2-SLI: 7.5% (n=8/107), but not in the adult L2 group 24.3% (n=9/37).

that adult L2 learners of German apply a linear SVX template due to age effects (see §2.3.2).⁷ Crucially, the adult L2 group patterns differently from the child L2 groups. In fact, the L2 adults make significantly more errors in all order conditions than the L2-SLI children (for SVX: $U=-3.452$, $p<0.001$, one-tailed; effect size: 2.12; for XVS: $U=-3.069$, $p<0.001$, one-tailed; effect size: 1.83; for SXV: $U=-3.446$, $p<0.001$, one-tailed; effect size: 1.86), highlighting the contrast between adult and child learners of verb placement in Dutch.

	SVX	XVS	SXV
Child L1-I	1.5 (n=137; sd=5.6)	0.0 (n=36; sd=0)	2.0 (n=141; sd=n\a) ⁸
Child L2	0.3 (n=321; sd=2.7)	6.8 (n=59; sd=33.3)	17.9 (n=106; sd=28.5)
Child L1-SLI	0.5 (n=370; sd=2.6)	8.7 (n=69; sd=38.0)	21.6 (n=125; sd=34.0)
Child L2-SLI	0.8 (n=250; sd=4.1)	26.4 (n=53; sd=41.6)	9.1 (n=99; sd=28.6)
Adult L2	10.9 (n=147; sd=6.5)	91.7 (n=24; sd=22.3)	65.3 (n=40; sd=37.1)

Table 6.7: Percentages of errors in verb placement (numbers in parentheses denote absolute numbers of responses and standard deviations of percentages). For examples of incorrect verb placement in the different conditions see Table 6.4.

6.4.3 Acquiring V2: Error frequencies

Table 6.7 showed that the conditions of SLI and L2 did not result in an adult-like error pattern in the application of Dutch placement rules: the L2-SLI group patterned similarly to all the other child groups. This finding lends support to the idea that the SLI children do not seem to have a deficit in the underlying representation of grammar. Rather, differences in error frequencies can be seen as the result of a deficit in reduced intake capacities. A closer look at the pace with which the V2 rule is acquired should specify the severity of delay in certain child groups (see predictions 3 to 6). This is done in two ways. Firstly, error frequencies in the application of verb placement rules are compared between groups (see Figure 6.3; the absolute numbers are the same as in Table 6.7). Secondly, the uses of avoidance strategies, i.e., RIs and dummy auxiliaries, in V2 contexts are counted and compared across the child groups (see Table 6.8).⁹

⁷Some of Blom's (2008) Turkish L2 participants also had low scores in SVX orders but high scores in the embedded SXV order. This is possibly due to L1 transfer since Turkish is head-final and, as such, shares surface properties with Dutch (see §3.2.3).

⁸As already mentioned, the percentage of accuracy in the embedded SXV order was taken from a subset of data of the Zuckerman (2001) corpus (N=10; age range 3;0-3;11) since Polišenská (in preparation) did not test that particular condition. Statistical testing for that condition was not possible.

⁹This study applies Brown's criterion for acquisition (Brown 1973), that is 90% of correct uses in obligatory contexts. Although this criterion is based on spontaneous speech data, it has been widely used in acquisition research using experimental elicitation techniques.

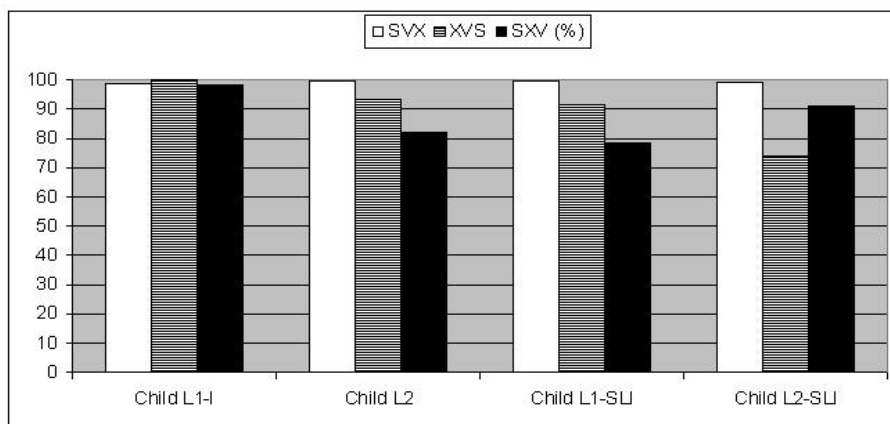


Figure 6.3: Percentage of accuracy in verb placement in the three different order conditions SVX, XVS and SXV (the percentage of accuracy in the embedded SXV order of the unimpaired child L1 group was taken from a subset of data of the Zuckerman corpus). See Table 6.4 for examples of correct and incorrect responses of verb placement.

As Figure 6.3 shows, the child groups do not perform equally accurately in the three order conditions. Firstly, performance in the XVS and SXV conditions (74%-93% correct) lags behind performance in the SVX condition (at around 100% correct) in the child L2, child L1-SLI and child L2-SLI groups, in contrast to the performance in the unimpaired child L1-I group. It is likely that the divergent outcomes between the child L1 group and the three other groups are due to differences in length of the experimental procedure as briefly discussed above (see Poliřenská (in preparation) and Zuckerman (2001) for details on the test conditions in the much younger child L1 groups). Secondly, the child L2-SLI group performs differently from the child L1-SLI and child L2 groups in the XVS and SXV conditions. Statistical testing revealed no significant differences, however.¹⁰ A closer look at the data revealed that only three L2-SLI children are responsible for these apparent differences: they overused SVX to SXV and, in particular, XVS orders.

As discussed in §3.3, unimpaired L1 and L2 children seem to prefer less costly operations at early developmental stages, namely leaving the verb in its base position (i.e., RIs) and/or inserting a dummy auxiliary in V2 position, instead of moving the finite lexical verb. From this evidence it can be assumed that the acquisition of V2 requires time and cognitive effort (see §3.3). Given the expected delay in the SLI groups in particular (see predictions 3 to 6),

¹⁰The L2-SLI group (73.6%) has a lower score in the inverted XVS order compared to the L1-SLI group (91.3%; $U=-1.662$, $p<0.1$, two-tailed) and child L2 group (93.2%; $U=-1.634$, $p=0.1$, two-tailed). On the other hand, the L2-SLI group (90.9%) scores higher with the embedded SXV order than their L1-SLI peers (78.4%, $U=-0.308$, $p=0.76$, two-tailed) and their L2 peers (82.1%, $U=-0.943$, $p=0.3$, two-tailed).

these child groups should produce higher frequencies of RIs and/or dummy auxiliaries in V2 conditions and, hence fewer lexical finite verbs than other groups. Table 6.8 presents the amounts of these three response categories in the two V2 order conditions; calculations are thus made based on the SVX and XVS order conditions. Note that only correctly placed finite lexical verbs and dummy auxiliaries were considered here since we are interested in the distribution of the three response types in the acquisition of V2.¹¹

	Finite lexical verbs	daux	RIs
Child L1-I	94.0 (n=171; sd=13.6)	6.0 (n=11; sd=13.6)	0
Child L2	83.0 (n=367; sd=20.8)	13.1 (n=58; sd=18.3)	3.9 (n=17; sd=7.5)
Child L1-SLI	72.3 (n=431; sd=28.2)	22.0 (n=131; sd=27.4)	5.7 (n=34; sd=10.0)
Child L2-SLI	63.5 (n=287; sd=29.7)	21.2 (n=96; sd=21.9)	15.3 (n=59; sd=17.2)

Table 6.8: Percentages of lexical finite verbs, dummy auxiliaries (daux) and RIs in V2 order conditions (numbers in parentheses denote absolute numbers of responses and standard deviations)

As expected, the SLI and L2 groups clearly choose the more economical and, hence, less demanding course of leaving the lexical verb in situ, compared to the unimpaired child L1 groups, revealing clear effects of SLI and L2. Mann-Whitney U tests revealed that the SLI groups use significantly fewer finite lexical verbs than their corresponding unimpaired L2 controls ($U = -2.482$, $p < 0.007$, one-tailed; effect size = -0.78) and L1 controls ($U = -3.813$, $p < 0.001$, one-tailed; effect size = -0.97). The use of the more economical dummy auxiliaries and RIs is also significantly higher in the L2-SLI group than in the child L2 group (for daux: $U = -1.909$, $p < 0.028$, one-tailed; effect size = 0.41 ; for RIs: $U = -2.936$, $p < 0.002$, one-tailed; effect size = 0.88). The same is true for child L1-I compared to child L1-SLI (for daux: $U = -3.266$, $p < 0.001$, one-tailed; effect size = 0.73 ; for RIs: $U = -3.331$, $p < 0.001$, one-tailed; effect size = 0.73). Compared to the younger child L1 group, the child L2 group produces significantly fewer finite lexical verbs in V2 order ($U = -2.515$, $p < 0.006$, one-tailed; effects size = -0.64) and significantly more dummy auxiliaries ($U = -2.014$, $p < 0.022$, one-tailed; effect size = 0.45) and RIs ($U = -3.097$, $p < 0.001$, one-tailed; effect size = 0.76). A closer analysis of the data revealed that a subset of the L2 children ($N=7$) is responsible for that difference. RI productions are also significantly higher in the child L2-SLI group than in the child L1-SLI group ($U = -2.539$, $p < 0.01$, one-tailed; effect size = 0.72). This is not the case though for the production of dummy auxiliaries ($U = -0.572$, $p = 0.28$, one-tailed) and finite lexical verbs ($U = -1.154$, $p = 0.12$, one-tailed). In

¹¹Actually, one might question whether any of the children had difficulties in placing the auxiliary verbs correctly. Errors did occur in some individual cases but these were marginal: in the child L2 group 3.3% ($n=2/60$); in the child L1-SLI group 5.1% ($n=7/138$); in the child L2-SLI 11.1% ($n=12/108$).

sum, we find a cumulative L2-SLI effect for RIs, but not for the production of finite lexical verbs and dummy auxiliaries. A first comparison of the child L1-SLI and child L2 group suggests that the impact of SLI is greater than that of L2, but the differences are not significant.¹² We should remember that there was a considerable difference in length of systematic exposure to Dutch between the two groups (L1-SLI group: 7;2 years and child L2 group: 5;3 years (compare Table 6.1)), so that possibly an SLI effect could have been visible at an earlier age.¹³

Compared to the unimpaired L1-I group, the child L2, L1-SLI and L2-SLI groups are often economical and avoid V2. This is in accordance with Van Kampen (1997) and Zuckerman (2001) who argue that children prefer the underlying (S)XV representation in early development: lexical verbs stay in final positions. Instead of raising the finite verb, they insert a dummy auxiliary into V2 position. When the V2 rule starts to apply to lexical finite verbs, the use of dummy auxiliaries should decrease. In this study, the following predictions are tested on the basis of group results: (i) auxiliary forms should not be produced in subordinate SXV order (see Table 6.9) and (ii) auxiliary forms should disappear once the V2 rule is established (see Table 6.10).

	Main clause (SVX and XVS)	Embedded clause (SXV)	sd
Child L2	15 (79.0)	4 (21.0)	17.1
Child L1-SLI	39 (83.0)	8 (17.0)	16.1
Child L2-SLI	28 (93.3)	2 (6.7)	11.8

Table 6.9: Distribution of dummy auxiliaries in main and embedded clauses in absolute numbers (numbers in parentheses denote percentages related to absolute numbers). The child L1-I data could not be used for this analysis.

Table 6.9 compares the uses of dummy auxiliaries of three child groups in V2 (i.e., SVX and XVS) and V-final (i.e., SXV) orders; the two V2 order conditions are pooled here. For a more reliable comparison, only the 3SG contexts were considered as these were tested in every word order condition. It is clear that the number of dummy auxiliaries are fairly small across the SLI and L2 groups, which supports the idea that most of the children have V2, that is they move the finite verb instead of inserting dummy auxiliaries. Although there is substantial individual variation in the use of dummy auxiliaries, the findings are in accor-

¹²The L1-SLI children use fewer finite lexical verbs ($U = -1.411$, $p < 0.16$, two-tailed) but more dummy auxiliaries ($U = -1.522$, $p < 0.12$, two-tailed), and RIs ($U = -0.534$, $p = 0.60$, two-tailed) than the L2 children.

¹³As before, the substantial standard deviations suggest variation. A closer observation of individual data shows that subsets of the L2 and SLI groups are more delayed in development in terms of higher use of dummy auxiliaries and RIs. Interestingly, the same children were also reported to produce with high frequency responses that had to be excluded from further analysis (see §6.4.1). I will come back to this issue in §8.5.

dance with Van Kampen's (1997) claim: dummy auxiliaries are predominantly used in V2 order conditions, and barely in SXV order.

In order to test whether the production of dummy auxiliaries decreases once the V2 rule has been established was done by relating the effects of length of Dutch exposure on the acquisition of V2 (see Table 6.10). The effects of length of input were not only tested for the production of dummy auxiliaries, but also for the production of finite lexical verbs and RIs (see prediction 7). Significant main effects of length of exposure on correct finite lexical verbs $F(1, 81) = 8.67$, $p < 0.01$ and dummy auxiliaries verbs $F(1, 81) = 6.64$, $p < 0.05$ were revealed by a univariate ANOVA. No main effect was found, though, for the use of RIs $F(1, 81) = 2.4$, $p > 0.1$. A Pearson product-moment correlation further specifies the relationship of length of input and response category for each child group given in Table 6.10.¹⁴

		Finite lexical verbs	daux	RIs
Child L1-I	(N=20)	0.57**	-0.54*	-
Child L2	(N=17)	0.58*	-0.58*	-0.31
Child L1-SLI	(N=25)	0.61**	-0.46*	-0.46*
Child L2-SLI	(N=19)	-0.001	0.12	-0.15

Table 6.10: Pearson product-moment correlation coefficients for length of exposure to Dutch and verb placement; dummy auxiliaries are indicated as 'daux' (**Correlation is significant at the 0.01 level (two-tailed); *Correlation is significant at the 0.05 level (two-tailed))

Significant positive correlations between length of exposure and the use of finite verb forms in V2 contexts are seen in the child L1-I-SLI, child L2 and child L1-I group: the longer the exposure to Dutch, the higher the use of finite verbs in V2 conditions. A similar outcome can be seen in the negative correlations found with the uses of dummy auxiliaries: a decrease of occurrence of dummy auxiliaries and RIs goes hand in hand with increasing length of exposure to Dutch. The findings suggest that both the unimpaired L2 children and L1-SLI children will eventually achieve the lexical finite stage with increasing exposure to Dutch, at least most of these children. Interestingly, no such correlations are found in the child L2-SLI group. Future research will have to match these groups more carefully on input to further investigate this issue.

6.4.4 Summary

Representational deficit or reduced intake? The results indicate that all child groups regardless of being SLI or L2 rely on the same system underlying verb placement rules given the relatively high scores in positioning the finite verb. This is in line with previous research on Dutch SLI (e.g., De Jong 1999; Bastiaanse and Bol 2001; Wexler et al. 2004) and in Dutch child L2 acquisition

¹⁴As pointed out in §5.2, information on the input situation is missing for one L2-SLI child and three unimpaired L2 children.

(e.g., Blom 2008). In contrast, L2 adults were shown to have severe difficulties in applying the V2 rule. They not only have lower accuracy rates, but they also overuse an SVX template, an error barely seen among the child groups. The differences between child and adult learners can best be understood in terms of age effects in the application of the V2 rule as earlier proposed by various scholars (e.g., Clahsen et al. 1983; Clahsen and Muysken 1986; Blom 2008) or in terms of limited access to the procedural memory system (e.g., Ullman 2004, 2005).¹⁵ That (L2-)SLI children are different from L2 adults is taken as evidence against the assumption that SLI entails a deficit in the representation of linguistic knowledge or procedural memory (see 1). The use of similar error patterns across the child groups, i.e., overusing RIs and dummy auxiliaries, is more in line with the reduced intake account (see 2): Children appear to have the same underlying resources to derive grammatical rules, but the crucial difference is that a limited processing capacity system slows down derivation of the rule causing developmental delay.

Do we find SLI effects? Most of the L2-SLI and L1-SLI children know how to apply the verb placement rules to lexical finite verbs. Compared to the unimpaired child groups, however, the L2-SLI and L1-SLI children were shown to avoid V2 more often and to use dummy auxiliaries and RIs instead. This outcome supports the predictions in (3). The prolonged use of RIs in subsets of the six-to-eight year old L1-SLI children and L2-SLI children is in line with the existence of an extended optional infinitive stage (see §2.2.3). The frequent overuse of dummy auxiliaries to V2 positions can also be seen as evidence for an avoidance strategy of movement of the finite lexical verb as proposed by Van Kampen (1997) and Zuckerman (2001) for child L1-I acquisition. This outcome raises the obvious question as to why the SLI children, who have, in fact, knowledge of the placement rules, avoid V2 and prefer the less costly operations. The difficulties in applying the actual placement rules might be due to some sort of a performance problem as proposed by Bishop (1994, 2000a) (see §2.2.3). Due to limited processing capacities, she posits, the SLI child is not able to apply rules if the task is too complex. As a consequence, SLI children prefer less costly operations and/or make more errors. The application of the V2 rule in Dutch seems to be a case in point. Instead of performing the cognitively more demanding movement operation, V2 is substituted by less costly operations, namely the production of RIs and dummy auxiliaries. I will further elaborate on that idea in §6.6.

Do we find L2 effects? The impact of reduced intake on the application of the V2 rule was also expected to be visible in an L2 effect and, hence, delay due to the limited length of exposure to Dutch in the L2 children (see prediction 4). The difference between the unimpaired child L1-I and child L2 groups was

¹⁵Lack of dummy auxiliaries in adult L2 learners (Blom and De Korte 2008) can be interpreted as additional evidence that syntactic knowledge of the Dutch target grammar is different or missing (§3.3.4).

statistically significant. Important to consider here is that only subsets of the unimpaired L2 children appeared to be responsible for a substantial amount of the dummy auxiliary and RIs productions (see §8.5). On the other hand, the comparison of the two impaired child groups showed an L2 effect only in the use of RIs, but not in finite lexical verbs and dummy auxiliaries.

Do we find a cumulative L2-SLI effect? Both SLI and L2 effects were expected to play a role in the L2-SLI children indicating a cumulative L2-SLI effect (see 5). In other words, the rates of RIs and dummy auxiliaries should be substantially higher in that group compared to any other child group. As discussed above, the L2-SLI group performed significantly worse than the unimpaired L2 group, but was only worse than the L1-SLI group in terms of RIs. That means, no clear double delay due to L2-SLI was found in the data. At first sight, these parallels in scores are surprising, especially when considering that the L1-SLI group (7;2 years) was exposed to Dutch for a substantial longer period of time than the child L2-SLI group (5;2 years). The rather small group differences between the child L2-SLI and child L1-SLI groups can, however, also be seen as additional evidence for the marginal effect L2 has on finite verb placement compared to the impact of SLI.

What is the relative impact of SLI and L2? As might be expected from the previous discussion, the effect of SLI is stronger than the effect of L2. In particular, the L1-SLI children use fewer finite lexical verbs, but more dummy auxiliaries. This finding is strengthened by the fact that the L2 children (5;3 years) had considerably less exposure to Dutch than the L1-SLI children (7;3 years).

The effect of length of exposure to Dutch. Length of exposure to Dutch was found to correlate significantly with (an increase) of finite lexical verbs and (a decrease) of dummy auxiliaries in the child L1-I, child L2 and child L1-SLI groups, but not in the child L2-SLI group. Future research should match all child groups in terms of length of exposure to explore this issue more carefully.

6.5 Results: Verb inflection

The data selection is described in §6.5.1 before turning to the analysis of verb inflection in terms of error types in §6.5.2 and in terms of error frequencies in §6.5.3. As was the case in verb placement, length of exposure to Dutch is considered as a covariate to examine its respective effects on the amount of errors per child group when applying the verb inflection rules.

6.5.1 Data selection

Finite verb inflection was tested in V2 order contexts only (see Table 6.2). Novel verbs were used to elicit verb inflection alongside three existing lexical verbs.

That resulted in a maximum of 24 responses per participant with existing verbs and a maximum of 16 responses with novel verbs in the child L2, L1-SLI, L2-SLI and adult L2 groups.¹⁶ For the child L1-I group, there was a maximum of 8 responses per participant and verb type.¹⁷ Table 6.11 presents the response types in the learner groups in terms of analyzed finite lexical verbs, substitutions (i.e., dummy auxiliaries and RIs) and excluded responses. Dummy auxiliaries and RIs were excluded for reasons discussed in §6.3.4. The distribution is separately documented for existing verbs (the upper section of the Table 6.11) and novel verbs (the lower section of Table 6.11) providing the mean (absolute numbers), standard deviation and range of occurrences.

Existing verb	Finite lexical verb				daux and RIs			Excluded		
	max	\bar{x}	sd	range	\bar{x}	sd	range	\bar{x}	sd	range
Child L1-I	8	6.9	1.4	3-8	0.3	0.7	0-3	0.9	1.3	0-3
Child L2	24	18.2	5.3	6-24	3.4	4.2	1-18	2.5	1.7	0-8
Child L1-SLI	24	16.4	6.9	1-23	5.5	5.9	0-22	2.1	2.4	0-9
Child L2-SLI	24	14	6.9	1-24	7.0	5.5	1-17	3.0	2.8	0-10
Adult L2	24	18.6	4.8	9-24	0.4	0.7	0-2	5.0	4.4	0-14
Novel verbs	Finite lexical verb				daux and RIs			Excluded		
	max	\bar{x}	sd	range	\bar{x}	sd	range	\bar{x}	sd	range
Child L1-I	8	6.9	1.8	1-8	1.0	0.7	0-4	0.5	1.0	0-3
Child L2	16	11.2	4.5	0-16	1.5	2.7	0-11	3.3	2.8	0-9
Child L1-SLI	16	10.3	6.1	0-16	1.4	3.4	0-14	4.4	5.0	0-16
Child L2-SLI	16	7.5	5.7	0-16	3.0	3.7	0-12	5.5	4.6	1-16
Adult L2	16	11.6	5.5	1-16	0.3	0.7	0-2	4.1	5.5	2-15

Table 6.11: Response types in verb inflection with existing lexical verbs and novel lexical verbs (all inflectional contexts are pooled here, and dummy auxiliaries are indicated as ‘daux’); due to rounding of figures, some totals do not add up to the exact maximum of contexts per participant.

