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Developmental Perspectives on Transfer in Third Language Acquisition

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2013

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Citation for published version (APA):

Sayehli, S. (2013). *Developmental Perspectives on Transfer in Third Language Acquisition*. [Doctoral Thesis (monograph), Centre for Languages and Literature].

Total number of authors:

1

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TRAVAUX DE L'INSTITUT DE LINGUISTIQUE DE LUND 51

Developmental Perspectives on Transfer in Third Language Acquisition

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ISSN 0347-2558
ISBN 978-91-7473-442-3

Printed in Sweden
Tryckeriet i E-huset
Lund 2013

Für Maja und Louise

Acknowledgments

Writing this thesis has been a long journey. Many people have followed me during these years. Their impact and inspiration made it possible to pull this work off. To all of them my deepest gratitude.

I would particularly like to thank my supervisor, Gisela Håkansson, for fruitful discussions, and for giving me the freedom and space to develop and follow my own ideas. Her patience and enthusiasm did not run out even when she had to wait for yet another manuscript and when she was confronted with one of my sudden bouts of inspiration and turnabouts. I would also like to cordially thank my co-supervisor, Sven Strömqvist, whose trust in me, support and knowledge has been invaluable especially in the final phase of the thesis.

This thesis would not have been the same without the comments, ideas and profound insights that I enjoyed receiving from Marianne Gullberg. My joyous and deep gratitude to her! I would also like to express my gratitude to Annika Andersson, a rather new friend and colleague on this long thesis-journey. Her support and help in revising this thesis has made it so much better and so much more fun. Her honesty, energy and knowledge are a treasure. I would also like to sincerely thank, Joost van de Weijer, who has been the statistical angel of this thesis and whose calmness and subtle humor when faced with endless rows of zeros and ones still amaze me. Special thanks also to everybody present at my final seminar, particularly and foremost to Jonas Granfeldt, to whom I am grateful for his thorough reading of my thesis draft. His comments and thoughts improved this thesis substantially. I also would like to thank Victoria Johansson and Anita Thomas for taking their time and giving me all their helpful comments on my final thesis draft.

Further, I would like to acknowledge the teachers and students who so kindly and generously agreed to take part in my study and without whom this thesis would simply not have been possible. On the more practical side of things I would like to express my thankfulness to Malgosia Andréasson and Jesper Olsson for readily dealing with all administrative issues during my time as a PhD student. Likewise, the Technical Support Unit of the Center for Languages and Literatures, particularly Lukas Gødke, Erik Strelert, Johan Dahl and Edin Kuckovic, deserve my thankfulness for helping me out of problems I did not even understand. I would also like to sincerely thank Johan Segerbäck for his meticulous reading and correction of my English.

The list of people to thank does not end here. There is more to come. During my research visit at Hunter College, CUNY, I had the privilege to learn more about elicited

imitations from Virginia Valian to whom I am deeply grateful for giving me that opportunity. The work with her and her lab members has been a great experience. I would particularly like to thank Natalie Batmanian, who became a precious friend and with whom I indulged in discussions on language acquisition during our weekly meetings, taking a break from my maternity leave.

Back in Lund I felt warmly welcomed by all my wonderful and supportive colleagues. Thank you hela korridorerna 4 och 5! You made work during and outside office hours both inspiring and truly enjoyable. I wish to particularly thank Mikael Roll, Marcus Uneson, Gilbert Ambrazaitis, Mechtild Tronnier, Simone Löhdorf, Teresa Strandviken, Caroline Willners, Jan-Olof Svantesson, Merle Horne, Arthur Holmer, Gerd Carling, Lars Larm, Shifteh Amirhekmat, Sandra Debreslioska, Joel Parthemore, Mats André and Frida Mårtensson. I am especially indebted to the participants of the language acquisition seminar series, Malin Ågren, Suzanne Schlyter, Jonas Granfeldt, Anita Thomas and Valéria Molnár who created an enjoyable and stimulating research environment. I would also like to thank Jordan Zlatev and Göran Sonesson and all the fine Psuii-members: Elaine Madsen, Sara Lenninger and Tomas Persson for an inspiring and instructive interdisciplinary work and for allowing me to focus on something other than my thesis from time to time.

Life would not be the same without all my wonderful friends. I thank you for all meaning and joy you bring and for staying by my side even when times and I are rough. Particularly, I would like to thank Josefin Hjelm, Deniz Gharsi, Linda Gustavsson, Thomas Lunderquist, Wibke Jonas, Daniel Olsson and Adriana Castro Aguilar who have more than once been the first guinea pigs for my studies. My huge multicultural, multilingual family: Who would I be without you? Thanks to all of you! Thank you for all your support and help, Lena Olsson Löfström, Marina Linnik, Måns-Olle Olsson, Cyrus Sayehli and Pi Pilotti. I am indebted to my parents, the most zealous and persevering language learners and users I will ever know. Thank you for not wondering too loud what I was doing all these years and for believing in me and all the projects and plans I entertain.

Last but not most: thank you, Andreas. My deep gratitude goes to you. Without you, I would not have started, I would not have enjoyed, and I surely would not have finished this enterprise. You have been *mein Fels in der Brandung* all the way through.

I would like to dedicate this thesis with all my love to two young ladies, my daughter Maja and my niece Louise, who have both taught me what life is really about.

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CHAPTER 1

INTRODUCTION

1.1 Research Questions and Scope of the Thesis

Researchers generally agree that transfer from previously learned languages, be it the first (L1) or any other later-acquired language, influences a language learner's acquisition of another language on all language levels, including lexicon, syntax, morphology, and discourse (e.g., Jarvis & Pavlenko, 2008). These language-specific factors have been of special interest in the emerging field of third language (L3) acquisition, because the multilingual scenario in which L3 acquisition takes place can generate various different transfer hypotheses (e.g., Bardel & Falk, 2007; Flynn, Foley, & Vinnitskaya, 2004; Rothman, 2011). The focus of L3 acquisition studies has usually been on the initial or final state of language acquisition. However, developmental perspectives have rarely been taken. It is therefore far from clear how previously learned languages affect the development of an L3 beyond the initial state (Whong-Barr, 2006). One important claim made in this context is that the development of certain syntactic and morphological structures follows predictable, learner-general trajectories (Clahsen & Muysken, 1986; Klein & Perdue, 1992; Pienemann, 1998, 2005a, 2005b). These trajectories are thus claimed *not* to be subject to language-specific factors.

The aim of this thesis is to examine the acquisition of an L3 taking into consideration how these learner-general morpho-syntactic developmental trajectories interact with language-specific factors, namely transfer from L1 or from another previously learned language (L2). It thereby brings together two lines of research that have tended to focus on different questions and whose respective main concepts—transfer and developmental trajectories—have often been defined as mutually exclusive.

The thesis tests the predictions for L3 acquisition of several transfer hypotheses. Some of these hypotheses, such as the *Cumulative Enhancement Model* (Flynn et al., 2004), the *L2 Status Factor Hypothesis* (Bardel & Falk, 2007; Falk & Bardel, 2011), and the *Typological Primacy Model* (Rothman, 2011), focus mainly on the initial state of language acquisition. By contrast, the *Developmentally Moderated Transfer Hypothesis* (DMTH; Håkansson, Pienemann, & Sayehli, 2002) takes a developmental perspective on transfer, suggesting that the transferability of L1 or L2 structures to L3 is constrained by learner-general developmental L3 trajectories. In addition, the present thesis explores a further factor that is also suggested to influence transfer: the learner's perception of the distance between the languages in question (psychotypology).

Specifically, the work presented in this thesis examines the acquisition of L3 German by native speakers of Swedish with English as their L2. The similarities and differences among these three languages enable the exploration of different transfer hypotheses. A developmental perspective was taken by testing participants of different proficiencies quasi-longitudinally on morphological and syntactic structures representing developmental stages of L2/L3 German. Additionally structures mirroring those of the participants' L1 or L2 were tested. As a proxy for their proficiency and the length of their exposure to L3 German, the participants were grouped by school year. They completed a battery of production tasks that yielded elicited and spontaneous speech data.

The interaction of L1/L2 transfer and developmental trajectories in the acquisition of *word order* was tested by means of an elicited imitation task and two tasks generating spontaneous speech data—a picture-based storytelling task and an unstructured interview. Development in *morphology* acquisition was examined using a communicative task. Finally, a questionnaire was used to measure the participants' *psychotypological* estimate of German versus Swedish. Its results were related to the participants' elicited and spontaneous speech L3 data. The use of different tasks measuring the production of the same structures (multi-method triangulation, e.g.,

Erzberger & Prein, 1997; Kopinak, 1999; Meijer, Verloop, & Beijaard, 2002) made it possible to compare different sets of results. To the extent that such results converged, this strengthened claims about the internal validity of the research findings.

1.2. Outline of the Thesis

The thesis is organized as follows: Chapter 2 presents a review of previous research on transfer and developmental trajectories as well as a discussion of its findings. (This general background information is supplemented by more specific reviews in Chapters 4–7, which deal with the linguistic structures studied.) Chapter 3 presents the general hypotheses put forward in the thesis as regards transfer, development, and their interaction, as well as information about and reviews of the methods used in the respective studies—their design, the participants, the tasks, and the specific analyses performed. Chapter 4 presents findings about the interaction between developmental stages and transfer as regards L3 acquisition of verb placement in declarative main clauses, with a focus on L1 transfer effects. Chapter 5 examines the interaction between L2 transfer and developmental stages as regards the first position of declarative sentences. Chapter 6 explores morphology acquisition—more specifically, it studies subject–verb agreement and adjectives in attributive and predicative position. Chapter 7 examines the effects of psychotypology on L1 transfer. Chapter 8 explains the meaning and importance of the findings from the previous chapters and discusses them in light of the predictions for L3 acquisition deriving from the different transfer hypotheses presented. The findings are discussed with the interaction between developmental stages and transfer in mind. Chapter 9, finally, presents the overall conclusions that can be drawn.

CHAPTER 2

THEORETICAL BACKGROUND

2.1 Transfer

Prior knowledge of a language is one of the factors that set the acquisition of a second language apart from that of a first language (Kellerman, 2001). Transfer—the influence that this prior knowledge exerts on a person’s knowledge of another language—has been a key issue of a great deal of research in Second Language Acquisition (SLA) ever since the inception of that field. Virtually every handbook and introduction to SLA has a section on transfer, and there are numerous books, some recent, that deal exclusively with this topic (e.g., Cenoz, Hufeisen, & Jessner, 2001; Cook, 2003; De Angelis & Dewaele, 2011; Gass & Selinker, 1992; Jarvis & Pavlenko, 2008; Kellerman & Sharwood Smith, 1986; Odlin, 1989; Ringbom, 2007; Weinreich, 1953). Over the years, ideas about the role of transfer and its effects on the production and comprehension of a second language have shifted from one extreme to the other. Initially, it was believed that the acquisition of a second language was entirely based on transfer, whereas later approaches saw transfer only as a side effect. Nowadays, researchers generally agree that transfer plays a role—but the importance, the limitations, and the mechanisms of that role are still a matter of debate.

The terms *transfer* and *interference* trace their origin to the Contrastive Analysis Hypothesis (CAH; Lado, 1957), which was based on behaviorist learning theory (Skinner, 1957). The CAH suggested that detailed comparisons (contrastive analyses) of the native and the target language would predict all areas of difficulties in SLA as well as all incorrect and correct forms produced by learners. “Negative transfer” or “interference” in the form of errors was suggested to occur where the native and the target language diverged, while “positive transfer” would facilitate learning when the two languages were similar. The CAH was later discredited as transfer effects were shown to be more intricate: some errors that it predicted did not occur, while many of those that did occur could not be explained by the CAH, such as certain errors consistently made by learners irrespective of their native language background (later referred to as “developmental errors”). For example, Schumann (1979) found that learners of English initially form negations by placing *no* before the word that is meant to be negated. This pattern was observed not only in speakers whose native language has pre-verbal negation (e.g., Spanish and Italian) and where it could thus be attributed to L1 transfer, but also in speakers whose native language has post-verbal negation (e.g., German and Japanese) and where L1 transfer could thus not explain the production of that structure.

To maintain a distance from the shortcomings of CAH and its terminology, some researchers started using more theory-neutral and general terms such as *mother tongue influence* (Corder, 1992) and *cross-linguistic influence* instead of “transfer” (Kellerman & Sharwood Smith, 1986). In particular, the term “cross-linguistic influence” gained wide acceptance and became widely used in the field (e.g., Cenoz et al., 2001; De Angelis & Dewaele, 2011; Odlin, 2003). Recent critics have felt that this term is misleading in that it may suggest a situation where two or several distinct language systems are influencing each other, rather than a multilingual competence arising from the acquisition of several languages (Cook, 2003, 2002; Grosjean, 1998; Jarvis & Pavlenko, 2008). However, despite this criticism, both “transfer” and “cross-linguistic influence” have been in frequent use, and still are, indeed often interchangeably (cf. Jarvis & Pavlenko, 2008). In the present thesis, for reasons of consistency, only the term “transfer” will be used. Several arguments can be put forward in favor of this choice. First, this is the term used in the hypotheses and theories that are further explored in the empirical part of the thesis. Second, it is not (unlike “mother tongue influence”) restricted to transfer from L1 but may refer to all instances where knowledge of one or several languages influences knowledge of another language. However, it should be

emphasized in this context that it is assumed that the interaction among languages in a multilingual person is an ongoing, dynamic process capable of affecting language performance (including L1 performance) in ways that differ from what can normally be observed in monolingual speakers of any of the languages involved (cf. Jarvis & Pavlenko, 2008).

2.1.1 Transfer and L3 Acquisition

Given that the subject of this thesis is third language (L3) acquisition, there is a need for some clarification of how languages are referred to. In the SLA field, “L2” has traditionally been used as a generic term for any language learned after the first one, thus including what would chronologically be referred to as “L3,” “L4,” “L5,” etc. By contrast, in this thesis—like in the literature on L3 acquisition—the term “L2” is used to refer to all *previously* learned languages except the first one (which is the “L1”) (Hammarberg, 2001). The language a person is currently learning (and the one whose acquisition is being studied) is referred to as “L3” even though it might actually be, say, the person’s fourth or fifth one. For the purposes of this thesis, in other words, the participants’ L1 is Swedish, their L2 is English, and their L3 is German.

For a long time, transfer research in the field of SLA focused exclusively on the influence of the L1 even though researchers had long ago admitted that it was theoretically possible that other previously learned languages might also influence the acquisition of a further language (Gass & Selinker, 1992; Odlin, 1989; Sharwood Smith, 1994). Even in 2001, De Angelis and Selinker were still able to conclude that there was hardly any empirical evidence for the claim that languages learned after the first one affected the acquisition of a further language. This was partly due to the fact that there was little empirical research into any transfer other than L1 transfer (see Hufeisen, 1993; Ringbom, 1987; Singleton, 1987; Stedje, 1977 for early exceptions). However, this has since changed radically, in part as a result of increasing awareness that many language learners already know several other languages and are thus not, properly speaking, “second” language learners. In addition, a growing body of empirical evidence has shown that all languages learned by a person really do affect each other in terms of acquisition, comprehension, and production (e.g., Williams & Hammarberg, 1998). Research into what was variously referred to as “trilingualism” (e.g., Barnes, 2006), “third language acquisition” (e.g., Cenoz et al., 2001; Dentler, Hufeisen, & Lindemann, 2000; Hufeisen & Lindemann, 1998), and “multilingualism” (e.g., Aronin & Singleton,

2012; De Angelis, 2007; Leung, 2009) emerged, studying how a multilingual competence arises from the acquisition of several languages and how all of a learner's language knowledge interacts. More specifically, researchers study not only the impact of L1 on L3 but also that of L2 on L3—in other words, the effects of “background languages” on the acquisition of an L3 are explored (Falk & Bardel, 2010). What is more, transfer effects in all directions are studied: not only from L1 or L2 to L3 but also, inversely, from L2 or L3 to L1. Although researchers studying L3 acquisition stress the complexities of multilingual acquisition, thus distinguishing it quantitatively from SLA, they usually start from the assumption that L3 acquisition and SLA are qualitatively similar. However, it has also been argued that they differ qualitatively in the sense that an L3 learner, because of his or her greater and more varied experience of language learning, uses different strategies than a person who is learning his or her first foreign language (e.g., Aronin & Singleton, 2012; Bardel & Falk, 2007; Gibson, Hufeisen, & Libben, 2001; Hufeisen, 2000).

As a result of the emphasis placed in L3 acquisition studies on exploring the interaction among all languages involved, it has been possible to refine the predictions and hypotheses about transfer. New questions have been raised, such as what factors (e.g., (perceived) typological distance, recency of activation, context of use, or proficiency) influence what structure of which background language will be transferred to L3 and whether L1, L2, or both of them will be the privileged source of transfer. (These factors will be further explored below.) Studies of transfer in L3 acquisition have mainly concerned lexical transfer (Cenoz et al., 2001; Cenoz, Hufeisen, & Jessner, 2003; Dewaele, 1998), and findings from lexical transfer research have often been used as a basis for exploring transfer effects in other language areas (Falk & Bardel, 2010). More recent research has also focused on phonological, morphological, syntactic, and conceptual transfer (e.g., Bardel & Falk, 2007; De Angelis & Dewaele, 2011; Flynn et al., 2004; Foote, 2009; Llama, Cardoso, & Collins, 2010; Wrembel, 2010). However, even though the volume of research on transfer in L3 acquisition has expanded considerably over the past two decades, there is as yet no consensus as to what factors or what combinations of factors guide the interaction among multiple languages in language acquisition.

Studies of transfer have mainly explored this phenomenon in relation to either the initial or the final state of L2/L3 acquisition (e.g., Dewaele & Véronique, 2001; Leung, 2005; Rankin, 2009; Rothman & Cabrelli Amaro, 2010; Schwartz & Eubank, 1996). The final

state has been of interest to examine what the L2 learner is ultimately capable of (Steinhauer, 2006), whereas research on the initial state has focused on what the learner brings to the acquisition task and what the mechanisms governing language learning are. It is important to note that the concept of “initial state” is quite differently operationalized across studies of L2/L3 acquisition. Sometimes it is defined by reference to the learner’s proficiency in the target language (e.g., Schwartz & Sprouse, 1994, 1996), sometimes by reference to the time that the learner has been exposed to it. Considering the latter, a small number of studies have focused on the very first encounter with the target language (e.g., Bardel & Falk, 2007; papers in Gullberg & Indefrey, 2010; Rast, 2008). More commonly, however, studies define the initial state somewhat vaguely by reference to short exposure to the target language (Bohnacker, 2006; Håkansson et al., 2002). It has been assumed that transfer effects are the most prominent in the early stages of acquisition, which explains the focus on the initial state (Jarvis & Pavlenko, 2008; Ringbom, 2007; Rothman, 2011). As mentioned before, the interaction between transfer and the learner’s language development has rarely been studied beyond the initial state (Whong-Barr, 2006), although general ideas about their interaction have been mentioned (Perdue, 2006; Ringbom, 2007; Schwartz & Sprouse, 1994, 1996; Wode, 1976, 1978; Zobl, 1980). For example, Wode (1977), studying the acquisition of English negation by German native speakers, suggested that learners must attain a certain level of L2 development in relation to a structure before L1 transfer of that structure can occur.

2.1.2 Taxonomies of Transfer

The research carried out in the field of transfer covers several transfer types and represents various approaches and perspectives. Jarvis and Pavlenko (2008) provides a useful taxonomy describing ten dimensions along which different types of transfer can be characterized (Table 1.1). This taxonomy gives an overview of the complexity of transfer and is useful in the specification of the focus of research. The presentation and discussion of dimensions below is restricted to those dimensions that were deemed important for the present thesis. The subsequent presentation of findings focuses on L3 acquisition research but also takes findings from traditional SLA research into account.

Table 1.1

Taxonomy of Types of Transfer along Ten Dimensions (Jarvis & Pavlenko, 2008)

Dimension	Types of transfer
1. Area of language knowledge	phonological, orthographic, lexical, semantic, morphological, syntactic, discursive, pragmatic, sociolinguistic
2. Directionality	forward, reverse, lateral, bi- or multidirectional
3. Cognitive level	linguistic, conceptual
4. Type of knowledge	implicit, explicit
5. Intentionality	intentional, unintentional
6. Mode	productive, receptive
7. Channel	aural, visual
8. Form	verbal, non-verbal
9. Manifestation	overt, covert
10. Outcome	positive, negative

2.1.2.1 Areas of language knowledge

Transfer affects different areas of language knowledge and has been studied on different language levels. While there is extensive research on certain areas, such as lexical (e.g., Arabski, 2006) and syntactic transfer (e.g., Gass, 1979), other areas such as conceptual transfer (e.g., Odlin, 2005) and sociolinguistic transfer (e.g., Fouser, 2001) have been given little attention. Although there is an expectation of transfer effects in certain areas (e.g., lexicon and phonology) but more skepticism about their strength and frequency in other areas (e.g., syntax and morphology), it is generally accepted that transfer can take place in all areas of language knowledge (Jarvis & Pavlenko, 2008; Odlin, 1989). This thesis focuses on syntactic and morphological transfer.

The idea of syntactic transfer has long been controversial. According to the behaviorism-based CAH, a complete transfer of syntax from L1 to L2 was to be expected (Lado, 1957). Thus all syntactic L2/L3 errors were thought to originate from transfer. However, as the CAH could explain neither avoidance or overgeneralization of structures (Schachter, 1974) nor developmental errors, its all-encompassing concept of “transfer” was refuted (see above). The finding of developmental errors led to a view of learner languages as language systems capable of being studied in their own right rather than merely being defective versions of the native or target language (Corder, 1971; Nemser, 1971; Selinker, 1972). In the study of learner languages, referred to as “Interlanguages,” transfer in general and syntactic transfer in particular was considered to be one of multiple factors that affected acquisition. By contrast, some researchers

considered syntax to be virtually immune to transfer effects because L1 influence on syntax seemed to be absent in some studies of L2 developmental sequences (Dulay & Burt, 1973, 1974; Krashen, 1981; see Odlin, 1989 for an extensive review on controversies about transfer in syntax).

Today there is a consensus that transfer does affect L2/L3 syntax (for a review see Jarvis & Pavlenko, 2008; or Odlin, 1989). Syntax transfer effects have been found in comprehension (e.g., Foote, 2009; Heilenman & McDonald, 1993; Su, 2001) and production (e.g., Vainikka & Young-Scholten, 1994) as well as in relation to grammatical judgments (e.g., Gass, 1979; Zobl, 1992).

Studies have been conducted in relation to various language combinations. Languages from virtually every language family have been studied as L1, but the range of target languages (L2s or L3s) is much more limited. Mostly Germanic and Romance languages have been studied, with English being at the top—not surprisingly, considering that it is the global *lingua franca* of the present time and hence often the first foreign language learned according to curricula all over the world (Phillipson, 2003). English is not only the most frequent target language in traditional SLA research but also the most frequent L2 in L3 acquisition research (see Chapter 2).

Various syntactic structures have been studied in research on syntactic transfer, particularly word order phenomena such as the placement of adverbials, negation, subject–verb inversion, and null subjects (Bardel & Falk, 2007; Håkansson et al., 2002; Jegerski, VanPatten, & Keating, 2011; Zhang, 2008; Zobl, 1982). Much of the research on syntactic transfer has been conducted within a Universal Grammar (UG) approach (Chomsky, 1981, 1995). Accordingly, common research questions are to what extent the UG is accessible; whether there is full, partial, or no transfer of L1 or L2 parameter settings to L3; whether clusters of structures associated with a certain parameter are acquired; etc. (Eubank, 1996; Hawkins & Chan, 1997; Leung, 2003, 2005, 2006; Schwartz & Sprouse, 1996; Vainikka & Young-Scholten, 1994). While its specific questions may not always be relevant outside UG theory, the data gathered remain useful for the field as a whole, and the findings clearly indicate that there is syntactic transfer in L2 and L3 acquisition (Jarvis & Pavlenko, 2008). Generally, studies of syntactic transfer have found that the influence of prior language systems in the area of syntax does not only manifest itself in right or wrong language behavior but also, more subtly, in preferences for certain structures and in the transfer of frequencies, causing specific structures to be over- or underproduced (e.g., Haukås, 2009; Schachter, 1974).

Like syntactic transfer, the idea of morphological transfer has met with skepticism. There is a general consensus that if morphological transfer occurs, it will be free rather than bound morphemes that transfer (Murphy, 2003). Since this thesis explores only the transfer and development of inflectional morphology, the review below is restricted to research into bound-morpheme transfer.

Transfer of inflectional morphology can be studied from different perspectives. If the transfer of language-specific forms of morphemes is studied, *lexical* issues are explored. *Conceptual* or *semantic* issues are examined when morphology is studied from the viewpoint of how certain concepts and meanings, such as gender, tense, or number, are expressed. Finally, *grammatical* issues are dealt with when what is studied are patterns of agreement, such as suffixes indicating subject–verb agreement.

The literature suggests that transfer of bound-morpheme forms is possible but rare (Eubank, Bischof, Huffstutler, Leek, & West, 1997); there are reports of isolated instances (De Angelis & Selinker, 2001; Hammarberg, 2001; Jarvis & Odlin, 2000). This type of transfer involves the mixing of background and target language forms, such as *tälten*—consisting of a Swedish stem *tält* ‘tent’ and a German infinitive ending *-en*—which was produced by an English L1/German L2 speaker learning Swedish L3 (Hammarberg, 2001). Such *lexical inventions* (Dewaele, 1998; Ridley & Singleton, 1995) seem to be more frequent in L3 than L2 acquisition (Murphy, 2003). It has been suggested that they are more likely to occur if the source and recipient languages have similar word stems (Jarvis & Pavlenko, 2008).

Conceptual/semantic transfer is the subject of a recent line of transfer research (e.g., Odlin, 2005) in relation, *inter alia*, to transfer of morphology. For example, Jarvis and Odlin (2000) found that Finnish L1 speakers (with an agglutinative bound-morpheme system in their L1) differed from Swedish L1 speakers (with free prepositional morphology in their L1) when making spatial references in L2 English.

Transfer of grammatical morphemes and agreement has been extensively studied in production (e.g., Schimke, 2011) and processing research (e.g., Sagarra & Herschensohn, 2010), often using UG approaches focusing on the question of whether learners can acquire grammatical features of functional categories (such as number, gender, or tense) that are not present in their L1. The approaches taken differ in whether the underlying functional categories in the learner are assumed to be intact (e.g., Epstein,

Flynn, & Martohardjono, 1996; Herschensohn, 2001; Ionin & Wexler, 2002; Lardiere, 1998a, 1998b; Prévost & White, 2000; Schlyter, 2003; Schwartz & Sprouse, 1994, 1996), deficient (e.g., Beck, 1998; Clahsen & Felser, 2006; Eubank, 1996), or absent (e.g., Dimroth, Gretsche, Jordens, Perdue, & Starren, 2003; Meisel, 1997; Vainikka & Young-Scholten, 1996a, 1996b). They can be further distinguished according to whether this state is considered to be permanent (Eubank, 1996; Meisel, 1997) or transitory in the sense that the representation of functional categories can reach native-likeness after a process of structure-building (Dimroth et al., 2003; Schimke, 2011; Vainikka & Young-Scholten, 1996a, 1996b). The above-cited studies have arrived at conflicting results and conclusions as regards whether learners can acquire grammatical features of functional categories and as regards the extent to which they are affected by transfer.

2.1.2.2 Directionality of transfer

The languages in the learner's mind can influence each other in all directions. Even though what has been studied are mostly L1 effects on L2 or L3 acquisition (*forward transfer*), research has also shown that the acquisition and use of an L2 or L3 can have an effect on the native language (*reverse* or *backward transfer*) (A. Brown & Gullberg, 2008, 2010; Cook, 2003). One quite pronounced and easily observable case of reverse transfer, which is presumably not qualitatively different from other reverse transfer, is *language attrition*. This refers to change in L1 due to L2 interference and is most evident among speakers who use a language other than their L1 in important domains on an everyday basis (Köpke & Schmid, 2004; Schmid, 2011; Schmid & Köpke, 2009).

“Lateral transfer” has been suggested as a term for transfer effects of languages other than L1 (Jarvis & Pavlenko, 2008). It could be possible to characterize lateral transfer as forward transfer (i.e., L2 on L3) or reverse transfer (i.e., L3 on L2), but research suggests that, in practice, the chronology of acquisition implied in the terms “forward” and “reverse” only sets the L1 apart from all other subsequently learned languages (Jarvis & Pavlenko, 2008). As regards, for example, whether L3 or L4 will transfer to L5, factors such as proficiency, typology, and recency of activation are presumably better predictors than the order of acquisition (e.g., Dewaele, 1998; Rothman & Cabrelli Amaro, 2010; Williams & Hammarberg, 1998). In this thesis, L3 German is explored as the recipient language (i.e., the language transferred to) and L1 Swedish and L2 English as source languages (i.e., the languages transferred from). This means that forward transfer and lateral transfer are the directions that will be studied.

2.1.2.3 Intentionality and type of knowledge

The traditional aim of transfer research has been to study unintentional influences from the languages a learner knows, but transfer can also be intentional (Jarvis & Pavlenko, 2008). Studies of intentional transfer have explored this as a communication strategy or as code-switching (Dörnyei, 1995; Dörnyei & Scott, 1997; Odlin, 1989). Intentional transfer presupposes explicit associations between two language systems as typologically close. It has been suggested that learners form subjective associations that do not necessarily overlap with linguistically established typological similarities (Kellerman, 1986). Whether these associations are used intentionally has not been explored. It is conceivable that once an association has formed, transfers could be made intentionally as well as unintentionally. However, it cannot be determined based on production data alone whether or not a particular transfer is intentional. To assess intentionality, some studies have used introspection in form of thinking-aloud protocols during or shortly after participants' language production (Jessner, 2006; Williams & Hammarberg, 1998), questionnaires, or interviews based on self-reports (Hufeisen, 2000).

2.1.2.4 Mode and channel

Standard language tests traditionally distinguish four language skills: speaking, writing, reading, and listening (e.g., TISUS (the standard Swedish-language proficiency test for university-level studies) and the Michigan Test of English Language Proficiency). These skills are usually differentiated in terms of their mode (production versus comprehension) and channel (oral/auditory versus written). Although occurrences of transfer have been mostly studied in oral production (e.g., Bardel & Falk, 2007), other studies have explored transfer effects in auditory comprehension, written production, and reading (e.g., Foote, 2009; Heilenman & McDonald, 1993; Ringbom, 1992; Su, 2001). The studies presented in this thesis investigate transfer phenomena in learners' oral production and, to some extent, in their comprehension.

2.1.2.5 Outcome

Traditionally, instances of transfer have been evaluated in terms of their grammaticality—that is, on the basis of whether the outcome would be judged by native speakers as acceptable. Transfer resulting in a grammatical outcome is an example of *positive transfer*, whereas when transfer results in an ungrammatical outcome it is an instance of *negative transfer*. The identification of negative transfer is simple and unproblematic: it is easy to see when something deviates from the target language

norms. Not surprisingly, much research has focused on this type of transfer. The frequent occurrence of negative transfer in a certain context has been taken as an indication that a certain form or structure is difficult to acquire, meaning that teachers should intervene in those contexts. However, negative transfer may account only for a small proportion of all transfer effects (Jarvis & Pavlenko, 2008), especially considering that it does not include subtle effects such as avoidance of structures (Schachter, 1974) or overgeneralization (Haukås, 2009). More recently, researchers have focused on positive transfer, which may occur when two languages are similar, as learners are expected to search actively for similarities in order to facilitate their learning task (e.g., Kecskes & Papp, 2000; Ringbom, 2007). The present thesis explores the effects of L1, L2, and developmental trajectories on the acquisition of L3. Because the learners' L1 and L2 differ in where they are more or less similar to their L3, whether there is negative or positive transfer in a certain area would depend on which language is exerting a dominant influence. Accordingly, both positive and negative transfer will be explored in this thesis.

2.1.3 Transferability

A variety of factors may affect what structures will be transferred in L3 acquisition. Some such factors will be discussed in greater detail below, along with the hypotheses that are further explored in the empirical part of the study, namely the Cumulative Enhancement Model (Flynn et al., 2004), the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011), the Typological Primacy Model (Rothman, 2011), and the Developmentally Moderated Transfer Hypothesis (DMTH; Håkansson et al., 2002). They all differ in the relative importance they ascribe to the various factors that might affect transferability.

2.1.3.1 Cross-linguistic similarity and difference

“Cross-linguistic similarity” or “typological similarity” is used in the L3 literature to refer, loosely, to an overall similarity between languages, language areas (i.e., lexicon, syntax, and morphology), specific structures, or items (De Angelis, 2007; Foote, 2009; Ringbom, 2007).

Lexical and syntactic transfer have been found to be more frequent with greater typological closeness (Cenoz, 2001; Leung, 2005; Ringbom, 1987). More recent research suggests that it is not the typological closeness as such of two languages but

rather the similarity of particular structures in them that causes transfer (Flynn et al., 2004; Ringbom, 2005). Ringbom (2007) has suggested to differentiate three similarity relations between languages: similarity relation, contrast relation and zero relation. In the first a one-to-one relationship of function and form in both languages is established (e.g., genitive marked by *-s* on the noun in both English and German). In the contrast relation, there is a similarity in function alone (e.g., subject–verb agreement exists in both English and German but is realized differently in the two languages). Finally in the zero relation, there is no similarity in either function or form. In this third case, a delay in acquisition and a higher frequency of errors are expected because the absence of a concept in L1 can negatively affect the acquisition of that concept in L2, such that this concept is acquired later than would be expected from how that language typically develops as an L1.