As is clear from the tables, the response rates in the two categories excluded from the analysis on inflection are, overall, higher in both SLI groups and the adult L2 group than in the unimpaired child L1-I and child L2 groups. Accordingly, on average, fewer responses with lexical finite verbs could be obtained (compare also standard deviations and range). These outcomes are the same as those previously discussed on verb placement in §6.4 and require therefore no further explanation. A comparison of the responses to both verb types led to the exclusion of novel verbs from the main analysis. Almost half of the responses with novel verbs had to be excluded in the SLI groups. There was even more substantial individual variation with novel verbs when comparing standard deviations and ranges across the child groups. A few children produced barely

¹⁶As discussed in §6.3.3, inflections in the 2SG inverted order were not regarded in the SLI and L2 groups given the low scores on construct reliability. That means, five responses had to be excluded per participant: three with existing verbs and two with novel verbs.

¹⁷1PL and 3SG inverted contexts were not tested given the shorter experiment in the L1 children (see §5.3.1), and inflections in the 2SG inverted order were not included here for reasons of comparability.

any finite inflections with novel verbs (0-2 occurrences). Maybe unsurprisingly, most of these children were also particularly delayed in acquiring V2. This is already an indication of problems SLI children might have in applying inflectional rules. Given that there were so few novel verb data available to provide information about inflection learning, they were excluded. Since the SLI groups do not perform at ceiling with the existing lexical finite verbs (see §6.5.3), exclusion of the novel verb data is not problematic. However, some relevant results are documented as footnotes confirming that the main error patterns found in existing verbs also hold for novel verbs.

6.5.2 Inflecting finite lexical verbs: Error types

The representational deficit account and the reduced intake account make different predictions about the error types that should occur in the various groups (compare predictions 1 and 2). The substitution of the *-en* morpheme in finite singular contexts was shown in previous research to be frequent in low to medium proficient adult L2 learners (see §3.3.4), whereas it is barely seen among child L2 and L1(-SLI) learners of Dutch (see §3.3). Incorrect uses of the morphemes *-t* and $-\emptyset$ are, however, typical for child learners of Dutch and therefore expected. By collapsing the inflectional contexts where errors are made with the same morphemes, it is possible to examine whether L2-SLI children pattern similarly to adult L2 learners or child learners of Dutch. Given the syncretisms in the Dutch paradigm (see §3.2.2), substitutions with the three morphemes may occur in different inflectional contexts (9).

- (9)
- a. Incorrect use of $-\emptyset$ in 2SG, 3SG, 3SG inversion, 1PL and 3PL contexts
 - b. Incorrect use of *-t* in 1SG, 1PL and 3PL contexts
 - c. Incorrect use of *-en* in singular contexts

Table 6.12 presents the proportion of substitution of *-en*, *-t* and $-\emptyset$ in percentages to the total possible responses within each morpheme context.

	<i>-en</i>	<i>-t</i>	$-\emptyset$
Child L1-I	0 (n=100; sd=0)	0 (n=70; sd=0)	11.5 (n=104; sd=17)
Child L2	0.4 (n=239; sd=2)	3.5 (n=172; sd=12)	11.4 (n=315; sd=14)
Child L1-SLI	1.2 (n=259; sd=8)	9.3 (n=204; sd=12)	16.9 (n=355; sd=16)
Child L2-SLI	2.8 (n=176; sd=23)	19.0 (n=142; sd=19)	15.7 (n=242; sd=27)
Adult L2	20.4 (n=113; sd=27)	3.7 (n=81; sd=9)	24.3 (n=140; sd=16)

Table 6.12: Percentages of substitutions in verb inflectional contexts with *-en*, *-t* and $-\emptyset$ (numbers in parentheses denote absolute numbers of responses and standard deviations of percentages)

As is clear from Table 6.12, having SLI and acquiring an L2 as a child does not result in an adult-like error pattern. Unlike the L2 adults, *-en* is barely used as a substitution type across the child groups (1 to 5 occurrences).¹⁸ Actually, only one L2-SLI child and one L1-SLI child are responsible for most of the *-en* productions in their groups. The same error types are used across child learners, i.e., *-t* and \emptyset , lending support to the prediction that SLI is the result of a reduced intake capacity rather than a deficit in the underlying representation of grammar.¹⁹

There seems to be one discrepancy between the child L2-SLI group and the other child groups, however. The L2-SLI children produce relatively more substitutions with *-t* than with \emptyset , the difference not being significant, though, using the Wilcoxon rank sum test ($W=-0.310$, $p=0.76$, two-tailed). In contrast, \emptyset is the predominant error in all the other child groups. A closer look at the data shows that a subset of the L2-SLI children ($N=6$) are responsible for a substantial amount of *-t* substitutions. This is a surprising outcome and difficult to interpret considering that omission errors have been shown to be the most common error in Dutch SLI (e.g., Bol and Kuiken 1988; De Jong 1999) and Dutch L2-SLI (Steenge 2006).

6.5.3 Inflecting finite lexical verbs: Error frequencies

Despite the fact that all child groups pattern similarly in contrast to the L2 adults, a delay should be visible in both SLI groups as finite verb inflection is supposed to be a clinical marker (see §2.2.2). The effect of L2, on the other hand, is expected to be less apparent on the basis of evidence discussed in §2.3.2 that child L2 learners of Dutch have acquired the target system after two to four years of exposure to Dutch. Table 6.13 shows the percentages of correct responses.

Percentages of correct inflections are relatively high across all child groups. However, only the unimpaired L1-I and L2 child groups perform at 90% correct.²¹ As expected, SLI effects are statistically confirmed when the SLI groups are compared to their corresponding unimpaired group: child L2 ($U=-2.504$; $p<0.006$, one-tailed; effect size= 0.59), child L1-I ($U=-2.996$; $p=0.015$, one-tailed; effect size= 0.75). On the other hand, only a marginal effect is found on the acquisition of verb inflection in both L2 groups: Comparing the accuracy between the L2-SLI group and L1-SLI group reveals no significant difference

¹⁸It is not only Turkish adult L2 learners who substitute the *-en* morpheme in finite singular contexts. As discussed in §3.3.4, Moroccan learners of Dutch (Berber and Tarifit as L1) were also reported to produce that particular error type and, hence, ruling out the possibility of an explanation in terms of L1 transfer (see Blom 2008 for details).

¹⁹Exactly the same patterns in incorrect use of the *-en* suffix were found with novel verbs: Hardly any *-en* inflections were produced across the child groups (2 occurrences in the L2-SLI children and L1-SLI children, respectively), whereas 15 finite *-en* forms were produced in the adult L2 group.

²⁰The child L1-I group has not been tested for inflections in the 3SG inverted order, as mentioned earlier.

²¹As already mentioned, this study applies Brown's criterion for acquisition (Brown 1973), that is 90% of correct uses in obligatory contexts.

	Correct inflection
Child L1-I ²⁰	91.2 (n=137; sd=12.7)
Child L2	88.2 (n=363; sd=14.3)
Child L1-SLI	80.0 (n=409; sd=17.1)
Child L2-SLI	75.0 (n=280; sd=29.1)

Table 6.13: Percentages of verb inflection accuracy in the V2 order contexts: 1,2,3SG, 3SG inversion and 1,3PL (numbers in parentheses denote absolute numbers of responses and standard deviations)

($U = -1.248$, $p = 0.106$, one-tailed). In other words, no cumulative effect of SLI and L2 is found in the L2-SLI group. Similarly, the difference between accuracies in the unimpaired L1 and L2 children is not significant either ($U = -1.519$, $p = 0.08$, one-tailed).²² The comparison of the percentage accuracies between the child L1-SLI and unimpaired child L2 group provides additional evidence that the relative effect of SLI is stronger than the effect of L2 on Dutch verb inflection. The L2 children with shorter exposure to Dutch (5;3 years) perform significantly better than the L1-SLI children (7;3 years Dutch exposure) ($U = -1.792$, $p = 0.036$, one-tailed, effect size = 0.53). In sum, the comparison of the results revealed precisely what is expected: Dutch verb inflection is a marker for SLI. Given the relatively high accuracies in verb inflection, access to UG or a deficit in procedural memory seems not to be the underlying cause of the problem. Rather, it is reasonable to interpret the delay in terms of factors that influence the processes to derive and apply grammatical rules. This point will be further discussed in §6.6.²³

Significant main effects are found for length of exposure on the performance on verb inflection using a univariate ANOVA: $F(1, 81) = 6.72$, $p < 0.05$). The correlation values in Table 6.14 specify the degree of relationship between length of input and proficiency of verb inflection per group.²⁴

Significant positive correlations between length of exposure to Dutch and

²²The results with novel verbs are overall in line with the patterns found in the incorrect inflections with existing verbs: in child L2-SLI: 72.6% (n=109/150; sd=36.8); in child L1-SLI: 73.2% (n=188/257; sd=31.2); in child L2: 85.7% (n=192/224; sd=23.04) and in child L1-I: 94.2% (n=129/137; sd=9.4). The similarities in accuracy rates between both SLI groups are possibly due to the fact that only the better performing SLI children actually used novel verbs.

²³One might question whether the difficulties in inflection manifest themselves across the verb paradigm or whether these problems occur in only a subset of the inflectional contexts. Appendix B therefore provides the reader with the outcomes on every inflectional context tested comparing, on the one hand, the child L1-I and child L1-SLI groups and, on the other hand, the child L2-SLI and child L2 groups. The comparisons show that, overall, the unimpaired groups outperform the impaired groups to similar degrees in most inflectional contexts, hence, emphasizing the delay in SLI.

²⁴Note again that it was not possible to gather information on the input situation in Dutch from one L2-SLI child and three unimpaired L2 children.

		Finite verb inflection
Child L1-I	(N=20)	0.56*
Child L2	(N=17)	0.49*
Child L1-SLI	(N=25)	0.29
Child L2-SLI	(N=19)	0.17

Table 6.14: Pearson product-moment correlation coefficients for length of exposure to Dutch and finite verb inflection (*Correlation is significant at the 0.05 level (two-tailed))

correct finite verb forms are apparent in both unimpaired child groups: the longer the exposure to Dutch, the more correct finite verb inflections in V2 conditions are produced. Although the tendency is the same for both SLI groups – correlations are positive – they are not statistically significant. It is possible that the lack of significant correlations is due to a plateau effect. In contrast, limited length of L2 exposure has barely a delaying effect in the unimpaired child L2 group. That average exposure to Dutch is roughly comparable in the unimpaired child L1-I (4;10 years) and child L2 (5;3 years) makes this outcome even more reliable.

6.5.4 Summary

Representational deficit or reduced intake? As is clear from the empirical facts, L2 adults are different from all child learners in terms of error types in acquiring finite verb inflection. This was substantiated by the disproportionate number of *-en* substitutions in singular contexts between the L2 adults and impaired and unimpaired child groups. As was the case with the acquisition of verb placement, the differences between child and adult learners can best be understood in terms of age effects (e.g., Blom 2008). That (L2-)SLI children pattern differently from adult L2 learners is not in line with the assumption that SLI entails a deficit in the representation of linguistic knowledge or procedural memory (see 1). Rather, the fact that no profound differences were found in error types between the impaired and unimpaired child groups is taken as evidence for the reduced intake account (see 2).

Do we find SLI effects? Both groups of SLI children produce more inflectional errors with $-\emptyset$ and $-t$ than their corresponding unimpaired peers in V2 contexts (see prediction 3). Omission errors were shown to be the most frequent type of agreement error across the child groups with the exception of some (L2-)SLI children who tended to use higher frequencies of $-t$ substitutions. That omission errors predominate is in accordance with previous research from Dutch SLI (e.g., Bol and Kuiken 1988; De Jong 1999) and Dutch L2-SLI (Steenge 2006). That the accuracy rates were relatively high in both SLI groups indicates, in fact, that the agreement rule has already been acquired. These children might, however, have limitations in applying the rule as a consequence of the processing

limitations in SLI. What that exactly means for the acquisition of finite verb inflection and verb placement in Dutch is further discussed in §6.6.

Do we find L2 effects? The two child L2 groups were also expected to rely on a poorer intake due to less exposure to Dutch compared to their corresponding L1 peers, resulting in more agreement errors (see 4). This expectation was, however, not confirmed by the data since no between-group differences were found. In fact, the unimpaired child L2 group performed at 90% correct and the L2-SLI group also performed at a quite high level with 75% accuracy. The findings are partly in contrast to Steenge (2006), who reported that the L2(-SLI) children made significantly more *-t* errors than the corresponding L1(-SLI) groups. In her study, the Turkish and Moroccan L2(-SLI) children were seven and nine years old (§3.3.5), thus covering a similar age range as the children tested here. As already pointed out in §3.3.5, this difference is possibly due to a test effect in the elicitation of 3SG and 3PL contexts in her study.

Do we find a cumulative effect of SLI and L2? Effects of SLI and L2 were expected to play a role in the L2-SLI children leading to a cumulative L2-SLI effect (see 5). In other words, inflectional errors should be substantially higher in that group than in any other child group. As a group, L2-SLI children made significantly more errors than their child L2 peers, but not than their L1-SLI peers. Considering the substantial difference in length of exposure to Dutch between the L1-SLI group (7;2 years) and the child L2-SLI group (5;2 years), it seems quite surprising that a greater difference was not found between the two groups. This outcome emphasizes the negligible effect L2 has on verb agreement compared to the impact of SLI, even in an L2-SLI group. That no cumulative L2-SLI effect was found in verb morphology is, in fact, similar to Steenge's (2006) overall findings and Paradis and colleagues studies on French-English 2L1 acquisition (see Paradis et al. 2005/2006; Paradis 2007), indicating that the problem in verb agreement in the 2L1/L2-SLI groups is not due to less exposure to the L2.

What is the relative impact of SLI and L2? As might be expected from the previous discussion, the intake problem in SLI effects the acquisition of verb inflection more seriously than having had less L2 exposure. Note as well that the L2 children (5;3 years) had considerably less exposure to Dutch than the L1-SLI children (7;3 years), which confirms again the weaker effect of L2 exposure. These findings are in contrast to the studies discussed in §2.4.1 reporting on clear similarities in error rates between both groups. The divergence in the results is possibly due to differences in the input situation. In most of the cited studies (e.g., Håkansson and Nettelbladt 1996; Håkansson 2001; Paradis and Crago 2000, 2001, 2004; Grüter 2004, 2005), the L2 children were exposed to the target language for less than two years, whereas the L2(-SLI) here were exposed to Dutch for roughly five years.

The effect of length of exposure to Dutch. Length of exposure to Dutch was found to correlate significantly with correct finite verb inflections in the unimpaired child L1-I and child L2 groups, but not in the SLI groups. As discussed above, this finding provides additional evidence that the L2 effects, i.e., less exposure to Dutch, are marginal on verb inflection compared to the SLI effects due to limited processing capacities in these children.

6.6 Conclusion

The focus of this chapter was to specify the relationship between SLI and L2 in terms of the acquisition of finite verb placement and finite verb inflection. In particular, testing the predictions in (1) and (2) contributes to the theoretical debate as to whether the locus of the deficit in SLI is in the innate representation of linguistic knowledge or in the limited capacity to process the language input. As discussed, the two approaches to SLI allowed for a discussion of error types in the five learner groups examined. Systematic comparisons revealed that, in contrast to the L2 adults, no large group differences were found in error types across children in placing and inflecting the finite verb:²⁵

- If finite lexical verbs were used, they were in most cases correctly placed in V2 or initial position in main clauses and in sentence-final position in embedded clauses.
- If no finite lexical verb was used, they were substituted by developmental errors typical for child acquisition in Dutch, namely dummy auxiliaries and RIs.
- If inflectional errors were produced, it was either substitution of $-\emptyset$ or $-t$.

The similarities in error types across the child learners are interpreted as support for the reduced intake account rather than for a deficit in UG or procedural memory. Differences between the impaired and corresponding unimpaired child groups were, however, found in terms of error frequencies marking a clear effect of SLI in both domains. Having less exposure to Dutch, on the other hand, was shown to barely have an effect in most L2 children. In fact, only few unimpaired L2 children were responsible for the uses of the more economical dummy auxiliaries and RIs in contexts where finite lexical verbs were expected. In verb inflection, the unimpaired L2 group performed at target-levels in verb inflection, namely approximating 90% correct, after being exposed to Dutch as a group for roughly five years. Both SLI groups made more errors in verb placement and verb inflection than their unimpaired peers. However, their accuracy rates remained relatively high, indicating that both SLI groups (at least most (L2-)SLI children) have, in fact, knowledge of the inflectional rules. These group results indicate that the threshold value to acquire the rules for positioning and inflecting verbs is reached relatively easily, especially in unimpaired acquisition. This

²⁵These general observations were corroborated by data from a Frog Story narrative task administered to the same L2, L1-SLI and L2-SLI children.

idea could potentially account for the fact that no apparent cumulative L2-SLI effect was found in these domains. Such an effect might have been visible at an earlier stage in development.

The results raise two obvious questions: (i) What causes the relatively fast and easy acquisition of these two grammatical phenomena?, and (ii) why do difficulties persist in both SLI groups although the accuracy rates suggest that the rule system underlying verb placement and verb inflection has been acquired? The syntactic and morphological properties of verb placement and verb inflection in Dutch (§3.2) offer a suitable explanation for speedy acquisition in terms of transparency. It was shown in §3.2.1 that word order affects the morphology (and finiteness) of the verb: morphologically finite forms are either placed in fronted or second sentence position in main clauses, whereas non-finite forms are in sentence-final position. The majority of children has been shown to be sensitive to these cues. For instance, the marginal numbers of finite *-en* forms in singular contexts can be taken as evidence that child learners are able to distinguish between finite plural forms and non-finite verb forms.

That the rules cannot be appropriately applied by (L2-)SLI children might be due to the complexity of the morphosyntactic operation itself, indicating a performance problem in the sense of Bishop (1994, 2000a). As discussed in §2.2.3, she argues that even if SLI children appear to have mastered a formal rule, application of that rule might be problematic due to the slowed processing in a limited capacity system in SLI. These children can only correctly apply the rules, if the language computation is not impeded by other cognitive demands such as high information load, complex sentences or novel verbs. As a consequence, it was predicted that SLI children make more errors or that they have to rely on less demanding operations. Correct verb inflection in V2 contexts in Dutch requires movement of the verb as well as correct inflection marking, both at the same time. Conducting these parallel operations might be too demanding for the SLI children. As a result, they use more dummy auxiliaries and RIs to avoid verb movement. Support for that idea comes from the fact that only few dummy auxiliaries were produced in embedded clause condition. Errors in verb inflection are also more frequent compared to their unimpaired peers, as was shown in the previous sections. Such an interpretation is in line with conclusions of Leonard and colleagues (Leonard 2000; Lukács et al. 2008) who showed that parallel processing of a complex combination of inflections in Hungarian SLI children resulted in higher error rates, whereas the children had no difficulties with producing the separate inflections (see §2.2.2).

In a recent paper by De Jong, Orgassa, Baker, and Weerman (in preparation), the accuracy scores in 3SG verb inflection in V2 orders (i.e., SVX and XVS) were compared with those in V-final (i.e., SXV) order condition. All child groups (irrespective of being SLI or not) were shown to perform better in the inflectional context without verb movement than in the V2 contexts. In fact, accuracies were above the 90% level in SXV order, whereas only the unimpaired child L1-I and L2 groups performed around that level in the V2 order conditions (see §6.5.3 and Appendix B). The high accuracy rates in the SXV condition are in accordance with the idea that knowledge of the inflectional rules is intact in

SLI. Instead, it seems to be the application of rules that is hampered when a cognitively more demanding operation must be performed.²⁶

For the L2-SLI group, there is, in fact, more evidence confirming that the rule system underlying verb inflection seems to be intact, as provided by the children's first language, Turkish. In De Jong, Orgassa, and Çavuş (2007) and De Jong et al. (to appear), subject-verb agreement in Turkish was examined in the same children tested here for Dutch. The analysis revealed high performance scores (89%) in the L1 of the child L2-SLI group. The high accuracies lie far outside the 'clinical range' and subject-verb agreement is, as such, not so useful as a clinical marker for Turkish SLI. Notably, however, the child L2-SLI group performed significantly worse than their unimpaired L2 age peers who were shown to perform target-like in Turkish: Mann-Whitney: $p=0,004$; $U= -2,907$, two-tailed (De Jong et al. to appear). That unimpaired monolingual Turkish children typically perform target-like in subject-verb agreement around age 2 (Aksu-Koç 1997) supports the idea of delay in the tested L2-SLI group. In sum, the low error rates in Turkish and the relatively low error rates in Dutch in the same L2-SLI group can best be accounted for in terms of factors that influence the processing abilities to accomplish certain linguistic operations.

²⁶This explanation also accounts for a subset of the unimpaired L2 children ($N=7$) tested here who were shown to be responsible for most of the inflectional errors and productions of dummy auxiliaries and RIs. Interestingly, no such disproportionate effect was found in the adult L2 group. The L2 adults, on the other hand, produced barely any RIs and dummy auxiliaries and they scored equally low in verb inflection in the three order conditions (see De Jong et al. in preparation). This observation can be taken as additional evidence that the L2 adults tested here rely on different resources for the acquisition of grammar than the child learners.

Production of agreement in determiners and adjectives

7.1 Introduction

In this chapter, I present the experimental production data on the acquisition of Dutch adjectival agreement and determiner-noun agreement in six groups of learners: Turkish-Dutch L2-SLI children and Dutch L1-SLI children are compared to a group of L2 adults, a group of unimpaired L2 children, and two groups of unimpaired L1 children. The production tasks in the experiment have basically two goals: (i) to determine whether learners are able to make gender distinctions in Dutch expressed by the use of *de* for common gender and *het* for neuter gender in Dutch definite determiners (§4.2.1), and (ii) to determine whether they can apply those gender distinctions to the more abstract agreement rules underlying attributive adjectival inflection (§4.2.2). The chapter is organized as follows: §7.2 briefly repeats the predictions to be tested here (§4.4). The details of the experimental method and procedure, used with the learner groups are presented in §7.3. §7.4 presents the results of the experiments on determiner agreement and §7.5 on adjectival inflection. In the same sections, the influence of length of exposure to Dutch is discussed per research variable. The final section (§7.6) then discusses the outcomes in terms of the predictions.

7.2 Previous evidence and expectations

There is a clear contingency between agreement in determiners and adjectives in Dutch and this is also found in the course of L1 acquisition (§4.3.2): If the child has acquired the correct gender, that is *de* or *het* in definite determiners, then the inflection in attributive adjectives (i.e., *-e* or $-\emptyset$) is usually correct (Polišenská in preparation for details). This is not the case in adult and child L2 acquisition, however: L2 learners fail to (fully) apply the correct inflectional

rules underlying adjectival inflection. Unlike L2 adults, L2 children follow the same developmental patterns in acquiring adjectival inflection as L1 children before they appear to fossilize in a stage where they overuse schwa with adjectives. This parallel between the child groups has been taken as evidence that they initially rely on the same grammatical representations for acquisition. Incomplete acquisition of adjectival inflection in adult L2 learners, on the other hand, is marked by a dual error pattern, namely overuse of $-e$ and $-\emptyset$, the latter error being less frequently seen among child learners (see Table 4.4 in §4.4). The differences in error types in adjectival inflection between adult L2 and unimpaired child learners were said to be the result of age effects, which means that underlying grammatical representations of the target grammar have become less accessible. Crucially, this divergence between child and adult learners was only found with adjectives but not with determiners, since, there agreement can be captured by input-driven lexicon based rules (§4.3.5). As in L1 acquisition, correct neuter gender assignment increases with growing knowledge of the Dutch lexicon.

Since empirical results on both variables are as yet infrequent in (L2-)SLI children, the particular interest here concerns the question if and how the effects of SLI and L2, together, affect the acquisition of gender in adjectival inflection. This question is addressed by relating two perspectives to SLI to L2 acquisition (see §2.4.3): (L2-)SLI children will be compared with adult L2 learners and with child (L2) learners. Note that it is the qualitatively different error patterns being expected in adjectival inflection that enable us to distinguish between both accounts. This distinction is repeated here as in (1) and (2).

- (1) On the basis of the representational deficit hypothesis:
Child L1-SLI and child L2-SLI acquisition can be expected to show a similar pattern to adult L2 acquisition in adjectival inflection, which is different from typical child L1 and child L2 acquisition.
- (2) On the basis of the reduced intake hypothesis:
All child groups show a similar pattern in adjectival inflection, which is different from adult L2 acquisition.

The reduced intake hypothesis allows for further predictions for adjectives and determiners in terms of delay, caused by intake problems in SLI, that is limited capacities to perceive and process input, and in child L2 due to the limited length of L2 exposure. SLI and child L2 groups are thus expected to show higher error rates in terms of overgeneralizing $-e$ with adjectives and overgeneralizing the common gender determiner *de* in neuter contexts and omitting definite determiners. The potential effects of SLI and L2 are summarized in (3) and in (4), respectively; $>$ means higher error rates.

- (3) SLI effects:
 - a. The error rate in child L1-SLI $>$ child L1
 - b. The error rate in child L2-SLI $>$ child L2
- (4) L2 effects:

- a. The error rate in child L2 > child L1
- b. The error rate in child L2-SLI > child L1-SLI

It is further assumed that both effects will be visible in the L2-SLI group causing a cumulative L2-SLI effect (§5.3.5). In other words, the L2-SLI groups should produce substantially more errors with adjectives and determiners than any other child group as laid out in (5).

- (5) The error rate in child L2-SLI > child L1-SLI, child L2 and child L1

It is as yet undefined for agreement in adjectives and determiners what the relative impacts are of SLI and L2. This issue is empirically addressed by comparing error frequencies between the child L1-SLI and child L2 groups to answer the question in (6).

- (6) Relative impact of SLI and L2:
Is the error rate in child L2 > child L1-SLI or is child L1-SLI > child L2?

As discussed in §4.3, sufficient input (and hence intake) is crucial to attain the <gender> feature and, hence, the inflectional rule for adjectival inflection. The <neuter> feature is activated only if a certain amount of input to Dutch has been received. In typical L1 acquisition children become more proficient in adjectival inflection with increasing exposure to the target language. This should be the case for L2 and SLI acquisition, but if this threshold is not reached in the critical period, SLI and L2 children may fossilize in development even though they begin with similar linguistic resources as the unimpaired L1 children. The expectations regarding the influence of input on the acquisition of agreement with determiners and adjectives can be formulated as in (7):

- (7) The effect of input:
- a. The longer the exposure to Dutch, the higher the accuracy rates in determiner agreement in the various child L1(-SLI) and child L2(-SLI) groups.
 - b. The longer the exposure to Dutch, the higher the accuracy rates in attributive adjectival inflection in the child L1 group, but not in the child L2, child L1-SLI and child L2-SLI groups.

7.3 Method

As discussed in §5.3.1, the FlexiT material was used to elicit data on agreement in determiners and adjectives in the various learner populations. Before presenting the results, details of the participants are repeated in §7.3.1 followed by a discussion of the experimental procedure (§7.3.2), the outcomes of an item analysis (§7.3.3) and the data analysis (§7.3.4).

7.3.1 Participants

As shown in Table 7.1, all selected learner groups were used for cross-group comparison (see §5.2 for more detailed information on the learner groups and the rationale of the selection and grouping criteria). The child L1-II was included here since unlike verb placement and verb inflection acquisition in this area continues over a larger period of time.¹

	N	Age			*AoE	**LoE		
		range	\bar{x}	sd		range	\bar{x}	sd
Child L1-I	20	4;0-5;11	4;10	0.6	0	4;0-5;11	4;10	0.6
Child L1-II	24	6;2-7;11	7;1	0.5	0	6;2-7;11	7;1	0.5
Child L1-SLI	25	6;1-8;0	7;3	0.7	0	6;1-8;0	7;3	0.7
Child L2	20	6;3-8;5	7;3	0.6	<1;0-4;0	3;3-8;5	5;3	1.3
Child L2-SLI	20	6;0-8;3	7;5	0.6	<1;0-4;0	3;4-7;7	5;2	1.2
Adult L2	9	22-36	27.9	4.5	>20	0.8-12;0	3;2	3.5

Table 7.1: Details of the participant groups (*AoE: age of systematic exposure to Dutch; **LoE: length of systematic exposure to Dutch)

The results of the L2 adults are relevant only when analyzing the error types to test the predictions in (1) and (2). These data are therefore only discussed in detail when presenting the adjectival inflection data since only there frame and rule learning can be distinguished (see §4.3.5). The various child groups will be systematically compared to further assess the severity of delay in the light of the predictions (3) to (7).

7.3.2 Procedure

Adjectival inflection and gender assignment to determiners was elicited using a picture description task (see §5.3.1). Both tasks involved the elicitation of high-frequency common gender nouns and neuter gender nouns. More neuter gender than common gender nouns were used for elicitation in order to potentially increase the number of interpretable inflected neuter gender data, namely five neuter root nouns and five neuter nouns with a diminutive suffix. Diminutives were included since they are morphologically marked for gender (see §4.2.1) making it possible to examine whether structural cues facilitate the acquisition of gender in determiners and attributive adjectives. Table 7.2 lists the nouns used for elicitation.²

The picture description task contained various test conditions for eliciting agreement between the adjective and the noun (see Table 7.3) using the common gender and neuter gender nouns listed above. As discussed in §4.2.2, there is

¹Recall that the child L1-I, child L1-II and adult L2 data presented here are subsets of data taken from the data sets of Polišenská (in preparation) and Blom (2008), respectively.

²The nouns were selected from the standardized vocabulary list for Dutch children under the age of three (N-CDI: Zink and Lejaegere 2002). Furthermore, nouns were also taken from the Dutch vocabulary list (Schlichting and Spelberg 2002) for non-native speakers of Dutch under the age of four.

Common gender	Neuter gender (root noun)	Neuter gender (diminutive noun)
apple ‘apple’	glas ‘glass’	boekje ‘small book.DIM’
auto ‘car’	mes ‘knife’	cadeautje ‘small gift.DIM’
baby ‘baby’	paard ‘horse’	huisje ‘small house.DIM’
schoen ‘shoe’	schaap ‘sheep’	raampje ‘small window.DIM’
vis ‘fish’	vliegtuig ‘plane’	varkentje ‘small pig.DIM’

Table 7.2: Dutch nouns used for the elicitation of gender assignment and adjectival inflection

only one case - the marked case - in attributive adjectival inflection where the adjective is not overtly inflected, namely if the determiner is indefinite and the adjective modifies a singular, neuter noun. In all other cases schwa is inserted. The adjectives that were used denote four common colours (*groen* ‘green’, *blauw* ‘blue’, *rood* ‘red’, *geel* ‘yellow’) or four contrasting adjectives (*klein-groot* ‘small-big’ and *kort-lang* ‘short-tall’).

Adjectival inflection	Common gender	Neuter gender (diminutive noun)	Neuter gender (root noun)
Definite singular	+	+	+
Indefinite singular	+	+	+
Definite plural	+	+	–
Indefinite plural	+	+	–

Table 7.3: Test conditions for the elicitation of adjectival inflection (‘+’ refers to the inflection contexts tested in each gender condition)

Each noun was tested twice in indefinite and once in definite conditions in singular contexts, and with common and derived neuter gender also in definite and indefinite plural contexts. The definite and indefinite plural conditions were included as control items to investigate whether the number feature has an effect on the gender distinction and, hence, inflection of Dutch.³ The gender contrasts observed in determiners and attributive adjectives are morphologically neutralized in plural contexts. Plural nouns are always preceded by the common gender determiner *de* and attributive adjectives modifying plural nouns are always inflected with *-e* (see Table 4.1 in §4.2.2 for details). Figures 7.1 and 7.2 illustrate examples in definite and indefinite singular and plural conditions, respectively, using the neuter gender nouns *glas* ‘glass’ and *boekjes* ‘small books.DIM’. The experimenter first introduced the nouns before giving the stimulus (italic words) and the capitals indicate the correct response of a participant (see 8 and 9). For discourse reasons, the adjectival inflection items were presented first in an indefinite context (8a and 9a) followed by a definite context (8b and 9b). The child had to describe a minimal contrast between the same objects (two or more), which are in the given examples the adjectives ‘big’ and ‘small’ and ‘red’ and ‘yellow’, respectively.

³It was a choice of practicality to not elicit adjectives with root neuter nouns in plural



Figure 7.1: Elicitation material for adjectival inflection in the indefinite, singular condition (Picture I) and the definite, singular condition (Picture II) with the neuter noun ‘glass’

- (8) a. Picture I: Indefinite, singular neuter condition
Kijk twee glazen. Dit is een GROOT GLAS en dat is een KLEIN GLAS.
 ‘Look, two glasses. This is a BIG GLASS and that is a SMALL GLASS’
- b. Picture II: Definite singular neuter condition
Ik neem HET GROTE GLAS
 ‘I am taking THE BIG GLASS’



Figure 7.2: Elicitation material for adjectival inflection in the indefinite, plural condition (Picture I) and the definite, plural condition (Picture II) with the neuter diminutive nouns ‘small books.DIM’

- (9) a. Picture I: Indefinite plural neuter condition
Kijk boekjes. Dit zijn RODE BOEKJES en dat zijn GELE BOEKJES.
 ‘Look small books.DIM. These are RED SMALL BOOKS-DIM and those are YELLOW SMALL BOOKS.DIM’
- b. Picture II: Definite plural neuter condition
Kroko staat achter DE RODE BOEKJES
 ‘Kroko is standing behind THE RED SMALL BOOKS.DIM’

Because attributive adjectival inflection in Dutch is dependent on the gender assigned to a noun, uses of definite determiners with the nouns in Table 7.2 were tested in order to control for gender assignment. The assumption was that stable selection of the definite determiner indicates the gender value assigned to a noun. The degree of stable gender assignment was therefore determined on the basis of multiple definite determiner elicitation per noun in singular, definite contexts, since only there is agreement expressed (see §4.2.1). More specifically,

contexts since the test battery would have simply been too long.

determiner-noun agreement was elicited twice per noun, and once in the definite singular condition in the determiner-adjective-noun agreement (8b). Examples of gender-noun assignment are given in Figure 7.3, where a definite determiner was elicited for each noun type: the root noun *mes* ‘knife’ and the diminutive noun *huisje* ‘small house.DIM’ for neuter gender and *appel* ‘apple’ for common gender. The experimenter prompted a sentence by creating a discourse context (in italics), introducing the noun(s) and a referent (here Kroko) who is located relative to the noun. The participant was expected to complete the sentence; the correct subject responses are given in capitals (see 10).



Figure 7.3: Elicitation material for determiners with neuter root noun ‘knife’ (Picture I), diminutive noun ‘small house.DIM’ (Picture II) and the common noun ‘apple’ (Picture III)

- (10) a. Picture I: Neuter gender (root noun)
Kijk, een mes. Waar is Kroko? Kroko staat naast HET MES.
 ‘Look, a knife. Where is Kroko? Kroko is standing next to THE KNIFE’
- b. Picture II: Neuter gender (diminutive noun)
Kijk, een huisje. Waar is Kroko? Kroko staat achter HET HUISJE.
 ‘Look, a small house.DIM. Where is Kroko? Kroko is standing behind THE SMALL HOUSE.DIM’
- c. Picture III: Common gender
Kijk, een appel. Waar is Kroko? Kroko staat achter DE APPEL.
 ‘Look, an apple. Where is Kroko? Kroko is standing behind THE APPLE’

As briefly discussed in §5.3.1, two examples of each task were introduced in a training session to familiarize participants with the experimental setting. The set-up of the training items was the same as the example scenarios just given. Items of the tasks eliciting verb placement and verb inflection (§6.3.2) were used in the same session, ordered in a pseudo-randomized order, to mask regularities in the items eliciting a particular grammatical structure.

7.3.3 Reliability of the elicitation material

Cronbach’s α was used to determine the reliability of the items eliciting adjectival inflection and gender assignment. As shown in Table 7.4, the items eliciting common gender determiner *de* and neuter gender determiner *het*, and the inflectional contexts with *-e* or $-\emptyset$ turned out to be homogeneous ($\alpha > 0.7$) meaning

that they consistently reflect the construct they are measuring ('k' denotes the number of items per context).⁴

Gender assignment	k	α	Adjectival inflection	k	α
Common gender contexts	15	0.86	-e inflection contexts	52	0.93
Neuter gender contexts	30	0.97	- \emptyset contexts	20	0.92

Table 7.4: Estimated reliability of the different tasks eliciting agreement with determiners and adjectives

7.3.4 Analysis

Each item eliciting determiner agreement and adjectival inflection was coded for three aspects, namely analyzability, correctness and consistency. Before describing the conventions of analysis per variable, the following responses were excluded from both tasks: imitations, repetitions, unintelligible or missing responses of the learner and investigator failure (i.e., the stimulus offered by the investigator did not follow the conventions set by the test manual). Furthermore, all responses in which a different noun than the stimulus noun was used were excluded in both tasks. For example, the use of a root neuter noun, e.g. *boek* 'book' instead of the diminutive noun, e.g., *boekje* 'small book' or the use of the plural, e.g., *appels* 'green apples', instead of the singular, e.g., *appel* 'green apple'. Each noun was presented to the participants up to three times and it was impossible to tell why a few of them used nouns different from the stimulus.

Determiner agreement. The determiner task was carried out to study the learner's knowledge of the Dutch gender system. Firstly, the quantity of errors in common and neuter gender assignment were compared across the child groups to test the predictions (3) to (7). Alongside the production of the definite determiners *de* and *het*, the use of bare nouns was also analyzed; these were interpreted as a reflection of an early stage in acquisition (see Table 7.5).⁵ Responses with an indefinite determiner *een* 'a' as a substitute for the definite determiner were excluded from this analysis since they do not provide any information about the acquisition of gender. For the same reason, responses in which the noun was omitted were excluded, e.g., *de/het* \emptyset . There were also a few instances of demonstrative pronouns (i.e., *dat* 'that', *dit* 'this' *die* 'those' and *deze* 'these') used instead of a definite determiner. Although these forms also reflect gender, they were also excluded in order to strictly measure definite (articles) determiners only.

⁴The scores of Polišenská's child L1-I and child L1-II groups are not included in the calculation on construct reliability since a slightly adapted version of the FlexiT material was used to elicit data in these children (see Polišenská in preparation for details).

⁵As discussed in §4.3.3, I do not specify or discuss the underlying cause of determiner omissions here. This discussion, although interesting and important, is beyond the scope of this study.

Condition	Correct	*Incorrect	Bare noun	
Common gender	De appel	Het appel	Appel	‘The apple’
Neuter gender	Het boekje	De boekje	Boekje	‘The small boek.DIM’

Table 7.5: Examples of correct and incorrect responses (i.e., incorrect gender and bare noun) in determiner assignment with common gender and neuter gender nouns

Secondly, the stability of determiner assignment to the same noun was analyzed. This is relevant for determining whether inflectional rules have been applied in indefinite singular contexts in adjectival inflection (see below). As discussed in §7.3.2, the gender assignment task tested the use of a definite determiner with a noun twice. An extra definite determiner was elicited in the definite condition of the adjectival inflection task, thus resulting in a maximum of three definite determiners per noun per participant. If a learner combined *de* or *het* with a noun in all three cases or in two cases, but where the third case was a different ‘other’ response (see above), it was considered a stable common noun or a stable neuter noun, respectively. In all the other cases, a noun’s gender assignment was classified as unstable (see Table 7.6). It was irrelevant for this analysis whether determiner agreement was in accordance with the Dutch standard.

Determiner assignment*	Stable	Unstable
Common gender	<i>de/de/de</i> or <i>de/de/other</i>	<i>de/de/het</i> or <i>de/het/other</i> or <i>de/other/other</i>
Neuter gender	<i>het/het/het</i> or <i>het/het/other</i>	<i>het/het/de</i> or <i>het/other/other</i> or <i>het/de/other</i>

Table 7.6: Stable determiner assignment with common and neuter gender nouns. *‘Other’ refers to bare nouns and responses that were not considered in the analysis (e.g., indefinite determiner ‘a’, pronouns etc.).

Adjectival inflection. As described above, two adjectival responses in the indefinite singular condition and one adjectival response per noun in the definite singular condition were used to examine the production of adjectival inflection (see 8 and 9). Responses were analyzed when the adjective was either inflected with *-e* or $-\emptyset$ in attributive position. Examples of correctly and incorrectly inflected adjectives are given in Table 7.7. The primary focus here is on the error types and error quantities to be able to assess the predictions (1) to (6). All other responses were therefore excluded from further analysis: Responses containing an elliptical construction in definite and indefinite contexts, where the noun was missing, for instance, *een grote \emptyset* or *een groot \emptyset* (a big \emptyset) ‘a big one’ were excluded, since the noun and, hence, gender information is missing. Occasionally, no adjective was produced and, obviously, such responses were excluded.

Since Dutch indefinite determiners *een* ‘a’ do not differentiate gender, it is

Condition	Correct	*Incorrect	
Definite singular common gender	De groene appel	De groen appel	‘The green apple’
Indefinite singular common gender	Een groene appel	Een groen appel	‘A green apple’
Definite plural common gender	De groene appels	De groen appels	‘The green apples’
Indefinite plural common gender	Groene appels	Groen appels	‘Green apples’
Definite singular neuter gender	Het grote mes	Het groot mes	‘The big knife’
Indefinite singular neuter gender	Een groot mes	Een grote mes	‘A big knife’
Definite plural neuter gender	De groene boekjes	De groen boekjes	‘The green small books.DIM’
Indefinite plural neuter gender	Groene boekjes	Groen boekjes	‘Green small books.DIM’

Table 7.7: Examples of correct and incorrect responses in inflecting the attributive adjective in the different test conditions

difficult to determine which gender is used, and, hence, whether inflectional rules have been correctly applied in indefinite singular contexts (§4.3). Assume that a learner incorrectly inflects the adjective in *een rode huisje* ‘a red house.DIM’ (the correct form being *een rood huisje*). There are several interpretations of this error. One option is that the learner is not aware of gender distinctions in the Dutch system; thus, he/she is not able to activate the <gender> feature. A second option is that the learner knows about gender but has incorrectly assigned gender to the noun in the lexicon or that gender is unstable for that noun. If *huis* ‘house’ is common gender for the learner, inflecting the adjective with schwa would be correct, even though, this is not in accordance with the Dutch standard. A third option is that the learner has knowledge of the gender distinction in Dutch but has not yet acquired the specific rule (bare adjectives) for adjectival inflection, and is still overgeneralizing the schwa ending (see §4.2.2).

In order to establish which of these options applies, the responses in the determiner task and the adjectival inflection task have to be related for each noun. In so doing, stable and unstable determiner assignment can be determined on the basis of the outcomes of the gender assignment task as discussed above. The adjectives, elicited in the indefinite singular conditions were also classified as stable or unstable for gender (recall that adjectives were tested twice in indefinite condition): the inflection of a given adjective with *-e* or *-∅* is considered to be stable, whereas the inflection with two endings is unstable. After excluding the unstable nouns, the corresponding stable nouns and adjectives were linked per item yielding the four patterns illustrated in Table 7.8.

Consistency level in adjectival inflection	Stable determiner assignment	Stable adjectival inflection
Consistent common gender	<i>de</i> De boek ‘the book’	Adjective + <i>-e</i> Een groene boek ‘a green book’
Inconsistent common gender	<i>de</i> De boek ‘the book’	Adjective + $-\emptyset$ een groen boek ‘a green book’
Consistent neuter gender	<i>het</i> Het boek ‘the book’	Adjective + $-\emptyset$ een groen boek ‘a green book’
Inconsistent neuter gender	<i>het</i> Het boek ‘the book’	Adjective + <i>-e</i> Een groene boek ‘a green book’

Table 7.8: Consistency analysis: Relating adjectival inflection and determiner data. ‘Consistency’ means that the adjectival inflection is consistent with the child’s gender assignment, whether correct in Dutch or not.