The *Cumulative Enhancement Model* (Flynn et al., 2004) attaches importance to cross-linguistic similarity. It suggests that all languages—L1 and any L2s— that a person has learned are equally available and that, if similar, they can all transfer to the target language. Crucially, Flynn and colleagues (2004) claim that language acquisition is cumulative and enhanced by prior knowledge, such that only positive effects of previously learned languages are expected.

2.1.3.2 Psychotypology

The concept of “psychotypology” was introduced by Kellerman (1977, 1979, 1983; 1986) to highlight the fact that the perceived distance between two languages does not necessarily correspond to the typological distance between them, which is assessed on more objective linguistic grounds. Kellerman suggested that it is psychotypology rather than typology that affects transfer (Kellerman, 1986). In addition, it has also been suggested that transfer is triggered by perceived similarities rather than by perceived differences (Jarvis & Pavlenko, 2008). It is assumed that a person’s psychotypological estimate will change as the person acquires more information about the target language (Kellerman, 1979) and also that the estimate will vary depending on the level at which the two languages are compared (De Angelis, 2007). Sometimes a distinction is made between “perceived” and “assumed” similarity. The former refers to experienced similarities and is suggested to cause semantic and conceptual transfer. The latter refers to *a priori* hypotheses made about the similarity of two languages and is argued to lead to syntactic transfer (Falk, 2010; Ringbom, 2007). The concept of psychotypology has recently attracted new interest in the field of transfer studies (see Chapter 8).

In the *Typological Primacy Model* (Rothman, 2011), which focuses on morpho-syntax, psychotypology is suggested to be the most important factor for determining which language (not which structure) will transfer to L3. According to this model, that language will then be the source of both positive and negative transfer. However, Rothman's studies did not include any measure of psychotypological closeness, because this was regarded as unconscious and also because it was claimed that any conscious psychotypological estimates would have no effect on transfer. In the present thesis, (conscious) psychotypology was measured using a questionnaire and the results obtained were compared with the occurrences of positive and negative transfer found in the data from the participants.

2.1.3.3 The privileged role of L1

L1, being the first language learned, has been suggested to have a privileged role in cases where various languages are competing to be the source language of transfer. There are some studies that find evidence for transfer to occur predominantly from L1 to L3, particularly in the realm of morpho-syntax (F. Jin, 2009; Na Ranong & Leung, 2009; Ringbom, 2005). Leung (2005) hypothesized, in an L3 extension of the L2 approach used by Hawkins and Chan (1997), that a learner cannot acquire L2 features that are absent in his or her L1 and thus will not be able to transfer such features from L2 to L3. This means that it is irrelevant whether L2 and L3 are similar. The initial L3 state will essentially be the final L1 state. However, counterevidence was found questioning this hypothesis, since there were indications of L2 transfer in her study, which explored the acquisition of French as L2 or L3, respectively (Leung, 2005).

It has also been suggested that L1 is the predominant source of transfer only in certain language areas. Ringbom (1987, 2001) found that meaning is transferred from L1, while forms may also transfer from L2. However, the findings concerning a privileged role for L1 in L3 acquisition are conflicting: some studies indicate a stronger L2 than L1 influence, suggested to be mediated by similarities between L2 and L3 (e.g., Foote, 2009).

2.1.3.4 L2 status

Findings of missing positive transfer of word order from L1 to L3 (Sayehli, 2001) have been explained by reference to L2 blocking access to L1 in L3 acquisition (Bardel &

Falk, 2007; Bohnacker, 2006). This phenomenon is at the origin of the *L2 Status Factor Hypothesis* (Bardel & Falk, 2007; Falk & Bardel, 2011), according to which transfer from L2 to L3 will occur irrespectively of the languages' typological or structural similarity. Importantly, L2 structures will transfer even if L1 transfer—unlike L2 transfer—would have generated target-like structures (Falk, 2010). Others have suggested that L2 transfer occurs only with high L2 proficiency (Hammarberg, 2001; Ringbom, 1983, 2005; Williams & Hammarberg, 1998) or only with high L2 proficiency combined with long L2 exposure (M.-C. Tremblay, 2006). The claim that L2 transfer is more likely than L1 transfer has been explained as the “foreign language effect” (De Angelis & Selinker, 2001; Llana, Cardoso, & Collins, 2008), given that learners are thought to form cognitive connections between their various “foreign languages” rather than between their L1 and the L3 (De Angelis, 2005). Further, reliance on L2 instead of L1 in L3 acquisition has been explained as motivated by an unconscious fear of transferring from L1; this phenomenon has been referred to as “homoiphobia” (Kellerman, 2000).

2.1.3.5 Age

The age factor can refer to effects of aging (e.g., maturation), age at task (i.e., a participant's chronological age at the time of taking a test), and age of acquisition (i.e., the age at which a person started to acquire the target language). Of these three, the effects of the age of acquisition (AoA) on how learners master an L2 have been explored most extensively (e.g., Abrahamsson & Hyltenstam, 2009; Johnson & Newport, 1989; Marinova-Todd, Marshall, & Snow, 2000; Singleton & Ryan, 2004; Steinhauer, White, & Drury, 2009). The interaction between AoA and transfer has not received the same attention (but see e.g., Hohenstein, Eisenberg, & Naigles, 2006; Mihaljevic Djigunovic, 2010); the findings so far indicate that older learners are more prone to transfer than younger ones, particularly in the area of phonology. It has been suggested that the more firmly established L1 is at the AoA of L2, the more strongly L1 will influence the acquisition of L2 (e.g., Flege, Schirru, & MacKay, 2003; Guion, Flege, Liu, & Yeni-Komshian, 2000). The idea is that even though the phonetic system of L1 and L2 can be activated to various degrees, none of them can be fully deactivated when one of the languages is in use. The more firmly the L1 is established the more difficult it will be to deactivate or inhibit it completely when using the L2.

It has also been argued that the amount of lexical transfer will be larger with a higher AoA (e.g., Cenoz, 2001; Hohenstein et al., 2006). Claims have been made that the

reason for the increase in the extent of lexical transfer is to be found in the more advanced metalinguistic skills of adults and older children (Cenoz, 2001). However, that study did not control for the duration of production, and nor was the extent of transfer reported in terms of proportions. In fact, it is conceivable that the older participants simply produced more language output and therefore had a larger absolute number of instances of transfer. A general difficulty causing results to be inconclusive is that AoA is often confounded with other variables. Particularly in studies of immigrant groups, a later AoA has been found to correlate with a higher age at task, shorter exposure to the target language, and less target language use (Guion et al., 2000).

2.1.3.6 Context

The setting in which a conversation takes place affects the likelihood of transfer. The topic has turned out to affect transfer both positively and negatively, while the formality of the conversation has only been shown to have negative effects (Dewaele, 2001; Grosjean, 1998). However, the effects of greatest relevance for the present thesis have been found for the interlocutor: having a bilingual interlocutor in a conversation increased the extent of transfer compared with having a monolingual interlocutor (Hammarberg, 2001). This is thought to be due to the speaker changing from a “monolingual mode” to a “bilingual mode” (Grosjean, 1998). To reduce transfer effects caused by the context, it is therefore preferable for a researcher to keep participants in a monolingual mode by speaking only one language during sessions (see Chapter 3).

2.1.3.7 Proficiency

Proficiency has been claimed to affect transfer in several ways. A negative relationship between transfer and L3 proficiency has been suggested in the sense that the amount of transfer from L1 and L2 to L3 will decrease with higher proficiency in L3 (Guion et al., 2000; Möhle, 1989; Poullisse, 1990; Ringbom, 1987). However, the extent of transfer from L2 to L3 is thought to correlate positively with L2 proficiency (Bardel & Falk, 2007; Hammarberg & Williams, 1993; Stedje, 1977). There has even been a suggestion of an L2 proficiency threshold below which no transfer will take place, but this has not been properly explored (Hammarberg, 2001; Ringbom, 2005; Williams & Hammarberg, 1998).

2.1.4 Identifying Transfer

Errors have often been defined as negative transfer *post hoc*. However, a better approach is to define transfer by reference to intra-group homogeneity, inter-group heterogeneity, and cross-linguistic performance congruity (Jarvis & Pavlenko, 2008). “Intra-group homogeneity” refers to the existence of similar patterns of transfer within a group of speakers with the same combination of L1, L2, and L3. “Inter-group heterogeneity” is defined as the existence of dissimilar patterns in production between groups that (a) differ in the source language of transfer to L3, i.e., L1 and L2, respectively; (b) are bilingual and monolingual native speakers, respectively, of L3; or (c) are bilingual and monolingual native speakers, respectively, of the language which is the source of transfer. One example of inter-group heterogeneity is a project that was originally designed to study transfer: the European Science Foundation’s project on Second Language Acquisition by Adult Immigrants (Klein & Perdue, 1992), where the acquisition of five different target languages was studied. For each target language, two learner groups with different source languages were selected. Finally, “cross-linguistic performance congruity” refers to production across languages by the same speaker. While there is no need to use all of these approaches in a study, comparisons across studies would be facilitated if there was a consensus to use one of them.

In the present thesis, all three approaches were used (see Chapter 3). Inter-group heterogeneity and cross-linguistic performance congruity were used by means of comparisons with a native speaker group and by means of an elicitation task performed in both L1 and L3. Intra-group homogeneity was investigated through analyses of variation in production within each group.

2.2 Developmental Trajectories

2.2.1 Overview

The acquisition of a second language develops over time. It can be approximated with a gradual increase in the complexity of the target language (Perdue, 2006). The course of development has been related to L2/L3 input and the role of L1; more importantly,

however, some features have been suggested to be independent of both L1 and L2/L3 (Corder, 1971; Nemser, 1971; Perdue, 2006; Selinker, 1972), such that the language produced is thought of as a system in its own right, which is why it has also been referred to as a particular type of language (i.e., “Interlanguage”; see above). Despite great individual variation in L2 production, similar developmental patterns have been discerned. These are referred to as “developmental stages” and have been defined by reference to the production of different grammatical properties (Perdue, 2006). That the development is similar across individuals has been explained by reference to universal, general language-learning mechanisms. The type of underlying mechanism postulated differs across theories (Clahsen & Muysken, 1986; Eubank, 1996; Klein & Perdue, 1992; Meisel, Clahsen, & Pienemann, 1981; Perdue, 2006; Pienemann, 1998, 2005b; Vainikka & Young-Scholten, 1994, 2005). Studies of developmental stages have focused on the acquisition of morphemes, morpho-syntax, information structure, word order, and features such as tense and aspect, in isolation or in combination with each other, depending on the theory (Bardovi-Harlig, 2000; Dimroth & Starren, 2003; Dulay & Burt, 1974; R. Ellis, 1994; Hyltenstam, 1977; Klein & Perdue, 1992; Pienemann, 1998; Vainikka & Young-Scholten, 2005).

Traditionally, theories using *representational approaches* have assumed the developmental trajectories to be “staged” in that the acquisition of a certain structure occurs throughout the grammar at the same time (McLaughlin, 1990). However, empirical data have failed to support this hypothesis in that no leaps between suggested stages have been found. Instead, development has been found to be stable for lengthy periods and to undergo short periods of transitions, leading to a sigmoid learning curve (Sharwood Smith & Truscott, 2005). It is assumed that, during the transitional phases, the language system is being restructured so that new representations are created (Ingram, 1989; Lightfoot, 1999).

Empirical data have also shown learners to be at several adjacent stages at the same time, for example alternately producing grammatical and ungrammatical structures. This coexistence of two or more variants of a given construction produced by the same learner has been difficult to explain for representational nativist approaches. This is because the underlying abstract representation of a construction is assumed to have undergone restructuring once a new variant appears, meaning that it should strictly speaking no longer be possible to generate the “older” variant. Such phases of coexistence of stages and variants have been referred to as “syntactic optionality”

(Sorace, 2000). The attempts made to solve the problem have mainly consisted in questioning whether true optionality exists. It has been suggested, for example, that the variant structures are not tied to the same lexical items. This explanation fits well with certain hypotheses that expect grammar acquisition to be lexically driven, meaning that structures are first acquired together with specific lexical items and are only later generalized to a category of words (e.g., Pienemann, 1998, 2005a, 2005b). In the same vein, it has been explored whether purportedly optional structures really express the same meaning. Further, syntactic optionality has been loosely ascribed to performance, leaving the idea of a single representation intact. Yet other approaches have explained optionality by reference to competition between different structures, which are selected on the basis of different thresholds of activation (Sharwood Smith & Truscott, 2005). However, as yet there has been no complete explanation of the empirical data that fits into the general representational framework (Sorace, 2000).

On the other hand, in theories taking an *emergentist* or *usage-based approach* under which language is seen as dynamic and variable, grammatical rules are expressed in terms of statistical probabilities. These theories therefore have no difficulty explaining the coexistence of variants of a construction that belong to different stages of acquisition (e.g., N. C. Ellis & Larsen-Freeman, 2006; Tomasello, 2003). In fact, from an emergentist perspective, variation such as that found in “phases of optionality” is characteristic of language acquisition. Language is assumed to be learned through the acquisition of single items from which the learner will generalize to item-based schemas and constructions. Different emergentist schools of thought disagree about whether these generalizations are formed by association or whether they will finally form categorizations and linguistic representations. However, importantly, it is generally assumed that these constructions are always affected by frequency and item effects deriving from the learner’s input and output. This means that variation is a necessary consequence of the generalization process.

2.2.2 Acquisition Criterion

The operational definition of “acquisition” used in a study will affect the interpretation of data and the delimitation of developmental stages. Ever since R. Brown (1973) used an acquisition criterion of 90% correct in obligatory contexts when studying first language acquisition, the percentage of accurate use has been a frequent definition of

acquisition in L2 studies as well (e.g., Dulay & Burt, 1974; Vainikka & Young-Scholten, 1994). Although the percentage chosen will thus define acquisition in the context of a given study, theoretical reasons have only rarely been given for such choices and cut-off points have often been set at seemingly arbitrary levels (Pallotti, 2007). There are in fact studies where changing the acquisition criterion reversed the order of acquisition for specific structures (Glahn et al., 2001; Hatch & Farhady, 1982; Hawkins, 2001; Jansen, 2000). Therefore it is not surprising that the use of accuracy criteria has been controversial, even though they are still used. In addition, a focus on “accuracy” as defined by reference to “standard” language norms will lead to other—“non-standard”—forms not being studied; this problem has been referred to as the “comparative fallacy” (Bley-Vroman, 1983).

Emergence as an acquisition criterion is less arbitrary than percentages of accuracy and relies on qualitative changes rather than quantitative ones (R. Ellis, 1994; Pallotti, 2007; Pienemann, 1998). However, while emergence as a criterion is sufficient for initial learning, it fails to address levels of mastery more important for higher-proficiency learners (Bartning, 2000). Emergence has been most frequently used as a criterion in research within Processability Theory (PT) and its precursors (e.g., Meisel et al., 1981). In these studies, emergence has been defined as the first systematic and productive use of a structure. To establish systematicity, distributional analyses of form–function relationships need to be performed. For example, morphemes that can mark both plural and gender are analyzed separately for each function—a process called “factorization.” This approach makes it easier to find patterns, even ones that are not target-like. However, especially in studies of morpheme acquisition, the thresholds of production set for incipient systematicity have varied (Glahn et al., 2001; Pallotti, 2007; Zhang, 2005). To exclude the use of unanalyzed forms learned as chunks, productivity is defined by reference to lexical and morphological variation such that minimal pairs need to occur (e.g., both a plural and a singular form of the same noun) involving different lexical items (lexical variation). In the present thesis, a morpheme was assumed to have emerged when there were at least two minimal pairs (see Chapter 7).

2.2.3 Developmental Trajectories for German

2.2.3.1 Word order

Developmental trajectories in untutored L2 and L3 acquisition of German word order were established by the ZISA project for native speakers of Italian, Spanish, and Portuguese (Meisel et al., 1981). This work has been further explored and revised by PT (Pienemann, 1998, 2005a, 2005b). Of the seven stages in the development of word order originally postulated, six remain and are presented below (Pienemann, 1998; Table 2.1). This developmental trajectory has also been supported in later studies of native speakers of English and Swedish (Håkansson, 2001; Håkansson et al., 2002; Jansen, 2008). Further, it has been shown that, in line with the Teachability Hypothesis (Pienemann, 1985), teaching did not change the order in which the structures appeared (Boss, 1996; R. Ellis, 1989; Pienemann, 1989). However, other studies have only supported the trajectory with revisions, for example to the effect that the initial state did not have to adhere to SVO order but could also be transfer of SOV structures from L1 (for Turkish L1 and Korean L1: Vainikka & Young-Scholten, 1994). Further, in two longitudinal studies of children’s L2 acquisition, both Italian and Russian L1 speakers were found to acquire INV and V-END (see Table 2.1) simultaneously (Haberzettl, 2005; Pienemann, 1981). In the present thesis, the focus is on the progressive acquisition of Stages 2 and 3 as well as Stages 3 and 5 (Table 2.1).

Table 2.1

Developmental Stages in the Acquisition of German Word Order

Developmental Stages	Examples
1. One word/chunks	
2. SVO (canonical word order: subject–verb–object)	<i>*Der Mann wird putzen die Schuhe morgen</i> ‘the man will polish the shoes tomorrow’
3. ADV (fronted adverbials)	<i>*Morgen der Mann wird putzen die Schuhe</i> ‘tomorrow the man will polish the shoes’
4. SEP (verb separation)	<i>*Morgen der Mann wird die Schuhe putzen</i> ‘tomorrow the man will the shoes polish’
5. INV (subject-verb inversion)	<i>Morgen wird der Mann die Schuhe putzen</i> ‘tomorrow will the man the shoes polish’
6. V-END (finite verb in subclause final position)	<i>Ich glaube, dass der Mann die Schuhe putzen wird</i> ‘I think that the man the shoes polish will’

Note. * indicates ungrammatically in standard German. Note that although the example sentences of stage two, three and four are ungrammatical in this table, not all sentences of these stages need to be so. For example, a sentence of stage one without a complex predicate would have been grammatical (e.g.; *Der Mann putzt die Schuhe morgen* ‘the man polishes the shoes tomorrow’).

During the first stage, only words or chunks appear. During the second stage, the learner produces sentences with stable SVO order and no other constituents; if adverbials are produced at this stage, they appear in sentence-final position. Next, in ADV, the learner begins to front adverbials but retains the canonical SVO order, such that the verb appears in third position, violating the German verb-second (V2) rule. In standard German, the adverb-fronting rule is optional, that is, the adverb can also appear in final or sentence-internal position where it does not trigger a change in verb placement. In SEP, the learners place non-finite verbal elements (participles, infinitives, particles) in sentence-final position, while the finite verb stays in second position. The verb group is thus separated, in accordance with standard German. However, at this stage the learner generalizes this pattern to subordinate clauses as well, which deviates from standard German. At the fifth stage, INV, the learner places the verb in sentence-second position, resulting in subject–verb inversion when adverbials are fronted, in agreement with the obligatory rule of standard German. Finally, during the sixth stage, the learner puts the finite verb in sentence-final position (V-End) in subordinate clauses, adhering to standard German word order.

2.2.3.2 Morphology

According to the most general description of the developmental trajectories in L2 acquisition of inflectional morphology, there are three stages (N. C. Ellis, 2002; Housen, 2002). In the first stage, learners produce invariant default forms. In the second stage there appear various inflectional morphemes in free variation, indicating that the function is not yet acquired. In the third stage, where the distribution is more systematic and target-like, form–function relationships can be observed.

The acquisition of inflectional morphology has been studied not only in terms of what types of suffixes appear when (Diehl, Christen, Leuenberger, Pelvat, & Studer, 2000; Pishwa, 1985) but also in terms of their form–function relationships (Glahn et al., 2001). Subject–verb agreement in particular has also been studied in connection with syntactic phenomena, given that some researchers have found the acquisition of verb-second (V2) word order and finiteness to be developmentally related in L2 acquisition (e.g., duPlessis, Solin, Travis, & White, 1987; Parodi, 2000; Tomaselli & Schwartz, 1990). According to PT, morphemes are acquired by type of grammatical information exchange, such that lexical morphemes are acquired before phrasal and inter-phrasal morphemes (Pienemann, 1998, 2005a, 2005b). The relevant distinction concerns the structural distance over which grammatical information is exchanged. In lexical

morphemes there is no grammatical exchange at all, while in phrasal morphemes the exchange takes place within a phrase, for example when an adjective and a noun agree in a noun phrase. Verb inflections in subject–verb agreement are an example of interphrasal morphemes where grammatical information is exchanged across phrases (noun phrase and verb phrase). This developmental trajectory has been supported by a longitudinal study of L2 German (Pienemann, 1998) and a cross-sectional study of L2 acquisition of Scandinavian languages (Glahn et al., 2001).

2.2.2.4 Developmentally Moderated Transfer Hypothesis

Studies of developmental trajectories explore universal aspects of L2 acquisition and commonly do not focus on language-specific factors such as transfer (but see Spada & Lightbown, 1999). The *Developmentally Moderated Transfer Hypothesis* (DMTH; (Håkansson et al., 2002) combines both factors and takes a developmental perspective on transfer. It expects transfer to occur as a function of the constraints of the learner’s language at a given time. Only when a learner is developmentally ready will he or she transfer a given structure. The DMTH was formulated within the framework of PT (Pienemann, 1998). Similar ideas have been expressed prior to the DMTH (Wode, 1976, 1978). For example, Zobl (1979, 1980, 1995) suggested that what induces transfer is the perception of similarity between source and target language at a certain level of development. Some approaches within current universal-trajectory research, such as the Learner Varieties approach, have also assumed that transfer is constrained by the current complexity of the learner’s language (Perdue, 2006).

Some evidence for developmentally constrained transfer has been reported. For example, Giacobbe (1992) found that learners did not profit from proximity between L1 and L2 until the learner language was at a level where the relevant syntactic structure could be accommodated. Similarly, the occurrence of subject–verb inversion, expected late in L2 and L3 development, was not precipitated by similarities between native and target language (Håkansson et al., 2002). Further, native speakers of Polish could not profit from the existence of subject–verb agreement in their L1 when learning English L2 but followed the same developmental trajectories as Vietnamese L1 English L2 learners, who have no agreement paradigm in their L1 (Johnston, 1997). Further evidence comes from unidirectional transfer—the finding that, in a given language combination, transfer occurs only from one language. In a longitudinal study of children who were simultaneously bilingual in Swedish and French, all of the children—even those who were dominant in Swedish—transferred XSV word order from French to

Swedish, even though Swedish is a V2 language and does not allow this word order (see Chapter 4). By contrast, none of the children used Swedish XVS word order when speaking French, even if Swedish was their dominant language (Schlyter & Håkansson, 1994).

In cases where a target structure in L3 occurs as expected according to developmental trajectories and that structure also exists in L1 or L2, it is difficult to determine whether that structure has been acquired or transferred. However, as mentioned above, negative transfer in such cases represents strong evidence. That is, any negative transfer taking place at a time predicted by developmental trajectories could be an indication of developmentally moderated transfer.

CHAPTER 3

METHODOLOGICAL PRELIMINARIES

This chapter sets out the hypotheses tested (3.1) and describes the methodology used to do so: the participants (3.2), the study design (3.3), and the five different tasks performed by the participants (3.5 to 3.9, each task being presented along with a methodological overview).

The present study examines the acquisition of L3 taking into consideration how general learning processes, such as developmental trajectories, interact with language-specific phenomena, such as L1 and L2 transfer. The focus is on the acquisition of German L3 in a formal setting by learners whose L1 is Swedish and who are acquiring English as an L2 in school. The participant learners were divided into four groups according to the amount of L3 instruction that they had received, and there was also a control group consisting of native speakers of German. The overall design of the study was quasi-longitudinal, with two sampling points. Five different tasks were carried out: an elicited imitation (EI) task (3.5), a questionnaire (3.6), a communicative task (3.7), a picture-based storytelling task (3.8), and an unstructured interview (3.9). The EI task and the communicative task were sampled twice while the other tasks were sampled once. The data from the picture-based storytelling task and the unstructured interview are

presented and discussed together, because both of these tasks yielded spontaneous speech data.

3.1 Hypotheses

This thesis takes a developmental perspective on transfer and tests the effect of previously learned languages on the development of a third language in and beyond the initial state of acquisition. More precisely, it explores the effects on the acquisition of word order in declarative sentences (Chapters 4 and 5) and bound morphemes (Chapter 6), which is claimed to pass through predictable, learner-general stages (Clahsen & Muysken, 1986; Klein & Perdue, 1992; Pienemann, 1998). It was tested whether L1 (Na Ranong & Leung, 2009) or L2 (Bardel & Falk, 2007; Falk & Bardel, 2011; Rothman & Cabrelli Amaro, 2010) had a privileged role in transfer to L3, taking cross-linguistic similarities (Flynn et al., 2004; Montrul, Dias, & Santos, 2011; Rothman, 2011) and psychotypology (Kellerman, 1983) into account, and whether developmental trajectories constrained the transfer of prior language knowledge (Håkansson et al., 2002; Pienemann, Di Biase, Kawaguchi, & Håkansson, 2005). The following general hypotheses, which are not in all cases mutually exclusive, were tested (for more specific hypotheses, see the individual chapters):

a) Initial L1 Transfer Hypotheses

If L1 transfer shapes L3 acquisition, then L3 morpho-syntax should initially mirror that of L1 as a result of positive and negative transfer from L1 to L3.

b) Initial L2 Transfer Hypotheses

If L2 transfer shapes L3 acquisition, then L3 morpho-syntax should initially mirror that of L2 as a result of positive and negative transfer from L2 to L3.

c) Developmentally Moderated Transfer Hypothesis

If developmental trajectories constrain transfer, then learners should pass through proposed learner-general developmental trajectories, irrespective of similarities to previously acquired languages. Transfer from L1 and L2 should occur only when the structures in question are appropriate given learners' current developmental stage.

d) Psychotypology

If learners' perception of similarities between source and target language affects the transferability of morpho-syntax, then learners who perceive L1 and L3 as more similar should exhibit more transfer than learners who perceive L1 and L3 as less similar.

3.2 Participants

3.2.1 Learner Groups

A total of 74 native speakers of Swedish who were learning English as L2 and German as L3 (defined chronologically) in a junior high school in southern Sweden were recruited to participate in the study. They ranged in age from 12 to 16 years. Participation was voluntary and the students were informed that participation would not affect their grades. Since all participants were minors, their parents (or other legal guardians) signed a form granting their consent for the students to participate in the study and for the data collected to be used for scientific purposes. The participants' identities are confidential. All names mentioned in this study are therefore code names.

The participants all studied both English and German in school. They had the same German teacher but were in four different school years (Years 6 through 9 of compulsory school). All students in Years 6, 8, and 9 (on average 75% of each class) who were willing to participate were accepted. However, in Year 7 only 43% were willing to participate. To ensure that the four groups would be of similar size, additional Year 7 students ($n = 9$) were recruited from a class taught by a different teacher. Students from this class were admitted on a first-come, first-serve basis.

A questionnaire in Swedish was used to obtain information about the participants' language histories, specifically about their (a) native language and (b) length of exposure to German. Three questions concerned the participants' native language: *Mitt/mina modersmål är...* ('My native language(s) is/are...'); *Jag talar följande språk hemma...* ('At home I speak the following language(s)...'); and *En vanlig dag talar jag*

på dessa språk... ('On a usual day I speak these languages...'). A participant was eligible for further data analysis if "Swedish" was the answer to all three questions. Some students also mentioned "English" and "German" as languages used on a usual day. However, as long as these languages were not reported to be spoken at home or claimed to be native languages, they were considered to be school languages and therefore not to make the student ineligible. Based on the answers to these three questions, data from ten participants were excluded from the analyses (four in Year 6, one in Year 7, four in Year 8, and one in Year 9).

To control for the extent of previous exposure to German, participants were deemed ineligible for the analyses if they had spent more than three months in a German-speaking country. This criterion led to the exclusion of two participants in Year 9. In addition, one participant in Year 6 was excluded for failure to participate in all elicitation tasks. In all, 13 participants were excluded from further data analyses.

The final sample thus consisted of 61 students across the four school years. It was divided into four groups characterized by different lengths of exposure to German and English classroom instruction (Table 3.1). The four groups could be described as follows: Year 6: beginners; Year 7: lower intermediate; Year 8: upper intermediate; and Year 9: advanced.

Table 3.1

Participants and Exposure to German and English

Year	n (F)	Age (SD)	German		English			
			T1	T2	T1	T2		
6	12 (8) ¹	12;7 (.5)	m	h	m	h	m	m
7	16 (6) ²	13;8 (.5)	4	21	9	48	31	36
8	17 (6) ¹	14;6 (.5)	13	88	18	138	40	45
9	16 (10)	15;33 (.5)	22	178	27	228	49	54
			31	268	36	318	58	63

Note: Average age is given as Years; Months at T1 (the first sampling point). SD = standard deviation, The "m" and "h" columns indicate the total amount of class instruction received by the time of the two sampling points, expressed in months (m) or hours (h). F = Females.

¹ Data from the EI task at T1 are missing for one student in Year 6 and five students in Year 8.

² Of Year 7 students, nine were recruited from a class with a different teacher on a first-come, first-serve basis.

It is common practice in SLA research on developmental patterns to group participants according to school year or amount of classroom instruction received (Alhawary, 2009; Barón & Celaya, 2010; Chang, 2010; Deguchi & Oshita, 2004; Rose, 2000; Rule & Marsden, 2006; Slabakova, 2009). Students' progression through school years is assumed to reflect developmental progression and to represent a good proxy for target language exposure. However, a given number of hours of instruction does not necessarily result in a given state of grammar, and nor does the school year reflect actual stages of language development (Rule & Marsden, 2006). In fact, learners in the same school year, having received a similar amount of instruction, have been shown to develop at different rates and to attain different levels of proficiency at the end of the academic year (Bardovi-Harlig, 1992, 2000; M.-C. Tremblay, 2006). Because of the high variability in the learners' production, which is reflected in the large standard deviations found for each group, statistically significant differences are often found only between distant school years, not between successive ones (Alhawary, 2009; Chang, 2010; Rule & Marsden, 2006).

3.2.2 Control Group

The control group consisted of eighteen 13–14-year-old native speakers of German (11 females; $M = 13;1$, $SD = .3$) enrolled in Year 7 in a German secondary school (a *Realschule*) in a suburb of Cologne, who were recruited by their teacher. They were tested once in their school. In Germany's tripartite secondary school system, the *Realschule* occupies the intermediate position academically. Both the school and the teacher were selected through social networking. According to their teacher, all students had only one L1 and had studied English as L2 for three years in school (since Year 5) and French as L3 for one year (since Year 7). Participation was voluntary, and since the students were minors their parents (or other legal guardians) signed a form granting their consent for the students to participate in the study and for the data collected to be used for scientific purposes. The participants' names were kept confidential. All names used below are code names.

3.3 Quasi-longitudinal Design with Two Sampling Points

To test the hypotheses about the interaction between developmental trajectories and transfer, developmental data were needed. A quasi-longitudinal study design was chosen to obtain such data. In quasi-longitudinal studies, the participants are measured only once but they are grouped according to an independent variable that represents time. This variable can be age or another variable that changes with time, such as the length of exposure to the target language, which is often used in SLA studies (Alhawary, 2009; Barón & Celaya, 2010; Chang, 2010; Deguchi & Oshita, 2004; Rose, 2000; Rule & Marsden, 2006; Slabakova, 2009). Any differences observed between groups as regards a dependent variable (e.g., language proficiency) are then presumed to represent a development over time that reflects individual development over the same period—in other words, if a number of individuals had been studied on several occasions over a period of that length, the development observed in them would resemble the differences observed across the groups in the quasi-longitudinal study (Larsen-Freeman & Long, 1991). It has been debated whether this assumption is legitimate (Gass & Selinker, 2001). Researchers agree that the strongest evidence for a developmental pattern consists of data from longitudinal studies proper, that is, studies in which the same participants' behaviors are measured repeatedly over an extended period. However, once a developmental pattern has been proposed, quasi-longitudinal designs are generally seen as acceptable for the further exploration of the suggested pattern (R. Ellis, 1994; Vainikka & Young-Scholten, 1994).

One advantage to a quasi-longitudinal study design is that it makes it easier to include a large number of participants, meaning that the results will often be more generalizable than those of longitudinal studies, which commonly include only a small number of participants. In addition, there is no need to monitor participants over long periods to record their development, which may be necessary, in particular, when learners have little contact with the target language and their progress is therefore slow. Hence, quasi-longitudinal studies are more economical and less time-consuming in cases such as those dealt with in the present study.

3.3.1 Study Design: Sampling and Groups

The developmental stages that are investigated in this study have been identified on the basis of longitudinal data (Clahsen, 1984; Pienemann, 1981, 1998). Hence, a quasi-longitudinal design would seem to be appropriate for the present study. In addition, a longitudinal component of data collection was introduced in that the (non-control) participants' development was measured at two sampling points (T1 and T2) separated by five months. The amount of German instruction was used to divide the learner group into four groups; this was assumed to be a good proxy for developmental progression with increasing exposure to the target language (Table 3.1). On the assumption that the structures tested would have stabilized in teenage native speakers, the control group consisting of native speakers of German was tested only once.