7.4 Results: Determiner agreement

This section discusses the results on determiner agreement to test the predictions (3) to (7a). Following the discussion in §4.3.5, no differences in error patterns with determiners are expected between the child and adult L2 learners. As such, the adult L2 data are not directly relevant for the discussion of the predictions. The adult L2 data are, however, included in most tables to show that they pattern indeed similarly to the children in their determiner agreement.⁶ Data selection is given in §7.4.1. Error frequencies with the various noun types are discussed across the child groups in §7.4.2. In the same subsection, it is examined whether morphological cues facilitate the acquisition of determiner assignment by comparing the productions with root neuter nouns and derived neuter nouns in each child group. Subsequently, factor and correlation analyses were done to see to what extent length of exposure to Dutch influences the pace of neuter gender assignment. §7.4.3 then presents the consistency with which determiners have been attributed to the same nouns. The section ends with a summary.

7.4.1 Selected data

Determiner agreement was tested in three noun conditions, namely common gender nouns, neuter gender root nouns and neuter gender diminutive nouns (§7.3.2). Table 7.9 presents the response types in gender assignment to determiners in each learner group in terms of determiner used, bare nouns and excluded responses. As discussed in §7.3.4, bare nouns were interpreted as indicating a developmental delay in acquiring Dutch gender. The table provides the mean use (absolute numbers), standard deviation and range of occurrence per response category. In total, the three elicited noun conditions provided a maximum of 45 contexts in all participant groups except for the child L1-I group.

⁶The L2 adult data are not presented when discussing gender assignment with root neuter nouns and diminutive nouns.

In the shorter experiment with the younger child group (§5.3.1), a maximum of 27 contexts per participants was elicited.

Overall use of determiners is relatively higher in the two unimpaired L1 groups than in the impaired and unimpaired SLI and L2 groups. Comparing the data in the SLI and L2 groups reveals that the use of determiners decreases from an average of 75% ($n=33.9/45$) in the child L1-SLI group to 59% ($n=26.7/45$), 57% ($n=25.5/45$) and 45% ($n=20.2/45$) in the child L2, L2-SLI and adult L2 groups, respectively (consider the range of occurrences as well). The adult L2 group uses the highest rate of bare nouns.⁷ The excluded responses are also fewest in the child L1 groups. These observations already suggest delaying effects of SLI and, in particular, L2 in acquiring gender, and this will be addressed further in the following sections. This thesis discusses group results although it is known that there is considerable (individual) variation in the data (compare standard deviations and range) inherent to the investigation of SLI and L2 acquisition. I will return to the issue of individual variation in §8.5.

⁷The relatively high omission rates of determiners in the adult L2 group are possibly due to a shorter exposure to Dutch compared to both child L2 groups. This subset of L2 adults taken from Blom (2008) can be described as being low and medium proficient learners (see §5.2.2).

	De/het assignment			Bare nouns			Excluded			
	max	\bar{x}	sd	range	\bar{x}	sd	range	\bar{x}	sd	range
Child L1-I	27	20.1	3.9	11-26	1.1	2.9	0-12	5.8	3.2	1-12
Child L1-II	45	36.1	4.0	31-43	0.9	1.1	0-4	8.0	3.8	2-14
Child L2	45	26.7	8.7	7-43	4.4	5.1	0-17	14.0	8.5	1-36
Child L1-SLI	45	33.9	7.4	3-42	2.0	4.4	0-22	9.1	4.3	1-20
Child L2-SLI	45	25.5	11.6	1-41	8.3	9.0	0-30	11.2	6.9	3-32
Adult L2	45	20.2	7.1	9-32	14.6	5.5	8-26	10.2	5.8	3-22

Table 7.9: Data selection in determiner-noun agreement (the two gender conditions: common gender and neuter gender (root nouns and diminutive nouns) are pooled here)

7.4.2 Determiner agreement: Error frequencies

Despite the fact that all child groups are predicted to pattern similarly in determiner agreement, a delay should be visible due to the respective effects of SLI and L2 acquisition (see predictions 3 to 7). As discussed in §7.3.4, three response categories (i.e., *de*, *het* and bare nouns) were distinguished in the analysis. The omission of determiners (bare nouns) was interpreted as a very early stage in acquisition and the use of *de* is assumed to be the default form in contexts requiring *het*. The results for common gender assignment (e.g., *de appel* ‘the apple’) are shown in Table 7.10 and the results for neuter gender assignment in Table 7.11.

	Common gender		
	<i>De</i>	* <i>Het</i>	Bare noun
Child L1-I	86.5 (n=147; sd=23.3)	8.2 (n=14; sd=19.4)	5.3 (n=9; sd=15.7)
Child L1-II	86.0 (n=282; sd=23.1)	11.0 (n=36; sd=23.6)	3.0 (n=10; sd=5.9)
Child L2	77.8 (n=189; sd=29.1)	9.5 (n=23; sd=19.9)	12.8 (n=31; sd=17.2)
Child L1-SLI	89.4 (n=311; sd=21.5)	3.7 (n=13; sd=12.6)	6.9 (n=24; sd=18.3)
Child L2-SLI	70.8 (n=189; sd=30.2)	0 (n=0; sd=0)	29.2 (n=78; sd=30.2)
Adult L2	55.7 (n=64; sd=12.9)	0.9 (n=1; sd=2.2)	43.5 (n=50; sd=14.4)

Table 7.10: Percentages of correct and incorrect determiner use and bare nouns in common gender *de* contexts (numbers in parentheses denote absolute numbers of responses and standard deviations of percentages)

Firstly, the learners hardly overgeneralize the neuter determiner *het* (between 0% and 11%) in the common gender context. All L1 groups are almost target-like in the common gender context as opposed to the L2 groups. Statistical testing shows that significant L2 effects are found between the child L1-SLI and child L2-SLI groups ($U=-3.204$, $p<0.001$, one-tailed, effect size: 0.74), but this may be due to different amounts of exposure to Dutch. No difference is found when comparing the unimpaired child L1-I and child L2 groups ($U=-0.819$, $p=0.21$, one-tailed), two groups that have been exposed to Dutch for roughly a similar period of time.

All groups show omission of definite determiners, although to different degrees revealing SLI and L2 effects: The child L1-SLI group uses more bare nouns than the unimpaired child L1-I group ($U=-1.249$, $p<0.11$, one-tailed) and the child L1-II group ($U=-1.727$, $p<0.042$, one-tailed, effect size: 0.29). A similar relationship is found when comparing the child L2-SLI and child L2 groups ($U=-2.354$, $p<0.01$, one-tailed, effect size: 0.67). Both L2 groups produce more bare nouns than their corresponding child L1 peers: the child L1-SLI and child L1-I groups use significantly fewer bare nouns than the child L2-SLI group ($U=-$

3.907, $p < 0.001$, one-tailed, effect size: -0.92) and the child L2 group ($U = -1.952$, $p < 0.03$, one-tailed, effect size: -0.46). A first comparison of the child L2 and child L1-SLI groups suggests that the impact of L2 is stronger than the SLI effect given the higher uses of bare nouns in the L2 group, but the difference is not significant ($U = -0.891$, $p < 0.38$, two-tailed). The fact that the unimpaired child L2 group also produces some instances of *het* as a substitute makes them more comparable to the unimpaired child L1 groups than to the child L1-SLI, child L2-SLI and adult L2 groups.

In neuter gender assignment (Table 7.11; root and diminutive nouns are pooled), the same tendencies can be found as in the common gender context (see above). All child L1 groups only substitute the default gender *de* for neuter *het*, whereas the L2 learners also frequently produce bare nouns. Again, there are clear differences between the accuracy rates in the L1 and L2 groups: both L1 groups use *het* more accurately. The child L1-I group outperforms the child L2 group ($U = -3.031$, $p < 0.001$, one-tailed, effect size: 1.1), and the child L1-SLI group outperforms the child L2-SLI group ($U = -2.928$, $p = 0.0015$, one-tailed, effect size: 1.2). Significant SLI effects are also found there being a higher error rate in the child L1-SLI group compared to their younger unimpaired child L1-I peers ($U = -2.223$, $p = 0.013$, one-tailed, effect size: -0.7) and age-matched child L1-II peers ($U = -4.104$, $p < 0.001$, one-tailed, effect size: -1.45). Similarly, the child L2-SLI group produces fewer instances of *het* than the unimpaired L2 group ($U = -1.564$, $p = 0.06$, one-tailed), the difference approaching significance.

	Neuter gender		
	<i>Het</i>	* <i>De</i>	Bare noun
Child L1-I	59.1 (n=150; sd=40.3)	35.3 (n=91; sd=38.9)	5.1 (n=13; sd=11.9)
Child L1-II	79.0 (n=442; sd=27.9)	19.0 (n=106; sd=27.1)	2.0 (n=11; sd=3.4)
Child L2	22.0 (n=83; sd=26.8)	63.0 (n=238; sd=28.9)	15.0 (n=57; sd=14.5)
Child L1-SLI	33.3 (n=183; sd=34.5)	62.0 (n=341; sd=35.8)	4.7 (n=26; sd=17.2)
Child L2-SLI	2.9 (n=12; sd=5.2)	75.6 (n=309; sd=28.0)	21.5 (n=88; sd=27.9)
Adult L2	10.1 (n=20; sd=11.5)	49.0 (n=97; sd=19.2)	40.9 (n=81; sd=19.3)

Table 7.11: Percentages of correct and incorrect determiner use and bare nouns in neuter gender *het* contexts (numbers in parentheses denote absolute numbers of responses and standard deviations)

As discussed in §7.3.2, morphologically marked diminutive nouns were elicited in addition to root neuter nouns to examine the use of the morphological suffix as a cue. Figure 7.4 presents the results in the various child groups for neuter gender assignment distinguishing between both noun types (see Appendix C for

a detailed overview of the absolute numbers).⁸

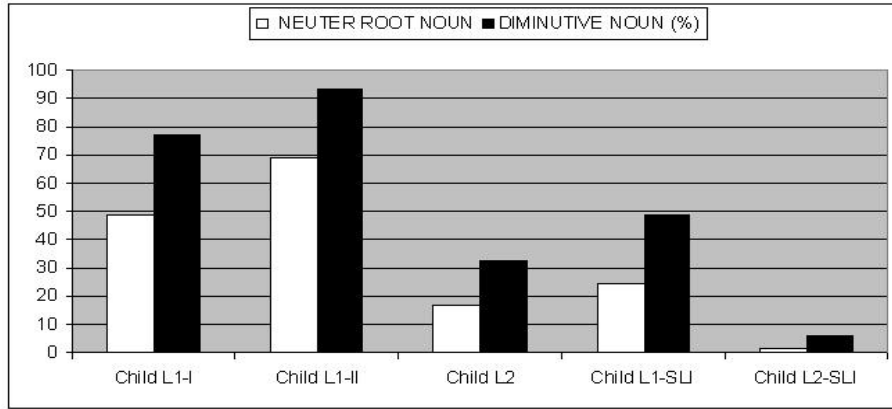


Figure 7.4: Differences in neuter gender assignment to root neuter nouns and diminutive nouns per child group

Clearly, all child groups are better in neuter gender assignment when morphological cues are present (i.e., diminutives) than with root neuter nouns. There are significant differences between the two noun conditions in determiner-noun agreement for the child L1-I group ($W=-2.198$, $p=0.014$, one-tailed, effect size: 0.67), the child L1-II group 93.2%/ 68.9% ($W=-3.216$, $p<0.001$, one-tailed, effect size: 0.86), the child L2 ($W=-1.785$, $p=0.04$, one-tailed, effect size: 0.53) and the child L1-SLI group ($W=-3.052$, $p<0.001$, one-tailed, effect size: 0.65). No statistically significant effect was found in the L2-SLI group, though ($W=-1.524$, $p=0.64$, one-tailed), lending support to the finding that their gender system is highly restricted, if not non-existent (compare also Figure 7.5 in §7.5.3 presenting both noun types with adjectival inflection).

The effects of length of Dutch exposure on the acquisition of neuter gender in terms of the prediction in (7) were examined using a univariate ANOVA. The assignment of common gender (*de*) was not included in the analysis below as common gender has widely been considered to be the default gender (see §4.3), and, as shown in the data above, it did not pose any problems. Significant main effects of length of exposure on correct neuter gender assignment $F(1, 105) = 13.92$, $p<0.001$ and use of bare nouns $F(1, 105) = 9.05$, $p<0.003$ were found. The decrease in common gender substitutions just missed significance $F(1, 105) = 3.75$, $p<0.55$). The length of Dutch exposure thus affects the assignment of neuter gender. A Pearson product-moment correlation specifies the relationship between length of input and response category per child group (Table 7.12) distinguishing between the two noun types. The child L1-I and child L1-II were

⁸All learners produced fewer diminutive nouns than root neuter nouns; the diminutives were frequently reduced to neuter root nouns. Given the smaller amounts across the groups, it is difficult to draw firm conclusions as to whether the morphological suffix serves as a cue for neuter gender assignment.

pooled for this analysis.⁹

	Neuter root nouns			Diminutive nouns		
	<i>Het</i>	<i>*De</i>	Bare noun	<i>Het</i>	<i>*De</i>	Bare noun
Child L1-I + II (N=44)	.32*	-.28	-.23	.35*	-.32*	-.13
Child L2 (N=17)	.30	.02	-.45	.35	-.41	.11
Child L1-SLI (N=25)	.47*	-.27	-.36	.42*	-.22	-.36
Child L2-SLI (N=19)	.23	.38	-.41	.28	.11	-.24

Table 7.12: Pearson product-moment correlation coefficients for length of exposure to Dutch and neuter gender assignment to root and derived nouns (*Correlation is significant at the 0.05 level (two-tailed))

Significant positive correlations between length of exposure and neuter gender assignment are seen in all child L1 groups: the longer the input to Dutch, the higher the use of correctly assigned neuter gender to root and derived nouns. These correlations are not seen in the child L2 groups. The negative correlations found with the overuse of common gender and bare nouns show the same relationship: a decrease of overusing *de* and bare nouns goes hand in hand with increasing length of exposure to Dutch. Interestingly, the correlations are less apparent in both child L2 groups. The findings are, however, not surprising when considering the child L2's input situation. As revealed from the literature (§4.3), lengthy exposure to Dutch is required for acquiring neuter gender. Both child L2 groups have had a rather brief exposure to Dutch: on average 5;3 and 5;2 years (see Table 7.1). Considering that L2 children are exposed to Dutch not only from Dutch speakers but also Dutch from L2 learners, among which L2 adults who also overgeneralize *de*, it is also possible that the L2 children have also had less consistent Dutch input compared to their L1 peers.

7.4.3 Stability in determiner agreement

The results thus far do not reveal whether the definite determiner assignment was stable. Only by correcting for stable and unstable determiner assignment is it possible to determine (i) which gender was assigned to the tested nouns (regardless of whether the Dutch standard is followed) and (ii) how well the gender system is established by comparing the distribution of neuter and common gender nouns with stable gender assignment. Following the model of analysis in §7.3.4, a noun was classified as stable common gender or stable neuter gender if the learner used *het* or *de* two or three times with the same noun, respectively (see Table 7.6 for details). All other responses leading to unstable classifications (e.g., *de/de/het*) were excluded. Also excluded were determiner omissions and productions of nouns and determiners that were not targeted (see §7.3.4 for details). The productions of the four response categories are given in Table 7.13.

⁹As pointed out in §5.2, some information on the input situation for one L2-SLI child and three unimpaired L2 children is missing.

The stability of determiner assignment confirms the same discrepancy between, on the one hand, the unimpaired child L1 groups and, on the other hand, the SLI and L2 groups as discussed above: the <neuter> feature seems to be specified only in the two unimpaired child L1 groups given the higher stability in neuter gender assignment. Furthermore, the older L1 children assigned stable *het* more often than the younger L1 children pinpointing the importance of lengthy exposure to Dutch for determiner agreement. In all the other learner groups stable neuter gender assignment is marginal. In fact, a gender differentiation seems to be absent in the child L2-SLI and the adult L2 groups, whereas the *het* consistencies in the child L2 and child L1-SLI point to some degree of gender activation.

Stable gender assignment in determiners					
	max	Stable <i>de</i>	Stable <i>het</i>	Unstable <i>de/het</i>	*Excluded
Child L1-I	180	40.0 (n=72; sd=23.2)	26.7 (n=48; sd=25.3)	13.3 (n=24; sd=14.2)	20.0 (n=36; sd=17.5)
Child L1-II	360	32.2 (n=116; sd=17.3)	40.8 (n=147; sd=22.6)	12.2 (n=44; sd=10.9)	14.7 (n=53; sd=10.6)
Child L2	300	47.0 (n=141; sd=27.0)	8.3 (n=25; sd=16.6)	7.3 (n=22; sd=15.7)	37.3 (n=112; sd=23.3)
Child L1-SLI	375	55.5 (n=208; sd=27.5)	11.7 (n=44; sd=18.7)	14.1 (n=53; sd=16.6)	18.7 (n=70; sd=19.3)
Child L2-SLI	300	58.7 (n=176; sd=32.9)	0.7 (n=2; sd=3.0)	1.0 (n=3; sd=2.4)	39.7 (n=119; sd=33.1)
Adult L2	135	37.8 (n=51; sd=19.4)	1.5 (n=2; sd=4.4)	6.7 (n=9; sd=10.5)	54.1 (n=73; sd=23.2)

Table 7.13: Percentages of (in)stability in assigning *de* or *het* to determiners in all learner groups (numbers in parentheses denote absolute numbers of responses and standard deviations). *Determiner omissions and other responses that were not targeted (see §7.3.4 for examples)

7.4.4 Summary

Do we find SLI effects? Statistical testing revealed clear SLI effects, that is a clear delay in development. Both SLI groups produced, overall, a higher omission rate of definite determiners and more overgeneralization of the common determiner *de* to neuter contexts than their corresponding unimpaired child L1-I, L1-II and L2 peers. These outcomes raise interesting questions about the underlying causes of the difficulties in SLI. In order to learn the arbitrary gender system in Dutch, a considerable amount of input/intake is required even in typical L1 acquisition (Polišenská in preparation). In the reduced intake account (prediction 2), it is plausible that the SLI children show such a considerable delay compared to their unimpaired peers. It seems even questionable whether most of the L1-SLI and L2-SLI children tested have an abstract representation of gender. The L2-SLI children, in particular, were shown to barely produce any instances of *het* with root neuter and diminutive nouns. The morphologically marked nouns did not trigger neuter gender assignment suggesting that these children are not able to analyze the morphologically complex nouns. In the child L1-SLI group, on the other hand, diminutives were shown to serve as a cue that triggers neuter gender, but correct neuter gender was barely assigned in that group when the morphological cue was absent. I will further elaborate on that issue in §7.6.

Do we find L2 effects? The comparison of the child L2 and corresponding child L1 groups disclosed L2 effects. Both L2 groups are clearly delayed in overt gender distinction given the higher frequencies of bare nouns in both gender conditions, and the few productions of *het*. These results are possibly unsurprising considering the differences in length of exposure for the child L1-SLI (7;3 years) and child L2-SLI group (5;2 years). On the other hand, the child L2 group (5;3 years) and the child L1-I group (4;10 years) have roughly similar exposure to Dutch (see Table 7.1). Despite this difference, group differences are evident in neuter gender assignment with both noun types, suggesting that the Dutch input/intake in the L1 and L2 groups is indeed different due to less input for reasons discussed above. Despite the poor performance with neuter gender nouns, the unimpaired L2 children assigned *het* significantly more often with diminutive nouns than with root neuter nouns, indicating that at least some of these children are aware of the morphological cue.

Do we find a cumulative effect of SLI and L2? The previous analyses showed that the L2-SLI group is not only the group with the lowest performance in both gender contexts, but that their gender system is also highly restricted, possibly non-existent: the L2-SLI children did not distinguish between neuter and common determiners with either root neuter or diminutive nouns.

What is the relative impact of SLI and L2? The results revealed that L2 has a more severe impact than SLI acquisition on determiner agreement. In particular, the L1-SLI group significantly outperformed the L2 group in terms

of using (i) fewer bare nouns and (ii) more neuter determiners. What makes this outcome possibly less surprising is that the child L2 group had considerably less exposure to Dutch than the L1-SLI child group. Clearly, this complicates the comparison. Future research will need to match these two groups on length of exposure to Dutch to address this question in full.

The effect of length of exposure to Dutch. Additional support that lengthy exposure to Dutch is needed for the acquisition of neuter gender assignment was revealed by the correlation analyses: significant positive correlations were only found in the child L1 groups, who had been exposed to Dutch for on average more than seven years. As discussed before, this is not an unsurprising outcome given the limited exposure to Dutch in both child L2 groups compared to the child L1 groups (see Table 7.1). For most of the child groups, however, negative correlations, although not significant, suggest a tendency for the overuse of the common gender determiner (*de*) and bare nouns to decrease with increasing length of Dutch exposure. This outcome suggests that a growing lexicon stimulates the activation of neuter gender assignment and, hence, more productions of *het*, but it is possible that there is a plateau effect as has been suggested by, for example, Cornips and Hulk (2008) and Unsworth (2008) for L2 acquisition. Future research should examine SLI and child L2 groups who have been exposed to Dutch for a longer period of time to explore this issue in more detail.

7.5 Results: Adjectival inflection

This section discusses the results on adjectival inflection in the six different learner populations. Data selection is described in §7.5.1 before analyzing the data in terms of error types (§7.5.2) and error frequencies (§7.5.3). Subsequently, the outcomes of the determiner task and the adjectival inflection task in the indefinite singular contexts are related to examine the application of the underlying agreement rules. Finally, length of exposure to Dutch is considered as a covariate to examine the effects on pace of acquisition of adjectival inflection. The results are summarized in §7.5.4.