3.4 General Procedure

The participants carried out five tasks: an elicited imitation task (EI) (Section 3.5), a questionnaire (Section 3.6), a communicative task (Section 3.7), a picture-based storytelling task (Section 3.8), and an unstructured interview (Section 3.9). A room in the school was reserved for the task sessions, where all participants were tested individually. Each participant was scheduled in advance, and timetables were distributed one week before the session to the students as well as their teachers. The collection of data from the learner group took 23 days at T1 and 17 days at T2, while it took 5 days to collect the data from the control group.

The task administrator and the participant sat opposite each other at a table in the session room. Both the participant and the task administrator wore microphones connected to a Digital Audio Tape (DAT) recorder. A digital video camera was placed behind and to the side of the task administrator, so as to record the participant along with part of the task administrator's face and any gestures that the participant might make.

On entering the room, the participants were welcomed and allowed to familiarize themselves with the recording equipment, including by looking through the camera and playing with the audio recorder. The recorded session began with some warm-up talk consisting of a simple conversation on topics usually covered in the first few pages of

German textbooks, such as names, age, and birthdays). To discourage them from using Swedish or English during the session and to keep them in a “monolingual mode” (see Chapter 2, Grosjean, 1998), the participants had been wrongly informed beforehand that German was the only shared language. The German native-speaking task administrator, though proficient in Swedish and English, pretended to speak those languages only poorly.

Each session began with the picture-based storytelling task in L3 German while the L1 Swedish version of the same task always ended the session, in order to keep these two tasks as distant as possible from each other so as to avoid long-term priming effects (Bock, Dell, Chang, & Onishi, 2007; Bock & Griffin, 2000). The second task was the unstructured interview. During this part of the session, the participants were encouraged to ask for help if they had any questions or if they were searching for words. The next two tasks were the communicative task and the elicited imitation task. The order of these two tasks was randomized for each participant. As mentioned, the L1 storytelling task ended each session. The complete session lasted between 35 and 45 minutes and was concluded by a debriefing allowing the participants to comment on the tasks and ask any additional questions they might have.

All participants, including those in the control group, filled out a questionnaire that took them approximately 10 minutes to complete during a subsequent German class.

In the sections below, the five tasks are explained more thoroughly and their general design is presented. Note that the order of presentation does not correspond to the order of performance as described above.

3.5 First Task: Elicited Imitation

An elicited imitation (EI) task—also referred to as *verbal imitation* (Over & Gattis, 2010), *oral imitation* (R. Ellis, 2008), or *sentence repetition* (Diessel & Tomasello, 2005)—was used to investigate the interaction of syntactic developmental trajectories with L1 and L2 transfer. The general design consists of the auditory presentation of a sentence (model sentence) followed by participants’ repetition thereof (response

sentence). EI tasks usually involve the acoustic/oral modality, but there are also studies using written model sentences (Yang & Givón, 1997) to elicit written response sentences (Spitze & Fischer, 1981).

The rationale for the use of EI tasks is based on the finding that speakers remember the meaning or gist of an utterance longer and more correctly than its precise form (Sachs, 1967). If a sentence cannot be held in working memory as a whole, its meaning is retained while its form tends to change—a process referred to as *reconstruction* (Lust, Chien, & Flynn, 1987) or as *rephrasing* or *assimilation* (Slobin & Welsh, 1973). Importantly, sentences are not arbitrarily reconstructed. Bock and Brewer (1974) found that participants in a sentence recall task tended to change the form of the model sentences to a form that, in a previous independent task, they had judged to be more natural or better-sounding. Moreover, model sentences with the preferred form were more often correctly recalled than those with non-preferred forms, and non-preferred forms were more likely to be changed into preferred forms than vice versa. There are also other findings supporting the idea that sentence reconstruction is not arbitrary but instead reflects participants' syntactic preferences and previously acquired knowledge. For example, native speakers have been found to produce accurate imitations of grammatical sentences more often than of ungrammatical sentences (Love & Parker-Robinson, 1972). A similar effect has also been shown in the case of single words: words were remembered better as a factor of phonotactical plausibility (for non-words) and as a factor of familiarity (for real words), such that familiar real words were remembered best (N. C. Ellis & Beaton, 1993; Hulme, Maughan, & Brown, 1991). Another relevant finding is that ungrammatical model sentences exceeding a native speaker's working-memory capacity tend to be spontaneously corrected (Smith, 1973)—a phenomenon termed “normalization” (Hamayan, Saegert, & Larudee, 1977).

These findings have been taken as evidence that the reconstruction of model sentences reflects speakers' syntactic preferences and is shaped by their previously acquired (grammatical) knowledge, suggesting that EI tasks can be used as a measure of speakers' grammatical knowledge (for reviews of EI see Bley-Vroman & Chaudron, 1994; Erlam, 2006; Jessop, Suzuki, & Tomita, 2007; Schimke, 2011; Vinther, 2002). EI tasks have therefore frequently been used in studies of L1 acquisition (e.g., Fraser, Bellugi, & Brown, 1963; Håkansson, 1989; Over & Gattis, 2010; Santelmann, Berk, Austin, Somashekar, & Lust, 2002; Slobin & Welsh, 1973; Valian, Prasada, & Scarpa, 2006), including sign language (Meier, 1987), in studies of L2 acquisition (e.g., R. Ellis, 2008; Hamayan et al., 1977; Naiman, 1974; Trofimovich, Lightbown, Halter, & Song,

2009), in studies of specific language impairment (SLI; e.g., Conti-Ramsden, Botting, & Faragher, 2001; Håkansson & Hansson, 2000; Menyuk, 1964), and for diagnosing and screening of children with atypical language development (Devescovi & Caselli, 2007; Sturmer, Kunze, Funk, & Green, 1993).

3.5.1 EI in Second Language Acquisition

In research on L2 acquisition, emphasis has been placed on the expediency of using grammatical and ungrammatical stimuli in trying to measure learners' syntactic preferences and grammatical knowledge with an EI task: "In particular, grammatical knowledge can be tapped if learners are presented with stimuli that are ungrammatical in the target language: if they normalize ungrammatical sentences to their grammatical counterparts, while repeating grammatical versions of the sentence unchanged, it can be assumed that they have knowledge of the grammatical structure in question." (Schimke, 2011, p. 17). It has indeed been found that L2 learners, just like L1 learners, change stimulus sentences on the basis of their grammar (e.g., Håkansson, 1989; Keeney & Wolfe, 1972; Smith, 1973). L2 learners also tend to show a preference for changing either grammatical or ungrammatical model sentences (R. Ellis, 2008; Hamayan et al., 1977; Markman, Spilka, & Tucker, 1975; Schimke, 2011; Verhagen, 2005, 2011). This preference for grammatical or ungrammatical model sentence structure is suggestive of their syntactic preferences and ability (Schimke, 2011; Verhagen, 2005, 2009, 2011). When analyzing data from EI tasks and attempting to describe and capture the transient process of language acquisition, it is therefore important to compare the success with which learners repeat grammatical versus ungrammatical model sentences, respectively, and to consider changes in the relative proportions.

Despite evidence suggesting that repetition patterns in EI tasks reflect learners' syntactic preferences, it is important to keep in mind that participants will manage to repeat a certain proportion of the model sentences verbatim: "Clearly, when compared directly, memory for meaning always trumps memory for structure, but there seems to be no solid evidence that verbatim memory disappears entirely, and in fact previous studies offer numerical indications that some verbatim memory does remain" (Gurevich, Johnson, & Goldberg, 2010, p. 57; for discussion of rote imitation versus reconstruction see McDade, Simpson, & Lamb, 1982). To limit the effects of verbatim memory, thus increasing the reliability of data from EI tasks, this issue must be addressed in the design of model sentences and in the procedure used (see Section 4.4.4).

EI tasks have been used in SLA research to study various languages, such as English (e.g., Eisenstein, Bailey, & Madden, 1982; R. Ellis, 2008; Erlam, 2006; Henning, 1983; Munnich, Flynn, & Martohardjono, 1994; Naiman, 1974; Roebuck, Martínez-Arbeláiz, & Pérez-Silva, 1999; Trofimovich et al., 2009), Dutch (e.g., van Boxtel, Bongaerts, & Coppen, 2005; Verhagen, 2005, 2011), French (e.g., Hamayan et al., 1977; Markman et al., 1975; Naiman, 1974; Schimke, 2011; Thomas, 2010), German (e.g., Hameyer, 1980; Reid, 1981; Schimke, 2011), Japanese (e.g., Hagiwara, 2010), and Spanish (e.g., Ortega Alvarez-Ossorio, 2000; Pérez-Leroux, Cuza, & Thomas, 2011; Scott, 1994). Usually, EI tasks have been used to examine syntactic and morphological structures. However, there are also studies on phonology (Burger & Chrétien, 2001; Henning, 1983; Trofimovich et al., 2009) and discourse markers (Burger & Chrétien, 2001).

3.5.2 Pros and Cons

Imitation is likely to involve several cognitive processes. This could impair the construct validity of the EI tasks. A participant performing an EI task will parse the sentence (analyze it in terms of words, constituents, and syntactic relations), process it (understand the meaning and structure of its parts), and then store, retrieve, and (re)produce it (e.g., Bley-Vroman & Chaudron, 1994; Vinther, 2002). That is, both comprehension and production are involved in EI tasks, even though the analysis is usually restricted to the final production data (Jessop et al., 2007). This limitation of the analyses to production data obscures the involvement of multiple cognitive processes in producing an incorrect imitation (Vinther, 2002). Hence it has been claimed that EI tasks measure grammatical knowledge in imitation rather than in comprehension or production (e.g., Fraser et al., 1963).

To study the construct validity of EI tasks and their relation to other linguistic tasks, results from EI tasks have been correlated with measures of general language proficiency according to standard language proficiency tests (Erlam, 2006; Sturmer et al., 1993), grammaticality judgment tasks (Munnich et al., 1994), and spontaneous speech production tasks (Eisenstein et al., 1982; Erlam, 2006; Schimke, 2011; Smith, 1973; Thomas, 2010; Verhagen, 2005, 2011). Generally, the correlations found were moderate to high, indicating that EI tasks are valid and reliable measures of linguistic behavior and knowledge. Indeed, several authors have suggested EI tasks as a screening method for children with atypical language development (Devescovi & Caselli, 2007; Sturmer et al., 1993).

Importantly, comparisons between spontaneous speech and EI data have usually been performed on group level, not on the individual level (e.g., Eisenstein et al., 1982; Erlam, 2006; Gallimore & Tharp, 1981; Thomas, 2010). There has been a debate as to whether EI tasks underestimate individual learners' proficiency relative to spontaneous speech in the sense that participants can produce sentences that they are unable to imitate (Hood & Lightbown, 1978; Slobin & Welsh, 1973)—or whether, on the contrary, EI tasks overestimate learners' proficiency because participants can imitate sentences that they are not (yet) able to produce spontaneously (Kuczaj & Maratsos, 1975; Schimke, 2011; Smith, 1973; Verhagen, 2011). One interpretation of this debate and the underlying findings is that participants may be able to imitate structures that they cannot yet produce but are on the verge of acquiring. For example, one participant in a longitudinal study did not produce auxiliary *can* and *will* in spontaneous speech, but normalized misplaced auxiliaries in an EI task at T1 (Kuczaj & Maratsos, 1975). At T2, however, he actively produced both auxiliaries (*can*, *will*), and continued to normalize their placement. Other studies have found cases where learners who did not actively produce a particular structure were able to imitate or normalize it, but no instances of the opposite scenario of learners actively producing a structure but being unable to imitate or normalize it (Schimke, 2011; Smith, 1973; Verhagen, 2011). These latter findings suggest that EI tasks are “suitable to confirm in a controlled way, the presence of linguistic knowledge that can also be detected in spontaneous production, and, in addition, might reveal knowledge that is not yet visible in spontaneous production” (Schimke, 2011, p. 17).

EI tasks allow a high level of control over the structures tested (Yang & Givón, 1997). More importantly, EI tasks allow testing of complex grammatical structures which are difficult to elicit in other ways and seldom occur in spontaneous production data (Sayehli, 2001). As an experimental task, EI is replicable and allows causal inferences to be drawn. If controlled structural changes to the model sentences co-occur with changes in how successful participants are at repeating them, inferences can be drawn about the structural changes that have resulted in the different rates of success. Moreover, EI is superior to other elicitation methods in its ability to yield language samples even from hesitant speakers. Spontaneous production data often contain only a small number of instances of particular structures, which makes it problematic to use such data to test theoretical claims. The use of EI tasks can be a way to remedy this problem (Schimke, 2011). Further, the ease of stimulus design and the limited need for technological

equipment to record the data would seem to be characteristic of a test type well suited to use outside of the laboratory, which in turn facilitates the recruitment of participants.

3.5.3 Design Issues

3.5.3.1 Model sentence length

Much of the success of EI hinges on the design of the model sentences (see Section 4.4.1). If the model sentence exceeds the participant's memory span, its form is less likely to be held in memory and to be repeated verbatim. However, working memory capacity varies with age, educational level, contextual factors, and language proficiency (Economou, 2009; Gathercole, 1999). The limitations of working memory relate not to individual items, but to "chunks" (G. A. Miller, 1956). The two chunks "378" and "962" are easier to remember than the series "3 7 8 9 6 2," which contains the six items of the two chunks.

Similarly, model sentences include items—words, syllables, morphemes, or sentence constituents—that can be chunked in the participant's memory. In attempts to determine the appropriate length of a model sentence, all of these have been used as units of analysis in relation to different EI tasks: (syllables: Eisenstein et al., 1982; Naiman, 1974; Trofimovich et al., 2009); (words: Lahey, Launer, & Schiff-Myers, 1983), (morphemes: Fujiki & Brinton, 1983; J. F. Miller & Chapman, 1975), (words and syllables: Håkansson & Hansson, 2000; Munnich et al., 1994; Schimke, 2011; Verhagen, 2005, 2011). There is no consensus either on the ideal unit or on the ideal number of units (these can range between 2 and 20 syllables and between 5 and 9 words). Instead, the choice of unit and the number thereof in EI tasks has been considered as dependent on the population studied (Erlam, 2006). Since SLA research may cover learners within a wide range of proficiency, designing model sentences can be challenging in that both floor and ceiling effects need to be addressed.

3.5.3.2 Delayed recall

When the repetition of a model sentence is delayed, sentences are less likely to be repeated verbatim (cf., Sachs, 1967; Yang & Givón, 1997). This has frequently been exploited in EI tasks to limit rote imitation. In some cases, the participants were simply prompted to reply only 3–5 seconds after being presented with the model sentence (McDade et al., 1982). In others, the response was delayed by means of an intervening

distractor task, such as identifying a picture (e.g., Fraser et al., 1963), counting (e.g., Thomas, 2010), or proposition agreement judgments (e.g., R. Ellis, 2008).

3.5.3.3 Serial order effects

In any serially ordered list, the first and last items are remembered best, owing to primacy and recency effects, respectively (for a review, see Ebbinghaus, 1885; Henson, 1998). In an EI task where different structures are compared, it is therefore important to compare only structures presented at the same place in a string of words. Alternatively, serial order effects can be controlled for either by presenting the structures at different positions and having equal numbers of occurrences, or by analyzing the material for serial order effects—that is, calculating whether the position of a word influenced the correctness of its imitation.

3.5.3.4 Instructions

Although it has been suggested that the instructions given to participants may affect the results of an EI task, this has not yet been thoroughly explored (but see Desberg, Marsh, & Stanley, 1977; as cited in Gallimore & Tharp, 1981 for an attempt). Participants are generally asked to repeat sentences to the best of their ability (e.g., R. Ellis, 2008; Verhagen, 2011), even when ungrammatical model sentences are used (but see Erlam, 2006 who asked participants to correct ungrammatical sentences). Verbatim memory is more likely to be lost when the model sentence has been understood (Gurevich et al., 2010); to limit verbatim memory of a sentence, it has therefore been recommended that participants' attention should be drawn to the meaning and comprehension of the model sentences (Vinther, 2002).

3.5.4 EI in the Present Study

EI measures participants' grammatical preferences and knowledge by means of grammatical and ungrammatical model sentences. It is a useful type of task for the purposes of the present study, above all because it makes it possible to control the number and types of the syntactic structures tested. This is especially important because some of the structures studied are optional in the target language. The EI task may reveal knowledge not manifested in the spontaneous production task, such that the combined results from these two tasks may capture more details of the developmental path of language acquisition than either task alone.

The model sentences used in the present study represent, first, syntactic developmental stages that any learner will allegedly pass through and, second, structures that correspond to structures in the participants' L1 or L2 (for more detailed information on developmental stages, see Chapter 2). To control for serial order effects, all structures of interest were in sentence-initial position. The length of the model sentences was controlled in terms of both the number of words and the number of syllables. To prevent floor effects, the sentences were short; and to prevent ceiling effects, a distractor task designed to tap working memory load was used: participants were asked to count five steps backward starting from different numbers. In the instructions given to the participants, the importance of understanding the meaning of the sentences was stressed. The same EI task was carried out on two occasions (T1 and T2) five months apart. The response sentences were binarily scored as either correct (1) or incorrect (0) imitations of the model sentences. Logistic regression analyses were performed on the data thus obtained.

3.6 Second Task: Questionnaire

A questionnaire was used to (a) gather information about the participants' language history and (b) measure their psychotypological estimates of the distance between German and Swedish. The psychotypological distance estimate was measured using multi-items on Likert-type scales (see below and Section 3.6.1).

Questionnaires are one of the most frequently used methods of data collection in SLA research (Dörnyei, 2003). They are relatively easy to design and make it possible to obtain information on a wide range of topics. For example, they can generate self-reported factual, behavioral, and attitudinal data. In SLA research, demographic data on participants (e.g., age, sex, and socioeconomic status) can be collected alongside data on their and their families' language histories. Data can also be collected to obtain information about participants' habits and lifestyles in relation to their use of their respective languages (L1, L2, or L3) and about their learning strategies, or to assess their motivation for language learning and specific personality traits that are related to their success in language learning.

The questions asked in a questionnaire can include open-ended questions, questions with a limited choice of possible answers (sometimes pre-specified), and binary yes–no questions. In many cases, items in questionnaires are in fact not questions but statements in relation to which the respondent is asked to indicate his or her extent of agreement or disagreement on a predetermined scale, such as a Likert scale (see Section 4.5.1 below). One crucial characteristic of the questionnaire is that its purpose is to ask for information in a non-evaluative manner: it should not be possible to label answers as right or wrong, nor as good or bad (Dörnyei, 2003; Foddy, 1993).

The traditional format of the questionnaire uses pencil and paper, but nowadays, with ready-made formats available online (e.g., Google docs), computer-administered and internet-distributed questionnaires are becoming increasingly common (for studies on the effects of the mode of the questionnaire see Denscombe, 2009; Dillman, 2005). Questionnaires can have very different layouts. It is generally considered that an attractive and professional design will make respondents pay more attention and feel a stronger obligation to fill out the questionnaire carefully and correctly, which increases both the reliability and the validity of the data (Dörnyei, 2003). The length of a questionnaire may have an impact on data reliability and validity: depending on the targeted participant group, a long questionnaire may seem less manageable (Dörnyei, 2003) and make respondents tired or unfocused.

Despite the advantages of being able to cover a wide range of data and of having a good cost–benefit ratio, there are also disadvantages to the questionnaire as a research tool. The major issues are threats to data reliability and validity. Especially when participants fill out their questionnaires without an experimenter being present, questions can be misunderstood or misread (Low, 1999). Motivation and the time spent on the questionnaire will differ across participants (Dörnyei, 2003). Hence, the results may also vary across participants owing to factors that are not measured. In addition, *social desirability bias* is thought to affect responses in that participants may be more likely to reply in a manner that they believe is viewed favorably by others. Thus, desirable or acceptable behaviors and attitudes can be expected to be over-reported whereas undesirable and unacceptable behaviors and attitudes can be expected to be under-reported (Holtgraves, 2004). A related problem is known as *acquiescence bias*: a respondent who is in doubt will be more likely to agree than disagree with a statement (McClendon, 1991; Watson, 1992).

To mitigate the above-mentioned effects of misunderstandings, social desirability bias, and acquiescence bias, *multi-item scales* are used. These are groups of several differently worded items (questions or statements) that target the same construct, with the scores for the different items being summed up into a total score. Multi-item scales are considered to be more reliable and less volatile than single-item questions in that a single biased response will have less impact on the total score (Dörnyei, 2003). To ensure that the different questions within a scale actually measure the same construct, they need to be checked for *internal consistency*. This can be done by calculating correlation coefficients, such as Cronbach's alpha, for all the items of a multi-item scale and for all except each one in turn. If a particular item reduces internal consistency (i.e., there is lower correlation with that item included than without it), that item is excluded from the scale. For internal consistency to be deemed adequate, Cronbach's alpha coefficients should approach 0.80 for scales with ten or more questions, and 0.70 for scales with fewer than ten questions (Dörnyei, 2003).

3.6.1 Likert-type Scales

Participants' estimates of the psychotypological distance between German and Swedish were measured by asking them to indicate their agreement with statements on Likert-type scales (Likert, 1932), that is, scales covering a continuum between two opposing endpoints: the anchors. On a true Likert scale, not only the anchors but also all intermediate points on the scale are labeled both verbally and numerically (numbers are used in order to approximate equal intervals). The most common Likert scales have five or seven response choices, with the midpoint indicating neutrality. However, there are scales that differ from this design both in scale length and in the extent and type of labeling. Scales deviating slightly from the original design are often referred to as *Likert-type scales*.

Likert-type scales have been frequently and successfully used in SLA studies exploring language learners' motivation, beliefs, and attitudes, as well as in studies examining the correlation between the strength of certain personality traits and the degree of success at language learning (e.g., Dewaele, 2002, 2007; Dörnyei & Csizér, 1998, 2005; Dörnyei & Kormos, 2000; Hinkel, 1996; Masgoret & Gardner, 2003; Randall & Strother, 1990; P. F. Tremblay & Gardner, 1995; Wilson & Dewaele, 2010). Scale design issues are rarely discussed in SLA research (but see Busch, 1993; and Dörnyei, 2003), but they will be dealt with in the following section.

3.6.1.1 Scale length

Although most researchers use Likert or Likert-type scales with between four and eleven points, there is, in principle, no limit to the length of a scale. Longer scales are not believed to increase reliability (McKelvie, 1978), but the consequent increase in the variance of answers will increase the likelihood of finding statistically significant results (Hatch & Lazaraton, 1991). Other factors affecting the choice of scale size include the topic targeted, the respondents' familiarity with the topic, and their educational and cultural background (Busch, 1993; but see Dawes, 2002; Dawes, 2008 finding higher variance for 11 point than 5 to 7 point scales, and lower means for 11 point than 5 to 7 point scales).

A Likert-type scale may lack a neutral point because it has an even number of scale points, which will force respondents to indicate a preference. In fact, the use of even-numbered versus uneven-numbered scales is a hotly debated topic (Adelson & McCoach, 2010). The proponents of an even-numbered design argue that it makes the results more discriminating and therefore more reliable. For example, Busch (1993) recommends an even number of categories to avoid "indecisive data" and Garland (1991) found that participants gave less socially desirable answers with an even number of categories. By contrast, advocates of the use of an uneven number of categories argue that the existence of the neutral point is what makes the data more discriminating (Cronbach, 1950; Gable & Wolf, 1993). So far, no conclusive answers have been given as regards which type of scale is more reliable.

3.6.1.2 Labeling and orientation of categories

Likert scales originally labeled the intermediate categories verbally and numerically. However, it is easier to approximate equal intervals without wording, using only numerals or graphic space to indicate an equal distance. If numerical labels are chosen and the number of categories is uneven, there are two general formats: with and without a central zero-point. The results are mixed concerning the effects of zero-point (e.g., a scale ranging from -2 to +2) versus no zero-point (e.g., a scale ranging from 1 to 5). Schwarz, Knauper, Hippler, Noelle-neumann, and Clark (1991) found more positive results without a zero-point, while Amoo and Friedman (2001) and Armitage and Deepröse (2004) found more positive results with a zero-point.

Contradictory results have also been reported for having the highest numerical label consistently on the right or on the left. Ratings have been found to be higher with the

highest label to the right (Toepoel, Das, & van Soest, 2009), but also with the highest label to the left (Hartley & Betts, 2010; Tourangeau, Couper, & Conrad, 2004).

To avoid patterned responses (e.g., consistent selection of answers to one side of the scale) and to keep participants attentive, it has been suggested to vary the horizontally displayed scale such that the positive anchor is sometimes to the left and sometimes to the right for different items on a questionnaire (e.g., Dörnyei, 2003).

3.6.1.3 Wording of statement items

Another way to avoid patterned responses is to vary the wording of statement items as between positively and negatively worded ones, such that an affirmative or positive statement is sometimes turned into its opposite through the use of a structural negation (Anastasi, 1982; Nunnally, 1978). Negatively and positively worded statements have been assumed to be equivalent when reverse-scored, meaning that complete agreement with a positive item gives the maximum score while complete agreement with a negatively worded item gives the minimum score. Recently, however, this practice has been questioned since it has been found that negatively and positively worded items are answered in significantly different ways (Barnette, 2000; Schriesheim, Eisenbach, & Hill, 1991; Weems, Onwuegbuzie, Schreiber, & Eggers, 2003). This is considered to be because participants agree differently with negatively and positively worded items, respectively (Stewart & Frye, 2004). These findings challenge the assumption that reverse scoring makes a negatively worded item equivalent to the original positively worded item. Accordingly, Dörnyei (2003) recommends avoiding negations. Instead he suggests the use of statements that are negative not in the sense that they include structural negations but in the sense that negative aspects of the construct rather than positive ones are emphasized.

3.6.1.4 Participants

Different cultural groups and age groups have been found to give different answers to Likert-type scales. For example, Asian participants have been found to be more prone to choose more neutral answers than participants from Western cultures, who readily chose the extremes (Chen, Lee, & Stevenson, 1995; Dolnicar & Grün, 2007). Although most studies exploring the psychometric properties of Likert-type scales have been carried out on adults (but see e.g., Laerhoven, Zaag-Loonen, & Derkx, 2007), it has been assumed that younger participants are better able to handle such scales if the number of categories is relatively small (Adelson & McCoach, 2010; Bourke & Frampton, 1992). With younger participants it has also been recommended to use forced choice through scales

with an even number of points (Adelson & McCoach, 2011). However, children as young as between eight and eleven (school years three to six) were able to handle five-point scales and were no more prone to choose the middle—neutral—option than adults of the same culture.

3.6.2 Questionnaires in the Present Study

The questionnaire used in the present study was administered to the learner group once, after the second sampling point. It was in a paper-and-pencil format and in the Swedish language. This questionnaire concerned information about the participants' language history and measured their psychotypological estimates of the distance between German and Swedish. The control group, whose members had no knowledge of Swedish, filled out a shortened version of the questionnaire in German concerning their language history only.

To mitigate the effects of misunderstandings, social desirability bias, and acquiescence bias, multi-item scales were used to measure the participants' psychotypological estimates of the distance between German and Swedish. All statement items were positively worded—i.e., focusing on similarity rather than dissimilarity between German and Swedish—because of the above-mentioned finding that reverse-scored negated items are not equivalent to the original positively worded items (Barnette, 2000; Schriesheim et al., 1991; Weems et al., 2003). The participants answered each item using a six-point Likert-type scale, meaning that there was no neutral or zero point. This was intended to force the participants to indicate a preference and thereby render the data more discriminating and more reliable (Garland, 1991). A scale length of six points/categories was considered to be manageable for the adolescent participants in the present study (c.f., Adelson & McCoach, 2010) while yielding enough variance to increase the likelihood of finding statistically significant results (Hatch & Lazaraton, 1991). The categories were not labeled either verbally or numerically. Instead, graphic space was used to approximate equal distance between categories. Pilot versions of the questionnaire showed that varying the orientation of the anchors caused confusion in the participants, and it was therefore concluded that the results would be less reliable if this format were used (for similar results see Nicholls, Orr, Okubo, & Loftus, 2006). Hence—despite existing recommendations to vary the orientation of positive and negative anchors to avoid set answers (Dörnyei, 2003)—the orientation of the anchors was kept constant. The final version of the questionnaire consistently displayed positive

anchors to the left and negative anchors to the right of the scale. The data yielded by the Likert-type scale were treated as ordinal.

3.7 Third Task: Communicative Task

The third task was a communicative one that elicited subject–verb agreement and adjectives in attributive (e.g., *the red car*) and predicative (e.g., *the car is red*) position. It tested whether learners followed predicted trajectories in their acquisition of morphology. Since the late 1970s, communicative or communication tasks have been widely used in the field of SLA to elicit production data (Chaudron, 2003; Loschky & Bley-Vroman, 1993; McDonough & Mackey, 2000; Nunan, 1991). Such a task is generally defined as (a) goal-oriented in that participants arrive at a certain outcome and (b) activity-generated in that it involves the performance by participants themselves of an activity (Pica, Kanagy, & Falodun, 1993). There are several theories and studies concerning the effects of communicative tasks and their facilitation of L2 development (e.g., R. Ellis, Tanaka, & Yamazaki, 1994; McDonough & Mackey, 2000; Pica, 1994; Sauro, Kang, & Pica, 2005). However, in this thesis communicative tasks are seen as a research tool used to elicit linguistic structures in order to assess participants' developmental level.

Communicative tasks vary widely and can involve such diverse sub-tasks as map-reading (Anderson & Boyle, 1994; Speciale, Ellis, & Bywater, 2004), where participants help each other through instructions to find or draw an object (M. Carroll, Murcia-Serra, Watorek, & Bendiscioli, 2000); acting out (Ervin-Tripp, 1974); or playing card games (Jaensch, 2011). However, they all target specific linguistic structures in the context of meaningful interactions. Communicative tasks are often used in cases where the targeted structures are not expected to appear frequently in learners' naturally occurring speech, either because they are rare in conversation in general or because learners tend to avoid them (Schachter, 1974). In both cases, those structures will not (or only rarely) occur in spontaneous speech, even though the learners may know them. To deduce whether a learner is or is not able to produce a given structure, there needs to be an obligatory context and this cannot be unambiguously created in spontaneous speech, meaning that learners' proficiency is easily underestimated. However, even the use of communicative

tasks does not guarantee that particular structures will appear with a frequency that makes it possible to perform the appropriate analyses (Gass & Selinker, 2001). Experimentally generated data may be more reliable in that respect, but on the other hand they have lower ecological validity than data from communicative tasks. Hence it can be claimed that communicative tasks represent a useful middle way between naturalness and underestimation of proficiency.

Communicative tasks can be classified according to whether, and if so how, the task administrator and/or the participant(s) engage with each other: some tasks involve interaction between two participants (two-way tasks) while others involve interaction between the task administrator and the participant (one-way tasks) (one-way task; Mackey, 1994). They can be further differentiated according to the requirements of information flow: either both partners need to provide information (jigsaw tasks) or only one partner needs to supply information (information gap tasks) (Pica et al., 1993). The linguistic structures targeted by communicative tasks have been classified according to the extent to which they necessarily occur in a task. Loschky and Bley-Vroman (1993) distinguishes (a) those structures that occur frequently even though they are not required for successful task completion (task-naturalness), (b) those that facilitate, but are not necessary for, task completion (task-utility), and (c) those that are necessary to complete the task (task-essentialness). Ideally, communicative tasks are designed in such a way that the structures targeted are task-essential and that the task yields a high *data density* (Pienemann, 1998), that is, a large number of contexts for the linguistic structures targeted.

3.7.1 Communicative Tasks in the Present Study

The communicative task used in the present study was designed analogously to that used in Glahn et al. (2001) and targeted color adjectives in attributive and predicative position as well as subject–verb agreement. The task was a one-way information gap task—in other words, it involved interaction between the participant and the task administrator but only the participant needed to supply information. The participants were asked to name items depicted on a piece of paper. To unambiguously specify an item, the participants needed to describe it using a color adjective in attributive or predicative position, depending on the question asked by the task administrator. The form of verbs used by the participants needed to reflect the varying number of items involved (i.e., third person singular or plural). The production of adjectives was task-essential: the

participants could successfully complete the task only if they produced color adjectives to describe the items pictured. By contrast, subject–verb agreement represented only task utility in that the task could be successfully completed without a participant producing number agreement between the subject and the verb. The entire task was carried out on two different occasions, five months apart. The adjectives produced were coded for the number of suffixes in obligatory contexts, such that the proportion produced in obligatory contexts could be calculated for each participant in each group studied.

3.8 Fourth Task: Picture-Based Storytelling

A picture-based storytelling task was carried out to elicit structures with a topicalized adverbial. Storytelling tasks (silent movies: e.g., Klein & Perdue, 1992); (comic strips: e.g., Hendriks, 2000; Ågren, 2008); (picture books: e.g., Berman & Slobin, 1994) have been widely used in SLA research to elicit production data, which have been analyzed to examine a variety of structures. The advantages of the method include (a) that the sequence of actions is known to the researcher, (b) that the narratives can be compared across learners, (c) that it gives even those learners who are reluctant to speak a topic to talk about, and (d) that the content of the story can be manipulated (Bardovi-Harlig, 2000). The main disadvantage is the variation usually found across participants in the length of narratives and in the number of types and tokens of the phenomenon under investigation.

3.8.1 Picture-Based Storytelling Task in the Present Study

The picture-based storytelling task was administered at T1. Its aim was to elicit temporal adverbials in topicalized position (e.g., *then* in the sentence *Then the man went into the shop*). The pictures used, produced by the Swedish cartoon artist Jan Romare, were two comic strips with no text, each consisting of four separate pictures (see Appendix B). They depicted a man and his unusual pet, a python. The task was to arrange the four pictures of a strip into a sequence and tell the related story. The participants were informed that they could arrange any story they liked and that there were many different

options. It was believed that arranging the pictures into serial order would encourage the participants to focus on temporal sequences, which would elicit temporal adverbials, preferably in topicalized position. In addition, the arranging procedure was thought to encourage the participants to produce longer stories since they would need to describe each picture in order to justify its position in the sequence. The data were scored for the occurrence of different word order structures and analyzed using implicational scaling (see Section 3.10). The data from the picture-based storytelling task are presented and discussed together with the data from the unstructured interview (see next section) as a set of (semi-) spontaneous speech data.

3.9 Fifth Task: Unstructured Interview

An unstructured interview was carried out to elicit different word orders and subject–verb agreement in spontaneous speech. In SLA research, both structured and unstructured interviews are often used to elicit production data that approach naturally occurring speech while at the same time particular linguistic structures are targeted (Meisel et al., 1981; Perdue, 2000). In structured interviews, questions are asked in the same order for each participant. In unstructured interviews, by contrast, the questions on a list are asked in an order that fits the general course of the particular conversation and will therefore vary for each participant. This means that unstructured interviews are more similar to naturally occurring communication than structured interviews are. Reports of SLA studies seldom include descriptions of the exact questions asked or the guidelines followed during interviews (see Chaudron, 2003). Moreover, interview data are usually analyzed for several different linguistic structures and features, and supplemented with data from more specific elicitation tasks. Further, data are commonly collapsed across several tasks, even though key data may derive predominantly from only one of them (e.g., Holmen, 1993; Viberg, 1993). In a few studies, however, researchers have specified from where—the interview or the more specific elicitation tasks—the data analyzed came (e.g., H. G. Jin, 1994; Mackey, 1994).

3.9.1 Unstructured Interviews in the Present Study

In the present study, the same set of questions was asked in all interviews to keep the data comparable across participants. To make the conversation more natural, there was no rigid layout for the communication; instead, the predetermined questions were woven into a general discussion. The aim was to create a non-formulaic and meaningful communication in which a real information exchange took place, such that the participants would be more involved in the subject matter and therefore produce more speech.

Specific questions were asked to elicit temporal adverbials. These included questions regarding future plans, such as *Was wirst du Weihnachten machen?* ‘What will you do for Christmas?’ and *Was willst du machen, wenn du groß bist?* ‘What do you want to do when you grow up?’. The participants were encouraged to talk about past events by questions such as *Was hast du im Sommer gemacht?* ‘What did you do this summer?’, and to talk about capabilities or preferences by questions such as *Was kannst du gut?* ‘What are you good at?’. To elicit various pronouns, especially the first and third person singular and plural, questions such as *Was machst du gerne mit deinen Freunden?* ‘What do you like to do with your friends?’ and *Was macht dein Bruder gerne?* ‘What does your brother like to do?’ were used (for a complete list of questions, see Appendix B, Table 3). The unstructured interview was carried out once, at T1. The data were scored for the occurrence of particular word order structures and analyzed using implicational scaling. These data are presented and discussed together with the data from the picture-based storytelling task (see previous section) as a set of (semi-) spontaneous speech data.

3.10 Implicational Scaling

The analytical method of *implicational scaling* (DeCamp, 1971), also referred to as the *Guttman procedure* (Guttman, 1944), has been used in several studies of developmental stages in learner language (R. Ellis, 2008; Hyltenstam, 1977; Meisel et al., 1981), even though it was first used in linguistic studies to reveal constraints on variability in an analysis of the Jamaican Creole Continuum (DeCamp, 1971). It shows hierarchical patterns in the acquisition or use of linguistic structures, such that the presence of

structure *a* implies the presence of structure *b*, but not vice versa (Rickford, 2003). Implicational scaling is thus able to determine that what may at first sight look like free variation does in fact manifest systematicity. This method makes it possible to display the distribution of nominal, dichotomous data so that they fit a “perfect scale” (Cichocki, 1996), which means that implicational orders, if any, can be discerned. A scalability test can be used to measure how well a model fits this perfect scale. In studies of language acquisition, implicational orders are hypothesized to reflect difficulty and/or time of acquisition and are therefore useful for studying developing systems. Crucially, not only longitudinal and quasi-longitudinal but also cross-sectional data can be used to infer developmental patterns from implicational scaling (cf., Hatch & Lazaraton, 1991; Pienemann, 1998).

In the present study, implicational scaling is used to combine language data from all participants into a single implicational scale. With this approach, both the behavior of the learner group as a whole and individual development are considered. When data are collected at a relatively small number of points in time, it is important to observe participants at different levels of proficiency, because if proficiency is held constant there will not be any scalable distribution.

The convention is to present structures horizontally and participants vertically in an implicational-scaling matrix, as shown in Table 3.2.

Table 3.2

Structures and Participants Presented According to Implicational Scaling Conventions

ID	Structures			
	a	b	c	d
A	1	1	0	0
B	0	1	0	0
C	1	1	1	0
D	0	1	1	1

Note. ID = Participant’s identification letter (A, B, C or D).

Table 3.2 shows that—in relation to the specific cut-off points used—participant *A* produced structures *a* and *b* but not *c* and *d*, participant *B* produced structure *b* but not structures *a*, *c*, and *d*, etc. This represents the stage after the preliminary data analysis.

The next step is to see if any patterns can be discerned by changing the order of the structures and/or the participants.

Participants are scored either 1 or 0 in relation to a predetermined cut-off point that indicates the presence (1) or absence (0) of a feature. Cut-off points used as the acquisition criterion in various studies of language acquisition range from the first appearance of a structure to 90% suppliance in obligatory contexts. The results obtained can change depending on the operational definition of acquisition. The acquisition criteria are sometimes based on explicit theoretical considerations, but cut-off points are also sometimes set at seemingly arbitrary levels without a theoretical explanation being given (for a review on acquisition criteria, see Pallotti, 2007; Pienemann, 1998). In some cases, results obtained with different cut-off points have been compared (Eklund Heinonen, 2009; Glahn et al., 2001). In the present study, the cut-off point representing the emergence of a structure is defined for word order as the first appearance, as applied in Processability Theory (for more information about the acquisition criterion, see Chapter 2).

How to address the non-presence of a structure is a concern, since this affects scalability. Specifically, the non-presence of a structure could be interpreted either as the effect of missing data or as an indication of non-acquisition. In the literature, the problem is usually solved by the convention that a participant scores zero for a structure only if it fails to appear in an obligatory context. In cases where there is no such context, a missing-data symbol (“/”) is inserted and the data remain inconclusive concerning that particular structure. Further, a single occurrence of a structure in an obligatory context is not considered to be enough to draw any conclusions about the acquisition or non-acquisition of that structure, because that could be an instance of a sequence of word forms or words that have been learned as a whole without being analyzed for its individual components (formulaic speech, prefabricated chunks, such as *How are you doing?*). However, studies diverge as regards the number of occurrences in obligatory contexts required to establish productive use of a structure (see Chapter 2).

Even though implicational scaling is frequently presented in studies that discuss developmental sequences, there are a great many cases of misattributions and wrongly applied statistical methods. For that reason, the scaling procedure is presented briefly below (for a more thorough description see Hatch & Lazaraton, 1991).

Once the presence or absence of the structures of interest has been determined for every participant (see Table 3.2), the participants and the structures are rank-ordered. By convention, the participant with the lowest number of structures present is at the bottom and the participant with the highest number is at the top of the list while the structure present in the most participants is at the right end of the list and the structure present in the fewest is at the left end. In our example (see Table 3.3.), the participants are ranked $C, D > A > B$ because C and D have produced the most structures and have thus produced more than participant A , who, in turn, has produced more than participant B . The structures are ranked $b > a, c > d$ because structure b is supplied by the most participants and there is no difference between structures a and c , both of which are supplied more often than structure d .

Table 3.3

Implicational Scaling: An Example

ID	Structures			
	d	c	a	b
C	0	1	1	1
D	1	1	0	1
A	0	0	1	1
B	0	0	0	1

Note. ID = Participant's identification letter (A, B, C or D).

In our example, as is frequently the case in the literature, the rank order is not completely neat. Participant D did not produce structure a , even though c and d were produced. Such inconsistencies, or deviations from an ideal perfect scale, represent the error of the scale. Depending on the size of the error, the data will be considered to be scalable or not. In order to make this evaluation, a dividing line is drawn inside the matrix, as can be seen in Table 3.3. In each row of the matrix, this line is placed so that the number of cells to its right equals the number of structures produced by the corresponding participant. Participant B produced one structure, namely b . Therefore the line in the bottom row starts one cell from the right edge of the matrix. Participant A produced two structures, corresponding to a dividing line two cells from the right. Participants D and C produced three structures each, albeit different ones, and accordingly their lines are located three cells from the right. In a perfect scalable order, there would be only ones to the right of the dividing line and only zeros to the left of it.

Any ones or zeros on the wrong side of the line represent the errors of the scale. In our example scale, there are thus two errors, both of which are attributable to Participant *D*. Based on the number of errors, a “coefficient of scalability” is calculated (see Hatch & Lazaraton, 1991 for details). If this coefficient is 0.6 or higher, the implicational scale is considered to be of a scalable order (Hatch & Lazaraton, 1991).

CHAPTER 4

VERB PLACEMENT AND L1 TRANSFER

4.1 Background

This chapter explores the interaction between developmental trajectories and transfer of verb placement in the acquisition of German. The first section (4.1) begins with a description of the characteristics of verb placement in declarative main clauses in the three participant languages (L1 Swedish, L2 English, and L3 German) (4.1.1.). This is followed by an overview of earlier findings on L2/L3 acquisition of German verb placement, with a special emphasis on subject–verb inversion and transfer (4.1.2). The second section (4.2) describes the focus of the present study. The third section (4.3) presents the design of the elicited imitation task used in the present study and the results obtained. This is followed by a section (4.4.) that presents the spontaneous speech data set and the two tasks (picture-based storytelling task and unstructured interview) that were used for elicitation purposes. The chapter concludes with a general discussion (Section 4.5).

4.1.1 Verb Placement in Declarative Main Clauses in German, Swedish, and English

German and Swedish, unlike English, are verb-second (V2) languages. In V2 languages, the finite verb—marking tense and/or agreement—is placed in the second position of a declarative main clause (see (1a) and (2a) below). The *V2 constraint* entails that the finite verb is also placed in the second position when the clause begins with an element other than the subject (*topicalization*). As a result of this constraint, the finite verb precedes the subject in such clauses. This word order is often referred to as *subject–verb inversion* (XVS, where X represents an element other than the subject and the finite verb, e.g., an adverbial) (see (1b) and (2b) below). In English, by contrast, SVO word order (3a) is normally retained even in topicalized sentences (3b), such that the verb appears in the third position (V3) there (XSV). While German and Swedish share the V2 constraint, they differ in the position of non-finite verbs (e.g., infinitival and participle/supine forms) in declarative main clauses with complex predicates. First, the non-finite verb is sentence-final in German but remains close to the finite verb in Swedish. Second, when a sentence with a complex predicate is topicalized, the non-finite verb is placed immediately after the (inverted) subject in Swedish but in sentence-final position in German (compare (4) and (5) below). In English, finite and non-finite verbs immediately follow each other after the subject (6).

1) German (simple predicate)

(a) SVO *Ich gehe heute ins Theater*
 ‘I go_{fin} today to theater’

(b) XVS *Heute gehe ich ins Theater*
 ‘today go_{fin} I to theater’

2) Swedish (simple predicate)

(a) SVO *Jag går på teater idag*
 ‘I go_{fin} to theater today’

(b) XVS *Idag går jag på teater*
 ‘today go_{fin} I to theater’

3) English (simple predicate)

(a) SVO *I go to the theater today*

(b) XSV *Today I go to the theater*

4) German XVS (complex predicate)

Heute werde ich ins Theater gehen
'today will_{fin} I to theater go_{non-fin}'

5) Swedish XVS (complex predicate)

Idag ska jag gå på teater
'today will_{fin} I go_{non-fin} to theater'

6) English XSV (complex predicate)

Today I will go to the theater

4.1.2 German Verb Placement in L2/L3 Acquisition

L1 learners of German and Swedish produce subject–verb inversions as soon as they produce topicalizations (Clahsen & Muysken, 1986; Jordens, 2006; Santelmann, 1995), but inversion is known to be a challenge for L2/L3 learners (for a review on German V2 acquisition, Bohnacker, 2006; Jansen, 2000, 2008). It is interesting to note that XVS word order is mastered late in L2/L3 acquisition despite a high frequency of this construction in student input (Ganuza, 2008; Hammarberg & Viberg, 1977). When L2/L3 learners produce topicalized sentences, they tend to retain the basic SV word order, such that the verb appears in the ungrammatical third position of the sentence (XSV). What is more, once the XVS structure has appeared in students, it tends to co-occur with the ungrammatical XSV structure for a long time (Clahsen, 1984; duPlessis et al., 1987; Eubank, 1994).

It has been claimed that this development from an initial stage characterized by XSV word order to a later XVS stage is language-general—applying to all cases of German L2/L3 acquisition regardless of the learners' previous language knowledge (Clahsen & Muysken, 1986; Pienemann, 1998, 2005a, 2005b)—and that it is learner-general (Klein & Perdue, 1992) (but see Bohnacker, 2006 for an alternative view). The developmental

trajectories proposed have been shown to persist irrespective of the learners' L1 (English: Boss, 1996; duPlessis et al., 1987; Jansen, 2008; Pienemann, 1981, 1989) (Korean: Vainikka & Young-Scholten, 1994) (Russian: Haberzettl, 2005) (Spanish, Portuguese and Italian: Meisel et al., 1981; Vainikka & Young-Scholten, 1996a) (Swedish: Håkansson, 2001; Håkansson et al., 2002) (Turkish: data from Schwartz & Sprouse, 1996; Vainikka & Young-Scholten, 1994) and not to be affected by classroom instruction (Boss, 1996; R. Ellis, 1989; Pienemann, 1989).

One possible way of exploring the universality of this developmental trajectory could be to investigate whether an L1 which is a V2 language produces any positive effects on V2 production in L2/L3 acquisition (this is often referred to as V2–V2 studies). Indeed, several transfer hypotheses suggest the existence of such initial transfer in that L1 grammar is assumed to be the basis on which the target grammar is constructed (e.g., Hawkins & Chan, 1997; Lado, 1957; Na Ranong & Leung, 2009; Schwartz & Sprouse, 1994, 1996). Even where L1 is not supposed to be the privileged source of transfer and other previously learned languages are expected to transfer as well, L1 word order is still assumed to transfer to L3 at the initial stage—when this may enhance subsequent acquisition, as suggested in the Cumulative Enhancement Model (Flynn et al., 2004); or when L1 and L3 are typologically close or perceived as being close, as suggested in the Typological Primacy Model (Rothman, 2011; Rothman & Cabrelli Amaro, 2010). According to these hypotheses about multilingual transfer, native speakers of Swedish should not produce XSV structures in early L3 German acquisition. Instead, subject–verb inversion should start to occur early on as a result of positive L1 transfer, either because of the general typological similarity between German and Swedish or because of the similarity between the two languages' V2 structures. Despite differences in theoretical background, the transfer hypotheses put forward so far (Flynn et al., 2004; Hawkins & Chan, 1997; Na Ranong & Leung, 2009; Rothman, 2011; Rothman & Cabrelli Amaro, 2010; Schwartz & Sprouse, 1994, 1996) all yield the common assumption that Swedish native speakers will transfer V2 to their early German L3 production. These common hypotheses will here be referred to as the “Initial L1 Transfer Hypotheses.”

In countries where the main language is a V2 language (e.g., Austria, Denmark, Germany, Netherlands, Norway, and Sweden), the first foreign language taught in school is typically English. As a result, any additional V2 language will be learned as L3 rather than L2. This complicates the examination of L1 transfer in V2–V2 studies

because L3 acquisition could be affected by L2 transfer as well. Bohnacker (2006) studied elderly learners who were acquiring German as L2 or as L3 with prior knowledge of English, finding that all learners produced XVS structures but only the L3 learners produced ungrammatical XSV structures. The absence of XSV structures in the production of the L2 learners was interpreted as evidence of initial L1 transfer, refuting the proposed learner-general order involving an initial XSV stage and a subsequent XVS stage. However, Bohnacker's data remain inconclusive because the learners studied all produced inversions, which indicates that they were already advanced learners at the time of sampling. Initial stages of acquisition may therefore have been missed (Pienemann & Håkansson, 2007). Even so, however, the L2 German learners seemed to have acquired XVS fully whereas XVS remained optional to the L3 German learners. Bohnacker attributed the XSV structures in the L3 learners' production to L2 English transfer, and it has also been suggested by others that L3 acquisition of word order is affected by L2 rather than L1 transfer (L2 Status Factor Hypothesis) (Bardel & Falk, 2007; Falk & Bardel, 2011), particularly when the L2 has been acquired to a high level of proficiency (Hammarberg, 2001; Williams & Hammarberg, 1998). These accounts for L2 transfer all yield the expectation that native Swedish speakers with English L2 will produce sentences with XSV word order in L3 German despite the fact that such sentences are ungrammatical not only in the L3 but also in their L1. These common hypotheses will here be referred to as the "Initial L2 Transfer Hypotheses."

Both the Initial L1 Transfer Hypotheses and the Initial L2 Transfer Hypotheses focus on the initial stage of L3 acquisition. The Developmentally Moderated Transfer Hypothesis (DMTH) (Håkansson et al., 2002), by contrast, includes a developmental perspective, combining transfer with learner-general developmental stages such that transfer will affect acquisition (positively or negatively) only when the learner is developmentally ready to accommodate structures from his or her L1 or L2 (see Chapter 2). According to the DMTH, Swedish L3 German learners would produce XSV word order prior to XVS word order, in line with the learner-general stages and despite the similarities between L1 and L3.

4.2 The Present Study

Studies investigating transfer have typically been based on spontaneous speech data (SD). Their findings have been mixed. The focus has usually been on the initial stage of L2/L3 acquisition, and developmental factors have not been taken into account. The present study aimed to supplement the existing evidence by testing different transfer hypotheses using data from participants representing different levels of proficiency taking part in a more controlled elicited imitation (EI) task and in SD elicitation procedures (a picture-based storytelling task and an unstructured interview). The interaction between transfer and developmental trajectories was studied in relation to verb placement in topicalized declarative sentences in German L3 acquisition by Swedish native speakers with English L2. The following sections will present the design used and the results obtained, first for the EI task (4.3) and then for the SD tasks (4.4). The final section (4.5) contains a general discussion of the results presented in this chapter.

4.3 Elicited Imitation Data

4.3.1 Method

4.3.1.1 Participants

The L3 learner participants were distributed across four school years (6–9), and there was also a control group (see Table 3.1). For a detailed description of the participants, see Chapter 3.

4.3.1.2. Tasks and materials

The EI task (see Chapter 3) was designed to measure participants' grammatical preference for sentences with XSV and XVS word order, respectively. The model sentences ($n = 18$) consisted of filler sentences (SVX, $n = 6$) and experimental sentences (XVS, $n = 6$; XSV, $n = 6$). From the perspective of standard German, the majority of the model sentences were ungrammatical ($n = 12$) and a minority were grammatical ($n = 6$). The sentences were 9–11 syllables long ($M = 9.67$, $SD = .59$) and consisted of 5–8 words ($M = 6.17$, $SD = .86$) (see Chapter 3). The twelve experimental sentences were of four different sentence types (Table 4.1). All sentences consisted of an adverbial, a

subject, a finite verb (an auxiliary or modal verb), a non-finite verb (a lexical verb), and an object. The finite verb in second (XVS) or third (XSV) position was thus an auxiliary or modal verb. The different sentence types represented word orders that learners typically produce during the developmental trajectory for German L2/L3 (Adverbial [ADV] → Separation [SEP] → Inversion [INV]; see Chapter 2, Table 2.1) and word orders corresponding to L1 (Swedish literal translation [SLIT]) or L2 (ADV). Half of the experimental sentences targeted XVS word order (i.e., INV and SLIT) and the other half targeted XSV word order (i.e., SEP and ADV). Note that even though XVS corresponds to grammatical German word order, only half of the experimental sentences of that type were grammatical from a standard German perspective (INV) because the others were designed to correspond to Swedish word order (SLIT) and thus did not display the non-finite verb sentence-finally. To control for serial order effects (see Chapter 3), all structures of interest were in sentence-initial position (for a complete list of model sentences in the EI task, see Appendix B, Table 1).

Table 4.1

Experimental Sentence Types: XSV and XVS

XVS Model sentence	
INV	SLIT
Dann hat Lena ein Buch gelesen X V _{fin} S O V _{non-fin} 'then has Lena a book read'	*Dann hat Lena gelesen ein Buch X V _{fin} S V _{non-fin} O 'then has Lena read a book'
XSV Model sentence	
ADV	SEP
*Dann Lena hat gelesen ein Buch X S V _{fin} V _{non-fin} O 'then Lena has read a book'	*Dann Lena hat ein Buch gelesen X S V _{fin} O V _{non-fin} 'then Lena has a book read'

Note. INV = subject-verb inversion, SLIT = Swedish literal translation, ADV = fronted adverbials, SEP = verb separation, S = subject, V = verb, X = any element other than the subject (here an adverbial), non-fin = non-finite verb, fin = finite verb, O = object, * indicates ungrammatically in standard German.

The German words used in the EI task were either cognates with Swedish words or appeared early in the learners' German textbooks (*Mahlzeit*: Karlsson, Lindström, Sandberg, & Schornack, 2001; *Du kannst!*: Svensson, Krohn, & Ericsson, 1998; *Flieg Mit!*: Filzwieser, 1996). Three different animate subjects (*Lena*, *Henrik*, and *Hund* 'dog') were combined with three different auxiliaries/modals, (*kann* 'can', *will* 'want', and *hat* 'has') in the third person singular of the present tense and four sentence

adverbials (*heute* ‘today’, *morgen* ‘tomorrow’, *manchmal* ‘sometimes’, and *dann* ‘then’) (for a list of words used in the model sentences, see Appendix A, Table 1). To increase participants’ recognition and enable them to concentrate on the position rather than the meaning of the words, each subject, auxiliary, and adverbial reappeared three to four times in the course of the experiment. However, to increase variation, most lexical verbs and objects appeared only once in a sentence. The filler sentences were not topicalized and belonged to either of the two sentence types SVO and V_{end}, corresponding to developmental stages of L2/L3 German (see Chapter 2). Note that only half of the fillers were grammatical from a standard German perspective, because the complex predicate was not separated in the SVO filler sentences.

The order of sentences was pseudo-randomized, with the restriction that the same structure could not appear more than twice in a row. The same order was used for all participants. The sentences had been prerecorded by a female native speaker of German. A backward-counting task (see Chapter 3) was used to delay recall: participants were shown a number (between 6 and 17) from which they were asked to count out loud five steps backward in German before repeating the model sentence. A pilot study had indicated that the use of this distractor task prevented ceiling effects without causing any floor effects. More specifically, this distractor task limited the potential ceiling effects in more advanced learners that could otherwise have arisen as a result of the shortness of the sentences used for the imitation task. Given that words learned early on were used, however, the floor effects in beginners remained limited since the sentences used were still manageable to them. In the pilot study, the starting number for the backward-counting distractor task was kept constant, and this led to the advanced learners performing at ceiling in the imitation task after a few sentences. In the present study, this effect of automatization or learning was reduced by varying the starting number for each sentence presented.

4.3.1.3. Procedure

The participants were instructed to listen to a sentence and to repeat that sentence to the best of their ability after counting five steps backward from the number presented by the experimenter. They were informed that some sentences would be strange, but that they should nevertheless try their best to repeat them as faithfully as possible. The participants were advised to listen carefully and to ensure that they understood the sentence. Participants who missed a word when repeating a sentence were encouraged to guess. The task was self-paced in the sense that the participants had unlimited time to repeat the sentence before the next one was presented. There were two practice

sentences to familiarize the participant with the task. The whole session was recorded for subsequent data transcription.

4.3.1.4 Predictions

Elicited Imitation (EI) tasks have been suggested to be a suitable measure of speakers' grammatical knowledge (see Chapter 3). The ability to reconstruct model sentences—more specifically, the difference in the rate of correct repetition between two alternative model structures (in the present study: XSV and XVS)—is assumed to reflect speakers' syntactic preferences as shaped by their grammatical knowledge (R. Ellis, 2008; Schimke, 2011; Verhagen, 2005, 2009, 2011). In other words, preference for a structure is assumed to be indicated by a higher ratio of successful repetition, and this preference is assumed to represent the best reflection of the learner's grammatical knowledge. If there is no difference in the rate of correct repetition between two structures, there are assumed to be grounds for concluding that both structures are included in the learners' grammatical knowledge. The three different (categories of) hypotheses of L3 acquisition and transfer to be tested yield different predictions regarding the results from the EI task, as listed below (a–c).

(a) Initial L1 Transfer Hypotheses

According to the Initial L1 Transfer Hypotheses, the XVS structure will be part of all participants' (learner and control groups) grammatical knowledge of German. This is because XVS word order is common and obligatory in the participants' native languages, while XSV is ungrammatical in both Swedish and German.

- Prediction: all participants will correctly repeat more instances of XVS structure than of (ungrammatical) XSV structure.

(b) Initial L2 Transfer Hypotheses

According to the Initial L2 Transfer Hypotheses, the XSV structure, which is common and grammatical in L2, will initially transfer to L3, since L3 acquisition is assumed to take place on the basis of L2. Theories of initial L2 transfer have not proposed any transfer effects beyond the initial state, meaning that there are no specific predictions as regards the acquisition of target XVS by intermediate and advanced learners.

- Prediction 1: beginners (Year 6) will correctly repeat more instances of XSV structure than of XVS structure.

- Prediction 2: the native-speaking control group will correctly repeat more instances of XVS structure than of XSV structure.

(c) Developmentally Moderated Transfer Hypothesis (DMTH)

According to the DMTH, the learners will progress along the proposed learner-general developmental trajectories. XSV word order will be preferred initially but this preference will gradually be replaced by a preference for XVS, such that XSV and XVS will be equally favored at intermediate stages.

- Prediction 1: Year 6 learners will correctly repeat more instances of XSV structure than of XVS structure.
- Prediction 2: in Years 7 and 8, the number of correct repetitions of XSV structures and the number of correct repetitions of XVS structures will be similar.
- Prediction 3: Year 9 learners will correctly repeat more instances of XVS structure than of XSV structure.
- Prediction 4: the control group will correctly repeat more instances of XVS structure than of XSV structure, since only the XVS structure is part of their German grammatical knowledge.

Note that the present study focuses on L1 transfer effects. It was not designed to determine whether the Initial L2 Transfer Hypotheses or the DMTH—which predict the same surface results for beginners but for different reasons—is more correct. This issue will be further examined in Chapter 5.

4.3.2 Analyses

4.3.2.1 Criteria of scorability

The participants repeated model sentences in 95% of the cases (i.e., all but 82 sentences were repeated). Intelligible responses were scored when they met the following general criteria: (1) they contained a verb, a subject, and an adverbial; and (2) the adverbial was sentence-initial. Lexical changes within the same category (e.g., adjectives: *kalten* ‘cold’ for *warmen* ‘warm’) were accepted and scored as correct, and so were changes to the inflection of words (e.g., *gelesen* for *lesen* ‘read’). The reason for accepting such changes was that the focus of the study was on word order and that a stricter criterion would have resulted in loss of data. Similarly, responses with reductions, omissions, and ellipses were scored provided that they met the criteria of scorability (see below).

Besides the above-mentioned general principles, three different criteria of scorability (A, B, and C) were applied in parallel to the data. The different inclusion criteria determined whether participants' final (Criterion A) or first (Criterion B) attempt to repeat a model sentence was scored as well as whether responses with an auxiliary (Criterion C) or with any verbal element (Criterion A) were scored. Thus three data sets were analyzed: final repetitions with any verbal element (A), initial repetitions with any verbal element (B), and final repetitions with an auxiliary/modal (C).

In the early stages of acquisition, learner speech is typically disfluent and contains pauses, reductions, omissions, and ellipses along with restarts and self-corrections (D. Carroll, 2004; Dörnyei & Scott, 1997; Temple, 2000). This is also true of responses in EI tasks. Even so, few studies report whether the first or final attempt to repeat the model sentence was analyzed (e.g., R. Ellis, 2008; Erlam, 2006). What is more, even when the version used is identified, reasons for the choice made are not given (Hamayan et al., 1977; Santelmann et al., 2002; Schimke, 2011; Smith, 1973; Valian & Casey, 2003; Valian et al., 2006). Given that the choice of version for the analyses may affect the results, in the present study the final (Criterion A) and first responses (Criterion B) were scored and the results compared. Note that a participant response was deemed to be scorable according to Criterion A or B provided that it contained any verbal element, that is, a modal/auxiliary, a lexical verb, or both.

As indicated above, the model sentences used in the EI task contained a modal/auxiliary in addition to a lexical verb, because previous studies have suggested that subject–verb inversion occurs first with auxiliary verbs (Verhagen, 2005, 2011). However, previous studies have also suggested that functional categories, such as auxiliaries or modals, are acquired late and are often omitted in production (e.g., Batmanian, Sayehli, & Valian, 2008; Lardiere, 1998a; Vainikka & Young-Scholten, 1994, 1996b). To explore the effects of the production of auxiliaries on inversion, Criterion C requiring an auxiliary was added.

With the application of Criterion A or B, 71% of the responses ($n = 1136$) were scorable, while 65% of the responses ($n = 1052$) were scorable when Criterion C was applied. To ensure the availability of stable and representative data for each learner, learners had to produce at least two scorable responses to XSV model sentences and two scorable responses to XVS model sentences to be eligible for further analyses.

4.3.2.2 Scoring

All responses that were scorable according to the general principles and Criterion A, B, or C were scored for correct (1) or incorrect (0) repetition. The correctness of the repetition of the model sentence was established on the basis of the position of the verb: repetitions of XSV as XSV and of XVS as XVS were deemed correct while repetitions of XSV as XVS and of XVS as XSV were deemed incorrect. Note that a repetition is here deemed to be correct if it reflects the structure of the model sentence, even if the model sentence was ungrammatical (for a sample of scoring, see Appendix C, Table 1).

4.3.3 Results

4.3.3.1 Criterion A

Main results

Using Criterion A (final responses), grand averages of the correct and incorrect repetition for each group at T1 and T2 were calculated (Table 4.2). The grand averages of correct repetition are also presented in Figure 4.1. A higher rate of correct repetition of a structure was construed as a preference for that particular structure.

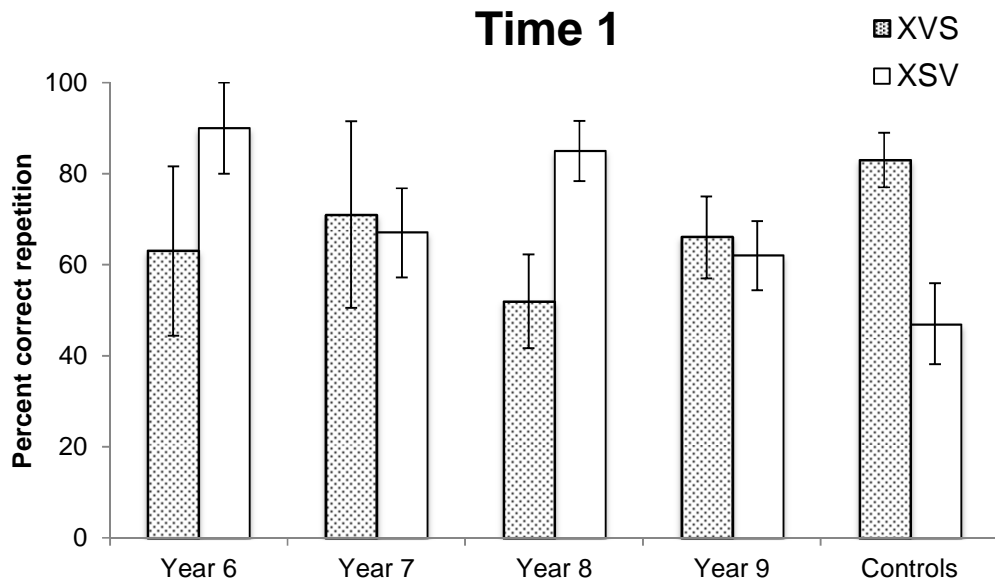
Table 4.2

Distribution of Correct Repetitions of XSV and XVS Using Criterion A

Time	Year	n	Utt	XVS		XSV	
				1	0	1	0
T1	6	5	27	26%	22%	48%	4%
	7	14	117	43%	13%	31%	14%
	8	12	120	29%	23%	41%	5%
	9	15	152	34%	17%	32%	17%
Total		46	416	35%	18%	35%	13%
T2	6	8	63	17%	37%	48%	-
	7	14	127	34%	15%	35%	16%
	8	17	187	28%	22%	40%	10%
	9	16	154	33%	16%	33%	18%
Total		55	532	30%	20%	38%	12%
Controls		18	188	42%	9%	24%	26%

Note. Scores given as percentages of the total number of scorable utterances (Utt). Time = sampling time, T1 = Time 1, T2 = Time 2, Year = school year, n = number of participants producing at least two scorable responses per condition, Utt = number of scorable utterances, XVS = model sentence with verb in second position, XSV = model sentence with verb in third position, 1 = percentage of correct repetitions, 0 = percentage of incorrect repetitions.