7.5.1 Selected data

Table 7.14 presents the use of response types in adjectival inflection in terms of analyzed inflections and excluded responses. It provides the mean use (absolute numbers), standard deviation and range of occurrence per response category. In total, the various inflectional conditions (see Table 7.3) provided a maximum of 72 contexts per participant in the SLI and L2 groups. Given the use of a shortened version of the experiment in the L1 children (Polišenská in preparation), a maximum of 18 and 30 contexts per participant was elicited in the child L1-I and child L1-II, respectively.

	max	Inflected adjective			Excluded		
		\bar{x}	sd	range	\bar{x}	sd	range
Child L1-I	18	12.8	2.5	9-18	5.2	2.5	0-9
Child L1-II	30	22.4	3.6	17-29	7.6	3.6	1-13
Child L2	72	44.7	18.3	3-72	27.3	18.3	0-69
Child L1-SLI	72	54.0	10.6	28-70	18.0	10.6	2-44
Child L2-SLI	72	54.5	9.5	38-70	17.5	9.5	2-34
Adult L2	72	43.8	9.1	30-60	28.2	9.1	12-42

Table 7.14: Response types in attributive adjectival inflection (all inflectional conditions requiring $-e$ or $-\emptyset$ are pooled here)

Comparing the figures in Table 7.14, it appears that overall use of inflected adjectives is similar in all child groups (71%; $n=12.8/18$ - 75%; $n=54.0/72$) with the exception of the child L2 group (63%; $n=44.7/72$). This difference is possibly due to some inconsistencies in carrying out the experimental procedure, which resulted in the extensive production of ellipsis in adjectival inflection *en dat is een groene* ‘and that is a green (one)’ in some of the L2 children (23.4%, sd: 33.1). As was the case with determiners, there is a considerable (individual) variation within the child L2, child L1-SLI and child L2-SLI groups considering the standard deviations.

7.5.2 Adjectival inflection: Error types

Differences in the type of errors should disclose whether SLI children pattern like their unimpaired peers or L2 adults testing the predictions following the representational deficit account in (1) and the reduced intake account in (2). On the basis of evidence discussed in §4.3, it was predicted that unimpaired child (L1 and L2) learners use the default form, i.e., inflections with $-e$, as the predominant error. In contrast, adult L2 learners tend to use a dual error pattern as indicated by the use of $-e$ and $-\emptyset$. By collapsing the inflectional contexts where errors are made with either $-e$ or $-\emptyset$, it is possible to examine whether both SLI groups are similar or divergent from their unimpaired peers. Table 7.15 presents the proportion of substitutions of $-e$ and $-\emptyset$ expressed as a percentage of the total of possible responses requiring $-e$ and $-\emptyset$.

As shown in Table 7.15, there is a tripartite distinction: the child L1 groups, the child L2 groups and the L2 adults. The child L1 groups (either impaired or not) produce barely any errors with $-\emptyset$, whereas errors substituting $-e$ are common. This observation is in line with the assumption that $-e$ is the default case in attributive adjectives and not $-\emptyset$ (see §4.2.2). In contrast, all L2 groups produce more errors with $-\emptyset$. Compared to the L2 adults, however, the numbers of $-\emptyset$ inflections are relatively low (7%-11%) in both child L2 groups. In fact, the adult L2 group produces significantly more bare adjectives than the child L2-SLI group ($U=-2.516$, $p<0.006$, one-tailed; effect size: 0.95) and the child L2 group ($U=-2.351$, $p<0.01$, one-tailed; effect size: 0.44).

Although they produce some errors with $-\emptyset$, the L2-SLI children perform

	*-∅	*-e
Child L1-I	1.2 (n=256; sd=3.7)	14.1 (n=256; sd=15.5)
Child L1-II	0.6 (n=537; sd=2.5)	10.2 (n=537; sd=11.9)
Child L2	11.2 (n=894; sd=14.4)	14.5 (n=894; sd=9.1)
Child L1-SLI	2.7 (n=1351; sd=4.6)	16.5 (n=1351; sd=8.9)
Child L2-SLI	6.9 (n=1090; sd=7.8)	22.0 (n=1090; sd=6.8)
Adult L2	18.0 (n=394; sd=17.8)	19.8 (n=394; sd=10.0)

Table 7.15: Percentage of substitutions in inflectional contexts incorrectly using $-e$ and $-\emptyset$ (numbers in parentheses denote absolute numbers of responses and standard deviations)

similarly to the L1 groups given the high percentages of $-e$ substitutions. On the other hand, both the child L2 and adult L2 groups produce $-\emptyset$ and $-e$ substitutions in almost equal percentages, which, at first sight, indicates a dual error pattern in these groups.¹⁰ That result is rather unexpected for the child L2 group given that schwa should be the default case. Considering the standard deviations, this result is possibly due to substantial individual variation. In fact, only a small number of children (N=4) in both child L2 groups is responsible for a substantial amount of $-\emptyset$ substitutions, whereas all L2 adults produce bare adjectives. It is therefore reasonable to assume that the outcome in the adult L2 group is a result of the two-directional error pattern rather than correct application of the inflectional rules, whereas this is only the case in few L2(-SLI) children. Therefore, it can be concluded that the adult L2 group is different from the child groups. That SLI does, overall, not result in an adult-like pattern lends support to the prediction that SLI is the result of a reduced intake capacity rather than a deficit in the underlying representation of grammar.

7.5.3 Adjectival inflection: Error frequencies

Despite the fact that most of the children patterned similarly, a delay should be visible in the SLI and child L2 groups. Based on the empirical results discussed in §4.3, acquisition of the marked case, i.e., *een groot glas* ‘a big glass’ and *een rood boekje* ‘a small red book’, is supposed to be vulnerable. Table 7.16, firstly, presents the contexts where $-e$, the default form, is always required, that is, definite contexts and indefinite common gender contexts (see Table 7.3 for details of the tested conditions).

¹⁰The outcomes in the child L2 group are different from those discussed in Orgassa and Weerman (2008) on account of the fact that the data analyzed in the present study underwent minor changes in subject selection.

	Inflectional contexts requiring $-e$		
	$-e$	* $-\emptyset$	sd
Child L1-I	98.2 (n=168)	1.8 (n=3)	5.2
Child L1-II	99.2 (n=356)	0.8 (n=3)	3.8
Child L2	85.1 (n=573)	14.9 (n=100)	18.6
Child L1-SLI	96.3 (n=972)	3.7 (n=37)	6.4
Child L2-SLI	90.7 (n=731)	9.3 (n=75)	10.4

Table 7.16: Percentage of inflections with $-e$ and $-\emptyset$ in inflectional contexts requiring $-e$ (numbers in parentheses denote absolute numbers of responses)

All child groups are similar, being above or close to the 90% accurate, irrespective of the contexts being tested.¹¹ That means that most of the child learners hardly ever overgeneralize bare adjectives, which is in line with the data in Table 7.15. More bare adjectives are produced by the child L2 groups than the child L1 groups. The difference between the child L2 group and child L1-I group is statistically significant ($U=-2.475$, $p<0.007$, one-tailed, effect size: 1.0). No statistical differences were found between the L1-SLI and L2-SLI groups ($U=-1.590$, $p<0.06$, one-tailed) or the child L1-SLI and child L2 groups ($U=-0.682$, $p<0.25$, one-tailed). As already pointed out in §7.5.2, subsets of L2 and L2-SLI children ($N=4$ per group) were responsible for the difference in uses of bare adjectives between the L1 groups (1% - 4%) and L2 groups (9% - 15%).

Table 7.17 presents the results of the child groups for the marked case of adjectival inflection, where a bare adjective is required in indefinite, singular neuter gender contexts (root neuter nouns and diminutive nouns are pooled here). The accuracy rates in this context are far below the 90% accuracy. Only the child L1-I and child L1-II perform, as expected, around and above chance level, whereas all other child groups show a preference for $-e$ inflection. The comparison between the SLI groups and the respective unimpaired groups reveals SLI effects. Both the L1-SLI and the L2-SLI children made significantly more errors than their corresponding child L1-I peers ($U=-2.074$, $p<0.02$, one-tailed; effect size: 0.63), age-matched child L1-II peers ($U=-3.391$, $p<0.001$, one-tailed; effect size: 0.97), and child L2 peers ($U=-2.302$, $p<0.01$, one-tailed; effect size: 0.88). Significant L2 effects are also found comparing the unimpaired child L2 to the child L1-II group ($U=2.422$, $p<0.008$, one-tailed; effect size: 0.76) and the child L1-I group ($U=-1.569$, $p<0.05$, one-tailed, effect size: 0.44), respectively. Note that the length of exposure to Dutch is similar for the child L1 group and child L2 group, which makes between-group comparisons

¹¹This study applies Brown's criterion for acquisition (Brown 1973), that is 90% of correct uses in obligatory contexts. Although this criterion is based on spontaneous speech data, it has been widely used in acquisition research using experimental elicitation techniques.

even more reliable (see Table 7.1). Clearly, the L2-SLI group is the least proficient group. Comparing the L2-SLI and L1-SLI groups ($U=-1.525$, $p<0.06$, one-tailed) approaches significance. These findings point in the direction of a cumulative L2-SLI effect. We have to be careful in drawing this conclusion, however, since not all differences are significant. The higher error rates in the child L1-SLI group compared to the child L2 group suggests that the SLI effect might be greater than the L2 effect, but the between-group difference is not significant ($U = -0.819$, $p<0.21$, one-tailed).

	Inflectional contexts requiring $-\emptyset$		
	* $-e$	$-\emptyset$	sd
Child L1-I	42.4 (n=36)	57.7 (n=49)	38.8
Child L1-II	30.9 (n=55)	69.1 (n=123)	36.5
Child L2	58.8 (n=130)	41.2 (n=91)	36.5
Child L1-SLI	65.2 (n=223)	34.8 (n=119)	34.2
Child L2-SLI	84.5 (n=240)	15.5 (n=44)	19.7

Table 7.17: Percentage of inflections with $-e$ and $-\emptyset$ in the marked case requiring $-\emptyset$; root neuter and diminutive nouns are pooled (numbers in parentheses denote absolute numbers of responses)

The variation among the child groups indicates that the acquisition of the marked case for adjectival inflection is particularly difficult. As discussed in §4.3.2, the unimpaired L1 children score at 90% correct by the age of eight (Polišenská in preparation), whereas it remains open whether the L2 and SLI groups eventually achieve that level given their low accuracy rates in applying the marked case at the ages six to eight. It is interesting, in this respect, to also examine whether the morphologically marked diminutive nouns trigger the production of bare adjectives in the marked case more successfully than root neuter nouns. As discussed in §7.3.2, diminutive nouns were used alongside root neuter nouns since they provide an additional cue to gender. The results are given in Figure 7.5 distinguishing between correct productions with $-\emptyset$ with root neuter nouns and diminutive nouns.¹²

With the exception of the child L2-SLI group, frequencies of correct $-\emptyset$ inflections are higher when morphological cues (i.e., diminutives) are present compared to the $-\emptyset$ inflections with root neuter nouns. Statistical testing discloses significant differences between the two noun types for the child L1-I group ($W=-2.239$, $p=0.013$, one-tailed, effect size: 0.58), the child L1-II group ($W=-2.136$, $p<0.002$, one-tailed, effect size: 0.61) and the child L2 group ($W=-2.045$,

¹²As already mentioned in footnote 8, all learners produced fewer diminutive nouns than root neuter nouns, and because the diminutive nouns were frequently reduced to neuter root nouns, it is difficult to draw firm conclusions as to the function of the morphological cue.

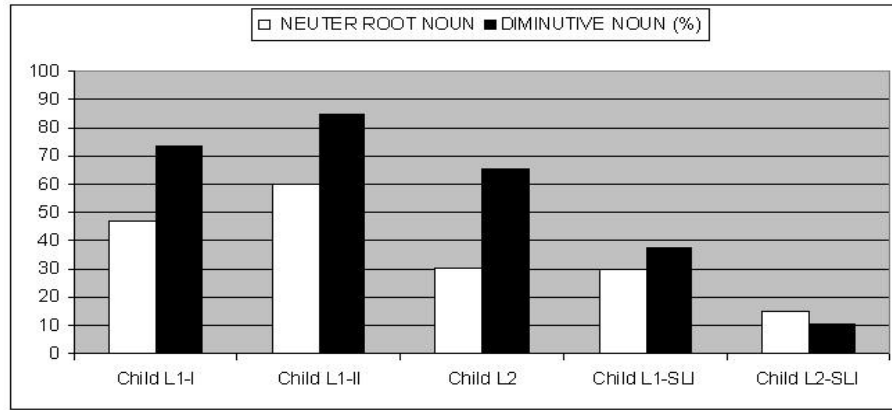


Figure 7.5: Differences in the application of the special rule for attributive adjectival inflection in root neuter nouns and diminutive nouns per child group

$p=0.02$, one-tailed, effect size: 0.99). No statistically significant effect was found in the L1-SLI group ($W=-1.197$, $p=0.12$, one-tailed), not even after six to eight years of exposure to Dutch. No effect was found either in the child L2-SLI group. These outcomes raise the obvious question as to the causes of difference between the SLI and unimpaired child groups. Apparently, most of the L1-SLI children and L2-SLI are not aware of the morphological complexity and, hence, facilitating status of diminutive nouns. It is, in fact, questionable whether most of the (L2-)SLI children specify gender at all when also considering the marginal numbers of neuter gender assignment with diminutive nouns in Figure 7.4.

Using a univariate ANOVA, significant main effects are found for length of exposure on the performance on the application of the marked rule (i.e., $-\emptyset$) in attributive adjectival inflection with root neuter nouns: $F(1, 105) = 4.07$, $p < 0.05$), but not with diminutive nouns: $F(1, 105) = 1.76$, $p > 0.05$).¹³ The correlation values in Table 7.18 specify the degree of the relationship between length of input and proficiency of adjectival inflection per group (the child L1-I and child L1-II were pooled for this analysis).¹⁴

Significant positive correlations between length of exposure to Dutch and correct application of the marked rule are apparent only in the unimpaired child L1-I-II groups: the longer the exposure to Dutch, the more bare adjectives are produced. Although the tendency is the same for the L1-SLI group - correlations are positive - they are not statistically significant. These outcomes can be seen as additional evidence for the delaying effects of SLI due to a reduced capacity to take in input for deriving inflectional rules. That the L1-SLI group has had

¹³As with determiner-noun agreement, common gender was not included in the analysis on adjectives as common gender was considered to be the default gender (see §4.3), and, as shown in the data above, it did not pose any problems.

¹⁴Note again that it was not possible to gather information on the input situation in Dutch from one L2-SLI child and three unimpaired L2 children.

		Neuter root nouns -∅	Diminutive nouns -∅
Child L1-I+II	(N=44)	.31*	.21
Child L2	(N=17)	-.05	-.12
Child L1-SLI	(N=25)	.35	.27
Child L2-SLI	(N=19)	-.11	.09

Table 7.18: Pearson product-moment correlation coefficients for length of exposure to Dutch and adjectival inflection with root and derived neuter nouns (*Correlation is significant at the 0.05 level (two-tailed))

a longer exposure to Dutch (7;2 years) compared to the unimpaired L1-I groups underlines this. The non-significant correlations in both L2 groups are also not surprising. As discussed, (i) early onset of L2 exposure and (ii) lengthy input is necessary to be able to derive the special rule of adjectival inflection. As shown in Table 7.1, both L2 groups have had a relatively brief (on average: 5;3 and 5;2 years) exposure to Dutch. Both L2 groups are also exposed not only to Dutch from Dutch speakers but also Dutch from L2 learners, among which L2 adults, who also overgeneralize bare adjectives. It is therefore only reasonable to assume that this input does not necessarily support acquisition of the rule. Given that much input is required to attain the threshold to be able to derive the rules underlying adjectival inflection (§4.3), it is questionable whether SLI and L2 children will establish the system. As discussed in §4.3.4, L2 adolescents being exposed to Dutch for more than 10 years seemed to have fossilized in a stage overgeneralizing *-e*.

The results discussed so far might, however, not be entirely conclusive as to whether learners have knowledge about the rule system underlying adjectival agreement. With the elicited adjectival inflection data from the indefinite singular contexts alone, it is difficult to determine which gender has been assigned (recall the analysis of the example *een rode huisje* in §7.3.4): the Dutch indefinite determiner *een* ‘a’ does not indicate gender in these contexts. In order to examine whether rules have been applied, the responses on the determiner task and the adjectival task had to be related per noun by conducting the consistency analysis yielding the four consistency patterns illustrated in Table 7.8. In so doing, only stable determiner use (see Table 7.13) and stable adjective use (see Appendix D) in terms of gender assignment were included in the analysis following the classification given in §7.3.4.¹⁵ Tables 7.19 to 7.20 present the consistency patterns for nouns that were shown to have stable assignment of common and neuter gender.

With nouns assigned as common gender most children consistently used *de* in combination with the overtly inflected adjective and hardly ever substituted bare

¹⁵A noun was classified ‘stable neuter’ or ‘stable common’ gender if the learner consistently used *het* or *de* with the same noun respectively. Similarly, adjectives were classified ‘stable neuter’ or ‘stable common’ gender if there were consistently inflected with *-∅* or *-e*, respectively. All other responses leading to unstable classifications (e.g., *de/de/het* or *-∅/-e*) and bare nouns and productions of nouns and adjectives that were not targeted were excluded.

Common gender	Consistent: <i>de huis(je) - een groene huis(je)</i>	Inconsistent: <i>de huis(je) - een groen huis(je)</i>
Child L1-I	95.2 (n=60; sd=13.0)	4.8 (n=3; sd=13.0)
Child L1-II	97.2 (n=106; sd=5.8)	2.8 (n=3; sd=5.8)
Child L2	88.2 (n=75; sd=27.3)	11.8 (n=16; sd=27.3)
Child L1-SLI	94.5 (n=158; sd=9.4)	5.5 (n=10; sd=9.4)
Child L2-SLI	84.6 (n=114; sd=25.2)	15.4 (n=14; sd=25.2)
Adult L2	74.4 (n=29; sd=40.3)	25.6 (n=6; sd=40.3)

Table 7.19: Percentages of consistency: stable definite determiner *de* with all noun types and stable adjectival inflection in indefinite singular contexts (numbers in parentheses denote absolute numbers of responses and standard deviations)

adjectives. Unlike the children, the L2 adults overgeneralized both inflectional endings. As seen before, L2(-SLI) children use bare adjectives more often than their L1 peers. An analysis of individual patterns showed that the L2 children's inconsistencies can be attributed to individual differences, whereas this is not the case for the L2 adults. From the child L2 groups, only two out of 20 unimpaired L2 children, and four out of 20 L2-SLI children are responsible for a substantial amount of the inconsistent pattern with common gender. In contrast, six out of the nine adults produced inconsistent patterns.

The diminutive and root nouns are pooled in Table 7.20 due to the small numbers of consistent neuter gender patterns. At first glance unlike the L2 groups, all child L1 groups seem to consistently use $-\emptyset$ in combination with nouns to which they have assigned neuter gender. This suggests that the L1-SLI children have also acquired the rule underlying adjectival inflection. A closer look at the data shows, however, that only the unimpaired child L1-I and child L1-II groups predominantly produce the correct consistency pattern. Around 70% of the unimpaired L1 children produced consistent patterns (child L1-I: N=11; child L1-II: N=19). This pattern is in line with previous research indicating that only the unimpaired L1 children acquire the inflectional rules, but slowly as the number of stable neuter nouns develops (Blom et al. 2007, 2008b; Polišenská in preparation). In contrast, only five L1-SLI children were responsible for the consistent neuter gender patterns, making the child L1-SLI group more similar to the child L2 group where only three children used neuter gender consistency patterns. Almost no consistencies were produced by the adult L2 and child L2-SLI groups.

These outcomes are compatible with the patterns discussed in §7.5 and §7.4 and raises the question whether the majority of the L1-SLI, L2 and L2-SLI children and adults will eventually acquire the complete rule system underlying

Neuter gender	Consistent: <i>het huis(je) - een groen huis(je)</i>	Inconsistent: <i>het huis(je) - een groene huis(je)</i>
Child L1-I	79.1 (n=34; sd=44.1)	20.9 (n=9; sd=44.1)
Child L1-II	79.3 (n=96; sd=34.5)	20.7 (n=25; sd=34.5)
Child L2	50 (n=7; sd=50.6)	50 (n=7; sd=50.6)
Child L1-SLI	75.6 (n=27; sd=40.1)	24.3 (n=6; sd=40.1)
Child L2-SLI	0 (n=0)	100 (n=1)
Adult L2	100 (n=2)	0 (n=0)

Table 7.20: Consistency analysis: definite determiners with neuter nouns and indefinite singular contexts in attributive adjectival inflection (numbers in parentheses denote absolute numbers of responses and standard deviations)

attributive adjectival inflection. The period in which the grammatical principles are available for adjectival agreement might simply be too short in these learners. It should be pointed out, though, that many responses had to be excluded in the consistency analysis, particularly, with neuter gender consistencies.¹⁶ The fairly small consistencies in all groups are partly an effect of the overuse of the common gender definite determiner *de* and *-e* inflections seen above (and in §4.2.2). In addition, high rates of determiner omissions and mixed (unstable) response categories also caused the small number of neuter gender consistencies, especially in the SLI and L2 groups (see Table 7.13 and Appendix D). Clear interpretations of the learners' rule system underlying attributive adjectives are therefore difficult to draw.

7.5.4 Summary

Representational deficit or reduced intake? The two approaches to SLI predict a different relationship between the groups examined here. On the assumption that the acquisition of agreement is age-dependent and that SLI is a deficit in the agreement system, it was expected that both SLI groups pattern as the L2 adult group. These groups should be different from the unimpaired child L1 and child L2 learners (prediction 1). This prediction is not confirmed with the adjectival inflection data. No clear differences were found in error types across the child groups: they overused inflections with *-e*, whereas L2 adults clearly overgeneralized in two directions. The asymmetry between child and adult L2 learners is less clear though on the basis of the limited consistency

¹⁶See Blom et al. (2007, 2008b) for consistency analyses in larger populations of Turkish and Moroccan L2 adults acquiring Dutch providing a clearer picture as to the asymmetry found in error types between adult and child learners.

data (see Table 7.20). Blom et al. (2007, 2008b) provide more robust data for the asymmetry between unimpaired child (L1 and L2) and adult L2 learners. Although some L2 children overgeneralized bare adjectives, they did so much less, and, crucially, the use of bare adjectives is not restricted to SLI groups. Hence, there is no evidence for the idea that the SLI groups are different from the unimpaired child groups in the construction of grammatical rules. The fact that all child groups showed, overall, the same error types in adjectival inflection is more in line with the reduced intake account (prediction 2).