(a)



(b)

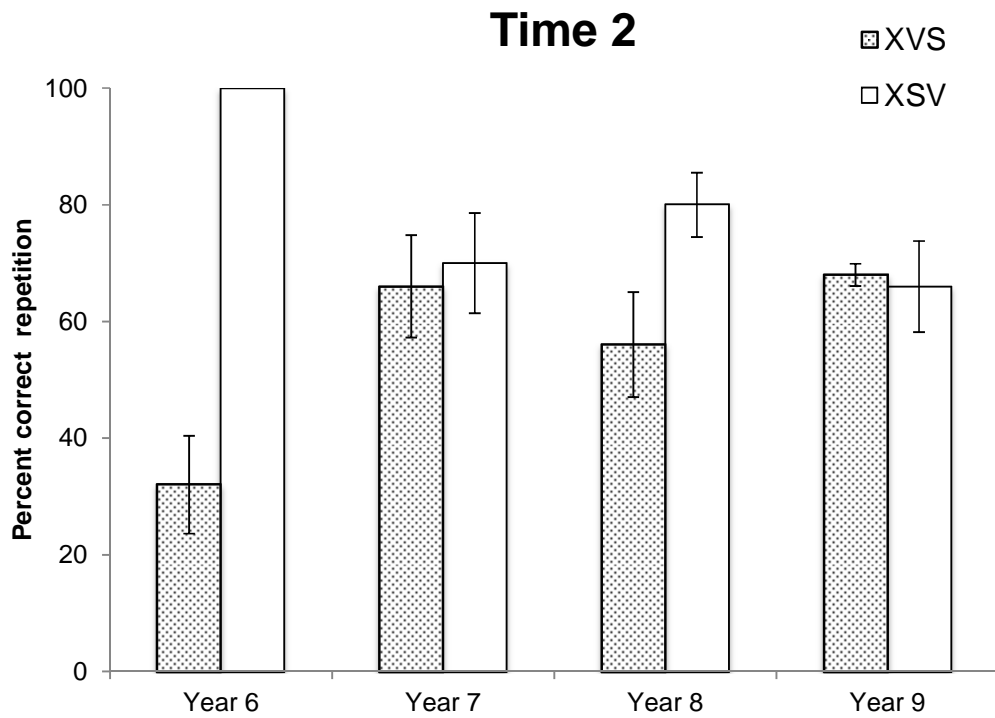


Figure 4.1. Grand averages (percentages) of correct repetition of XVS and XSV structures across groups. The error bars represent standard errors.

The data were analyzed using logistic regression analysis (fitted by the Laplace approximation). This analysis estimates the variance in a binary dependent (outcome) variable (in this case *correct repetition*) due to predictors (in this case Year, Time, etc.). This method involves no assumption of homogeneity in variance and takes the confidence of proportions into account by means of logit transformation (Baayen, 2008). More specifically, a proportion of, say, .5 calculated from one out of two instances is considered a less confident measure of probability than the same proportion calculated from three out of six instances.

In the learner groups, the logistic regression analysis was used to explore the effect of verb position in model sentences (XSV versus XVS structure) on correct repetition. The effects of group (Years 6–9), elicitation time (T1, T2), individual participants, test items, and order of presentation (Order) on correct repetition were also tested. The analysis showed an effect for verb position ($Est = .61, SE = .22, z = 2.77, p < .01$), suggesting that the learner group as a whole repeated ungrammatical XSV structures more correctly than grammatical XVS structures, as predicted by the DMTH and the Initial L2 Transfer Hypotheses but not by the Initial L1 Transfer Hypotheses. No other effects were statistically significant ($p > .342$ in all cases).

To explore the DMTH's predictions about differences across years in the percentage of correct repetitions, separate analyses of verb position for each group (including the control group) were carried out. Alpha-levels were corrected to .008 for multiple analyses. Correct repetition was predicted by the position of the verb in the model sentence for Year 6 ($Est = 4.79, SE = 1.29, z = 3.73, p < .008$) and Year 8 ($Est = 1.27, SE = .27, z = 4.75, p < .008$), meaning that those groups were statistically significantly better at imitating XSV structures than XVS structures. The opposite pattern was observed for the control group, which imitated XVS structures better than XSV structures ($Est = -1.97, SE = .39, z = 4.72, p < .008$). No other differences were significant (all p 's $> .485$).

These results suggest that the control group preferred grammatical XVS structures. They support the assumption that sentences were not repeated verbatim but reconstructed in a way that reflected grammatical preferences and knowledge. Participants in Years 6 and 8 preferred the ungrammatical XSV word order while there was no statistically significant difference between the rates of correct repetition of XSV and XVS structures, respectively, for Years 7 and 9.

Below are a number of examples of data. First, two examples are given of the predominant repetition patterns of Years 6 and 8, with correct repetition of XSV structures (7a) and incorrect repetition of XVS structures (8a) (Chris, Year 8, at T1). This is followed by two examples from the control group of correct repetition of XVS structures (7b) and incorrect repetition of XSV structures (8b) (Korinna). It should be noted that, in addition to word-order changes, both participants made a lexical change (“warm” coffee became “hot” in Chris’s rendition and “cold” in Korinna’s), another indication of sentence reconstruction (Schinke, 2011).

- (7) Model XSV: *Dann Henrik will warmen Kaffee trinken*
‘then Henrik want_{fin} warm coffee drink_{non-fin}’
- (a) Repetition XSV, Year 8: *Sedan Henrich will heiss Kaffe trinken*
‘then (Swedish) Henrik want_{fin} hot coffee drink_{non-fin}’
- (b) Repetition XVS, Control: *Dann will Henrik einen kalten Kaffee trinken*
‘then want_{fin} Henrik a cold coffee drink_{non-fin}’
- (8) Model XVS: *Dann hat Lena ein Buch gelesen*
‘then have_{fin} Lena a book read_{non-fin}’
- (a) Repetition XSV, Year 8: *Dann Lisa willst der Buch lesen*
‘then Lena want_{fin} the book read_{non-fin}’
- (b) Repetition XVS, Control: *Dann hat Lena ein Buch gelesen*
‘then have_{fin} Lena a book read_{non-fin}’

The results of the logistic regression analysis support the DMTH, because the beginners showed a preference for XSV structures while the more proficient learners showed an equal preference for XSV and XVS structures. However, diverging from the predictions of the DMTH, there was no evidence of a linear development from beginners (Year 6) to advanced learners (Year 9), as Year 8 performed similarly to Year 6, preferring XSV structures, and Year 7 performed similarly to Year 9, manifesting an equal preference for XSV and XVS structures. Nor did Year 9 show the expected preference for XVS structures. In addition, the initial preference for XSV structures also supported the Initial L2 Transfer Hypotheses and challenged the Initial L1 Transfer Hypotheses, which did not predict a preference for XSV structures in any group. The findings will be further scrutinized in the EI discussion below.

Item and order effects

The present study lacked controls for item and order effects. The same list of sentence items was used for all participants performing the EI task. It was therefore investigated whether there were any effects of order on the correctness of repetition. Similarly, the words in the test sentences were not balanced across sentence structures, and it was therefore investigated whether there were any effects of sentence items on the correctness of repetition. The statistical analyses failed to find any statistically significant effects of either order or item, suggesting that neither predicted the correctness of repetition.

Effects of type of adverbial

The present study did not control for the type of adverbial across word order structures. More specifically, *heute* ('today') and *manchmal* ('sometimes') appeared in XSV structures (V3) while *morgen* ('tomorrow') appeared in XVS structures (V2). Only *dann* ('then') appeared in both types of structures. (Henceforth expressions such as *V2 dann*, *V3 dann*, *V3 heute*, etc., will be used to indicate structure type and adverbial). Frequencies of correct repetition for each adverbial and structure across time were calculated for the learner group, but this did not suggest any effects of adverbial type with verb position (Table 4.3). However, *V3 dann* seemed to diverge from the overall V3 pattern. To explore any specific effects of adverbial type with verb position, the frequency distribution was then calculated for each group (Table 4.4, visualized in Figure 4.2).

Table 4.3

Frequency Distribution of Correct Repetition by Type of Adverbial

	Utt	<i>M</i> (<i>SE</i>)
<i>V2 morgen</i>	137	57% (5)
<i>V2 dann</i>	160	61% (5)
<i>V3 dann</i>	150	69% (5)
<i>V3 heute</i>	103	81% (4)
<i>V3 manchmal</i>	62	79% (5)

Note. Utt = Utterances that were correct imitations of model sentences, *M* = mean percentage of correct imitation, *SE* = standard error given in percent. Of the 12 experimental model sentences, there were three with each of *V2 dann*, *V2 morgen*, and *V3 dann*, two with *V3 heute*, and one with *V3 manchmal*.

Table 4.4

Percentages of Correct Repetition across Type of Adverbial and Verb Position

	Year 6		Year 7		Year 8		Year 9	
	Utt	M (SE)	Utt	M (SE)	Utt	M (SE)	Utt	M (SE)
V2 morgen	10	55% (18)	48	75% (6)	41	50% (10)	38	50% (7)
V2 dann	6	22% (11)	44	69% (8)	46	54% (9)	64	83% (7)
V3 dann	18	92% (7)	33	57% (10)	63	84% (4)	36	53% (10)
V3 heute	14	100% (0)	21	87% (11)	35	84% (7)	33	74% (8)
V3 manchmal	5	83% (17)	15	83% (12)	18	75% (10)	24	80% (8)

Note: Utt = Utterances that were correct imitations of model sentences, M = mean percentage of correct repetition, SE = standard error.

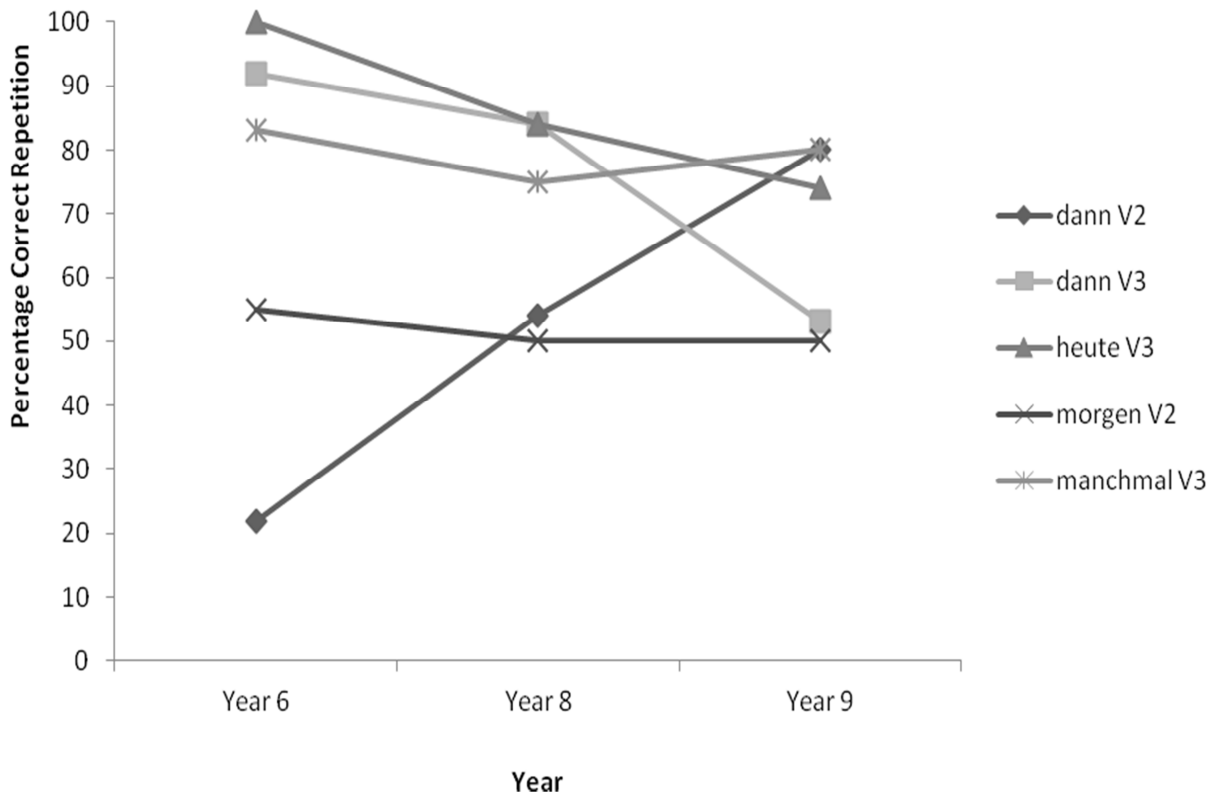


Figure 4.2. *Effects of Adverbial Type and Sentence Structure on Correct Repetition*

This graph shows that the percentage of correct repetition increases for *dann V2* and decreases for *dann V3* with more exposure to German while there is no significant difference in the rate of correct repetition for any other adverbial across school years. Since it is suggested that the participants enrolled in Year 7 have a higher proficiency because of a difference in sampling procedure (see the discussion section of this chapter and Chapter 3), they were not included in the graph. However, their percentages of correct repetition can be seen in Table 4.4.

The percentages of correct repetition did not seem to differ across groups for the adverbials *V3 heute*, *V3 manchmal*, or *V2 morgen*. However, the percentage of correct repetition of *V2 dann* increased with school year while the reverse pattern was found for *V3 dann* (Table 4.4) (see the discussion section as regards the outcomes for Year 7). The pattern thus observed was supported by a post-hoc analysis (generalized linear mixed models, fitted by the Laplace approximation) with the alpha-level corrected to .01 for multiple analyses. The differences between years were statistically significant or approached significance for *V2 dann* (difference between Year 8 and Year 9: $Est = -1.73$, $SE = .70$, $z = -2.48$, $p = .013$; difference between Year 6 and Year 9: $Est = -3.72$, $SE = .97$, $z = -3.81$, $p < .01$) and *V3 dann* (difference between Year 8 and Year 9: $Est = 1.58$, $SE = .59$, $z = 2.67$, $p < .01$; difference between Year 6 and Year 9: $Est = 3.05$, $SE = 1.37$, $z = 2.22$, $p = .026$) but no other adverbial. These results were interpreted as indicative of a gradual acquisition of XVS structure manifested by differences in the rate of success at correctly repeating structures containing the topicalized adverbial *dann*, which could be assumed to be an early exponent of this gradual acquisition.

Effects of auxiliary type

As the appearance of the three different auxiliaries was not balanced across structures in the model sentences, their effect on correct repetition was explored by means of logistic regression analysis. This analysis did not establish any statistically significant difference in rates of correct repetition across sentences and verb positions (overall rates: *hat* ‘has’: 67%; *kann* ‘can’: 67%; *will* ‘want(s)’: 70%).

Effects of word order type per verb position condition

Both XSV and XVS model sentences consisted of two types of sentences (ADV and SEP for XSV and INV and SLIT for XVS: Table 5.3). Logistic regression analyses indicated that the sentence type did not predict the correctness of repetition for either XSV or XVS structures. This confirmed that legitimacy of the choice to pool the four types of sentences into XSV and XVS structures, respectively.

4.3.3.2 Criterion B

Criterion B involved scoring the initial rather than final attempt in cases where a participant made more than one attempt to repeat a model sentence. The scores obtained using Criterion B did not differ from those obtained using Criterion A (final repetition in case of several attempts) when compared across Time, Structure, and Group. Considering that no differences were found and that many EI studies restrict their

analyses to the final repetition (e.g., Santelmann et al., 2002; Schimke, 2011), all further analyses were based on final repetitions only.

4.3.3.3 Criterion C

As previously mentioned, all model sentences contained an auxiliary and a lexical verb. In XVS model sentences (9), the auxiliary was inverted with the subject (see Section 4.3.2.1 above). A participant who repeated an XVS structure without the auxiliary but retained the relative order of the remaining words produced an XSV structure with either a non-finite verb (9a; Sabina Year 9) or a finite verb (9b; Thomas Year 9). This could be interpreted as either (a) a reconstruction to XSV or (b) omission of the auxiliary. To control for this possible confounding factor, Criterion C entailed the exclusion of all repetitions without auxiliaries from the analyses. This resulted in the loss of 10% of the data (108 utterances) overall and 32% in Year 6, where this phenomenon was the most common.

(9) Model XVS:	<i>Dann hat Lena ein Buch gelesen</i>
	X Aux S O V
	'then have _{fin} Lena a book read _{non-fin} '
(a) Repetition XSV _{non-fin}	<i>Dann Ø Lena einen Buch gelesen</i>
	X Ø S O V _{non-fin}
	'then ø Lena a book read _{non-fin} '
(b) Repetition XSV _{fin}	<i>Dann Ø Lena eh ein Buch liest</i>
	X Ø S O V _{fin}
	'then ø Lena eh a book read _{fin} '

Grand averages of the correct and incorrect repetition for each group at T1 and T2 were calculated using Criterion C (Table 4.5). A logistic regression analysis (fitted by the Laplace approximation) was used to explore the effect of verb position in model sentences (XSV versus XVS structure) on correct repetition. The analysis did not find a statistically significant effect for verb position for the learner group as a whole, in contrast to what was found using Criterion A, possibly owing to the smaller size of the dataset. To explore the predictions of the DMTH, conditions were analyzed separately for the five different groups (the alpha-level was corrected to .008 for multiple analyses). Participants in Years 6 and 8 were again statistically significantly better at imitating XSV structures, while the control group was statistically significantly better at imitating XVS structures (Year 6: *Est* = 4.08, *SE* = 1.13, *z* = 3.60, *p* < .001; Year 8: *Est* = .95, *SE* =

.27, $z = 3.47$, $p = .008$; control group: $Est = -2.08$, $SE = .44$, $z = -4.73$, $p < .008$). These results suggest that the verb position, but not the inclusion of an auxiliary, predicted the likelihood of correct imitation.

Table 4.5

Distribution of Correct Repetitions of XSV and XVS Using Criterion C

Time	Year	<i>n</i>	Utt	XVS		XSV	
				1	0	1	0
T1	6	4	18	33%	6%	56%	6%
	7	12	102	47%	8%	29%	16%
	8	11	112	30%	22%	39%	8%
	9	15	142	36%	16%	30%	18%
Total		42	374	37%	15%	34%	14%
T2	6	6	46	17%	39%	43%	-
	7	14	111	36%	13%	34%	17%
	8	17	166	32%	20%	37%	11%
	9	16	143	36%	16%	30%	18%
Total		53	466	33%	19%	35%	14%
Controls		18	186	42%	9%	23%	26%

Note. Scores given as percentages of the total number of scorable utterances (Utt). Time = sampling time, T1 = Time 1, T2 = Time 2, Year = school year, *n* = number of participants producing at least two scorable responses per condition, Utt = number of scorable utterances, XVS = model sentence with verb in second position, XSV = model sentence with verb in third position 1 = percentage of correct repetitions, 0 = percentage of incorrect repetitions.

4.3.4 Discussion

Native speakers of Swedish with English as L2 were not able to profit from similarities between L1 and L3 structures when repeating L3 sentences. Instead, participants repeated ungrammatical XSV structures more correctly than XVS structures. This supports the DMTH and the Initial L2 Transfer Hypotheses but not the Initial L1 Transfer Hypotheses.

With increasing exposure to German in school, an initial preference for XSV over XVS structures in earlier years was replaced in later years by a tendency to treat both types of

structures similarly, as predicted by the DMTH. However, according to DMTH the upper intermediate group (Year 8) should have repeated XSV and XVS structures correctly to a similar extent and the most advanced group (Year 9) should have shown the same preference for the grammatically correct structure as the native speakers in the control group actually did. The absence of such a result could possibly be due to the fact that Year 8 and Year 9 students (in general, or the specific ones studied) are not as proficient as they were assumed to be. Indeed, the developmental trajectory predicted by the DMTH was supported by the results, provided that the lack of differences between the rates of correct repetition of grammatical and ungrammatical structures in the most advanced group of learners can be interpreted as representing a step on the way toward developing such a full-blown preference for grammatical structures as that displayed in the native group.

Interestingly, although the native German speakers repeated grammatical XVS structures better than ungrammatical structures, in accordance with previous studies (e.g., Love & Parker-Robinson, 1972), they did not imitate the grammatical structures perfectly. Part of the explanation could be that the high rate of ungrammatical word orders in the model sentences (in fact only one third were grammatical) biased them toward the production of ungrammatical structures. To explore this hypothesis, future studies should compare rates of correct repetition of grammatical structures in native speakers presented with material containing different proportions of ungrammatical structures.

Separate analyses of correctly imitated XVS structures showed that correct repetition was more common in sentences containing the adverbial *dann*. Acquisition of this structure thus seems to take place earlier in conjunction with this adverb. Indeed, earlier studies have suggested that syntactic development is lexically driven, such that a structure is first learned with a specific word and later generalized to other lexical items (Bybee, 2008; Bybee & Hopper, 2001; Pienemann, 1998; Tomasello, 2003). Longitudinal studies exploring the progression of XVS acquisition could possibly determine whether acquisition actually starts with a specific lexical item, such as the adverbial *dann* and, if so, show how the subsequent generalization of XVS to other adverbials develops and what role the input received by the learner plays in this process.

The present study grouped participants by length of exposure on the basis of school year rather than proficiency, which is known not to be perfectly related to exposure (Bardovi-Harlig, 1992, 2000). There were some indications that participants in Year 7 were of

higher proficiency than participants in later years, which could be due to sampling effects. In fact, relatively few students in the Year 7 class taught by the teacher first involved in the study were interested in participating, and therefore a group of students from a class taught by a second teacher were recruited on a first-come, first-serve basis. It could be that this led to the inclusion of students with higher motivation and higher proficiency in Year 7 only. The inclusion of a general German proficiency test could have readily controlled for this possible confounding factor. In addition, it is possible that a focus on new syntactic structures in later years may have caused a regression to previously learned forms in verb placement, as suggested by Dynamic Systems Theory approaches to L2 acquisition (Verspoor, Lowie, & de Bot, 2007).

A great deal of time was spent on generating model sentences prior to conducting the study. The lack of ceiling and floor effects for both grammatical and ungrammatical structures suggested that the design of the EI was sound and that it would measure grammatical preferences and linguistic knowledge. Previous studies using an EI task did not specify which repetition (i.e., initial or final) was used in their analyses. In an attempt to further the understanding of how the choice of repetition version affects results, the present study compared outcomes of analyses based on either the initial or the final imitation. No differences were found and the main analyses were therefore performed only on the final response, which was thought to be the one preferred by the speaker.

The omission of auxiliaries made it a more challenging task to judge whether repetitions of structures were correct or incorrect. The participants, especially those in Year 6, tended to omit the auxiliary when imitating XVS structures. If the rest of the structure was then repeated verbatim, the outcome was an XSV structure. When datasets from which repetitions not containing any auxiliary had been removed were separately analyzed, there was a less pronounced difference in the rate of correct repetition of XSV versus XVS, even though this pattern was still statistically significant for Years 6 and 8. Such a loss of data could easily have been avoided by having the model sentences include lexical verbs only.

It was concluded that native speakers imitated grammatical XVS structures better than ungrammatical XSV structures, while learners showed the reverse pattern. These results indicate a lack of positive transfer of L1 structures to L3 in early acquisition.

4.4 Spontaneous Speech Data

The following sections present and discuss the design and results of the two spontaneous speech tasks: the picture-based storytelling task and the unstructured interview.

4.4.1 Method

4.4.1.1 Participants

To ensure that all groups were represented in the analysis while reducing the amount of time-consuming transcription work as far as possible, half of the participants in each group (i.e., Year 6: $n = 6$; Year 7: $n = 8$; Year 8: $n = 6$; Year 9: $n = 8$) were randomly sampled and only their data were transcribed. For further details on participants' language background, age, eligibility, exposure to German and English, and recruitment, see Chapter 3 and Table 3.1.

4.4.1.2 Tasks and material

Picture-based storytelling task

The picture-based storytelling task was designed to elicit spontaneous speech data (SD), specifically sentences with topicalized adverbials. The participants' task consisted of arranging four comic-strip pictures in sequence and telling the story depicted in the resulting strip. This procedure was performed twice in German L3 and Swedish L1 for each participant at T1 using two different sets of pictures. The task of ordering the pictures (which allowed multiple orders) was expected to focus participants' attention on sequences, which would increase their use of temporal adverbials. A positive side effect of this task turned out to be that the participants appeared to be more at ease and distracted from the pressure of speaking German—and this effect seemed to last throughout the production task. Each of the two comic-strip stories was told first in German L3 and then in Swedish L1. For more details on the storytelling task, see Chapter 3.

Unstructured interview

Spontaneous speech data were also collected at T1 using an unstructured interview intended to elicit topicalized sentences and subject–verb agreement. The interviews were based on a predetermined set of questions to increase the comparability of the data obtained from the various participants. These questions were woven into a dialog to

increase the naturalness of the conversation, such that questions could appear in different order across participants, depending on the flow of the conversation. For further information about the unstructured interview, see Chapter 3.

4.4.1.3 Procedure

The session with each participant began with the SD tasks. The participant first performed the L3 storytelling task, which was followed by the unstructured interview. The next task was either the EI task or the communicative task (their relative order was randomized for each participant). Finally, to avoid long-term priming effects, the L1 storytelling task was always the last task of a session (Bock et al., 2007; Bock & Griffin, 2000). The order of the two comic-strip stories in a given language was randomized for each participant by that participant's choice of either of two envelopes containing the pictures. The participants were informed that the pictures could be combined into more than one story and that, before telling the story, they would need to order the pictures. The participants were free to ask the interlocutor for help with German words since the focus of the present study was on syntactic, not lexical, phenomena. The session was audio- and video-recorded for later transcription and analyses.

4.4.1.4 Predictions

To elicit SD data from the same participants who took part in the EI task, they were interviewed and asked to retell a picture story. The picture-based storytelling task was carried out in both L1 and L3, to enable comparison of participants' production of different word orders across their languages. One main difference between the analysis of the EI data as described above and that of the SD data was that the EI data were measured on a binominal scale (correct versus incorrect repetition) while the analyses of the SD data used an implicational scale, with emergence as the cutoff point for acquisition. Since data from the EI task are suggested to reveal grammatical knowledge not yet visible in spontaneous production (see Chapter 3), it was expected that the participants' performance in the EI task would be better than that in the SD task. Other than that, the hypotheses for the SD data were similar to those for the EI data as regards the interaction of transfer (from L1 and L2) and developmental trajectories (see below).

(a) Initial L1 Transfer Hypotheses

According to the Initial L1 Transfer Hypotheses, L1 is the basis for L3. XVS structures are common and obligatory in the participants' native Swedish, while XSV is ungrammatical in both Swedish and German.

- Prediction: Participants will produce XVS word order from an early stage of acquisition and XSV word order will not occur.

(b) Initial L2 Transfer Hypotheses

According to the Initial L2 Transfer Hypotheses, XSV structures (common and grammatical in L2) will transfer initially and will be part of the L3 learners' grammatical knowledge of German. The hypotheses of initial L2 transfer do not include any proposed transfer effects beyond the initial state, meaning that there are no specific predictions as regards the acquisition of target XVS by intermediate and advanced learners.

- Prediction: The topicalized utterances of the beginners (Year 6) will have XSV structure.

(c) Developmentally Moderated Transfer Hypothesis (DMTH)

According to the DMTH, the learner groups will progress along the proposed learner-general developmental stages, from production of XSV structures to production of XVS structures.

- Prediction 1: The beginners (Year 6) will produce topicalized utterances with XSV word order.
- Prediction 2: The participants in Years 7 and 8 will produce both types of structures, as the number of utterances with XVS word order will increase with development while the number of utterances with XSV order will decrease.
- Prediction 3: The participants in Year 9 will still produce both structures, as XSV structures have been shown to be produced long after the first appearance of XVS structures.
- Prediction 4: Implicational scaling (see 3.10) will reveal a progression from exclusive production of XSV structures to increasing production of XVS structures.

4.4.2 Analyses

The data from the SD tasks were transcribed using the transcription standard of the CHAT transcription system (MacWhinney, 2000). German particularities were transcribed in accordance with Szagun (1999). The phonological and lexical closeness of

the three languages involved in the present study resulted in some ambiguous cases. For example, in the utterance *hast um eh die Urlaub [bin]* ‘have been on holiday’ (where the last word is placed in squared brackets to indicate pronunciation), [bin] could have been transcribed as either of two phonetically similar but otherwise different words: the German first-person singular form of the copula: *bin*, or the past participle of the English copula: *been* (Sayehli, 2001). Both alternatives were legitimate choices. All ambiguous cases were marked as such in the database.

The criterion for scorability of an utterance was the presence of at least one identified German word and the production of each of topicalized adverbial, subject, and verb (see Examples 10 and 11).

(10) XSV, Year 7: *und dann die schlange äter*
 ‘and then the snake eats (Swedish)’

(11) XVS, Year 9: *in april war wir*
 ‘in April were we’

Scorable utterances were identified and coded for word order structure (XSV as in (10) or XVS as in (11)). The proportions of these structures were calculated for each participant, that is, the number of instances of XSV and XVS structure, respectively, divided by the total number of scorable utterances.

4.4.3 Results

4.4.3.1 Spontaneous speech data across and within tasks

Most of the 83 scorable utterances across the SD tasks had ungrammatical XSV word order (92%, or 72 utterances; see Table 4.6). More specifically, all scorable utterances from the picture-based storytelling task were non-inverted XSV structures (Table 4.7). The pattern was reversed for the picture-based storytelling task in Swedish L1, where only 8% (9 utterances) of all scorable utterances were non-inverted (Table 4.8).

Table 4.6

Scores across Tasks (Storytelling + Interview) in German L3

Year	Utt	XSV	XVS
6	2	100%	-
7	31	97%	3%
8	21	100%	-
9	29	79%	21%
Total	83	92%	8%

Note. The column Utt shows the number of scorable utterances by Year. The XSV and XVS columns indicate the percentages of utterances representing each structure. The grammatical structure is XVS throughout.

Table 4.7

Storytelling Scores in German L3

Year	Utt	XSV	XVS
6	2	100%	-
7	22	100%	-
8	13	100%	-
9	14	100%	-
Total	52	100%	-

Note. The column Utt shows the number of scorable utterances by Year. The XSV and XVS columns indicate the percentages of utterances representing each structure. The grammatical structure is XVS throughout.

Table 4.8

Storytelling Scores in Swedish L1

Year	Utt	XSV	XVS
6	19	5%	95%
7	39	5%	95%
8	30	13%	87%
9	28	7%	93%
Total	116	8%	92%

Note. The column Utt shows the number of scorable utterances by Year. The XSV and XVS columns indicate the percentages of utterances representing each structure. The grammatical structure is XVS throughout. Utterances with XSV order all started with så ('so'), a Swedish word which is multifunctional in in that it can function as an adverbial or a subordinating conjunction. These sentences therefore remain ambiguous as to whether they represent a declarative main clause or a subordinate clause.

Even though the L1 and L3 narrations appeared to be similar in content for the individual participants, subject–verb inversion (XVS) was produced only in L1 (See Examples (13a) and (13b), produced by Cecilia, Year 8; and Examples (14a) and (14b), produced by Hans, Year 8).

(13)

(a) German L3, XSV: *und wann den mann kommt der schlange hat der hund essten*

X S V_{fin} O V_{non-fin}

‘and when the man comes the snake has the dog eaten’

(b) Swedish L1, XVS: *när han kommer ut igen har ormen ätit upp hunden*

X V_{fin} S V_{non-fin} O

‘when he comes out again has the snake eaten up the dog’

(14)

(a) German L3, XSV: *und dann er malen dem tillbaka – vad heter det?*

X S V_{non-fin} O

‘and then he paint them back – how do you say that (Swedish)’

(b) Swedish L1, XVS: *sen målar han tillbaka fläckarna på ormen*

X V_{fin} S O

‘then paints he back the spots on the snake’

4.4.3.2 Implicational scaling

The German spontaneous speech data produced by the individual participants were scored for presence or absence of XVS and XSV structures, with first emergence as the cut-off point (see Chapter 2). These data were entered into an implicational scale (Table 4.9). This scale turned out to be perfect ($C_{scal} = 1.0$): there were only 1’s to the right of the dividing line and only 0’s to the left of it. In other words, all participants who produced XVS structures (only three: one in Year 7 and two in Year 9) also produced XSV. This suggests an implicational order of acquisition: XSV prior to XVS.

4.4.3.3 Comparison of SD and EI data

To compare SD and EI data, in the implicational scale, the 1’s and 0’s indicating the presence or absence of a structure in SD (Table 4.9) were replaced by percentages of correct imitation of XVS and XSV, respectively, in the EI task at T1 (Table 4.10). The general pattern thus obtained indicated that participants were able to repeat structures that they could not yet produce. More specifically, while there were learners who correctly repeated structures but did not actively produce them (e.g., Hans, Year 8;

Melanie, Year 9; Mikael, Year 6), the opposite scenario of learners producing a structure but being unable to repeat it did not occur. In other words, the level of proficiency reflected by EI data was consistently either higher than or equal to that reflected by SD data.