Do we find SLI effects? On the basis of the idea that reduced intake capacities are the crucial distinction between the impaired and unimpaired groups, a substantial delay and, thus, higher error rates were expected in both SLI groups compared to their unimpaired L1 and L2 peers. The data strongly supported this, especially, in acquiring the marked case ($-\emptyset$). Given the relatively low accuracy scores in both SLI groups in assigning neuter gender and inflecting the marked case, it is questionable whether most of the SLI children are actually able to make the gender distinction necessary to derive the rules. The rather low scores with the gender marked diminutive nouns underline this since the morphological cue does not activate gender in SLI. In the contexts requiring $-e$, it turned out that all children performed at 90% accuracy. Interestingly, in these contexts the child L2-SLI group was better than the unimpaired L2 children, an outcome that is further discussed below.

Do we find L2 effects? Reduced intake due to limited length of Dutch exposure was also expected to cause delay in the two child L2 groups. Statistical testing revealed significant L2 effects in most conditions. In the contexts requiring bare adjectives, the child L2 group used more $-e$ inflections than the child L1-I and the L1-II groups, and the L2-SLI group uses more $-e$ inflection than the L1-SLI group. Interestingly, only the unimpaired child L2 group seems to be able to use the morphological gender cue with adjectives. Higher error rates were also found in the inflectional contexts requiring $-e$ when comparing the child L2 and child L1-I and child L1-II groups, whereas no significant difference was found between the L1-SLI and L2-SLI groups. Although the length of exposure to Dutch between L1-I (4;11 years) and the unimpaired child L2 group (5;3 years) is comparable, it is reasonable to assume that the total amount as well as the quality of Dutch input differs considerably in the child L2 groups. This is particularly the case when considering the input they may receive from L2 adults. That variation in input might also explain why only a few L2 children overused substantial amounts of bare adjectives. Overall, the findings suggest that the delay is indeed due to the reduced intake necessary to derive the rule system for adjectival inflection.

Do we find a cumulative effect of SLI and L2? Based on these findings, the child L2-SLI group is the least proficient group: The L2-SLI group showed barely any sign of applying the marked rule ($-\emptyset$), and they were also shown to

fail using the reinforcing neuter gender cue (i.e., diminutives). Consequently, it looked as if the L2-SLI children perform better in the conditions requiring *-e* compared to the unimpaired L2 children, but this might partly be a side effect of their overuse of common gender to adjectives. Taken together, the data indicate that most of the L2-SLI children have a more profound delay than any other child group in this area. These differences could be seen as a cumulative effect in this area. This outcome should, however, be treated with caution since the differences between both SLI groups only approached significance.

What is the relative impact of SLI and L2? The results revealed that in conditions requiring *-e*, the L1-SLI children performed significantly better than their unimpaired L2 peers. Both groups are comparable, however, in the inflection of the marked case. In addition, L2 children were also shown to use the morphologically marked neuter nouns more successfully with adjectives than the L1-SLI children. This suggests that the reduced intake in the L1-SLI children has a more significant impact than the reduced intake due to the limited length of exposure to Dutch in the L2 children. Too little data were, however, available from the consistency analysis (see Table 7.20) to draw firm conclusions. In fact, only a small number of children in both child groups produced the consistent neuter gender patterns, which is indicative of having knowledge of the rule system underlying adjectival agreement.

The effect of length of exposure to Dutch. Length of exposure to Dutch was found to correlate significantly with the number of correct inflections in the special case, but only in the unimpaired child L1 groups. Future research should match all child groups in terms of length and, preferably, quality of exposure to further explore the question of whether SLI and L2 children eventually achieve the target system.

7.6 Conclusion

This chapter discussed the relationship between SLI and L2 acquisition in terms of the acquisition of determiner agreement in attributive adjectives and definite determiners. Two approaches to SLI were presented that made different predictions about similarities in error types between groups in attributive adjectival inflection (see predictions 1 and 2). Systematic comparisons revealed that, overall, all child groups robustly overgeneralized the *-e* ending in adjectival inflection, but not the bare adjective with the exception of a few L2 children. Unlike the children, the adult L2 learners produced a dual error pattern, which is compatible with the results of an input analysis examining the input distributions of inflectional endings with adjectives (see §4.3.1): it was shown that *-e* outnumbers $-\emptyset$ by a ratio of 1.8:1. When predicative adjectives (also ending with $-\emptyset$) were also taken into account, the distribution was skewed towards the bare adjective; 3.4 times as many $-\emptyset$ was used than *-e* (Blom et al. submitted). This outcome could support the argument that both inflectional endings will be used

if the learner only relies on input distributions. Age effects seem to play a role in the acquisition of agreement, reducing the ability to rely on rule-governed mechanisms (Blom et al. 2008b for an extensive discussion). That all child groups, overall, showed the same error type in adjectival inflection can best be understood in terms of the reduced intake account rather than in terms of grammatical principles to which the children may or may not have access. Despite the similarity across the child learners, the data also revealed that activation of the feature <neuter> was particularly difficult for the child L2, child L1-SLI and child L2-SLI groups causing a substantial delay in both gender domains. As argued above, that delay might be so severe that these children end up with an incomplete system since they fail to deduce the special rule in attributive adjectival inflection in the period in which grammatical principles are available. In contrast, only the unimpaired child L1-I+II groups showed robust activation of neuter gender as indicated by the consistency analysis: for these groups stable neuter determiner assignment *het* goes hand in hand with an increase of the production of bare adjectives in the marked case of adjectival inflection.

That most of the children irrespective of being SLI or L2 performed (relatively) poorly in assigning neuter gender and inflecting the adjective can be taken as evidence that the threshold value that must be attained to activate <neuter> and, hence, the underlying inflectional rules is relatively high. As argued before, it is reasonable to suggest that missing transparency of the syntactic and morphological properties of Dutch gender explain these apparent difficulties. In Dutch, gender is visible only in a small number of very specific contexts and is moreover often neutralized. As discussed in §4.2, gender is visible in determiners only in definite contexts and if the noun is singular; gender is neutralized in indefinite and plural contexts. Gender is encoded in attributive adjectives, only if the determiner is indefinite and the adjective modifies a singular noun; definiteness and plurality neutralize gender. There are other cases in Dutch where gender is encoded, namely in relative pronouns and demonstrative pronouns if the noun is singular. In both cases, plural neutralizes gender. What makes it more difficult to detect gender in Dutch is that gender is only arbitrarily assigned to (root) nouns, and that, in terms of frequency, common gender (75% of the noun-types in Dutch) clearly predominates (§4.3.1).

Only diminutive nouns are morphologically marked for neuter gender, and they may thus facilitate the activation of the feature <neuter>. Data suggested that most of the child groups were, to some extent, sensitive to this cue when assigning gender to a noun, with the exception of the child L2-SLI group (see Figure 7.4). The diminutive nouns did not seem to trigger productions of bare adjectives in the marked case in adjectival inflection in either SLI group compared to the unimpaired child L1 and L2 groups (see Figure 7.5). However, too few diminutive data was produced by the child groups making it difficult to draw firm conclusions. Future research should explore this issue more deeply.

Given such properties of gender encoding in Dutch, lengthy and consistent exposure to input, on the one hand, and the ability to take in this input appropriately, on the other hand, seem to be the only way to tackle the opaque gender system, and, hence, the rule system underlying attributive adjectives.

L1 children seem to have acquired the rule system underlying adjectives by the age of three or four (Blom et al. 2008b; Polišenská in preparation). The prolonged phase of schwa overuse can be explained by the default use of common gender. With the growing lexicon, parallel accuracy of definite determiners and attributive adjectival inflection increases between the ages three and eight in typical L1 acquisition (Polišenská in preparation). The L2, L1-SLI and L2-SLI children, on the other hand, may not overcome the default stage with adjectives. The data showed that between the ages six and eight, knowledge of an abstract gender system of Dutch was marginal in the child L2 and L1-SLI groups, and absent in the child L2-SLI group.

This observation raises the question of whether age effects are apparent in this domain. More specifically, the delay caused by L2, SLI and L2-SLI might be so severe that gender is not fully internalized so that certain rules may not be adequately acquired within a critical period. This would be compatible with Meisel's and colleagues (e.g., Meisel 2004; Kroffke 2006; Rothweiler 2006; Meisel 2007) claim that it is at around the ages of three or four that maturational changes take place in the brain so that age effects become visible. Alternatively, if input distributions are taken into account, following Blom et al. (2008b), it might be possible to successfully extract gender and derive the rule system underlying adjectives until the ages six or seven. That, however, would require a substantial amount of input and intake in order to be able to compensate for the skewed distributions of determiners and inflectional suffixes *-e* and \emptyset in attributive adjectives in the input (see §4.3.1). From this point of view, the two accounts of SLI can be related: As with a deficit in the innate grammar, reduced intake capacity in these children might in the end also lead to an incomplete grammatical representation since grammatical representations were not established within a certain maturational period.

Conclusion

8.1 Introduction

The present study was conducted with the aim of specifying the relationship between SLI and L2 acquisition based on the comparison of production data of various groups of L1 and L2 learners with and without SLI. The first language of all child and adult L2 groups was Turkish. The experiments centered on the application of morphosyntactic rules in Dutch that were considered vulnerable in SLI and L2 acquisition: on the one hand, subject-verb agreement in various word order conditions and, on the other hand, agreement as marked on definite determiners and attributive adjectives. The results of systematic cross-group comparisons of error types and error frequencies contributed to the ongoing theoretical debate as to whether (L2-)SLI is caused by linguistic-representational deficits or by limitations in intake. The issue of age dependencies on grammatical rule learning was also discussed in relation to L2 acquisition. The interaction of SLI and child L2 acquisition was explored. Answers to the questions in (1) were sought:

- (1)
 - a. What are the separate effects of SLI and child L2?
 - b. What are the combined effects of SLI and child L2 in L2-SLI?
 - c. What is the relative impact of the effects of SLI and child L2?

This chapter summarizes the results of the linguistic domains studied and further discusses their implications for the underlying causes of SLI and their interaction with L2 acquisition. More specifically, in §8.2 it is argued that the patterns in the results can best be captured by accounts that posit problems with intake rather than those positing representational deficits. §8.3 then further discusses factors that influence intake in order to account for the differences found in the pace of rule acquisition in, on the one hand, verb placement and verb inflection and, on the other hand, agreement in determiners and attributive adjectival inflection. §8.4 outlines how computational aspects, i.e., task

demands, cause performance limitations once inflectional rules have been established. In Chapters 6 and 7, group results and comparisons were presented although we know that SLI and L2 groups constitute heterogeneous populations. In §8.5 therefore individual variation found in the data will be briefly discussed. The current study also has implications for clinical practice in terms of diagnosing SLI in a Turkish-Dutch L2 context §8.6. The chapter concludes (§8.7) by offering an outlook for future research on L2-SLI acquisition.

8.2 Reduced intake rather than representational deficit

Two different perspectives on SLI lead to different hypotheses about error patterns in the different groups, thus reflecting the relationship between SLI and L2 acquisition. These are presented schematically in Figure 8.1 (same as Figure 1.1 in Chapter 1).

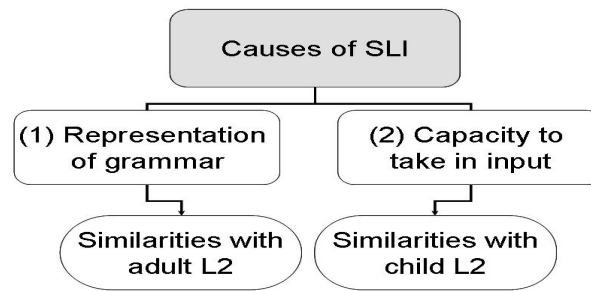


Figure 8.1: Potential relationships between SLI and L2 acquisition

A representational deficit might constrain the availability of one or more principles of UG in SLI (e.g., Clahsen 1989; Gopnik 1990a; Gopnik and Crago 1991; Clahsen 1992; Van der Lely 1998). Accordingly, the resources to construct grammar are different from typical child (L1 and L2) acquisition. These resources might be comparable to those used by adult L2 learners who have been shown to also diverge from child (L1 and L2) learners due to critical period effects (see §2.3.2). It was then predicted that L1-SLI and L2-SLI children would pattern as L2 adults, but different from unimpaired child L2 acquisition where grammatical representations are assumed to be intact. A similar specification of the relationship between SLI and adult L2 acquisition can be derived by using Ullman's declarative/procedural (DP) model. For both learner groups, Ullman and collaborators claim that there is some sort of deficiency in the procedural system necessary for rule-governed computations, which is either the result of SLI (Ullman and Pierpont 2005) or the critical period (e.g., Ullman 2001a,b, 2004, 2005). Given the inefficiency of the procedural system, both SLI children and L2 adults have to rely predominantly on the declarative memory which is responsible for the storage of lexical chunks and frames. This perspective offers

an explanation of why adult L2 and SLI groups are reduced in their ability to derive grammar.

On the other hand, reduced intake due to general limitations in perceiving and processing input can be seen as the cause of slower acquisition in SLI (Leonard 1989, 1998; Kail 1994; Windsor and Hwang 1999; Miller et al. 2001). The linguistic resources to derive grammar in the L1-SLI and L2-SLI groups should then, in principle, be similar to those in typical child (L1 and L2) acquisition. Unimpaired L2 children were also assumed to have reduced intake, but in this group, reduced intake is directly related to the fact that these children have had less exposure to Dutch (Paradis and Genesee 1996). Crucially, all child learners should then from this perspective make the same error patterns as seen in typical L1 acquisition.

The error analyses in Chapters 6 and 7 revealed that, overall, all child groups used the same error types when rule-governed operations were involved and, crucially, these patterns differed from the L2 adults in Blom's (2008) study. The similarity and differences in error patterns across the child and adult L2 groups are summarized in Table 8.1 per grammatical structure tested.

Overuse of error types in	Verb placement	Verb inflection	Adjectival inflection	Determiner agreement
All child groups	daux and RIs	$-\emptyset$ and $-t$	$-e$	bare nouns, de
Adult L2 group	SVX template	$-\emptyset$, $-t$ and $-en$	$-e$ and $-\emptyset$	bare nouns, de

Table 8.1: Error types found in the tested variables separated by child and adult L2 learner groups

Given the similarity in error patterns across the child groups, there is no evidence for the idea that the SLI groups are different from the unimpaired child groups in the construction of grammatical rules, hence, ruling out the assumption of SLI being a deficit in UG or in procedural system. Only with definite determiners do adult L2 and child learners produce the same type of errors. Since the errors are the same in impaired and unimpaired acquisition (see Table 8.1), there is no reason to assume that the SLI children have a representational deficit in this domain. There is an explanation for the similarity in error patterns with determiners between the child and adult L2 learners. Blom et al. (2007, 2008b) proposed that age effects are not apparent in the acquisition and use of determiners since determiners can be learned quite successfully by relying on lexical frame units or co-occurrence patterns based on input distributions (see §4.3.5).

The similarity of error types across the impaired and unimpaired child L1 and L2 groups are interpreted as support for the reduced intake hypothesis rather than for a deficit in UG or procedural memory. Furthermore both SLI groups performed relatively well in verb placement and verb inflection (at 75% correct and higher; see Chapter 6), providing additional evidence that the representation of rules must be in place.

If it is assumed that reduced intake affects SLI due to processing limitations,

and child L2 due to limited exposure to Dutch, higher error rates are expected in these groups compared to (typical) child L1 acquisition. As indicated in Figure 8.2 (same as Figure 1.2 in Chapter 1), (i) SLI effects, (ii) L2 effects and (iii) a cumulative L2-SLI effect can be determined by making different group comparisons. It was also possible to explore the relative impact of SLI and L2 by comparing the L1-SLI group with the unimpaired child L2 group (see dotted line).

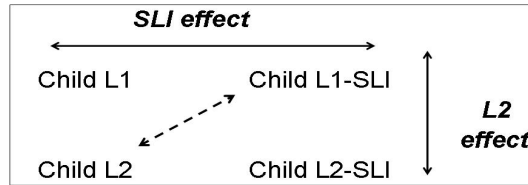


Figure 8.2: Specifying ‘delay’ in SLI and L2 acquisition

Systematic group comparisons revealed that being L2, SLI and L2-SLI affected the acquisition of the grammatical structures tested, but in different ways. SLI effects were found across both grammatical domains, whereas L2 effects were visible only in the domain involving knowledge of gender agreement. A cumulative L2-SLI was thus only apparent in this area (see Table 8.2).

	Verb placement	Verb inflection	Determiner assignment	Adjectival inflection
L2 effect	no ¹	no	yes	yes
SLI effect	yes	yes	yes	yes
L2-SLI effect	↓ no	↓ no	↓ yes	↓ yes

Table 8.2: Areas of vulnerability marking effects of L2 and SLI

The SLI effects found across the two grammatical domains of the verb phrase and noun phrase confirm that inflection learning is vulnerable contributing to the cross-linguistic evidence discussed on SLI in §2.2.2 and on L2-SLI in §2.4.2.

In sum, it is highly unlikely that a representational deficit can satisfactorily account for the error patterns found in (L2-)SLI acquisition. Instead, the similarities in error patterns across the impaired and unimpaired child L1 and child L2 groups indicate that all children rely on the same linguistic resources to derive grammar. The differences in pace of acquisition and, hence, delay in some child groups are best understood in terms of factors that influence input and intake in SLI and L2.

¹Only a few L2 children (N=7) were responsible for the significant effects found in verb placement.

8.3 Reduced intake and domain differences

The group comparisons revealed that the two grammatical domains studied were not equally affected in the SLI and L2 groups. In fact, the rule system underlying verb placement and verb inflection seemed to be much less vulnerable than the rule system underlying adjectival agreement. This section discusses factors that could account for the varying degree of vulnerability in relation to reduced intake in the grammatical domains under investigation.

Studies of first language acquisition suggest that children master their target grammar quickly and effortlessly (Wexler 1998; Bittner et al. 2003; Polišenská in preparation). It has been argued, however, that weak or strong perceptual characteristics of a particular language may relatively inhibit or accelerate acquisition respectively (e.g., Slobin 1984, 1985; Leonard 1989, 1998). If a language has relatively weak characteristics for a particular structure, then both SLI and L2(-SLI) children should need more input in this area as a result of their intake problems. A relative delay in such areas should occur in all child groups, but particularly in the SLI and L2(-SLI) children.

With respect to this factor, Dutch verb inflection has more structural cues facilitating acquisition than the gender system of Dutch. The overt morpho-phonological marking of person and number features in Dutch verb inflection can be extracted more easily from the input than the gender feature in Dutch necessary for determiner selection and deduction of the rule system underlying adjectival inflection. Dutch regular verb forms are distinctive in the singular and plural, and the singular forms also distinguish person (see §3.2.2). The gender feature, in contrast, was shown to be highly arbitrary in Dutch. There are barely any cues in the input as to how gender is assigned to (root) nouns (see §4.2.1 for some exceptions). On this basis, a difference in rate of acquisition in these two areas is predicted for all groups and greater problems for the SLI and L2 groups.

From Figure 8.3 the accuracy rates of both variables across the tested child groups can be compared; the adjectival inflection data represent the production of the marked case. As can be seen in the figure, all child groups, whether L1, L2, L1-SLI or L2-SLI, produce higher rates with inflecting verbs than with adjectives, showing that the Dutch target is more easily achieved in verb inflection than in attributive adjectival inflection. Although the rule system underlying attributive adjectives is learned by the age of three or four by L1 children (Polišenská in preparation) they still make errors since they need to stabilize their gender assignment with neuter nouns (Blom et al. 2008b; Polišenská in preparation). That explains the prolonged overuse of *-e* inflections. In contrast, knowledge of this rule system was shown to be marginal in the L2 and L1-SLI groups and to be absent in the L2-SLI group as revealed from the analyses in §7.5.3.

Input frequency, not only form, may also contribute to the salience of the verb inflection paradigm. In the input a high proportion of utterances contains a verb, but not necessarily an adjective. Input frequency would then have

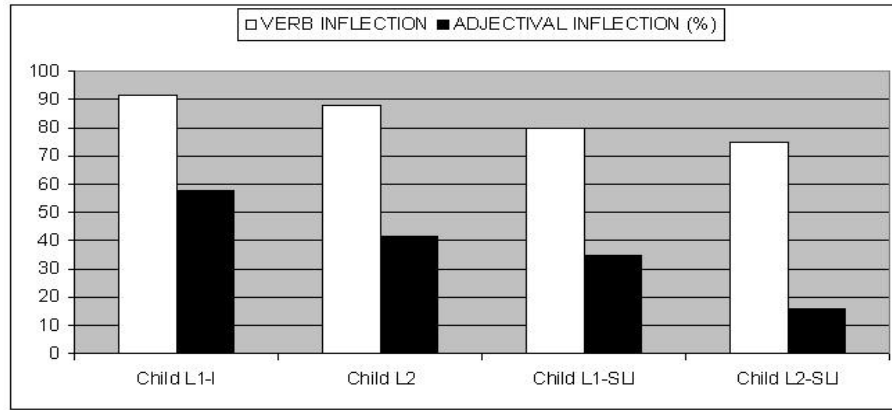


Figure 8.3: Percentage accuracy in finite verb inflection (V2 contexts) and the marked case in attributive adjectival inflection per child group (the accuracy rates are the same as given in §6.5.3 and §7.5.3, respectively).

a stronger facilitating effect on the acquisition of verb inflection than on the acquisition of adjectival inflection.² Moreover, Dutch gender has a skewed distribution in the input: Common nouns (*de*) outnumber neuter nouns (*het*) by a ratio of about 2:1 in terms of type frequencies and by a ratio 3:1 in terms of token frequencies (Van Berkum 1996). Neuter gender is therefore likely to be underrepresented in the input.³

The comparison of the two inflectional domains from Figure 8.3 also suggests that each individual grammatical domain may have a certain threshold value that must be reached by a child to acquire the rule. The differences in accuracy rates between the groups suggest that the L2 and SLI groups need more time to acquire the target than the unimpaired L1 group. Following the discussion in §8.2, this difference can, at first sight, best be accounted for by factors that influence the intake.

For adjectival agreement, reduced intake seems to account well for the low accuracy rates in the child L2, L1-SLI and L2-SLI groups resulting in L2, SLI and L2-SLI effects. As discussed in §7.6, frequent and consistent input is required to activate neuter gender, which is in turn necessary to derive the rule system underlying adjectival agreement. The cross-sectional data from Polišenská (in preparation) comparing three-to-eight year old L1 children revealed that L1 children perform at 90% correct with neuter gender assignment only by age eight, which explains the prolonged overuse of *-e* inflection with attributive adjectives. Given the rather lengthy development of the L1 children, it is highly

²To my knowledge, there are no studies on Dutch that investigate the input frequency of finite verb forms in comparison to adjectival forms in Dutch.

³Framed in terms of saliency, Polišenská (in preparation) confirms that Dutch finite verb inflection scores are higher on a saliency hierarchy than adjectival inflection due to differences in feature complexity, conceptual saliency and input frequency (see Polišenská in preparation for a detailed analysis on that matter).

plausible that the child L2(-SLI) groups with shorter exposure to Dutch and the L1-SLI and L2-SLI groups with processing limitations would need more input to overcome their intake problem.

The high error rates in both gender domains raised the question whether the child L2, L1-SLI and L2-SLI groups will eventually acquire the rule system underlying adjectival agreement within the critical period (§7.6). A closer look at the developmental patterns in gender assignment to determiners and adjectival inflection suggest a difference between the unimpaired L1 children, on the one hand, and the SLI and L2(-SLI) children, on the other hand. Both gender domains develop in parallel in typical L1 acquisition (see §4.3.2), that is stable neuter determiner assignment *het* goes hand in hand with an increase of $-\emptyset$ inflections in the marked case in adjectival inflection. In contrast, development is divergent in these two structures in the L2 and SLI groups: whereas gender assignment to definite determiners shows a slow, gradual development (see §7.4.2), these children seem to fossilize in a stage where they overuse $-e$ with attributive adjectives (see §7.5.3). The child L2 data from Blom et al. (2007) (see also §4.3.4) and data from older L2 children in the age range 9 to 16 years (e.g., Laloï et al. 2005; Cornips et al. 2006; Weerman et al. 2006; Cornips and Hulk 2008) and older Dutch L1-SLI children (Weerman and Duinmeijer p.c.; mean age: 12.7) confirm this finding.

Interestingly, as with a representational deficit, a reduced intake capacity might thus in the end also result in an incomplete representation. There are two options. It could be the case that (some of) the L2 and SLI children fail to activate the gender feature in Dutch. That would imply that, as L2 adults, child learners rely on lexical representations only (see Blom et al. 2008b or §4.3.5). Alternatively, the children might be able to activate the gender feature, but they fail to use it in such way that the more abstract rule system underlying attributive adjectival inflection can be fully derived. Rather than deriving the complex feature combination to establish the marked case, children fossilize in the default stage and overuse $-e$ where $-\emptyset$ is required.

In order to assess whether the L2 and SLI children have knowledge of the Dutch gender system, domains of Dutch involving gender marking other than definite determiners or adjectival inflection, should be examined such as demonstrative pronouns, possessive pronouns or relative pronouns. If the development resembles that seen with neuter gender assignment to definite determiners (§7.4.2), it is likely that the L2 and SLI children have activated gender. In that case, attributive adjectives certainly constitute a particularly vulnerable gender domain in Dutch. This is plausible considering that the child has to discover a particularly complex feature set (indefiniteness, singularity and neuter gender) in order to establish the marked rule. It is debatable whether gender has been activated, if gender marking turns out to be problematic for the L2 and SLI groups across various gender domains.

These results have clearly shown that the amount of input/intake required to reach the threshold value for acquiring adjectival agreement is much greater than for subject-verb agreement. Accordingly, SLI and L2 children must need a greater amount of input in gender agreement to overcome their intake problem.

It is possible that an intake problem, although not attested here, might have been visible at an earlier stage in the development in subject-verb agreement.

8.4 Reduced intake and reduced performance

Three to four years of input seemed to be enough in the unimpaired L1 and L2 children to perform at 90% accuracy in finite verb inflection and verb placement (see §3.3 and §6.5.3). Furthermore, no L2 effect was found in this domain meaning that the child L1 group did not perform significantly better than the child L2 group. The same result was found in the comparison of the two SLI groups. The L2 groups are thus not more severely affected in verb inflection than their corresponding L1 peers. Although SLI effects were apparent in verb inflection - both SLI groups made significantly more errors than their unimpaired peers - they both performed at quite high accuracy levels. Recall that the L1-SLI and L2-SLI groups were exposed to Dutch for, on average, seven and five years, respectively (see Table 6.1).

As already suggested in §6.6, the relatively high accuracy rates in both SLI groups lend support to the idea that most of the SLI children seem to have mastered the inflectional rules. That no cumulative effect was found in the L2-SLI children tested confirms this. Accordingly, there must be another explanatory factor that accounts for the persistent difficulties in applying the grammatical rule once established. The presence of performance limitations is a plausible explanation for the persistent difficulties in applying the inflectional rules underlying verb placement and verb inflection in SLI, since clearly, as discussed above, the children know the rule. Following Bishop (1994, 2000a), the automatic application of such rules would be impeded if the already limited capacity system in SLI is burdened with additional cognitive demands. As shown in §3.2, inflecting Dutch verbs in main (V2) clauses requires both movement of the verb and inflection marking. The data indicate that this is relatively demanding for the (L2-)SLI children. Firstly, both SLI groups were shown to avoid verb movement by using substantial amounts of dummy auxiliaries and RIs (§6.4). Secondly, the analysis of verb inflection errors in various order conditions revealed that both SLI groups performed target-like in the cognitively less demanding V-final (SXV) order, whereas verb inflection errors were more frequent in contexts where the verb moved to V2 (De Jong et al. in preparation). In fact, this comparison of word order conditions shows that the increase in cognitive load not only affects the performance of SLI children, but also that of unimpaired L1 and L2 children, albeit to a lesser extent.

There is additional support for the idea that the demands of the cognitive task result in performance limitations. A comparison of responses in novel and existing verb types revealed that there were fewer inflections with novel verbs than with existing verbs across the SLI and L2 groups (see Table 6.11). Almost half of the responses with novel verbs also had to be excluded in both SLI groups. Inflecting novel verbs requires more effort since the child has to map the new word to (a series of) events in the experimental task while also processing the

morpho-syntactic information to be added to the verb stem. In the present experiment it was also the case that the novel verbs had to be generalized to an event with the same action, but with a different subject(s) and/or object. This might also have added to the cognitive load of the task. The form of the elicitation in finite verb inflection might also have had an effect on the cognitive load in 2sg contexts in inverted (XVS) order (see Figure 6.1 and example (8) in the same chapter). While applying the correct inflection, the participant had to establish that the person on the stimulus picture was actually the experimenter. This dual operation also turned out to be difficult for the SLI groups and some individual L2 children. As was revealed by the item analysis in §6.3.3, all L2 and SLI groups produced only small token numbers of inflected lexical verbs with the 2sg inverted order contexts. Instead, learners preferred the cognitively less demanding production of dummy auxiliaries and RIs.

These observations are consistent with findings from other studies (e.g., Gillam, Hoffman, Marler, and Wynn-Dancy 2002; Leonard et al. 2002; Coady, Kluender, and Evans 2005; Coady, Evans, Mainela-Arnold, and Kluender 2007) reporting that the type of stimuli and the memory demands of the task negatively affect the performance of SLI children. Coady and collaborators, for instance, showed that SLI children performed similarly to typically developing age controls when natural speech rather than synthetic speech was used, when the stimuli were real words rather than novel words, and when the memory demands of the tasks were reduced. Similarly, there are also studies on unimpaired child L1 and L2 acquisition showing that performance is poorer with increasing task demands (e.g., for child L1: Gibson 1996; Bader and Bayer 2006 and for child L2: Bialystok and Miller 1999; Thorn and Gathercole 1999; McDonald 2000; Foursha, Austin, and Walle 2008).

These results indicate that the L2-SLI and L1-SLI children have varied, but probably related, processing limitations that affect their language development in different ways, namely in terms of (i) deriving rules and (ii) applying rules (see Figure 8.4).

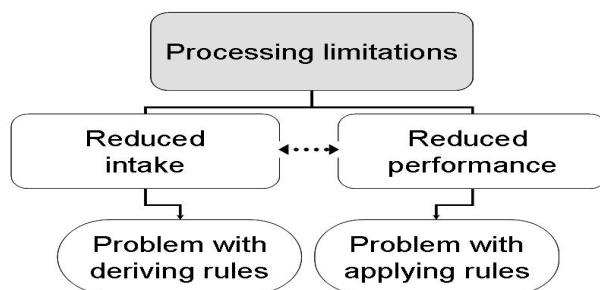


Figure 8.4: Processing limitations and its causes in SLI

It is not clear how reduced intake and performance are related (dotted line) since the present study did not investigate the individual aspects of perceptual and cognitive abilities that may cause processing limitations. Here, pro-

cessing limitation are treated as one undifferentiated whole. The relationship between reduced intake and specific computational restrictions limiting performance in (L2-)SLI remains as yet unclear. The large body of research on SLI has revealed limitations in speech perception and working memory, and slowed reaction times. There is also evidence that these children may have deficits in attention and various other executive functions (e.g., Bishop and Leonard 2000; Schwartz 2009 for overviews). It is plausible that some of these processing aspects affect intake capacities, but not all of these aspects, necessarily, also influence performance capacities, and vice versa. The specific nature of and relationship between these limitations as well as their relative impact on linguistic performance thus remain topics of future research.

8.5 Reduced intake and individual differences

As already shown, regardless of the exact nature of processing limitations, they are a more likely candidate for the general cause of problems with inflection in SLI than representational deficit. However, it could still be the case that some individuals have deficits of this kind. In the (L2-)SLI literature, there are frequent reports of individual cases who show a different error pattern from other SLI peers (e.g., Grimm and Weinert 1990; Clahsen 1991; Clahsen et al. 1997; Van der Lely 1996; Leonard 1998; Van der Lely 2005). Yet other studies point to individual SLI children that are much more severely delayed in the acquisition of grammar than others (Leonard 1998; De Jong 1999; Wexler et al. 2004; Paradis et al. 2005/2006). This could also be indicative of the fact that some SLI children have more severe processing limitations than others, and possibly in different areas of processing.

In the data discussion in Chapters 6 and 7, a certain level of variation in the child L2-SLI, child L1-SLI and child L2 groups was revealed, not unexpectedly. A closer look at these individual patterns illustrates that some children have more difficulties than others in acquiring Dutch inflection. In comparison to their corresponding peers, the children listed in Table 8.3 stand out because they produced

- far fewer lexical verb inflections with existing verbs and novel verbs
- far more productions of dummy auxiliaries and RIs
- far more errors in finite verb inflection
- barely any neuter gender assignment to determiners
- barely any inflections with $-\emptyset$ in the marked case
- barely or no consistencies in adjectival agreement

Although individual error rates varied among the SLI and L2 groups, the overall error patterns with grammatical morphemes did not. For the vast majority of

the children, error patterns are consistent pointing to limitations with intake rather than a deficit in representation (see §8.2). Thus, the overall error patterns discussed in Chapter 6 for placing and inflecting finite verbs and in Chapter 7 for agreement in determiners and adjectives hold regardless of the proficiency levels in these children. The question then remains why some individual children perform particularly badly.

The discussion here will concentrate on verb morphology since the variability in the L2 and SLI groups with finite verb placement and inflection was much more pronounced than with adjectival agreement since gender performance was generally quite low for all L2 and SLI children (see Chapter 7). Table 8.3 presents the distribution of the response types in V2 contexts, that is the percentages of (i) finite lexical (existing) verbs, (ii) RIs and dummy auxiliary and (iii) excluded (not analyzed) responses. In total, the two V2 conditions (SVX and XVS) where verb inflection was tested provided a maximum of 24 contexts per L2 child (N), L1-SLI child (M) and L2-SLI child (B) (see Appendix A for further subject details). The last column lists the absolute numbers of correctly inflected finite verbs as a proportion of the total of finite verbs used in V2 order (maximum 24 contexts) and V-final order (maximum 6 contexts).

Child code	Distribution of responses (in V2)				Correct verb inflection	
	max	Finite verb	daux + RIs	Excluded	V2	V-final
N2	24	37.5	37.5	25	6/9	2/2
N7	24	37.5	37.5	25	8/9	4/4
N6	24	25	62.5	12.5	5/6	5/5
M5	24	4.2	91.7	4.2	1/1	2/2
M7	24	37.5	29.2	33.3	3/9	2/3
M11	24	33.3	45.8	20.8	5/8	4/4
M21	24	41.7	50	8.3	6/10	5/5
M23	24	4.2	66.7	29.2	1/1	4/4
B1	24	25	33.3	41.7	5/6	4/4
B9	24	29.2	62.5	8.3	2/7	0/0
B14	24	4.2	66.7	29.2	0/1	3/6
B17	24	4.2	62.5	33.3	0/1	1/1

Table 8.3: Percentages of lexical finite verbs, dummy auxiliaries and RIs and excluded responses in V2 order + absolute numbers of correctly inflected finite lexical verbs in subsets of the L2 (N), L1-SLI (M) and L2-SLI (B) children

As is clear from Table 8.3, overall use of finite lexical verbs in V2 contexts is relatively smaller in the children listed than the use of the category ‘dummy auxiliaries and RIs’. Furthermore, a substantial part of responses had to be excluded in these children. Accordingly, only few finite lexical verbs were available for inflection. A look at the verb inflection data shows that the accuracy rates are particularly low in the L1-SLI (M) and L2-SLI (B) children in the

V2 contexts.⁴ In addition, most of these children used not only relatively few finite lexical verbs in the less costly embedded clause order, they also made inflectional errors in that context. Following the discussion in §8.4, this outcome seems not to be compatible with the claim that the inflectional rules are intact and that cognitive task demands hamper the application of such rules. Instead, the observations from Table 8.3 raise reasonable doubts as to whether (most of) these individual children have, in fact, acquired the rule system underlying verb placement and verb inflection. It looks as if the reduced intake in these children caused a pattern that can be observed in much younger unimpaired L1 children (see §3.3.1), indicating a substantial developmental delay.⁵ The high rates of excluded responses also suggest some sort of performance problem. Taken together, the substantial delay could indicate that these children have a more severely affected processing system than others, and possibly affecting different areas of processing. As with adjectival agreement, it is possible that for some of these children the reduced intake problems are so severe that they may fossilize in an immature stage where they use errors that are characteristic of an earlier developmental stage. Future research should focus on individual patterns in L1-SLI and L2(-SLI) children who have been exposed to Dutch for a longer period of time to explore this issue in more detail.⁶

8.6 Reduced intake and clinical implications

It is obvious that the results of this study are restricted to one language combination, namely Turkish and Dutch. The results of this study cannot therefore be applied clinically to L2(-SLI) children with other language backgrounds.⁷

⁴Note that the L2-SLI children listed in the table were also shown to perform extremely poorly (one standard deviation below the mean) on a Turkish elicitation task examining various structures of verb and noun morphology (N. Cavus p.c.).

⁵The poor performance in these children is, overall, not related to age or length of exposure to Dutch (see Appendix A).

⁶Two of the children listed in Table 8.3, namely M7 and B17, produced errors that were not seen among the other children. In verb placement, the children occasionally overused an SVX pattern to embedded SVX order: **Dat is de man die tandenpoets zijn tanden.* instead of *Dat is de man die zijn tanden poetst.* ‘That is the man who brushes his teeth.’. The same children seem to lack the syntactic information to differentiate between finite and non-finite verb forms resulting in the substitution of *-en* in finite positions: *het meisje poetsen tanden* instead of *het meisje poetst tanden* ‘The girl brushes her teeth.’ The same children were also shown to use such inflection errors in narrative data that were not presented in the present study, however: e.g., **de hond likken kind* ‘the dog licks the child.’, **en kind vallen in een boom* ‘the child falls off the tree.’. In attributive adjectival inflection, the L1-SLI child (M7) also frequently overused the \emptyset suffix to contexts where *-e* was required, e.g., **Kroko zit in de groene schoen* ‘Kroko sits in the green shoe.’; **dat zijn schoon varkens* ‘These are clean pigs.’. Surprisingly, these error patterns found in the two children resembled those seen in L2 adults (compare §3.3.4 and §4.3.5). Following the argumentation in §8.2 that would mean that these children have a representational deficit. However, given that only very few children produced such errors, limitations in processing capacities are the more likely candidate for the general source of problems with inflection in SLI.

⁷Steenge’s (2006) study also reports on some SLI effects in verb morphology in Turkish-Dutch and Moroccan-Dutch children aged seven and nine. However, her study suffered from

However, the results offer suggestions for the clinical practice.

The present study revealed a clear overlap in developmental patterns found in typical and atypical child L1 and child L2 acquisition, which is consistent with the evidence discussed in §2.4.1 and §2.4.2. At first sight, this finding is discouraging for identifying SLI in L2 children; at least if children are diagnosed on the basis of their L2.⁸ Recall that the two types of misdiagnosis discussed in §1.4, lead to instances of mistaken identity and missed identity, respectively (e.g., Cummins 1984; Roseberry-McKibbin 1995; Crutchley, Conti-Ramsden, and Botting 1997; Genesee, Paradis, and Crago 2004). However, the way the various child groups have been compared in the current study (see Figure 8.2) allowed for the detection of SLI and L2 effects. More specifically, the performance of L1 and L1-SLI children offered a benchmark for detecting L2 effects in the L2 and L2-SLI children, and the performance of unimpaired L1 and L2 children offered a benchmark for detecting SLI effects in the L1-SLI and L2-SLI children (see Figure 8.2).

As shown in Table 8.2, clear SLI effects were found in the acquisition of V2 and finite verb inflection in the absence of L2 effects. The L1-SLI and L2-SLI children used fewer finite lexical verbs and higher rates of dummy auxiliaries and RIs as well as more errors in finite verb inflection compared to their unimpaired L1 and L2 peers. This grammatical domain can thus be seen as a safe indicator for SLI in the age groups being examined, but all aspects have to be considered, not just the accuracy of finite inflection in the V2 condition. On the other hand, both SLI and L2 effects were visible in the acquisition of agreement in determiners and attributive adjectives. In fact, all L2 and SLI groups performed at quite low accuracy levels, making it difficult, if not impossible, to tease apart SLI and L2 effects in this particular domain. Thus, separate norm groups for SLI and L2 acquisition are required here in order to be able to determine the respective effects of both conditions. Although it was not possible to disentangle SLI and L2 in both linguistic domains studied, the data provided useful information to set appropriate expectations as to typical L2 development in Dutch. For instance, the group comparisons revealed that unimpaired L2 children are expected to make many errors with determiners and adjectives in Dutch given the reduced amount of input they received compared to L1 children. In fact, it is quite possible that these children do not acquire the rule system at all (see §7.6), even without having SLI. Crucially, the same L2 children should perform well in verb placement and verb inflection in Dutch, since there no profound delay was found due to reduced input (see above). Such observations may thus be useful in the clinical practice in preventing L2 children from undergoing unnecessary assessment.

several methodological problems (see §3.3.5), which made the interpretation of results in terms of underlying representation of rules difficult.

⁸Obviously, the L2 children should, preferably, also be examined in their L1 performance making the comparisons even more reliable. The L2(-SLI) children's first language, Turkish, was investigated and compared to the results in Dutch (e.g., De Jong et al. 2007, to appear). Results revealed that noun morphology seems to be a useful marker for Turkish SLI, more so than subject-verb agreement, at least for the age range of children addressed here.

The findings suggest that L2 has a limiting effect on SLI children if a large amount of consistent input is required for rule acquisition, agreement in determiners and attributive adjectives being a case in point. However, that outcome does not necessarily mean that children should not be exposed to both languages. Recall that it is commonly assumed among educators and speech-language therapists that acquiring two languages would be too challenging for children with SLI (§1.4). It is true that the L2-SLI child is challenged with a reduced intake system due to processing limitations in SLI and less L2 exposure. However, in a contemporary modern multilingual society such as in the Netherlands, children do not have the option of being exposed to either one or the other language for various practical and emotional reasons. Language choice is, in first place, the choice of the parents. However, living in a multilingual society requires the use of both languages in order to be able to communicate with family members in and outside the host country as well as people in the host country. It would be the best for such children if teachers and clinicians would look for possibilities for teaching and intervention material that provides impaired (and unimpaired) L2 children with enough and consistent input to Dutch.

8.7 Reduced intake and future directions

The present study sought to demonstrate that systematic group comparisons is a fruitful approach in research studying the separate and combined effects of L2 and SLI on grammatical development. It has been shown that L1-SLI and L2-SLI children have, in principle, the capacity to acquire the grammar of one or two (or more) languages as indicated by the similarities in error patterns compared to their unimpaired peers. The persistent problems with inflectional morphology in the SLI groups were interpreted in terms of processing limitations that affected either the intake needed to derive rules or the degree of automaticity to apply rules once established. The present study also revealed how reduced intake affects typical child L2 acquisition. If a large amount of consistent input is needed to derive grammar, it is possible that both SLI and L2(-SLI) children may fossilize in immature stages resulting in incomplete structure-specific representations. Interestingly, processing accounts and representational accounts can then be related.