Table 4.9

Implicational Scale for XVS and XSV Structures

Year	ID	German	
		XVS	XSV
9	Eva	1	1
9	Jakob	1	1
7	Karsten	1	1
9	Cassie	0	1
7	Cecilia	0	1
8	Chris	0	1
8	Claudia	0	1
9	Curt	0	1
7	David	0	1
7	Hans	0	1
7	Jacquelin	0	1
8	Jens	0	1
9	Jim	0	1
9	Justus	0	1
8	Lara	0	1
7	Linda	0	1
7	Markus	0	1
9	Mats	0	1
8	Melanie	0	1
8	Natascha	0	1
6	Ralf	0	1
9	Rudolf	0	1
7	Sabina	0	1
6	Ingrid	0	0
6	Max	0	0
6	Mikael	0	0
6	Sofie	0	0
6	Tanja	0	0

Note. Year = school year. Participants who produced the same type(s) of structures are ordered alphabetically.

Table 4.10

Implicational Scale with Percentages of Correctly Repeated Structures in the EI Task

Year	ID	German	
		XVS repetition	XSV repetition
9	Eva	33	100
7	Jakob	50	100
9	Karsten	100	67
7	Cassie	75	33
8	Cecilia	17	100
8	Chris	0	100
7	Claudia	75	100
7	Curt	100	33
7	David	0	100
8	Hans	67	83
6	Jacquelin	100	50
8	Jens	40	100
9	Jim	67	67
9	Justus	50	80
7	Lara	100	50
9	Linda	0	100
8	Markus	100	67
7	Mats	83	50
9	Melanie	100	33
9	Natascha	83	80
8	Ralf	83	33
7	Rudolf	80	100
9	Sabina	40	80
6	Ingrid	50	100
6	Max	0	0
6	Mikael	0	100
6	Sofie	0	0
6	Tanja	0	0

Note. Year = school year. The separation line is taken from Table 4.10 and thus indicates the structures produced by each participant in the spontaneous speech tasks, starting at the bottom of the scale with five participants who produced neither XSV nor XVS, followed by twenty participants who spontaneously produced XSV but not XVS, and finally three participants who produced both structures. Participants in each cluster are ordered alphabetically. The figures represent percentages of correct repetition of the structure (either XSV or XVS) in the EI task. Note that no participant produced a structure that he or she could not repeat correctly at least some of the time.

4.4.4 Discussion

Of the topicalized L3 sentences produced in the spontaneous speech tasks, 92% had XSV structure which is ungrammatical not only in L3 but also in L1. By contrast, the task performed in L1 showed a similarly high prevalence of the grammatical XVS structure. Thus, despite the high frequency of XVS in L1, there seemed to be no positive transfer of this structure from L1 to L3 production, as the Initial L1 Transfer Hypotheses predicted. In fact, only three participants (two in Year 9, one in Year 7) produced the grammatical XVS structure in L3, and not all of their utterances had this grammatical word order. With emergence as the criterion of acquisition, the results suggest an implicational order of appearance of XSV structures prior to XVS structures, replicating previous results (Sayehli, 2001) and supporting the Initial L2 Transfer Hypotheses and the DMTH. According to the DMTH, the intermediate and advanced learners were expected to produce more XVS than they did, but this deviation from the expected result could readily be explained by reference to a lower-than-expected level of proficiency in the learner group.

The few German XVS structures that did occur appeared in the unstructured interview, which suggests that the more controlled and limited data-acquisition procedure using the storytelling task may have its limitations. This represents a useful reminder that estimates of learners' proficiency based on spontaneous speech data can be conservative and leave the issue of acquisition undetermined.

4.5 Verb Placement and Transfer: A Discussion

The studies described in this chapter explored the interaction between developmental trajectories and language transfer in the acquisition of verb placement in German declarative main clauses. Specifically, investigations of L1 transfer effects on imitation and spontaneous production of topicalized declarative sentences were carried out.

There was no evidence of L1 transfer of XVS structures in any task. Instead, the results were compatible with the DMTH, which suggests that transfer of word order occurs only when the learner's development has reached the appropriate stage (Håkansson et al., 2002; Pienemann et al., 2005; Wode, 1976, 1978; Zobl, 1980). General language-

learning mechanisms, which may be reflected in learner-general developmental trajectories, are thus assumed to constrain the influence of language-specific factors such as transfer.

Further, learners may be able to repeat structures that they cannot yet produce but are on the verge of acquiring. In the present studies, the elicited imitation data consistently overestimated learners' proficiency in that the participants were able to repeat sentences that they were apparently not (yet) able to produce spontaneously, replicating the results from several other studies (Kuczaj & Maratsos, 1975; Schimke, 2011; Smith, 1973; Verhagen, 2011). This means that elicited imitation data could be used to reveal knowledge not yet visible in spontaneous production (Schimke, 2011).

Earlier research has suggested L2 as a main source of transfer to L3 (Bardel & Falk, 2007; Bohnacker, 2006). The studies described in this chapter found no support for L1 transfer, but transfer from L2 English (where XSV is grammatical in the relevant contexts) cannot be ruled out on the basis of those studies, because they were not designed to determine whether the DMTH or the Initial L2 Transfer Hypotheses better explain the results obtained. This issue will instead be further explored in the following chapter.

CHAPTER 5

FIRST POSITION AND TRANSFER FROM L2

5.1 Background

This chapter explores the interaction between L2 transfer and developmental trajectories in relation to the first position of declarative sentences. The first section describes the structure of declarative sentences in the three languages involved (German, English, and Swedish) (5.1.1). This is followed by a summary of the main earlier findings relating to L2 processing and the acquisition of subject-first (Sf) sentences and topicalized (Tp) sentences (5.1.2). Then three sections present the method and analysis of the present study (5.2), the results of the analysis of the data from the elicited imitation task (5.3), and the results of the analysis of the spontaneous speech data elicited through the picture-based storytelling task and the unstructured interview (5.4). Finally, the results relating to both elicited imitation and spontaneous speech data are discussed (5.5).

5.1.1 First Position in Declarative Main Clauses in German, Swedish, and English

Typologically, languages can be categorized according to the basic or canonical order of their main syntactic constituents: the finite verb (V) and its arguments, the subject (S) and the object (O). Of the world's languages, approximately 77% have a canonical word order in which the subject appears in first position (i.e., SVO as in English or Swedish; or SOV as in German or Dutch; for a discussion of whether the basic word order of German is SVO or SOV, see Dryer, 2011; Hinterhölzl & Petrova, 2009). Other languages have other word orders or even lack a dominant word order (Dryer, 2011).

The canonical word order of a language is not necessarily the only possible order in which sentence constituents can be arranged: it is merely the most common and pragmatically most neutral one among a variety of word orders that are possible in single sentences. Languages differ in the number of possible word orders and in the flexibility with which they can be used. For example, German has rather flexible word order, relying largely on case marking to indicate who does what to whom in a sentence, whereas English has fixed word order, with grammatical roles being indicated by the relative position of constituents (Lenerz, 1977; Quirk, Greenbaum, Leech, & Svartvik, 1985). Even so, both of these languages, as well as Swedish, allow topicalization, that is, having a constituent other than the subject appear in first position at the left edge of the clause (marked with “X” in (1–3) below).

(1) German XVS:

Heute lese ich ein Buch
'today read_{fin} I a book'

(2) Swedish XVS:

Idag läser jag en bok
'today read_{fin} I a book'

(3) English XSV:

Today I read a book

Topicalized elements can be differentiated according to their lexical category, their scope, and their grammatical and pragmatic function (Speyer, 2010). The three languages in question differ in which elements can fill the first position of a clause in a given context (Bohnacker & Rosén, 2007; Speyer, 2010). However, adverbials are

admissible and indeed frequently seen in first place in all three languages (see (1a–c) above) (Bohnacker & Rosén, 2007; Speyer, 2010). Topicalized adverbials can be temporal or local, functioning as scene-setting elements (e.g., *dann* ‘then’, *heute* ‘today’, *morgen* ‘tomorrow’, *in der Schule* ‘in school’), or sentential adverbials modifying the whole sentence in terms of its probability or desirability (e.g., *überraschenderweise* ‘surprisingly’, *glücklicherweise* ‘luckily’). Just like subjects, adverbials with these types of functions can appear in sentence-initial position without obtaining any additional pragmatic force (Fanselow, 2004).

Topicalizations are frequent: at least 30% of all sentences in corpus studies of the three languages of interest were topicalized (Bohnacker & Rosén, 2007; Engel, 1974; Fabricius-Hansen & Solfjed, 1994; Jörgensen, 1976; Los, 2012; Nordman, 1992). Even so, sentence processing studies examining object–subject ambiguities in L1 German OVS sentences (i.e., topicalized ones) indicate that objects are initially misidentified as subjects; this suggests a preference for subject-first structure (for a review, see Kaan, 1997). Difficulties processing OVS sentences have been linked to constraints on working memory (Schlesewsky, Fanselow, Kliegl, & Krell, 2000). The processing of adverbials in first position has not yet been explored, but similar difficulties could be expected given the similar burden on working memory.

5.1.2 Subject-first and Topicalized Sentences in German L2/L3 acquisition

Similarly to native speaker studies, research on L2 acquisition of SVO and SOV languages has reported a preference for subject-first sentences over topicalizations as regards comprehension (Jackson, 2007, 2008; VanPatten, 2007). Several theories of language acquisition have incorporated the idea that the first noun or pronoun initially tends to be parsed as the subject of the sentence. Learners are thought to make form–meaning connections during comprehension, such that any noun–verb–noun sequence will be interpreted as agent–action–patient (Bever, 1970; First Noun Principle: VanPatten, 2007). Canonical word order is taken to yield a default interpretation that, at early stages of development, will be used even for sentences deviating from canonical word order (Slobin, 1973). However, it has been questioned whether this claim is universally applicable (Bates et al., 1984).

The production of subject-first sentences and topicalized sentences in German as an L2 or L3 has been studied mostly in connection with verb placement (see Chapter 4). Only

a few studies focus explicitly on the sentence-initial position. Early projects studying the development of German L2 acquisition described development from the production of syntactically unconnected words via subject-first structures to topicalizations (Clahsen, Meisel, & Pienemann, 1983). This developmental trajectory has been claimed to be learner-general (Clahsen & Muysken, 1986; Pienemann, 1998, 2005a; 2005b; for a review of developmental trajectories see Chapter 2).

This implicational developmental order from subject-first to topicalization is supported by empirical findings from studies of the production of adult learners with various L1s, such as Swedish (Håkansson et al., 2002), English (Boss, 1996; Jansen, 2008), Korean and Turkish (Vainikka & Young-Scholten, 1996b), as well as by data from child L2 learners with Italian (Pienemann, 1981) or Russian (Haberzettl, 2005) as their L1. However, only spontaneous speech data have been explored, meaning that structural constraints may have been confounded with lexical constraints (Bardel & Falk, 2007). In other words, the observed initial lack of adverbials in first position could be the result of the absence of adverbials in the participants' lexicon rather than necessarily being linked to difficulties handling the structure as such. Still, some studies have reported frequent use of adverbials in other positions before they appear in sentence-first position, suggesting that the difficulty is indeed structural and not lexical (Jansen, 2008; Meisel et al., 1981).

Several transfer hypotheses would not be compatible with a developmental trajectory from subject-first to topicalization in the three-language scenario of the present study (Swedish L1, English L2, and German L3). While those hypotheses would predict similar outcomes in early L3 acquisition—namely, production of subject-first sentences alongside topicalizations—the assumed source language of transfer differs across hypotheses. The Cumulative-Enhancement Model (Flynn et al., 2004) and the Typological Primacy Model (Rothman, 2011; Rothman & Cabrelli Amaro, 2010), for example, would consider both L1 or L2 as potential source languages, since both structures exist in both languages and transfer is predicted to occur from any language so long as it will enhance L3 acquisition (Cumulative Enhancement Model) or from any language that is typologically close or perceived as being close (Typological Primacy Model).

Some hypotheses would suggest only the L1 to be the source language, because L1 grammar is assumed to be the basis on which the target grammar is constructed (e.g., Hawkins & Chan, 1997; Lado, 1957; Na Ranong & Leung, 2009; Schwartz & Sprouse,

1994, 1996). These hypotheses will here again be collectively referred to as the “Initial L1 Transfer Hypotheses.” According to other hypotheses, by contrast, the L2 would be the source language (e.g., Bohnacker, 2006). In particular, the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011) would consider the L2 to be the only source of transfer, irrespective of whether the L2 is typologically close to or shares similar structures with the L3, since the knowledge of an L2 is assumed to block L1 transfer. These hypotheses will again be collectively referred to as the “Initial L2 Transfer Hypotheses.” Importantly, all of these hypotheses share the prediction that subject-first sentences and topicalizations will both occur from an early stage of L3 German acquisition by Swedish native speakers with L2 English.

By contrast, the earlier-presented Developmentally Moderated Transfer Hypothesis (DMTH) combines the idea of developmental trajectories with that of transfer, such that transfer can take place only when the learner has reached the developmental stage where production of topicalizations can be expected. At that point, both positive and negative transfer of structures may occur. Accordingly, the DMTH predicts that the production of subject-first sentences will precede that of topicalizations.

A study based on spontaneous speech data from Swedish native speakers acquiring German as L2 or L3 (depending on whether they had prior knowledge of English) did not support the implicational developmental order of subject-first sentences and topicalizations (Bohnacker, 2006). The participants produced both topicalizations and subject-first sentences after only four months of exposure to German, which was interpreted as evidence of full transfer from L1 for the German L2 learners and of partial transfer from L2 (English) for the German L3 learners. However, when the results from that study were reanalyzed using implicational scaling with emergence rather than accuracy as the acquisition criterion, it appeared that, despite their short exposure, all participants were at an advanced level of German acquisition. In fact, they had acquired syntactic structures that could not be ascribed to L1 or L2 transfer (e.g., the separation of finite and non-finite verbs in complex predicates; see Chapter 2, Table 2.1), and they also all produced subject-verb inversion, irrespective of their overall language combination. Hence, the reanalysis of the data suggested that all participants were already at an advanced level of German, meaning that their data probably were not representative of the beginning stages of German acquisition (Pienemann & Håkansson, 2007).

The potential transfer of topicalizations from L1/L2 to L3 at initial stages of acquisition has not previously been experimentally explored. The present study extends previous research with the inclusion of an elicited imitation task and the elicitation of spontaneous speech data.

5.2 The Present Study

The present study examined the transfer of topicalizations in L3 acquisition, in particular the interaction between L2 transfer and developmental trajectories. It extended previous research on the acquisition of topicalizations with more controlled data from an elicited imitation task. Elicited imitation tasks enable a high level of control over the structures that are tested. This is particularly important in the case of the production of topicalizations, since these are optional in the three languages included in the present study and it is therefore not possible whether the absence of topicalizations in spontaneous speech data reflects the effects of structural or lexical difficulties nor to conclude whether the structure in question has been acquired or not. By contrast, data from elicited imitation tasks enable such a conclusion, since production is forced. However, the present study also explored spontaneous speech data, because the combination of both data types provides a more detailed picture of any transfer effects as well as of the development of L3 German. In the following sections, task design and results are presented and discussed, first for the elicited imitation task (5.3) and then for the two spontaneous speech tasks: the picture-based storytelling task and the unstructured interview (5.4). Finally, the results from the spontaneous speech data and the elicited imitation data taken together are discussed in the concluding section of the chapter (5.5).

5.3 Elicited Imitation Data

5.3.1 Method

5.3.1.1 Participants

The participants in the elicited imitation (EI) task were the same Swedish native speakers and German controls as presented above in Chapters 3 and 4 (Table 3.1).

5.3.1.2 Task and materials

The model sentences were the same as those presented in Chapter 4. There were a total of six subject-first (Sf) sentences and twelve topicalized (Tp) sentences. The model sentences were analyzed as filler sentences ($n = 6$) and experimental sentences ($n = 12$). Of the experimental sentences, six were subject-first sentences (three SVO and three Vend—i.e., subordinate clauses) and six were topicalized sentences. The topicalized sentences with XSV structure (three ADV and three SEP) were analyzed for Analysis 1, and the topicalized sentences with XVS structure (three INV and three SLIT) were analyzed for Analysis 2 (Table 5.1). The remaining topicalized sentences in each analysis were treated as fillers (for a complete list of model sentences in the EI task, see Appendix B, Table 1). The choice of performing two separate analyses was made in the light of the finding from the previous study (see Chapter 4) that XSV structures were more likely than XVS structures to be correctly imitated, across the learner groups. The targeted items appeared in first position in both types of structures (Sf and Tp), which controlled for the primacy and recency effects that can be seen in EI tasks. (For more details on the task and the materials, see Chapter 4.)

Table 5.1

Experimental Sentence Types: Sf and Tp

(a) Subject-first model sentences

SVO					Vend		
<i>*Lena kann lesen ein Buch morgen</i>					<i>Lena sagt, dass sie ein Buch lesen kann</i>		
S	V _{fin}	V _{non-fin}	O	X	S	V _{fin}	O
'Lena can read a book tomorrow'					'Lena says that she a book read can'		

(b) Topicalized model sentences

Analysis 1: Tp-XSV									
ADV					SEP				
<i>*Morgen Lena kann lesen ein Buch</i>					<i>*Morgen Lena kann ein Buch lesen</i>				
X	S	V _{fin}	V _{non-fin}	O	X	S	V _{fin}	O	V _{non-fin}
'tomorrow Lena can read a book'					'tomorrow Lena can a book read'				
Analysis 2: Tp-XVS									
INV					SLIT				
<i>Morgen kann Lena ein Buch lesen</i>					<i>*Morgen kann Lena lesen ein Buch</i>				
X	V _{fin}	S	O	V _{non-fin}	X	V _{fin}	S	V _{non-fin}	O
'tomorrow can Lena a book read'					'tomorrow can Lena read a book'				

Note. * indicates an ungrammatical sentence from a standard language perspective. SVO = Subject–Verb–Object, Vend = finite verb in subclause final position, INV = subject-verb inversion, SLIT = Swedish literal translation, ADV = fronted adverbials, SEP = verb separation, S = subject, V = verb, X = any element other than the subject; here an adverbial, V_{non-fin} = non-finite verb, V_{fin} = finite verb, O = object, Tp = topicalization.

5.3.1.3 Procedure

The elicited imitation task was carried out as previously described in Chapter 4.

5.3.1.4 Predictions

The results from the previous study on verb placement (Chapter 4) ruled out explanations based on an initial transfer from L1. However, initial L2 transfer was acknowledged as a possible alternative explanation of the data, since that study did not enable the effects of L2 transfer to be disentangled from those of developmental trajectories. In the present study, however, the predictions derived from the Initial L2 Transfer Hypotheses differed from those yielded by the Developmentally Moderated Transfer Hypothesis (DMTH), allowing the respective effects to be isolated. The data from EI task presented in Chapter 4 were reanalyzed for correct repetition of Sf and Tp structures, and tested for possible transfer. Under both of the initial transfer hypotheses (a and b below), topicalizations are assumed to be part of a learner's grammatical knowledge, while under the DMTH (c) a progressive acquisition of these structures is expected.

(a) Initial L1 Transfer Hypotheses

Both Sf and Tp structures are grammatical and common in the participants' L1 (Swedish), which is the basis for L3 according to the Initial L1 Transfer Hypotheses.

- Prediction 1: Sf and Tp structures will be correctly repeated at equal rates by all participants, both at T1 and at T2.
- Prediction 2: The control group will also repeat both structures equally well because both structures are grammatical in standard German.

(b) Initial L2 Transfer Hypotheses

Since Tp structures are grammatical and common in the participants' L2 (English), they will transfer to the participants German L3.

- Prediction 1: Sf and Tp structures will be correctly repeated at equal rates by all participants, both at T1 and at T2.
- Prediction 2: The control group will also repeat both structures equally well because both structures are grammatical in standard German.

(c) Developmentally Moderated Transfer Hypothesis

Learners will progress along the proposed learner-general developmental trajectories and thus acquire Sf before Tp structures.

- Prediction 1: The beginners (Year 6) will repeat Sf better than Tp structures, and the difference between the rates will be more pronounced at T1 than at T2.
- Prediction 2: With advancement in L3 acquisition, the number of correctly repeated Tp structures will increase such that learners in Years 7, 8, and 9 will correctly repeat Tp and Sf at similar rates.

Note that the initial transfer hypotheses (a and b) predict the same results (albeit for different reasons), meaning that the present study is unable to distinguish the effects of these two hypotheses from each other. However, the previously presented study (Chapter 4) did not find any evidence for L1 transfer based on typological or structural similarities using partly the same data as in the present study. L1 transfer is therefore tentatively ruled out and the present study is principally intended to test the Initial L2 Transfer Hypotheses and the DMTH.

5.3.2 Analyses of Data

5.3.2.1 Criteria of scorability

A response from a participant was scored when it was intelligible and contained a verb, a subject, and a third element (adverbial or object). Lexical changes within the same category (e.g., nouns: *Bruder* ‘brother’ for *Buch* ‘book’) were accepted (meaning that responses containing them were scored as correct), as were inflectional changes in words (e.g., from the third person singular *hat* ‘has’ to the second person singular *hast* ‘have’). Responses with reductions, omissions, and ellipses were scored when they met the general criteria of scorability given above, to reduce the loss of word order data. To ensure that the data from individual participants would be stable and representative, each participant had to produce at least two scorable responses to Sf model sentences and two scorable responses to Tp model sentences to be eligible for further analyses.

5.3.2.2 Scoring

Repetitions of the model sentences were scored using a binominal scale: correct repetition (1) vs. incorrect repetition (0). For a response to a model sentence with Sf structure to be scored as correct, it had to begin with a subject; a response to a Tp model sentence had to have an adverbial in the initial position. Note that these scores (correct

vs. incorrect) do not take verb placement into account. Grand averages of the correct repetition of model sentences in each condition for each group at T1 and T2 were calculated. If the rate of correct repetition for one structure was higher than that for the other, it was concluded that the more correctly imitated structure was the preferred one (see Chapter 4).

5.3.3 Results

5.3.3.1 Results of Analysis 1

In Analysis 1, repetitions of topicalized model sentences with a verb in third position (Tp-XSV) and subject-first (Sf) model sentences were compared. Of all responses, 90% ($n = 1,445$) were scorable. Grand averages of the correct and incorrect repetition of model sentences in each condition for each group at T1 and T2 were calculated (Table 5.2). Percentages of correct repetition are presented in Figure 5.1.

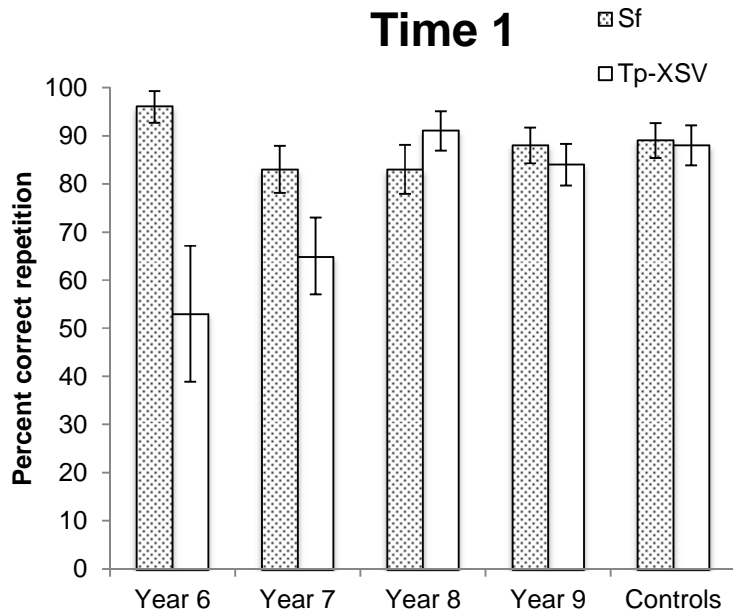
Table 5.2

Distribution of Correct Repetitions of Sf and Tp-XSV

Time	Year	<i>n</i>	Utt	Sf		Tp-XSV	
				1	0	1	0
T1	6	10	78	54%	3%	22%	22%
	7	16	164	42%	9%	34%	16%
	8	12	131	44%	8%	44%	4%
	9	15	185	44%	6%	42%	8%
Total		53	558	45%	7%	37%	11%
T2	6	11	113	42%	8%	27%	22%
	7	16	179	41%	9%	38%	12%
	8	17	197	41%	9%	47%	3%
	9	16	183	46%	5%	42%	7%
Total		60	672	43%	8%	40%	10%
Controls		18	210	45%	6%	43%	6%

Note. Sf = model sentence with subject-first, Tp-XSV = topicalized model sentence with verb in third position, Time = sampling time, T1 = Time 1, T2 = Time 2, Year = school year, *n* = number of participants producing at least two scorable responses per condition, Utt = number of scorable utterances, 1 = percentage of correct repetitions, 0 = percentage of incorrect repetitions.

(a)



(b)

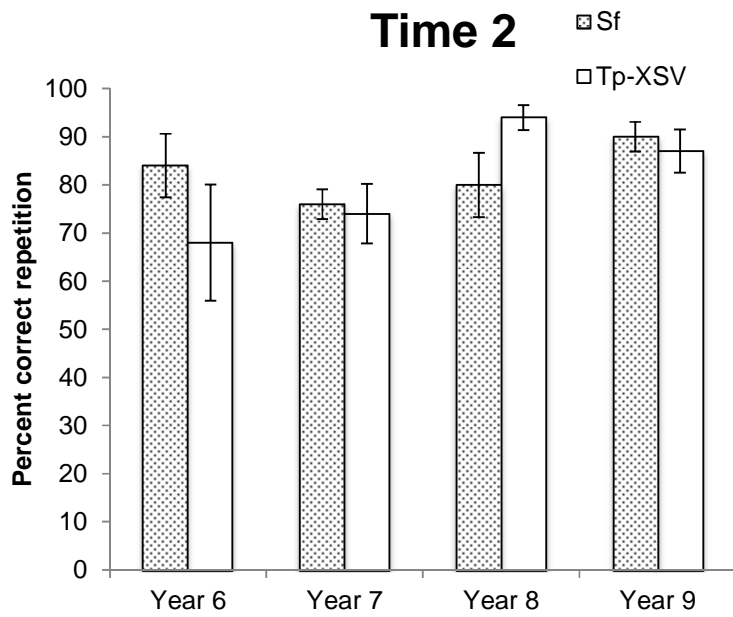


Figure 5.1. Percentages of correct repetition of subject-first model sentences (Sf) and topicalized model sentences with XSV structure (Tp-XSV). The error bars represent the standard errors.

A logistic regression analysis (fitted by the Laplace approximation) was used to test whether the initial item in a model sentence—a subject (Sf) or an adverbial (Tp-XSV)—had an effect on the likelihood of correct repetition of that model sentence across groups and sampling times. This analysis found no statistically significant effects ($p > .05$). To explore the DMTH’s predictions that the initial item in a model sentence would have an effect on the likelihood of correct repetition, particularly in Year 6 learners at T1, separate analyses for groups (Years 6–9 and the control group) and sampling times (T1 and T2) were carried out. Alpha-levels were corrected to .005 for multiple analyses. These analyses showed that correct repetition was predicted by the first item in the model sentence for Year 6 at T1 ($Est = -3.27, SE = .87, z = -3.76, p < .001$) and at T2 ($Est = -1.7, SE = .6, z = -2.84, p < .005$) in the sense that Year 6 participants were statistically significantly better at repeating Sf structures than Tp-XSV structures. With an alpha corrected to .005, the effect was not statistically significant for Year 7 at T1 ($Est = -1.59, SE = .93, z = -1.71, p = .087$). Nor were any effects found for any of the remaining groups at either time (all p ’s $> .13$). These results suggest that, both at T1 and at T2, the beginners (Year 6) preferred Sf structures to Tp-XSV structures while the other participants (Years 7–9 and the control group) had no preference for either structure.

As a typical example of the beginners’ repetition pattern, two responses given by Jacqueline, Year 6, are presented (4a and 5a). In sentence (4a), she correctly repeated an Sf model sentence; and in sentence (5a), she changed a model Tp-XSV sentence into an Sf structure. The inclusion of a (sentence-final) adverbial in sentence (5a) suggests that the absence of that adverbial from the initial position of the same sentence reflects a structural change rather than poor knowledge of the lexical category. One example of the repetition pattern displayed by older learners and the control group is presented in sentences (4b and 5b) (Hans, Year 8). Here, model sentences with both Sf and Tp-XSV structures were correctly repeated. Note the presence of structural and lexical changes, indicating that the sentences were not repeated verbatim but reconstructed.

- (4) Model Sf: *Lena kommt wenn sie Henrik treffen kann*
‘Lena come_{fin} if she Henrik meet_{non-fin} can_{fin}’
- (a) Repetition Sf, Year 6: *Lena treffen Henrik*
‘Lena meet_{non-fin} Henrik’
- (b) Repetition Sf, Year 8: *Lena kommt wenn Henrik kann treffen sie*
‘Lena come_{fin} if Henrik can_{fin} meet_{non-fin} her’

- (5) Model Tp-XSV: *Heute Lena kann hören die Hunde*
 ‘today Lena can_{fin} hear_{non-fin} the dogs’
- (a) Repetition Sf, Year 6: *Lena kannst hören die Hunde heute*
 ‘Lena can_{fin} hear_{non-fin} the dogs today’
- (b) Repetition Tp-XSV, Year 8: *Heute Lena kann hören die Hunde*
 ‘today Lena can_{fin} hear_{non-fin} the dogs’

These results did not represent any evidence in favor of the Initial L1 and L2 Transfer Hypotheses, which both predicted that all participant groups would repeat Sf and Tp-XSV equally well. By contrast, these results are compatible with the predictions derived from the DMTH according to which the beginners would prefer Sf structures to Tp-XSV structures. However, the DMTH also predicted a stronger effect of Sf preference at T1 than at T2, for which no evidence could be found.

Item and order effects

There was only one pseudo-randomized list of sentence items. Order and item effects overlapped, since each item appeared only once and the same order was used for all participants. Statistical analyses of effects of order and item on the likelihood of correct repetition yielded non-significant results, suggesting that neither order nor single sentence items affected the correctness of repetition.

Effects of model sentence type

A logistic regression analysis of the effect of sentence type (SVO or Vend for Sf, and ADV or SEP for Tp-XSV) found no significant effect on correct repetition of type within structure. It was thus legitimate to subsume each pair of sentence types into one structure in the analyses.

5.3.3.2 Results of Analysis 2

In Analysis 2, the rates of correct repetition of subject-first (Sf) structures and topicalized structures with a verb in second position (Tp-XVS) were compared. A total of 88% of the responses ($n = 1,408$) were scorable (Table 5.3). Grand averages of correct repetition of model sentences in each condition for each group at each time were calculated (Figure 5.2). Although the scores were generally high, there were no groupwise ceiling effects in the data.

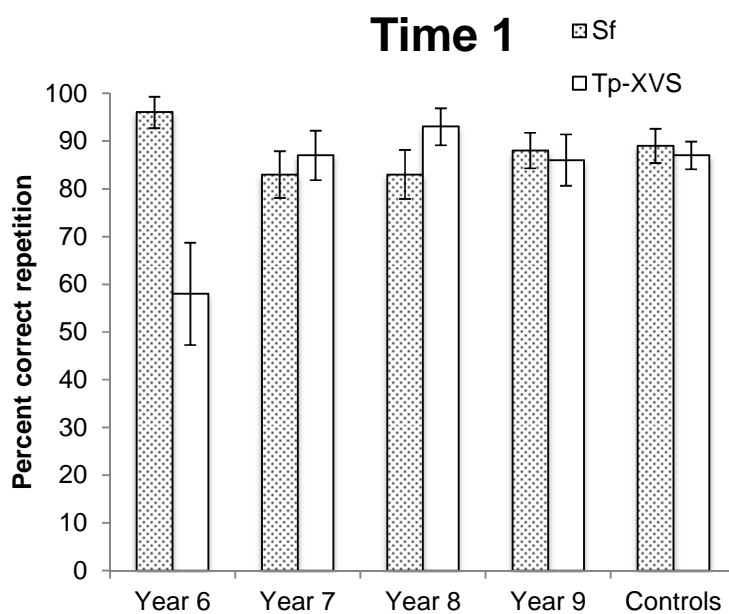
Table 5.3

Distribution of Correct Imitations of Sf and Tp-XVS

Time	Year	n	Utt	Sf		Tp-XVS	
				1	0	1	0
T1	6	8	68	54%	3%	25%	18%
	7	15	162	42%	9%	43%	6%
	8	12	134	43%	8%	46%	3%
	9	16	184	45%	6%	42%	7%
Total		51	548	45%	7%	41%	7%
T2	6	10	97	44%	9%	35%	11%
	7	16	175	42%	9%	39%	9%
	8	17	196	41%	9%	48%	2%
	9	16	178	48%	5%	42%	5%
Total		59	646	44%	8%	42%	6%
Controls		18	214	44%	6%	44%	7%

Note. Sf = model sentence with subject-first, Tp-XVS = topicalized model sentence with verb in second position, Time = sampling time, T1 = Time 1, T2 = Time 2, Year = school year, n = number of participants producing at least two scorable responses per condition, Utt = number of scorable utterances, 1 = percentage of correct repetitions, 0 = percentage of incorrect repetitions.