This study was not aimed at exploring the cognitive mechanisms underlying language processing in the targeted learner groups. Future research should fill that gap by measuring the extent to which the reduced intake hypothesis holds up in light of evidence from various aspects involved in language processing on-line, hereby getting a clearer picture concerning the separate effects of L2 and SLI as well as the interaction between L2 and SLI. Furthermore, the same group comparisons as in Figure 8.2 should be conducted involving different language combinations - with varying L1's - in order to determine the effects of L1 interference. As regards the question of cognitive load, a set of grammatical structures should be examined in tasks that differ in several aspects of com-

plexity. These structures should also preferably be tested using experimental on-line as well as off-line methods. As is clear from the present study, SLI and L2 constitute heterogeneous learners groups. It is therefore desirable that future research match the various child groups in age, length of exposure, working memory span etc. and also systematically explore inter-individual differences along these lines.

By focussing on the role of reduced intake capacities, this study furthers the recent trend of exploring the relationship between SLI and L2 acquisition serving as a solid point of departure for future research.

Appendices

Biodata subjects

Child L1-I (N=20)			Child L1-II (N=24)			Child L1-SLI (N=25)		
Code	Sex	Age	Code	Sex	Age	Code	Sex	Age
A1	f	4;0	A21	m	6;2	M11	f	6;1
A2	m	4;1	A22	m	6;3	M16	m	6;2
A3	f	4;1	A23	f	6;5	M7	m	6;3
A4	m	4;1	A24	m	6;6	M25	m	6;4
A5	f	4;2	A25	f	6;7	M21	m	6;6
A6	f	4;3	A26	m	6;7	M9	f	6;9
A7	m	4;5	A27	m	6;9	M23	f	6;9
A8	m	4;8	A28	f	6;10	M24	m	6;9
A9	f	4;10	A29	f	6;10	M8	m	6;11
A10	f	4;10	A30	m	6;10	M10	m	7;0
A11	f	4;11	A31	m	6;11	M5	f	7;1
A12	f	5;1	A32	m	7;0	M1	f	7;2
A13	f	5;1	A33	m	7;1	M3	m	7;4
A14	f	5;3	A34	m	7;1	M4	m	7;6
A15	f	5;3	A35	f	7;2	M2	m	7;7
A16	f	5;4	A36	m	7;4	M22	f	7;8
A17	f	5;4	A37	m	7;5	M12	f	7;9
A18	f	5;6	A38	m	7;8	M15	m	7;9
A19	m	5;10	A39	m	7;8	M13	m	7;10
A20	m	5;11	A40	m	7;8	M18	m	7;10
			A41	m	7;9	M6	f	7;11
			A42	m	7;10	M17	f	7;11
			A43	m	7;11	M14	m	8;0
			A44	f	7;11	M19	m	8;0
						M20	m	8;0

Table A.1: Gender and age information on the participants (in years) in the child L1-I, child L1-II and child L1-SLI groups

Child L2 (N=20)					Child L2-SLI (N=20)				
Code	Sex	Age	*AoE	**LoE	Code	Sex	Age	*AoE	**LoE
N8	m	6;3	3;0	3;3	B2	f	6;0	2;6	3;5
N7	m	6;4	2;6	3;10	B3	f	6;7	>0	>6
N2	f	6;5	2;6	3;11	B1	m	6;8	2;6	4;2
N11	m	6;6	2;6	4;0	B16	f	6;9	2;9	4;0
N16	f	6;7	>0	>6	B19	m	7;2	>0	>7
N12	f	6;10	1;0	5;10	B20	f	7;2	>0	>7
N5	f	6;11	n\ a	n\ a	B13	f	7;4	3;6	3;10
N4	f	7;1	3;0	4;1	B9	m	7;5	4;0	3;5
N6	m	7;2	>0	>7	B7	m	7;5	3;0	4;5
N10	m	7;2	2;0	5;2	B17	m	7;6	2;0	5;6
N9	f	7;4	2;0	5;4	B10	m	7;7	2;6	5;1
N20	f	7;6	n\ a	n\ a	B18	f	7;7	>0	>7
N1	f	7;7	2;0	5;7	B5	m	7;7	n\ a	n\ a
N3	f	7;8	3;0	4;8	B6	m	7;9	3;0	4;9
N14	m	7;8	2;0	5;8	B15	f	7;10	3;0	4;10
N15	f	7;8	2;0	5;8	B8	m	7;10	2;6	5;4
N18	f	7;8	2;0	5;8	B11	f	7;10	2;6	5;4
N19	m	7;11	3;6	4;5	B14	m	8;0	2;9	5;2
N13	m	8;2	n\ a	n\ a	B4	m	8;1	3;0	5;1
N17	m	8;5	>0	>8	B12	v	8;3	3;6	4;9

Table A.2: Gender, age and L2 input information (in years) on the participants in the child L2 and child L2-SLI groups (*AoE: age of systematic exposure to Dutch; **LoE: length of systematic exposure to Dutch)

Adult L2 (N=9)						
Code	Sex	Age	*AoE	**LoE	***LoI	Proficiency level (TAK score) ^a
V7	f	22	>20;0	1;6	0;10	17
V4	f	23	>20;0	1;6	0;11	6
V8	f	24	>20;0	3;0	1;0	16
V2	f	26	>20;0	4;0	0;8	6
V1	f	29	>20;0	1;3	0;5	12
V5	f	29	>20;0	3;6	1;0	13
V9	m	30	>20;0	1;0	0;5	19
V3	f	31	>20;0	1;0	0;5	8
V6	f	36	>20;0	12;0	0;9	25

Table A.3: Gender, age and L2 input information on the participants (in years) of the adult L2 group (*AoE: age of systematic exposure to Dutch; **LoE: length of systematic exposure to Dutch; ***LoI: length of systematic instruction to Dutch)

^aThe L2 adults were selected from a group of low to medium proficient learners so that errors can be expected (see §5.2.2). The level of Dutch proficiency in the adult L2 group was determined by the outcome of a sentence repetition task, a subtest taken from the ‘Child Language Assessment (TAK, Verhoeven and Vermeer 2002). The test contained 20 items, resulting in a maximum score of 40. In this task, each test sentence contains a word order property of Dutch and a function word. If both were repeated correctly, the sentence received two points. If only one of the two was repeated correctly, one point was assigned per sentence (see Blom 2008; Blom et al. 2008b for more details).

Finite verb inflection per inflectional context

Child L1 ¹	-∅	-t	-en	Child L1-SLI	-∅	-t	-en
1sg SVX (n=33)	100	0	0	1sg SVX (n=54)	83.3	14.8	1.9
2sg SVX (n=35)	25.7	74.3	0	2sg SVX (n=52)	11.5	88.5	0
3sg SVX (n=32)	9.4	90.6	0	3sg SVX (n=114)	22.8	75.4	1.8
3sg XVS	na	na	na	3sg XVS (n=39)	30.8	69.2	0
1pl SVX	na	na	na	1pl SVX (n=51)	9.8	5.9	84.3
3pl SVX (n=37)	0	0	100	3pl SVX (n=99)	11.1	8.1	80.8

Table B.1: Percentages of accuracy (in bold) and substitution in the child L1 group and child L1-SLI group in each inflectional context (numbers in parentheses denote absolute numbers of responses)

Child L2	-∅	-t	-en	Child L2-SLI	-∅	-t	-en
1sg SVX (n=48)	97.9	2.1	0	1sg SVX (n=38)	84.2	15.8	0
2sg SVX (n=50)	12	88	0	2sg SVX (n=36)	5.6	94.4	0
3sg SVX (n=99)	18.2	81.8	0	3sg SVX (n=72)	30.6	63.9	5.6
3sg XVS (n=42)	11.9	85.7	2.4	3sg XVS (n=30)	36.7	60	3.3
1pl SVX (n=41)	2.4	4.9	92.7	1pl SVX (n=43)	0	16.3	83.7
3pl SVX (n=83)	7.2	3.6	89.2	3pl SVX (n=61)	4.9	23	72.1

Table B.2: Percentages of accuracy (in bold) and substitution in the child L2 group and child L2-SLI group in each inflectional context (numbers in parentheses denote absolute numbers of responses)

¹The child L1 controls were not tested for inflections in 3sg inverted order and the 1pl context since a shortened version of the experiment was used (§5.3.1)

Adult L2	-∅	-t	-en
1sg SVX (n=27)	81.5	3.7	14.8
2sg SVX (n=24)	37.5	37.5	25
3sg SVX (n=42)	35.7	38.1	26.2
3sg XVS (n=20)	25	65	10
1pl SVX (n=21)	4.8	9.5	85.7
3pl SVX (n=33)	12.1	0	87.9

Table B.3: Percentages of accuracy (in bold) and substitution in the adult L2 group in each inflectional context (numbers in parentheses denote absolute numbers of responses)

Determiners and adjectives per neuter noun type

Determiner agreement	Neuter gender (root nouns)		
	Het	*De	Bare noun
Child L1-I	48.8 (n=79; sd=42.4)	45.0 (n=73; sd=39.8)	6.2 (n=10; sd=14.3)
Child L1-II	68.9 (n=224; sd=31.9)	29.9 (n=97; sd=31.6)	1.2 (n=4; sd=2.7)
Child L2	16.9 (n=43; sd=24.3)	65.9 (n=168; sd=29.1)	17.2 (n=44; sd=17.5)
Child L1-SLI	24.4 (n=85; sd=32.9)	70.7 (n=246; sd=34.8)	4.9 (n=17; sd=16.1)
Child L2-SLI	1.1 (n=3; sd=3.1)	76.0 (n=199; sd=27.2)	22.9 (n=60; sd=27.2)

Table C.1: Neuter root noun in neuter gender assignment: Percentages of accuracy (numbers in parentheses denote absolute numbers of responses and standard deviations)

Determiner agreement	Neuter gender (diminutives)		
	Het	*De	Bare noun
Child L1-I	77.2 (n=71; sd=43.2)	19.6 (n=18; sd=41.6)	3.3 (n=3; sd=12.3)
Child L1-II	93.2 (n=218; sd=24.3)	3.8 (n=9; sd=23.4)	3.0 (n=7; sd=8.1)
Child L2	32.5 (n=40; sd=33.7)	56.9 (n=70; sd=33.6)	10.6 (n=13; sd=15.3)
Child L1-SLI	48.5 (n=98; sd=41.3)	47.0 (n=95; sd=42.7)	4.5 (n=9; sd=20.2)
Child L2-SLI	6.1 (n=9; sd=14.7)	74.8 (n=110; sd=36.2)	19.1 (n=28; sd=33.9)

Table C.2: Diminutive nouns in neuter gender assignment: Percentages of accuracy (numbers in parentheses denote absolute numbers of responses and standard deviations)

Adjectival inflection	Inflectional contexts requiring $-\emptyset$ (root nouns)		
	*-e	$-\emptyset$	sd
Child L1-I	52.9 (n=27)	47.1 (n=24)	45.4
Child L1-II	39.8 (n=45)	60.2 (n=68)	43.5
Child L2	69.5 (n=111)	30.5 (n=48)	29.6
Child L1-SLI	69.9 (n=165)	30.1 (n=71)	33.1
Child L2-SLI	84.7 (n=155)	15.3 (n=29)	24.7

Table C.3: Neuter root nouns in adjectival inflection (marked case): Percentage of inflections with $-e$ and $-\emptyset$ in contexts requiring $-\emptyset$ (numbers in parentheses denote absolute numbers of responses)

Adjectival inflection	Inflectional contexts requiring $-\emptyset$ (diminutives)		
	*-e	$-\emptyset$	sd
Child L1-I	26.5 (n=9)	73.5 (n=25)	45.8
Child L1-II	15.4 (n=10)	84.6 (n=55)	36.7
Child L2	34.7 (n=19)	65.3 (n=43)	39.8
Child L1-SLI	62.2 (n=58)	37.8 (n=48)	43.9
Child L2-SLI	89.6 (n=85)	10.4 (n=15)	19.2

Table C.4: Diminutive nouns in adjectival inflection (marked case): Percentage of inflections with $-e$ and $-\emptyset$ in contexts requiring $-\emptyset$ (numbers in parentheses denote absolute numbers of responses)

Stability in adjectival inflection

	Stable adjectival inflection				*Excluded
	Stable -e	Stable - \emptyset	Unstable -e/- \emptyset		
Child L1-I	50.6 (n=91; sd=18.6)	27.2 (n=49; sd=23.5)	0 (n=0; sd=0)	22.2 (n=40; sd=10.8)	
Child L1-II	46.1 (n=166; sd=17.7)	33.9 (n=122; sd=21.6)	0 (n=0; sd=0)	20.0 (n=72; sd=11.0)	
Child L2	40.3 (n=121; sd=21.5)	14.0 (n=42; sd=18.0)	5.7 (n=17; sd=6.2)	40.0 (n=120; sd=24.9)	
Child L1-SLI	53.9 (n=202; sd=20.2)	14.1 (n=53; sd=19.7)	5.3 (n=20; sd=6.7)	26.7 (n=100; sd=16.4)	
Child L2-SLI	58.3 (n=175; sd=19.3)	7.0 (n=21; sd=11.3)	7.3 (n=22; sd=10.1)	27.3 (n=82; sd=15.3)	
Adult L2	40.0 (n=54; sd=24.9)	19.3 (n=26; sd=21.5)	8.9 (n=12; sd=9.4)	31.9 (n=43; sd=11.9)	

Table D.1: Percentages of (in)stability in inflecting attributive adjectives with -e or - \emptyset in all learner groups (numbers in parenthesis denote absolute numbers of responses and standard deviations of percentages). *Uses of responses that were not targeted; see Table 7.8 in §7.3.4 for examples.

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Samenvatting

Dit proefschrift gaat over de relatie tussen een primaire taalontwikkelingsstoornis (ofwel specific language impairment (SLI)) en tweede taalverwerving (L2).

De ontwikkeling van een moedertaal verloopt normaal gesproken overal ter wereld moeiteloos, spelenderwijs en bij iedereen hetzelfde. Er zijn helaas ook kinderen bij wie de taalontwikkeling vanaf het begin niet zo voorspoedig verloopt. Dat is bijvoorbeeld het geval als een kind SLI heeft. SLI is een taalstoornis die niet het gevolg is van een aandoening van neurologische origine, van de intelligentie, of van het gehoor. Ook een taalstoornis als gevolg van sociaal-emotionele of gedragsproblemen, of van ernstige verwaarlozing wordt per definitie niet als SLI beschouwd.

Uit eerder onderzoek is gebleken dat kinderen met SLI veel problemen hebben om de grammaticale regels van een taal te leren. Ze maken bijvoorbeeld fouten die normaal gesproken alleen veel jongere kinderen zonder taalstoornis maken. Kinderen met SLI lijken dus een flinke vertraging in hun taalontwikkeling op te lopen. Soms komt het echter ook voor dat kinderen met SLI fouten maken die jonge niet-taalgestoorde kinderen nooit maken. Er is nog niet voldoende onderzoek naar SLI gedaan om te weten of kinderen met SLI op latere leeftijd (na tien jaar) alsnog de grammatica van hun moedertaal perfect kunnen leren.

Een opvallend feit is dat de ontwikkelingspatronen bij kinderen met SLI een behoorlijke overeenkomst vertonen met kinderen die pas als peuter/kleuter beginnen met het leren van een andere taal. Denk bijvoorbeeld aan Turkse of Marokkaanse kinderen in Nederland die pas vanaf een jaar of drie/vier beginnen met het leren van het Nederlands. Onderzoek heeft laten zien dat beide groepen kinderen vaak dezelfde fouten maken gedurende de taalontwikkeling. Dus ook tweetalige kinderen zijn wat langzamer dan hun eentalige leeftijdsgenoten, maar dat is ook logisch als je bedenkt dat het taalaanbod is verdeeld tussen twee talen én dat ze wat later zijn begonnen met het Nederlands.

SLI komt natuurlijk niet alleen bij eentalige kinderen voor, maar ook bij kinderen die naast hun eerste taal nog een tweede taal leren. Automatisch roept dit een aantal vragen op: Kan zo'n kind de tweede taal eigenlijk wel aan? Met andere woorden: welke invloed hebben de taalstoornis en het leren van een tweede taal op zijn taalontwikkeling en hoe zwaar tellen die effecten eigenlijk bij elkaar op? En hoe kom je er überhaupt achter of deze kinderen een taalstoornis

hebben of dat ze simpelweg te weinig Nederlands hebben gehoord, zodat ze een achterstand op basis van hun tweetaligheid hebben opgelopen? Deze twee effecten zijn moeilijk te ontwarren. Het is dan ook lastig om diagnostische criteria te formuleren voor een taalgestoord kind dat moeilijkheden heeft met het leren van een tweede taal.

Dit onderzoek had tot doel de relatie tussen SLI en tweede taalverwerving nader te specificeren. Om dit doel te bereiken, werden diverse groepen leeders van het Nederlands met elkaar vergeleken, namelijk eentalige en tweetalige kinderen met en zonder SLI (tussen vier en acht jaar oud) en een groep tweetalige volwassen leeders. De eerste taal van de tweetalige leeders was Turks. De experimenten richtten zich op de toepassing van grammaticale regels van het Nederlands, waarvan werd aangenomen dat deze zeer moeilijk te leren zijn door de verschillende groepen leeders: enerzijds de congruentierelatie tussen het onderwerp en de persoonsvorm in verschillende woordvolgordes, en anderzijds de congruentierelatie tussen het zelfstandige naamwoord en het lidwoord en het zelfstandige naamwoord en het bijvoeglijke naamwoord. De focus van de analyse lag zowel op de kwaliteit (het type) als op de kwantiteit (het aantal) van fouten.

De resultaten van de groepsvergelijkingen leverden een bijdrage aan het theoretisch debat of (L2-)SLI veroorzaakt wordt door een gebrek in de toegang tot het systeem van grammaticale regels (de universele grammatica) (hier beschreven als de representatiebenadering) of door problemen in de verwerking van taal (hier beschreven als de verwerkingsbenadering). Ook werd de invloed van leeftijd op grammaticale regelverwerving bediscussieerd in relatie tot tweede taalverwerving. Het is namelijk zo dat het leren van grammatica moeilijker wordt naarmate je ouder wordt. Onderzoekers denken dat dit komt doordat er een specifieke leeftijdsgebonden periode voor natuurlijke taalverwerving bestaat. Dus kinderen die vroeg genoeg blootgesteld worden aan meerdere talen bevinden zich, in tegenstelling tot volwassen leeders van het Nederlands bijvoorbeeld, nog steeds in een 'kritische' periode voor taalverwerving en hebben alle kansen om de doeltaal volledig te verwerven. Als er echter sprake is van onvoldoende taalaanbod in deze periode rijst de vraag of deze kinderen de doeltaal daadwerkelijk zullen verwerven.

Uit dit onderzoek komt duidelijk naar voren dat alle groepen kinderen dezelfde typen fouten vertonen, dit in tegenstelling tot volwassen leeders van het Nederlands, die andere foutentypen laten zien. Dit verschil tussen kinderen en volwassenen geeft een duidelijke indicatie voor leeftijdseffecten op grammaticaverwerving. Echter, de groepen kinderen verschillen wel duidelijk in de hoeveelheid fouten die worden geproduceerd.

De centrale stelling van dit proefschrift is dat de overeenkomsten in foutenpatronen tussen eentalige en tweetalige kinderen met en zonder SLI een duidelijke aanwijzing geven dat alle kinderen in principe dezelfde taalkundige middelen hebben om de doelgrammatica af te kunnen leiden. De data suggereren dat de verschillen in foutenaantallen tussen de groepen kinderen te verklaren zijn in termen van factoren die de verwerking van taal in SLI en tweetaligheid beïnvloeden.

Zo leidt SLI tot een flinke vertraging in de taalontwikkeling op basis van verwerkingsproblemen. Enerzijds lijken deze verwerkingsproblemen invloed te hebben op de *intake*, dat wil zeggen dat kinderen er niet in slagen om de benodigde informatie uit de talige input zodanig te verwerken om grammaticale regels in hetzelfde tempo af te kunnen leiden als niet-taalgestoorde kinderen (dat is bijvoorbeeld het geval bij de congruentierelatie tussen het zelfstandige naamwoord en het bijvoeglijke naamwoord). Anderzijds lijken deze verwerkingsproblemen ook invloed te hebben op de mate van *automatisering* waarmee grammaticale regels – als ze eenmaal zijn verworven – worden toegepast (dat is het geval bij de congruentierelatie tussen het onderwerp en de persoonsvorm). Uit de resultaten blijkt ook dat problemen met intake invloed hebben op tweede taalverwerving. Maar dat is afhankelijk van de te leren structuur. Als er een flinke hoeveelheid input nodig is om een grammaticale regel af te leiden (zoals bij het leren van de congruentierelatie tussen het zelfstandige naamwoord en het bijvoeglijke naamwoord), is het zelfs mogelijk dat SLI en L2(-SLI) kinderen lijken te fossiliseren in kindertaalstadia, resulterend in incomplete structuur-specifieke representaties.

Als dit het geval is lijken twee tegengestelde benaderingen van SLI – de representatiebenadering en de verwerkingsbenadering – bij elkaar te komen. In dergelijke gevallen rijst namelijk zelfs de vraag of SLI, L2 en L2-SLI kinderen de specifieke structuur uiteindelijk ooit nog onder de knie zullen krijgen.

Curriculum Vitae

Antje Orgassa was born on May, 4 1977 in Goch (Germany). After graduating from the Friedrich-Spee-Gymnasium in Geldern (Germany) in 1996, she studied speech and language therapy at the Hogeschool van Arnhem and Nijmegen from 1996 to 2000. Subsequently, she did an internship as a speech and language therapist at the Department of Neurology in the San Isidro Hospital in Buenos Aires. Between 2001 and 2003 she was enrolled in the master's program in applied linguistics at the Radboud University Nijmegen, graduating with a thesis on co-speech gesture behaviour in anomic aphasia. After finishing her master's studies, she was employed as a speech and language therapist at the Rehabilitation Center Groot Klimmendaal in Arnhem before starting as a PhD student at the Amsterdam Center for Language and Communication. This thesis is the result of the research she carried out there between 2004 and 2009. Antje Orgassa is currently a lecturer in applied linguistics at the Radboud University in Nijmegen.