(a)



(b)

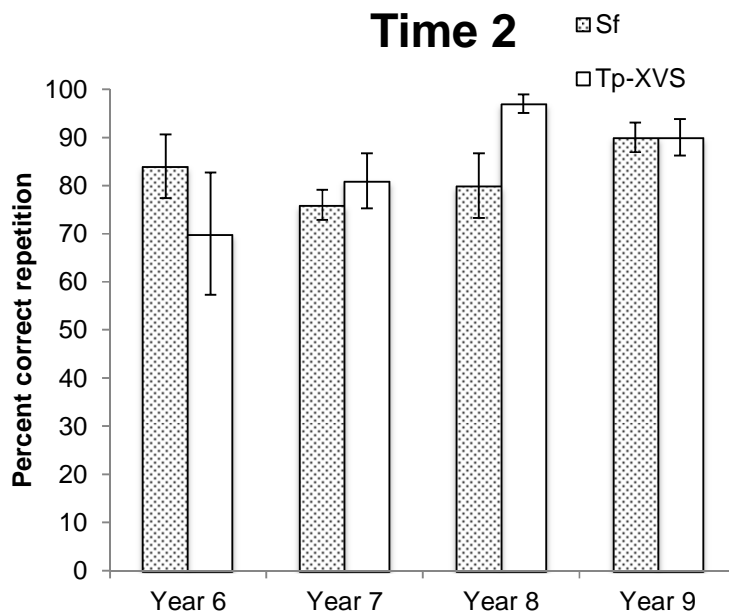


Figure 5.2. Percentages of correct repetition of subject-first model sentences (Sf) and topicalized model sentences with XVS structure (Tp-XVS) across groups. The error bars represent the standard errors.

A logistic regression (fitted by the Laplace approximation and containing two random predictors: individual participants and item/order) found no effect of the type of the first item in the model sentence—a subject (Sf) or an adverbial (Tp-XVS)—on the correctness of imitation. As in Analysis 1, separate analyses for groups (Years 6–9 and the control group) and sampling times (T1 and T2) were carried out to explore the specific group- and time-related predictions of the DMTH. Alpha-levels were corrected to .005 for multiple analyses. Participants in Year 6 were significantly better at imitating Sf structures than Tp-XVS structures at T1 ($p < .005$). There was an opposite pattern for Year 8 learners at T2, but this failed to reach significance with corrected alpha levels ($Est = 3.55$, $SE = 1.94$, $z = 1.83$, $p = .068$). There were no other significant effects of structure, item or order, or model sentence type (Tp-XVS: INV and SLIT; Sf: SVO and Vend) on the rate of correctness of repetition in any group at any time. This means that the results of Analysis 2 for Year 6 pointed in the same direction as, but were weaker than, those yielded by Analysis 1 (no significant differences at T2 in Analysis 2).

5.3.3.3 *Adverbials interpreted as subjects in first position*

A qualitative analysis of the data showed that some participants (25%) may have interpreted the topicalized adverbials of model sentences as their subjects, turning those adverbials into proper names when repeating the model sentences (6% of all Tp repetitions). This type of interpretation was independent of verb or subject position, given that it was found for all sentence types that were tested in the Tp condition (see Sentences 6–9 below). The adverbial interpreted as a proper name and the actual subject of the model sentence were often co-ordinated in the repetitions: *Dan und Henrik* ‘Dan and Henrik’ (*dann* ‘then’ interpreted as *Dan*); *Lena und Morgan* ‘Lena and Morgan’ (*morgen* ‘tomorrow’ interpreted as *Morgan*). A further indicator that *morgen* ‘tomorrow’ was indeed interpreted as a subject was the transformation of the sentence subject into a genitive attribute of the direct object (6a–b). Most participants who interpreted adverbials as subjects were in Years 6 and 7—supporting the finding from the regression analyses of a subject-first preference in early acquisition (Figure 5.3).

- (6) Model Tp-XSV (ADV): *Dann Henrik hat gewaschen die Jacke*
‘then Henrik has washed the jacket’
- (a) Repetition Sf, Year 7: *Dan und Henrik hast die Jacke gewochen*
‘Dan and Henrik have_{fin} the jacket washed’
- (b) Repetition Sf, Year 6: *Henrik und Dan hat Jacke nicht schmutzig*
‘Henrik and Dan has jacket not dirty’
- (7) Model Tp-XSV (SEP): *Dann Henrik will warmen Kaffee trinken*
‘then Henrik wants_{fin} warm coffee drink_{non-fin}’
- (a) Repetition Sf, Year 7: *Dan und Henrik will warm Kaffee trinken*
‘Dan and Henrik want_{fin} warm coffee drink_{non-fin}’
- (b) Repetition Sf, Year 9: *Dan und Henrik will in der Kafeter eh ja getrinken*
‘Dan and Henrik want_{fin} in the cafeteria eh well drink_{non-fin}’
- (8) Model Tp-XVS (INV): *Morgen kann Lena Mama treffen*
‘tomorrow can_{fin} Lena mom meet_{non-fin}’
- (a) Repetition Sf, Year 6: *Morgan kannst treffe Lenes Mama*
‘Morgan can_{fin} meet_{fin} Lene’s mom’
- (b) Repetition Sf, Year 7: *Magnus will Lenas Mama treffen*
‘Magnus want_{fin} Lena’s mom meet_{non-fin}’

- (c) Repetition Sf, Year 7: *Morgen will Mutter treffen*
 ‘Morgen want_{fin} mother meet_{non-fin}’
- (9) Model Tp-XVS (SLIT): *Morgen will Henrik essen kaltes Eis*
 ‘tomorrow want_{fin} Henrik eat_{non-fin} cold ice cream’
- (a) Repetition Sf, Year 7: *Morgan eller Henrik essen något*
 ‘Morgan or (Swedish) Henrik eat_{fin or non-fin} something
 (Swedish)’
- (b) Repetition Sf, Year 7: *Eh Morgan will essen kall Eis*
 ‘Eh Morgan want_{fin} eat_{nonfin} cold ice cream’

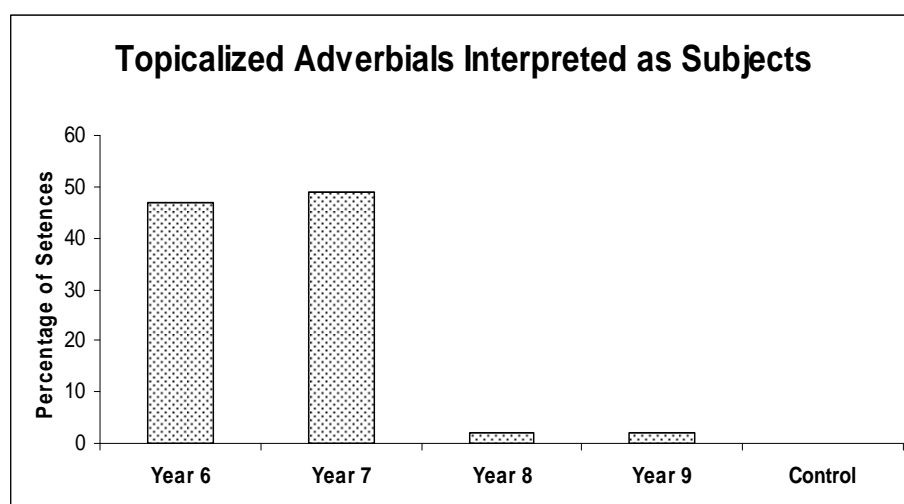


Figure 5.3 *Distribution of Topicalized Adverbials Interpreted as Subjects across Groups*

The x-axis displays Years 6 through 9 and the control group while the y-axis shows percentages of responses turning topicalized adverbials into subjects for each of these five groups.

5.3.4 Discussion: Elicited Imitation Data

The present study found evidence for a developmental pattern in that learners of German L3 at early stages (Year 6) showed a repetition pattern for subject-first sentences and topicalizations that indicated a preference for subject-first sentences while there were no indications of a preference for either structure in the more advanced groups (Years 7-9 and the native speaker control group). There were also a few cases where adverbials that could phonetically be interpreted as proper names were repeated as subjects by

beginners (e.g., *morgen* ‘tomorrow’ was interpreted as *Morgan*). This pattern of interpreting the first element of a sentence as its subject has been reported previously (the First Noun Principle: VanPatten, 2007). These findings are incompatible with the initial transfer hypotheses, which predicted a positive transfer from L1 or L2, respectively, such that no preference for a particular structure should be found at any stage.

The analyses reported in Chapter 4 showed different rates of correct repetition of topicalizations depending on whether they were XSV or XVS structures. Some indications of different rates of correct repetition were found here as well when each of these structures was compared with subject-first sentences. However, it cannot be ruled out that these differences in patterns are an effect of the design of the present study, for two reasons: the lexical and semantic content of the sentences was not controlled across types of structure, and the XVS structures were partly grammatical (INV but *SLIT) while the XSV structures were not (*ADV and *SEP). Even so, previous results having suggested a null effect of grammaticality, these two types of topicalizations should probably be further explored.

Although differences in the frequency of subject-first and topicalized sentences in a task (there were twice as many topicalized model sentences as subject-first model sentences) could affect repetition by structural priming (Bock, 1986; Hartsuiker & Kolk, 1998), this seemed not to be the case for any group at either time (except possibly Year 8 at T2). This absence of an effect of the frequency of structures in model sentences or in natural language suggests that elicited imitation provides a good reflection of participants’ grammatical knowledge. Further, the instruction to focus on imitation could possibly have reduced the effects of priming and frequency.

In sum, the results suggested (1) that the beginners were unable to profit from the similarity to structures in L2 and L1 when imitating topicalizations in L3 German; and (2) that subject-first and topicalized sentences were progressively acquired. Both of these findings support the DMTH.

5.4 Spontaneous Speech Data

This section presents and discusses the design and results of the two spontaneous speech tasks—the picture-based storytelling task and the unstructured interview.

5.4.1 Methods

For a presentation of the participants, the task, the material, and the procedure, see Chapter 4 (Section 4.4.1).

5.4.1.1 Predictions

Spontaneous speech data were elicited at T1, using a picture-based storytelling task and an unstructured interview, from a subset of the participants who took part in the EI task. For the present purposes, the data were analyzed for the presence of a subject or an adverbial in the first position of declarative sentences. Although topicalized sentences represent an optional structure in the languages of interest, this type of structure is frequent across these languages, which increases the likelihood of its appearance. Further, the storytelling task was carried out in both L1 and L3 so as to enable comparison of the ratios of subject-first sentences to topicalizations. The predictions yielded by the three different transfer hypotheses are based on the same assumptions as for the elicited imitation task described above. These assumptions are repeated here along with the specific predictions for the spontaneous speech data.

(a) Initial L1 Transfer Hypotheses

Both Sf and Tp structures are grammatical and common in the participants' L1 (Swedish), which is the basis for L3 according to the Initial L1 Transfer Hypothesis.

- Prediction 1: All participants will produce Sf and Tp structures in L3 German.
- Prediction 2: The ratio of Tp to Sf structures in L3 will be similar to that in L1.

(b) Initial L2 Transfer Hypotheses

Since Tp structures are grammatical and common in the participants' L2 (English), they will transfer to the participants German L3.

- Prediction: The participants, even the beginners, will produce both Tp and Sf structures in their German L3.

(c) Developmentally Moderated Transfer Hypothesis (DMTH)

Learners will progress along the proposed learner-general developmental trajectories and thus acquire Sf before Tp.

- Prediction 1: Learners in Year 6 will produce Sf sentences only.
- Prediction 2: Learners in Years 7–9 will produce both Sf sentences and Tp, given that Tp is acquired at an early stage of acquisition.
- Prediction 3: The participants will produce more Tp structures in L1 than in L3.

5.4.2 Analyses of Data

5.4.2.1 Criteria of scorability

For information about the transcription of the data, see Chapter 4. For the present analysis, utterances were deemed scorable if they contained at least one identifiable German word. To be included in the analysis, a scorable utterance further had to contain at least a subject, a verb, and an unspecified third constituent (X), in any order.

5.4.2.3 Scoring

A scorable utterance was scored as an Sf structure if a subject appeared in first position and as a Tp structure if an adverbial appeared in first position. Unlike in the analyses presented in Chapter 4, verb placement was disregarded in the scoring. For each participant, the relative frequency of Sf and Tp was calculated (e.g., the number of Sf structures as a percentage of the total number of scorable utterances).

5.4.3 Results

5.4.3.1 Across and within tasks

Across the storytelling task and the interview in German L3, most scorable utterances had Sf structure (Table 6.4). The difference in the relative frequency of the structures was smaller in the German L3 storytelling task (Table 6.5), and in the Swedish L1 storytelling task the two structures were about equally frequent (Table 6.6)

Table 5.4

Scorable Utterances across Tasks in German L3

Year	Utt	Sf	Tp
6	45	96%	4%
7	186	83%	17%
8	145	86%	14%
9	216	87%	13%
Total	592	86%	14%

Note. In this and the two subsequent tables, the Utt column shows the number of scorable utterances by Year. Utt = Utterances, Sf = subject-first sentences, Tp = topicalized sentences.

Table 5.5

Scorable Utterances from the Picture-based Storytelling Task in German L3

Year	Utt	Sf	Tp
6	32	94%	6%
7	62	65%	35%
8	48	71%	29%
9	61	77%	23%
Total	203	74%	26%

Table 5.6

Scorable Utterances from the Picture-based Storytelling Task in Swedish L1

Year	Utt	Sf	Tp
6	43	56%	44%
7	68	43%	57%
8	50	40%	60%
9	66	58%	42%
Total	227	49%	51%

5.4.3.2 Implicational scaling

The L3 German production data from both tasks were analyzed using an implicational scale (Table 5.7). For each participant, the presence or absence of each structure—Sf and Tp—was determined using emergence as the cut-off point (i.e., one occurrence indicated acquisition). The scale was perfect, with the highest scalability coefficient possible ($C_{scal} = 1.0$). In fact, almost all participants produced both structures—the exceptions were five participants in Year 6 who did not produce any Tp (one of them did not produce any Sf either).

Table 5.7
Implicational Scale for the Structures of Tp and Sf in L3 German

Year	ID	German	
		Tp	Sf
7	Cassie	1	1
8	Cecilia	1	1
8	Chris	1	1
7	Claudia	1	1
7	Curt	1	1
7	David	1	1
9	Eva	1	1
8	Hans	1	1
6	Jacqueline	1	1
7	Jakob	1	1
8	Jens	1	1
9	Jim	1	1
9	Justus	1	1
9	Karsten	1	1
7	Lara	1	1
9	Linda	1	1
8	Markus	1	1
7	Mats	1	1
9	Melanie	1	1
9	Natascha	1	1
8	Ralf	1	1
7	Rudolf	1	1
9	Sabina	1	1
6	Ingrid	0	1
6	Max	0	1
6	Mikael	0	1
6	Sofie	0	1
6	Tanja	0	0

Note. Years = school years. Participants who produced the same types of structures are ordered alphabetically.

5.4.3.3 Comparison of spontaneous speech and elicited imitation data

To compare SD with EI data, the implicational scale referred to in the previous section (Table 5.7) was used, with the 1's and 0's indicating presence or absence of a structure in the spontaneous speech data being replaced by percentages of correct imitation of Sf and Tp-XSV/Tp-XVS in the EI task at T1 (Table 5.8). Most participants repeated all structures correctly at least once. However, there was one participant (Tanja, Year 6) who was able to repeat structures that she could not yet produce. The opposite scenario, of learners producing a structure but being unable to repeat it correctly, did not occur. Accordingly, the elicited imitation data sometimes overestimated the learners' proficiency compared with and never underestimated the spontaneous speech data.

Table 5.8
Implicational Scale with Percentages of Correctly Repeated Tp and Sf in the EI Task

German			
Year	ID	Tp (XSV/XVS)	Sf
7	Cassie	60/100	83
8	Cecilia	100/100	100
8	Chris	100/100	67
7	Claudia	100/100	100
7	Curt	50/83	83
7	David	50/40	100
9	Eva	83/100	100
8	Hans	100/100	100
6	Jacqueline	50/67	100
7	Jakob	33/50	100
8	Jens	100/100	50
9	Jim	60/100	80
9	Justus	83/80	67
9	Karsten	50/67	100
7	Lara	40/100	67
9	Linda	50/17	100
8	Markus	100/100	100
7	Mats	100/100	100
9	Melanie	100/100	67
9	Natascha	100/100	100
8	Ralf	75/100	75
7	Rudolf	100/100	80
9	Sabina	83/100	67
6	Ingrid	33/100	100
6	Max	n.a.	n.a.
6	Mikael	100/80	100
6	Sofie	0	100
6	Tanja	0	100

Note. Years = school year. Participants who produced the same types of structures are ordered alphabetically.

5.4.3.4 Participants without topicalizations in L3

Comparison of the data from the storytelling task in L3 and L1 revealed that four out of the five participants who did not produce any Tp in L3 did produce that structure in L1 (Table 5.9). Their ratios of Sf to Tp in L1 varied greatly, but in all cases more than 33% of the L1 utterances were topicalized.

Further, in storytelling in L3, most topicalized elements produced by participants in the learner groups were prepositional phrases (e.g., *in Lund* ‘in Lund’), noun phrases (e.g., *den dreizehn* ‘on the thirteenth’), or adverbials of time (e.g., *dann* ‘then’) or place (e.g., *hier* ‘here’). Even the five participants whose L3 data entirely lacked Tp structures, produced nine prepositional phrases and two adverbials among them—only never in sentence-initial position. The absence of Tp structures in these five participants was therefore not due to limitations in their vocabulary.

Table 5.9

Percentages of Tp and Sf Utterances in Swedish L1 Storytelling by Participants Having Produced No Tp Utterances in L3 German Storytelling

ID	Utt	Sf	Tp
Ingrid	6	33%	67%
Max	7	14%	86%
Mikael	6	67%	33%
Sofie	9	44%	56%
Tanja	9	100%	-
Total	37	52%	48%

Note. ID = participant’s code name, Sf = subject-first sentences, Tp = topicalized sentences, Utt = total number of scorable utterances in the picture-based storytelling task.

5.4.4 Discussion of the Spontaneous Speech Data

The combined results from this study indicated a developmental trajectory where subject-first sentences are produced before topicalizations. The perfect implicational scale (with emergence as the criterion for acquisition) and the absence of topicalized structures only in the learners with the least amount of exposure (Year 6) replicated earlier findings of native Swedish speakers initially not producing topicalizations in German L3 (Sayehli, 2001). Hence, these results support the DMTH and suggest the absence of transfer of topicalizations in early acquisition.

It is possible that the absence of topicalized sentences could be due to stylistic preferences, given that these structures are not obligatory in any of the languages in question and that their production was not forced in the spontaneous speech tasks. However, at least assuming a measure of stylistic consistency across languages, then a similarly low rate of topicalized structures would have been expected for the L1 spontaneous speech task as well, and this was not the case. In fact, the comparison of data from the storytelling tasks in L1 and L3 suggests that stylistic preference was not the reason why topicalization structures were less frequent than subject-first structures in L3.

It has been suggested that adverbials and prepositions, which are typically involved in topicalizations, are among the lexical items that are acquired late (Bardel & Falk, 2007). The lack of topicalized sentences in data from beginners could therefore be due to gaps in their lexicon. However, since the participants who did not produce any topicalized sentences actually produced both adverbials and prepositions, this explanation can be ruled out.

The analyses of spontaneous speech data supported the DMTH and were incompatible with the Initial L1 and Initial L2 Transfer Hypotheses in that the results suggested a developmental progression from an initial higher rate of subject-first than topicalized sentences to similar rates of both structures.

5.5 General Discussion

In this chapter, the interaction of developmental trajectories and transfer in the acquisition of topicalization in German declarative main clauses was examined. More specifically, it was explored whether there were any effects of L1 or L2 syntax transfer in the imitation of declarative sentences such that topicalizations would be equally well repeated as subject-first sentences and would be produced at an early stage of acquisition.

The results from the EI task showed similar rates of correct repetition of topicalized and subject-first sentences, but only in the intermediate and more advanced learner groups and among the native speakers, suggesting that the beginners did not transfer structures from L2 at initial stages of acquisition. The spontaneous speech data supported the absence of transfer from L1 as well. More specifically, even though topicalized sentences are frequent in L1 (e.g., Jörgensen, 1976) and L2 (e.g., Los, 2012), they did not appear in all participants' L3 production. Hence, the results did not find evidence for developmentally and structurally unconstrained transfer claims such as L1 transfer (Schwartz & Sprouse, 1994, 1996), L2 transfer (Bardel & Falk, 2007; Falk & Bardel, 2011), partial transfer (Flynn et al., 2004), or transfer between languages that are typologically close (Rothman, 2011).

However, it is possible that transfer was developmentally constrained (Håkansson et al., 2002; Pienemann et al., 2005; Wode, 1976, 1978; Zobl, 1980). That is, a general learning mechanism that constrains learner-general developmental trajectories may also have influenced transfer such that only structures matching the learner's current developmental stage were transferred. According to the DMTH, for example, a learner would not be able to take advantage of the existence of topicalization structures in L1 or L2 until he or she was developmentally ready to produce them in L3, meaning that the acquisition of subject-first sentences would precede that of topicalized sentences.

The results presented in this chapter gave evidence that subject-first structure is acquired before topicalization structure, meaning that they were in line with the predictions yielded by the DMTH. The study presented in the next chapter explores evidence in favor of the DMTH by investigating negative transfer and its relationship with developmental trajectories.

CHAPTER 6

BEYOND WORD ORDER: DEVELOPMENTAL TRAJECTORIES IN MORPHOLOGY

6.1 Background

The results of the previous studies presented in this thesis suggest that learners follow learner-general developmental trajectories when acquiring L3 German word order. The study reported in the present chapter explores the universal order of morpheme acquisition proposed by Processability Theory (PT: Pienemann, 1998, 2005a, 2005b) and the interaction between universal order and transfer by investigating native Swedish-speakers' acquisition of German adjectival inflections and subject–verb agreement. The first subsection (6.1.1) of this section presents the rules governing adjectival inflection and subject–verb agreement in the participants' three languages (L1 Swedish, L2 English, and L3 German). The next two subsections discuss the acquisition of adjectival inflections (6.1.2) and subject–verb agreement (6.1.3) in L2/L3 German. This is followed by a discussion of phrasal and inter-phrasal morphemes (6.1.4).

6.1.1 Adjectives in Attributive and Predicative Position and Subject–Verb Agreement in German, Swedish, and English

6.1.1.1 The German inflectional system

German, which is a fusional language, employs inflectional morphemes to express grammatical categories such as case, number, person, gender, mood, and tense. These morphemes are cumulative such that there is not a one-to-one relationship between form and function. One inflectional morpheme can have several functions. For example, the verbal morpheme *-e* expresses both person and number (Bickel & Nichols, 2011a, 2011b; Boase-Beier & Lodge, 2003). In addition, German displays a high degree of syncretism in its inflectional system: the same morphological form can have distinct functions depending on context and word root (Baerman, Brown, & Corbett, 2005; Hopp, 2010). For example, the morpheme *-en* attached to a verb can mark either the first person plural or the third person plural (*wir steh-en*, *sie steh-en* ‘we stand’, ‘they stand’). By contrast, if the same surface form (*-en*) is attached to a feminine noun, it can mark the nominative, genitive, dative, or accusative plural (*die/der/den/die Frau-en* ‘the women, of the women, to the women, the women’), and if attached to an adjective it can mark the dative, accusative, or genitive case (*der groß-en Frau* ‘to the tall women’, *den groß-en Mann* ‘the tall man’, *des groß-en Kindes* ‘of the tall child’). It has been assumed that both the existence of one-to-many relationships between form and function and the syncretism of the inflectional system affect the rate of acquisition negatively (Diehl et al., 2000).

6.1.1.2 Adjectival inflection

In German, when the adjective is in attributive position, the choice of suffix depends not only on the case, number, and gender of the noun phrase but also on its definiteness. Taking the determiner as a starting point, three different inflectional paradigms can be defined: a strong one (without determiner), a weak one (with the definite determiner), and a mixed one (with an indefinite or possessive determiner) (Boase-Beier & Lodge, 2003). A total of five different suffixes are used in these three paradigms: *-e*, *-en*, *-es*, *-er*, and *-em* (see Appendix D, Table 1, for a presentation of the mixed paradigm).

Adjectives in predicative position are not inflected (on a variable use of inflected and uninflected predicative adjectives in Old High German, however, see Fleischer, 2007). Instead, the syntactic context constrains the agreement between noun and modifying adjective in German (Fleischer, 2007). For a comparison between the inflected

adjectives in the mixed paradigm used when the adjective is in attributive position and the uninflected adjectives used in predicative position, see Table 6.1; all forms given are in the nominative case.

In Swedish, unlike in German, adjectives are inflected in both attributive and predicative position and agree with nouns in gender, number, and definiteness (Hammarberg, 1996; Table 6.1 below). Gender is distinguished in indefinite contexts while the adjective always takes the suffix *-a* in plural and definite contexts.

English adjectives can occur in attributive and predicative position but are not inflected in either position. Adjectives do not exhibit grammatical gender, definiteness is not marked, and number is marked only on the noun (Table 6.1).

Table 6.1

(a) German Adjectives in Attributive and Predicative Position in the Mixed Declension

	Singular			Plural
	M	F	N	
Attr	ein braun-er Hund	eine braun-e Kuh	ein braun-es Haus	braun-e Hunde
	'a brown dog'	'a brown cow'	'a brown house'	'brown dogs'
Pred	der Hund ist braun	die Kuh ist braun	das Haus ist braun	die Hunde sind braun
	'the dog is brown'	'the cow is brown'	'the house is brown'	'the dogs are brown'

Note. Adjectives and their inflections are in bold. Since gender is not distinguished in plural forms, only one example noun (*Hund* 'dog') is given. All forms given are in nominative case. M = masculine gender, F = feminine gender, N = neuter gender, Attr = attributive position, Pred = predicative position.

(b) Swedish Adjectives in Attributive and Predicative Position

	Singular		Plural
	Uter	Neuter	
Attr	en brun hund	ett brun-t hus	brun-a hundar
	'a brown dog'	'a brown house'	'brown dogs'
Pred	hunden är brun	huset är brun-t	hundarna är brun-a
	'the dog is brown'	'the house is brown'	'the dogs are brown'

Note. For the purpose of this study, and for the sake of simplicity, only the indefinite paradigm is presented for adjectives in attributive position. For the whole paradigm, see Appendix D, Table 2. Attr = attributive position, Pred = predicative position.

(c) English Adjectives in Attributive and Predicative Position

	Singular	Plural
Attr	a brown dog	brown dogs
Pred	the dog is brown	the dogs are brown

Note. Attr = attributive position, Pred = predicative position.

6.1.1.3 Subject–verb agreement

The German verbal inflectional paradigm for the present tense has four different suffixes (-e, -st, -t, and -en). The first, second, and third persons are marked in both the singular and the plural, and the German copula (*sein* ‘be’) has suppletive forms and is highly irregular (see Appendix D, Tables 3 and 4).

Swedish lacks subject–verb agreement even though finite verbs are marked for tense¹, with inflections added to the verb stem. The Swedish copula *vara*, ‘to be’ does not mark person, number, or gender—e.g., the present-tense form is always *är*: *jag är hungrig* ‘I am hungry’; *de är hungriga* ‘they are hungry’).

English has subject–verb agreement but only in that the third person singular of the present tense is marked with -s. The English copula (*be*) is highly irregular, with suppletive forms (see Appendix D, Table 5).

6.1.2 Acquisition of Adjectival Inflections in L2/L3 German

The use of inflections in L2 learners is highly variable and inconsistent throughout acquisition (Lardiere, 1998a; Prévost & White, 2000) (for a review see Hopp, 2010). The inflections are rarely target-like. They are often omitted, but a frequent pattern found among learners is to use a default form throughout a paradigm (Slabakova, 2009). Even though the German system of adjectival inflections is thus difficult to acquire, it is rare for it to be explicitly taught in L2 acquisition contexts (Cox, 1982; Kirrmann, 1961).

¹ In the present tense, the suffix -er is added to the verb stem if it ends in a consonant (*jag spring-er* ‘I run’). If the verb stem ends in a vowel, the suffix -r is added (*jag titta-r* ‘I look’). The infinitive is formed by adding -a to verb stems ending in a consonant (*spring-a* ‘to run’). If the stem ends in a vowel, the infinitive form is identical with the stem (*gå* ‘to go’; *titta* ‘to look’) (Hansson, Nettelblatt, & Leonard, 2000).

German adjectives are inflected in attributive position only. Consequently, studies of the acquisition of the inflectional system all examine noun phrases (NP). It is only in recent years that such studies have been given similar attention in L2 acquisition research as, for example, studies of agreement in the verb phrase (VP) (e.g., Böhlke, 2003; Diehl et al., 2000; Jaensch, 2008, 2011; Parodi, Schwartz, & Clahsen, 2004). The main focus of NP agreement studies has often been on gender assignment or agreement (e.g., Salamoura & Williams, 2007; Schriefers, Jescheniak, & Hantsch, 2005; Spinner & Juffs, 2008), on differences in target-like production related to age of acquisition (Blom, Polisenská, & Weerman, 2008; Weerman, Bisschop, & Punte, 2006), or on sources of the variable use of inflections (Jaensch, 2008, 2011).

Although developmental trajectories in the acquisition of the adjectival paradigms have rarely been explored, a longitudinal study of German acquisition by French native speakers found that, initially, the participants did not add suffixes to adjectives. Their first adjectival inflections appeared in free variation (Diehl et al., 2000). When systematicity in suffixation appeared at a later stage, this was not related to any specific grammatical categories. The learners either used a default form or adjusted the inflections phonologically. Grammatically sensitive systematicity occurred only in more advanced learners, first with number and later with gender.

Some studies have found adjectives to be inflected in plural contexts prior to singular ones (Jaensch, 2008, 2011) (for Scandinavian languages: Glahn et al., 2001). These results were attributed to number being acquired before gender (Glahn et al., 2001) (Hammarberg, 1996 in Scandinavian languages) and to formal features of the adjectival paradigm in German: it has fewer plural forms (two) than singular forms (five) (Jaensch, 2008, 2011).

In Dutch, like in German, attributive adjectives agree with the following noun but there is no agreement with the noun for predicative adjectives. In a study of fourteen L2 learners, who had been exposed to Dutch for between 6 months and 18 years, it was found that attributive but not predicative adjectives were suffixed by all but three learners (Weerman et al., 2006). One weakness of that study was the variation in the learners included: they represented a wide range of L1s (Berber, Chinese Danish, Dari, French, Hindi, Kurdish, Thai, and Turkish), and two of them had had 12 and 18 years, respectively, of exposure to Dutch. The results were interpreted as indicating that attributive adjectives are differentiated from predicative ones in early acquisition, similarly to what has been found in L1 development. This was attributed to the absence

of input with suffixed predicative adjectives and the difference in syntactic context between attributive and predicative adjectives.

6.1.3 Acquisition of Subject–Verb Agreement in German L2/L3

Research on the development of subject–verb agreement in the acquisition of L2/L3 German has examined the relationship between production of verb morphology and syntax (e.g., syntactic rules for negation and verb-second (V2) word order). This was inspired by findings in German L1 acquisition that children consistently produced finite verbs in the second position of the sentence, even when this placement involved subject–verb inversion (Clahsen, 1982). However, no such pattern has been unequivocally established in L2/L3 acquisition, in part owing to differences in definitions of “finiteness” and acquisition criteria (Clahsen & Muysken, 1986; Jordens, 1988; Meisel, 1997); (for discussions see Jansen, 2000; and Schlyter, 2003).

When verbs were grouped into lexical verbs and semantically light verbs (e.g., auxiliaries, modals), simultaneous acquisition of finiteness (i.e., inflections) and syntax (i.e., V2 word order) was established in L2/L3 for light verbs only (Parodi, 1998, 2000).

Similarly, L2 acquisition of verbal inflections associated with agreement at an earlier stage for auxiliaries and modals than for lexical verbs, irrespective of syntactic phenomena, has been reported several times (Diehl et al., 2000; Köpcke, 1987; Parodi, 2000; Pienemann, 1998; Rieck, 1989). Generally, L2 learners—irrespective of their L1—at first use invariant forms in all persons. Several studies have reported overuse of the bare stem and the suffixes *-en* and *-e* in various L1 groups (Blackshire-Belay, 1995; Köpcke, 1987; Parodi, 2000; Pishwa, 1985; Vainikka & Young-Scholten, 1994). In line with the findings presented above, four stages have been suggested for the acquisition of verbal inflection: (1) invariant forms, (2) systematic use of *-t* to mark the third person singular, (3) *-st* to mark the second person, and (4) *-en* to mark the first and third person plural (Köpcke, 1987).

Although L2 learners typically do not transfer suffix forms from L1 to L2, it is a topic of debate whether the existence of an agreement paradigm in L1 facilitates the acquisition of such a paradigm in L2. In some cases, no facilitation effects have been found (e.g., Diehl et al., 2000; Vainikka & Young-Scholten, 1994). In a study where participants were divided into two groups depending on whether the plural was marked in the noun phrase (NP) in their L1, there were no indications of positive L1 transfer (Parodi et al.,

2004). Across types of L1, plurality was expressed lexically through numerals and quantifiers while adjectives were not inflected in early acquisition.

6.1.4 Phrasal and Inter-phrasal Morphemes

In Processability Theory (PT, Pienemann, 1998, 2005a, 2005b), morphemes are divided into *phrasal* and *inter-phrasal* ones. This distinction concerns the structural distance over which grammatical information needs to be exchanged to achieve agreement. One example of a phrasal morpheme is the inflectional suffix of an adjective in attributive position agreeing with the noun (within the same NP) in gender and number (German: *ein braun-es Haus* ‘a brown house’; Swedish: *ett brun-t hus* ‘a brown house’). One example of an inter-phrasal morpheme is the inflectional suffix of a verb, where information about number and person is exchanged across two phrases (NP and VP) (German: *der Junge lach-t* ‘the boy laugh-s’). Another example of an inter-phrasal morpheme is the inflectional suffix of a Swedish adjective in predicative position, agreeing with the noun in gender and number (*Huset är brun-t* ‘the house is brown’).

According to PT, phrasal morphemes are acquired before inter-phrasal ones (see Chapter 2). This has been established to be the case in the acquisition of Scandinavian languages as L2 (Glahn et al., 2001). More specifically, agreement of adjectives in attributive position (phrasal morphemes) occurred earlier in production than did agreement for adjectives in predicative position (inter-phrasal morphemes).

It was therefore hypothesized that the L3 acquirers of German in the present study would acquire adjective–noun agreement in attributive position (phrasal morphemes) prior to subject–verb agreement (inter-phrasal morphemes).

It was also thought possible that Swedish native speakers might transfer noun–adjective agreement both in attributive position and in predicative position to their L3. The latter transfer would result in ungrammatical L3 structures (*negative transfer*; see Chapter 2). According to the Developmentally Moderated Transfer Hypothesis (DMTH; (Håkansson et al., 2002), where transfer is expected to be constrained by the learner’s current level of development, agreeing adjectives in attributive position are expected to occur before agreeing adjectives in predicative position. Therefore, the DMTH would predict that the Swedish native speakers in the present study would produce noun–adjective agreement for adjectives in attributive position before they would produce subject–verb agreement,

and that any negative transfer of agreement for adjectives in predicative position would occur after the acquisition of attributive adjective agreement.

6.2 The Present Study

The present study examined developmental trajectories in morphological acquisition of German as an L2/L3 and explored the relationship between developmental trajectories and transfer suggested by Processability Theory (PT; (Pienemann, 1998, 2005a, 2005b). More specifically, the study explored whether development does indeed constrain transfer.

6.2.1 Methods

6.2.1.1 Participants

There were 61 participants in the four learner groups and 18 in the control group (Table 3.1). All groups except the control group were tested on two different occasions (T1 and T2) five months apart.

6.2.1.2 Task and materials

Attributive and predicative adjectives

The communicative task was intended to elicit color adjectives in attributive and predicative position (analogous to the study of Glahn et al., 2001). The participants were asked to identify the colors of 24 items depicted on a sheet of paper (see Chapter 3 and Appendix A, Table 2, for the items and Appendix B for pictures of the items). Two types of questions were used to elicit attributive and predicative adjectives: (1) *Was ist neben den rot-en Blumen?* ‘What is next to the red flowers?’ and (2) *Welche Farbe hat der groß-e Hund?* ‘What color is the big dog?’. Note that both question types included inflected adjectives, here with the suffixes *-en* and *-e*. The targeted answers were, for the first type of question, NPs such as *ein blau-er Fisch* ‘a blue fish’ (attributive adjectives); and, for the second type of question, full sentences such as *Er ist braun* ‘it is brown’ (predicative adjectives) (for a complete list of questions and target answers see Appendix B, Table 2). The number of targeted answers was controlled across position

(attributive vs. predicative), number, and gender (Table 6.2). The specific suffixes targeted by the task are listed below (Table 6.2).

Table 6.2

Targeted German Adjective Endings in Attributive and Predicative Position

	Attributive		Predicative		Total
	Singular	Plural	Singular	Plural	
M	-er	-e	-∅	-∅	8
F	-e	-e	-∅	-∅	8
N	-es	-e	-∅	-∅	8
Total	6	6	6	6	24

Note. Total indicates the number of adjective elicitation by position, number, and gender. Each cell (e.g., masculine, attributive position, singular) was elicited at both T1 and T2. M = masculine, F = feminine, N = neuter.

Most of the adjectives and nouns used in the task appeared in the early chapters of the participants' German textbooks, and all of them were cognates with Swedish words. Cognates were chosen in order to facilitate comprehension and production, and also because cross-language transfer of morphological features is more frequent in cognates than in non-cognates (Lemhofer, Schriefers, & Hanique, 2010; Salamoura & Williams, 2007). (See Appendix A, Table 2, for a list of the word items used in the task.)

The order of the questions was pseudo-randomized, with the restriction that no more than three consecutive questions could target the same number, suffix, adjective, or noun. Further, the first twelve questions always targeted attributive adjectives and the last twelve targeted predicative ones.

Subject–verb agreement

The questions of type (2) in this task—those intended to elicit answers in the form of full sentences—also targeted subject–verb agreement with the copula *sein* 'to be'. Of the twelve questions, half targeted the third person singular (e.g., *Es ist braun* 'It is brown') and half targeted the third person plural (e.g., *Sie sind braun* 'They are brown').

6.2.1.3 Procedure

In the first step, the participants were asked to identify the colors of blotches on a sheet of paper. This was done both to review the necessary vocabulary and to obtain a baseline with which the forms of elicited adjectives in attributive and predicative position could be compared. The second step was the elicitation of attributive adjectives, preceded by a practice item after which the participants could ask questions about the task. Finally, predicative adjectives and subject–verb agreement were elicited. The participants were explicitly encouraged to answer in full sentences (e.g., *Es ist rot* ‘It is red’ or *Sie sind rot* ‘They are red’) in order to avoid fragmentary answers such as *gelb* ‘yellow’. The session ended with a short debriefing.

6.2.1.4 Predictions

The following predictions for the present study were formulated in relation to the following three hypotheses.

(a) Initial L1 Transfer Hypotheses

In L1 (the basis for L3), adjectives are inflected in both attributive and predicative position and there is no subject–verb agreement. Hence, transfer will be expected only in the inflection of adjectives.

- Prediction 1: Participants in all learner groups will produce agreement for adjectives not only in attributive but also in predicative position.
- Prediction 2: Subject–verb agreement will not be produced in early acquisition (Year 6).
- Prediction 3: German native speakers (the control group) will produce subject–verb agreement and agreement for adjectives in attributive but not predicative position.

(b) Initial L2 Transfer Hypotheses

Adjectives are not inflected in L2 (English), which is the basis for L3. Hence, learners will initially not inflect adjectives in L3. There are no predictions concerning the relative order of production of inflections for adjectives in different positions. Learners will mark subject–verb agreement from an early stage of acquisition, since such agreement exists in L2.

- Prediction 1: Beginners (Year 6) will not produce any adjectival inflections.

- Prediction 2: All participants will produce subject–verb agreement.

(c) Developmentally Moderated Transfer Hypothesis (DMTH)

Learners will progress along the proposed universal developmental trajectories, and they will produce phrasal morphemes (e.g., attributive adjectives) before inter-phrasal morphemes (e.g., inflected predicative adjectives and subject–verb agreement). Transfer from a previously learned language will be constrained by these developmental stages.

- Prediction 1: Year 6 participants will not produce any adjectival inflections (i.e., no information exchange will take place).
- Prediction 2: Participants in later years will inflect adjectives in attributive position.
- Prediction 3: Participants who display subject–verb agreement (inter-phrasal morphemes) will also display agreement for attributive adjectives (phrasal morphemes).
- Prediction 4: Inflections on adjectives in predicative position may occur but then only in more advanced learners who display agreement for attributive adjectives.
- Prediction 5: The native-speaker control group will display subject–verb agreement and agreement for adjectives in attributive but not predicative position.

6.2.2 Analyses

6.2.2.1 Criteria of scorability

Data targeting attributive adjectives

The participants' answers were recorded and subsequently transcribed. The requirements for an utterance to be scorable included the occurrence of a noun and an adjective in attributive position before or after the noun. All utterances with adjectives in predicative position only (e.g., *zwei Lampe is blu, blau* 'two lamp is blu, blue'; *zwei Hund und der Farbe ist blau* 'two dog and the color is blue') were excluded, as were utterances without any adjectives. More than 99% of the data were scorable (Table 6.3).

Data targeting predicative adjectives

For utterances targeting predicative adjectives to be scorable, they had to contain an adjective in predicative position and a copula. Utterances without a copula (e.g., *der Mann hast braun* ‘the man has brown’; *gelb und schwarz* ‘yellow and black’) were excluded, as were those in which the adjective appeared in attributive position (e.g., *der große Haus hass grüne Farbe* ‘the big house has green color’). More than 85% of the data were scorable (Table 6.3).

Table 6.3

Scorable Utterances in Attributive and Predicative Position

Time	Year	<i>n</i>	Attributive		Predicative	
			Utt	%	Utt	%
T1	6	11	132	99%	132	78%
	7	16	193	98%	192	87%
	8	17	204	100%	204	85%
	9	16	193	99%	191	91%
Total		60	722	99%	717	86%
T2	6	12	144	100%	144	93%
	7	16	192	99%	193	97%
	8	17	204	100%	204	100%
	9	16	192	100%	192	99%
Total		61	730	100%	730	98%
Controls		18	216	100%	215	100%

Note. Percentages of scorable utterances (the ratio of the number of scorable utterances to the total number of scorable and excluded utterances). Subject–verb agreement occurred in utterances with adjectives in predicative position, meaning that the scorability rate for utterances targeting subject–verb agreement is the same as for utterances with adjective in predicative position. T1 = Time 1, T2 = Time 2, *n* = number of participants, Utt = number of scorable utterances, % = percentage of utterances that were scorable, Attributive = utterances with adjectives in attributive position, Predicative = utterances with adjectives in predicative position (also used to explore subject–verb agreement).

Subject–verb agreement

An utterance was deemed scorable for the exploration of subject–verb agreement when it contained a noun phrase and a copula. (Note that, in practice, this was the same as the criteria for utterances targeting adjectives in predicative position, for which the

requirements were a copula and an adjective in predicative position—in that case, the copula would always have a noun phrase as its subject, and in the present case, for practical reasons, the copula would always have a predicative in the form of a (color) adjective.) The noun phrase could be lexical (e.g., *der Mann* ‘the man’) or realized as a pronoun (e.g., *er* ‘he’). Utterances without a copula were excluded (e.g., *der Mann hast braun*, ‘the man has brown’; *gelb und schwarz*, ‘yellow and black’). More than 85% of the data met the criteria for scorability (Table 6.3).

6.2.2.2 Scoring

Scorable utterances were coded for the following:

- a. Time (T1, T2);
- b. Year (Year 6, Year 7, Year 8, Year 9, Controls);
- c. ID (individual participants);
- d. Adjective position (attributive, predicative);
- e. Suffixation (suffixed, unsuffixed);
- f. Suffix type (-e, -es, -er, -e, -t, or other)
- g. Attributive agreement (agreement: 1, no agreement: 0)
- h. Number (plural, singular)
- i. Gender (masculine, neuter, feminine)
- j. Color term (color adjective)
- k. Subject–verb agreement (agreement: 1, no agreement: 0)

Suffixation

Adjectives were considered to be suffixed when they differed from the baseline elicited in the vocabulary review in at least one word-final phoneme; suffixes did not need to be target-like. For example, *rote* ‘red’ would be scored as suffixed if the baseline for that participant was *rot* but not if the baseline was also *rote*.

Suffix types

The suffix types produced were recorded and calculated for each participant.

Attributive agreement

Since gender is not marked on German nouns, an adjective in attributive position would have to agree with a determiner or a numeral in the noun phrase instead (for similar reasoning in a study of Scandinavian languages, see Glahn et al., 2001). Attributive

agreement was scored on a binominal scale (agreement: 1, no agreement: 0), and it was assessed as between the adjective and the determiner or numeral, meaning that both *ein-e rot-e Blume* ‘a red flower’ and **ein rot-er Blume* ‘a red flower’ were scored as being in agreement even though it is only in the former utterance that the numeral and adjective agree in gender with the noun, which is feminine (whereas the latter utterance would have been correct if the noun had been masculine).

Only Standard German combinations were coded for. The determiner *ein* could agree with either of two adjectival suffixes depending on whether the noun was masculine (*-er*) or neuter (*-es*). The determiner *eine* and the numeral *zwei* were coded as agreeing when they occurred with an adjective with the suffix *-e*. (For a more detailed example of scoring, see Table 2 in Appendix C.)

Subject–verb agreement

Subject–verb agreement was scored on a binominal scale (agreement: 1, no agreement: 0), when the pronouns *er/sie/es* or an NP_{sing} occurred with *ist* and when the pronoun *sie* or an NP_{pl} occurred with *sind*.

6.2.3 Results

Below, the results for the task relating to adjectives in attributive position are presented first, followed by those for the task relating to adjectives in predicative position. Then the results from all three tasks (subject–verb agreement, predicative adjectives, and attributive adjectives) are presented in an implicational analysis (6.2.3.4).

6.2.3.1 Descriptive statistics

Adjective position

Suffixation frequency in attributive and predicative position was calculated across sampling times (T1 and T2). The proportion of suffixation was calculated as the number of suffixed adjectives divided by the total number of scorable utterances per individual and group. The control group correctly suffixed all adjectives in attributive position and none in predicative position. As regards the learner groups, the proportions observed suggested an increase of suffixation in attributive position with longer exposure to German (Table 6.4). In predicative position, there were no suffixed adjectives at T1 in any group but at T2 four participants in Years 7 and 9 suffixed some adjectives (Table 6.4). No pattern was apparent for suffixation of adjectives in predicative position.

Table 6.4.

Percentages of Suffixed Adjectives in Attributive and Predicative Position

	Year 6		Year 7		Year 8		Year 9	
	Utt	%	Utt	%	Utt	%	Utt	%
Attr	34	13%	136	37%	175	43%	258	68%
Pred	0	—	8	2%	0	—	3	1%

Note. Utt = number of utterances, %= percentage of suffixed adjectives per scorable utterance for each group, Attr = attributive position, Pred = predicative position.

Time, number, gender, and color term

The rate of suffixed adjectives over time (T1 and T2) was calculated individually and per Year (6–9) (Table 6.5). The control group was measured at T1 only and was therefore not included in this analysis. The proportion of suffixation of attributive adjectives, which had been shown to increase cross-sectionally (between school years), was found to increase longitudinally as well (from T1 to T2; Table 6.5). Further, adjectives were suffixed more often in plural than singular contexts (Table 6.6). Comparisons across gender in singular contexts revealed no suffixation patterns for the learner groups (Table 6.7). The control group reached ceiling in all of these cases. Further, no pattern emerged when proportions of suffixation were compared across the three color terms (Table 6.8) used in the part of the task eliciting attributive adjectives. Finally, there were no indications of order or item effects of the single list of items used.

Table 6.5

Percentages of Attributive Suffixation at T1 and T2

	Year 6		Year 7		Year 8		Year 9	
	Utt	%	Utt	%	Utt	%	Utt	%
T1	19	15%	29	15%	74	36%	114	60%
T2	15	10%	107	58%	101	50%	144	76%

Note. In this and the three subsequent tables, Utt = number of utterances, %= percentage of suffixed adjectives per scorable utterance in the context in question, T1 = Time 1, T2 = Time 2.

Table 6.6
Percentages of Attributive Suffixation in Plural and Singular Contexts

	Year 6		Year 7		Year 8		Year 9	
	Utt	%	Utt	%	Utt	%	Utt	%
Singular	14	11%	60	33%	73	36%	106	56%
Plural	20	15%	76	40%	102	50%	152	80%

Table 6.7
Percentages of Attributive Suffixation across Gender (Singular Contexts)

	Year 6		Year 7		Year 8		Year 9	
	Utt	%	Utt	%	Utt	%	Utt	%
Masculine	4	9%	19	30%	30	44%	34	53%
Feminine	5	11%	24	38%	23	39%	42	66%
Neuter	5	11%	17	27%	20	29%	30	47%

Table 6.8
Percentages of Attributive Suffixation across Color Terms

	Year 6		Year 7		Year 8		Year 9	
	Utt	%	Utt	%	Utt	%	Utt	%
<i>blau</i> 'blue'	15	13%	53	35%	70	41%	105	66%
<i>grün</i> 'green'	6	9%	38	40%	41	40%	79	82%
<i>rot</i> 'red'	13	14%	45	35%	64	48%	74	58%

6.2.3.2 Inferential statistics relating to suffixation of attributive adjectives

A multi-level logistic regression analysis was carried out to test whether any of the predictor variables of *Year* (6–9, excluding the controls), *Time* (T1, T2) *Number* (singular, plural), *Gender* (masculine, feminine, neuter), and *Color term* (*blau*, *grün*, *rot*) had an effect on the outcome variable of *Suffixation* (suffixation: 1, no suffixation: 0). *Items* (test items) and *ID* (participant) were entered into the regression as random effects. The analysis was carried out for attributive adjectives only, as the variation in the predicative condition was too small. There were significant main effects of *Year*

(between Years 6 and 7: $Est = 1.78$, $SE = .49$, $z = 3.67$, $p < .001$; between Years 6 and 8: $Est: 2.12$, $SE = .48$, $z = 4.4$, $p < .001$; and between Years 6 and 9: ($Est = 3.48$, $SE = .49$, $z = 7.13$, $p < .001$). This suggested that the participants in Years 7-9 suffixed adjectives more often than those in Year 6. The main effect found for *Time* ($Est = 1.12$, $SE = .13$, $z = 8.44$, $p < .001$) showed that the suffixation rate in each group was higher at T2 than at T1. These effects found for *Year* and *Time* were strong indications of a learning effect. There was also a main effect of *Number* ($Est = -.81$, $SE = .20$, $z = -4.07$, $p < .001$), indicating that adjectives were significantly more often suffixed in plural than in singular contexts. No other effects approached statistical significance.

6.2.3.3 Suffixed predicative adjectives

At T1, no suffixes were produced in any of the 617 scorable utterances containing an adjective in predicative position. At T2, 2% (i.e., 11 of the 715 scorable utterances) contained a suffixed adjective in predicative position. These cases were distributed across four participants and two groups (three participants in Year 7 and one in Year 9). There were some indications that predicative adjectives were more likely to be suffixed in plural ($n = 9$) than in singular contexts ($n = 2$).

6.2.3.4 Implicational scaling of adjective suffixation

The proportion of suffixes added to adjectives in attributive position that agreed with the determiner and the numeral, the proportion of suffixed adjectives in predicative position, and the proportion of cases of subject–verb agreement that had been calculated for each participant were entered into an implicational scale using an emergence criterion of two occurrences. The acquisition criterion was increased from one occurrence, as used for word order (Chapters 4 and 5), to two occurrences because subject–verb agreement could only be established when a participant had produced two different forms of the copula *sein*—*ist* and *sind* (Table 6.9); that is, a participant had to have produced at least one instance of agreement in the singular and one in the plural ($NP_{\text{sing}} /er/sie/es \textit{ ist}$; $NP_{\text{pl}}/sie \textit{ sind}$).

Table 6.9: *Implicational Scale for Suffixation*

		T1					T2		
Year	ID	Pred	SV	Attr	Year	ID	Pred	SV	Attr
9	Lena	0	1	1	7	Maja	1	1	1
9	Madelen	0	1	1	9	Christel	1	0	1
8	Melchior	0	1	1	8	Clas	0	1	1
8	Mona	0	1	1	7	David	1	0	1
9	Natasja	0	1	1	9	Eva	0	1	1
9	Anders	0	0	1	8	Jessica	0	1	1
9	Christel	0	0	1	9	Johanna	0	1	1
8	Clas	0	0	1	9	Lena	0	1	1
8	Conrad	0	0	1	9	Madelen	0	1	1
7	Curt	0	0	1	9	Melanie	0	1	1
9	Eva	0	0	1	8	Melchior	0	1	1
8	Hans	0	0	1	7	Måns	1	0	1
7	Jakob	0	0	1	9	Natasja	0	1	1
6	Jana	0	0	1	8	Otto	0	1	1
9	Jeanette	0	0	1	7	Rudolf	0	1	1
9	Jim	0	0	1	9	Anders	0	0	1
9	Johanna	0	0	1	7	Anton	0	0	1
9	Justus	0	0	1	7	Artur	0	0	1
9	Karsten	0	0	1	7	Cassie	0	0	1
7	Lara	0	0	1	8	Chris	0	0	1
9	Linda	0	0	1	8	Conrad	0	0	1
8	Markus	0	0	1	7	Curt	0	0	1
9	Melanie	0	0	1	7	Emil	0	0	1
8	Otto	0	0	1	8	Hans	0	0	1
9	Paul	0	0	1	7	Jakob	0	0	1
8	Petter	0	0	1	9	Jeanette	0	0	1
8	Ralf	0	0	1	8	Jens	0	0	1
7	Rudolf	0	0	1	9	Jim	0	0	1
9	Sabina	0	0	1	9	Justus	0	0	1
8	Saskia	0	0	1	9	Karsten	0	0	1
8	Thomas	0	1	0	9	Linda	0	0	1
7	Anton	0	0	0	7	Louis	0	0	1
7	Artur	0	0	0	7	Mats	0	0	1
7	Carmen	0	0	0	6	Mikael	0	0	1
7	Cassie	0	0	0	8	Mona	0	0	1
8	Cecilia	0	0	0	9	Paul	0	0	1
8	Chris	0	0	0	8	Petter	0	0	1
7	Claudia	0	0	0	8	Ralf	0	0	1
7	David	0	0	0	9	Ronald	0	0	1
7	Emil	0	0	0	9	Sabina	0	0	1
6	Eskil	0	0	0	6	Sofie	0	0	1
6	Ester	0	0	0	8	Thomas	0	1	0
6	Ingrid	0	0	0	7	Carmen	0	0	0
6	Jacquelin	0	0	0	8	Cecilia	0	0	0
8	Jens	0	0	0	7	Claudia	0	0	0
8	Jessica	0	0	0	6	Eskil	0	0	0
6	Joel	0	0	0	6	Ester	0	0	0
6	Josefine	0	0	0	6	Ingrid	0	0	0
8	Lili	0	0	0	6	Jacquelin	0	0	0
7	Louis	0	0	0	6	Jana	0	0	0
7	Maja	0	0	0	6	Joel	0	0	0
7	Mats	0	0	0	6	Josefine	0	0	0
6	Mikael	0	0	0	7	Lara	0	0	0
8	Mirjam	0	0	0	8	Lili	0	0	0
7	Monika	0	0	0	8	Markus	0	0	0
7	Måns	0	0	0	6	Max	0	0	0
9	Ronald	0	0	0	8	Mirjam	0	0	0
6	Sara	0	0	0	7	Monika	0	0	0
6	Sofie	0	0	0	6	Sara	0	0	0
6	Tanja	0	0	0	8	Saskia	0	0	0
6	Max	n.a.	n.a.	n.a.	6	Tanja	0	0	0

The scalability of the implicational scale at both T1 and T2 was high² (T1: $C_{scal} = .95$; $MM_{rep} = .79$; % improvement in reproducibility = .20. T2: $C_{scal} = .95$; $MM_{rep} = .80$; % improvement in reproducibility = .16). This suggests an implicational order of acquisition of the three structures applying at both T1 and T2. As stated above, Processability Theory (PT; (Pienemann, 1998, 2005a, 2005b) expects there to be an implicational order between phrasal and inter-phrasal morphemes, meaning that attributive adjectives will be acquired prior to subject–verb agreement and predicative adjectives; however, PT yields no predictions as regards the implicational order, if any, between the latter two structures. In the present study, only one of the four learners who produced suffixed predicative adjectives also produced subject–verb agreement, and therefore no implicational order could be inferred between the two inter-phrasal morphemes in question. However, the other results supported PT in that phrasal morphemes were acquired before inter-phrasal ones.

6.2.3.5 Detailed analyses of participants suffixing adjectives in predicative position

In the data collected, all participants who produced suffixation in predicative position also produced suffixation in attributive position. The four participants who suffixed adjectives in predicative position did so at T2 only.

David, Year 7

At T1, David suffixed one adjective in attributive position: *rot-en* ‘red’, meaning that he was one occurrence short of the acquisition criterion. At T2, he suffixed 67% (8 out of 12) adjectives in attributive position, using two different suffixes: *-e* and *-en*. More specifically, he suffixed all adjectives in plural contexts (6 out of 6) and two in singular contexts (2 out of 6). While his use of *-en* was restricted to plural contexts and his baseline form to singular contexts, *-e* appeared in both singular and plural contexts. According to the criteria for agreement applied to adjectives in attributive position, David showed 25% agreement.

In predicative position, David suffixed 17% (2 out of 12) of his adjectives at T2—one adjective in a singular context and one in a plural context. In both of these cases, the color adjective *gelb* ‘yellow’ was suffixed with *-t*, which may represent a negative transfer of the identical Swedish suffix. This suffix occurred only in predicative position,

² Scales are considered to be valid and scalable when the coefficient of reproducibility is above .9 and the coefficient of scalability is above .6 (Hatch & Lazaraton, 1991, pp. 210-212).

suggesting that structural position may have constrained its use. Further, as exemplified by the two sentences below, David consistently used the third person singular form *ist* ‘is’ with both singular and plural NPs at both T1 and T2. His production was therefore analyzed as not displaying subject–verb agreement.

(1) Singular (David, T2)

- (a) *die kleine Fische ist gelb-t*
‘the small fish is yellow’
- (b) *die kleinen Blumen ist gelb-t*
‘the small flowers is yellow’

Maja, Year 7

At T1, Maja produced one suffixed attributive adjective (*blü-en* ‘blue’), thus not meeting the acquisition criterion, and no suffixed adjectives in predicative position. At T2, she suffixed all adjectives in attributive position using two different suffixes: *-e* and *-en*. Both of these suffixes appeared in both singular and plural contexts. The color adjective *rot* ‘red’ was invariably produced with *-en*; *grün* ‘green’ and *blau* ‘blue’ invariably with *-e*. In predicative position, 33% (4 out of 12) of her adjectives were suffixed. Only adjectives in plural contexts were suffixed, using two different suffixes: *-en* and *-e*. As regards subject–verb agreement, Maja used the third person singular form *ist* as the default form at T1 while at T2 she used *ist* only in singular contexts and the third person plural form *sind* in plural contexts, as exemplified in the sample sentences below. Maja’s production at T2 was therefore analyzed as displaying subject–verb agreement.

(2) Singular (Maja, T2)

- (a) *er ist blau*
‘it is blue’
- (b) *er ist gelb*
‘it is yellow’
- (c) *er ist rot*
‘it is red’
- (d) *er ist braun*
‘it is brown’

Plural (Maja, T2)

- (e) *sie sind blau-e*
'they are blue'
- (f) *sie sind gelb eh gelb-en*
'they are yellow eh yellow'
- (g) *sie sind rot-en*
'they are red'
- (h) *sie sind braun-e*
'they are brown'

Måns, Year 7

Måns did not produce any suffixed adjectives at T1, while at T2 all adjectives in attributive position were suffixed (using *-e*, *-en*, or *-es*). The suffix *-en* occurred in plural contexts, *-es* in singular contexts, and *-e* in both singular and plural contexts. The color adjectives *blau* 'blue' and *rot* 'red' were produced with different suffixes in different number contexts (*-en* in the plural, *-e* in the singular), while *grün* 'green' was invariably produced with final *-e* in attributive position. Måns had a 58% rate of agreement at T2.

In two cases at T2, an adjective in predicative position was suffixed with *-e*, irrespective of the number context. In the example below it can be noted that Måns invariably used the third person singular form of the copula (*ist*), which he also invariably used at T1. Hence, he had not acquired subject–verb agreement.

(3) Singular (Måns, T2)

- (a) *es ist blau-e*
'it is blue'

Plural (Måns, T2)

- (b) *der ist blau-e*
'he is blue'

Christel, Year 9

In attributive position, Christel produced 67% (8 out of 12) suffixed adjectives at T1. She used only the suffix *-e*, which also appeared in her base form for a number of adjectives. Christel did not produce any adjectives in predicative position at T1, using

instead circumlocutions such as *die große Glas hat grün Farbe* ‘the big glass has green color’.

At T2, all of Christel’s adjectives in attributive position except one were suffixed (92%). There was no systematic distribution of her suffixes, even though she used *-e* in most cases. In the predicative condition, 30% of her adjectives (3 out of 10 utterances) were suffixed with *-en*. These cases were all in plural contexts and involved three different adjective stems. Further, the examples below exemplify Christel’s invariable use of the third person singular of the copula along with her use of the third person neutral pronoun *es* ‘it’ in all number and gender contexts. Hence, she had not acquired subject–verb agreement.

(4) Singular (Christel, T2)

- (a) *es ist blau*
‘it is blue’
- (b) *es ist rot*
‘it is red’
- (c) *es ist grün*
‘it is green’

Plural (Christel, T2)

- (d) *es ist eh blau-en*
‘it is eh blue’
- (e) *es ist rot-en*
‘it is red’
- (f) *es ist grün-en*
‘it is green’

6.3 Discussion

The results showed overall learning effects as regards suffixation of adjectives in attributive position. There was an increase in adjective suffixation between T1 and T2,

and also between Year 6 and Year 9. However, the majority of the adjectives produced by the participants were not inflected (not even when only adjectives in attributive position were considered). Further, in the cases where the learners added a suffix to the adjectival stem, there were at first no obvious patterns of agreement. Adjective forms seemed to occur in free variation, and there were many invariant forms across participants. However, some learners did display target-like agreement patterns. When an emergence criterion of two occurrences was applied in an implicational scaling, there emerged an implicational order of acquisition where adjectives in attributive position were followed by subject–verb agreement. This was further supported by the finding that subject–verb agreement increased both cross-sectionally (it did not occur in Year 6) and longitudinally.

When suffixed adjectives appeared, the participants distinguished between structural positions: suffixation appeared in attributive position but not in predicative position (except in four participants at T2). This pattern indicated a sensitivity to the syntactic context, replicating earlier findings (Klein & Perdue, 1992; Spinner & Juffs, 2008; Weerman et al., 2006). Further, suffixation of adjectives in predicative position appeared only in learners who also produced suffixed adjectives in attributive position (one of the four, Christel, Year 9, met the acquisition criterion for attributive suffixation even at T1), suggesting that the production of suffixed attributive adjectives precedes that of suffixed predicative adjectives.

The results from this study cannot be explained by the Initial L1 Transfer Hypotheses, according to which adjectives would be suffixed in both predicative and attributive position. Further, the results are not compatible with the Initial L2 Transfer Hypotheses, which predicted the appearance of subject–verb agreement patterns even at beginner level. Any attempts at explaining the results with reference to partial transfer—for example that the lack of suffixation of adjectives in predicative position was due to L2 transfer while the lack of subject–verb agreement was due to L1 transfer—would require a theoretical justification as to why certain patterns would transfer from L1 and others from L2 (cf., Pienemann & Håkansson, 2007 on partial L1 and L2 transfer as post hoc explanations).

By contrast, the results of the present study support the developmental implicational order of morpheme acquisition suggested by Processability Theory (PT; (Pienemann, 1998, 2005a, 2005b). That is, at earlier stages the participants seemed limited to information exchange within the same phrase (adjective–noun agreement in attributive

position). Information exchange across phrases (subject–verb agreement) followed at a later stage of acquisition. The cases where adjectives in predicative position were inflected could represent developmentally moderated transfer from L1. That is, this pattern could be an indication that the learners transferred this L1 structure only at the stage where they were able to produce phrasal morphemes. This would thus be consistent with the Developmentally Moderated Transfer Hypothesis (DMTH). However, as the current study included only a single L1 (Swedish), this interpretation cannot be conclusive. Instead of having transferred, suffixation of adjectives in predicative position could have arisen as an overgeneralization of adjective suffixation from attributive position to predicative position. A follow-up study of native English speakers could potentially establish whether this effect is indeed a transfer effect and whether the production of inter-phrasal morphemes is indeed restricted by development.

A previous study proposed a semantic difference between number and grammatical gender that would affect the learning of number positively because of its semantic content (Glahn et al., 2001).

“Hence, in a language that has number agreement in adjectives, such morphological marking contributes in a straightforward way to the clarity of the utterance. Lexical gender, on the other hand, lacks this clear conceptual basis, it has to be known by the speaker, and it has little relevance, if any, for the meaning of the utterance. With this in mind, the priority of number marking over gender marking in learner production should not be surprising.” (Glahn et al., 2001, p. 412).

The authors suggest, in line with previous studies (Hammarberg, 1996; Lund, 1998, 1996; Ågren, 2008), that the explanation of developmental trajectories in the acquisition of morphology needs to take conceptual and semantic differences into account alongside the morpho-syntactic processing constraints of PT (Pienemann, 1989).

The impact of semantic factors on acquisition was supported by the results of the present study in that a difference was found for number: adjectives in plural contexts were significantly more often suffixed than adjectives in singular contexts. However, the present study was not designed to be able to confirm whether the acquisition of plural suffixation before singular suffixation was indeed dependent on the semantic information contained or whether the reason was that the singular paradigm of German consists of a larger number of different forms than the plural paradigm. This alternative

explanation is based on the assumption that a clearer form–function relationship facilitates acquisition (Goldschneider & DeKeyser, 2005; Jaensch, 2008).

To sum up, the present study of adjective agreement and subject–verb agreement in German L3 acquisition supported the existence of a developmental trajectory in the acquisition of morphemes. There was no evidence in favor of the Initial L1 Transfer Hypotheses or the Initial L2 Transfer Hypotheses.

CHAPTER 7

EFFECTS OF PSYCHOTYPOLOGY ON L1 TRANSFER

The results reported earlier in this thesis suggest that learners follow general developmental trajectories for syntax and morphology acquisition in German. There was no indication of full transfer of structures from either L1 or L2 to L3. The conclusion drawn so far is that developmental trajectories constrain transfer. However, an alternative explanation could be that structures transfer only when languages are perceived as structurally similar, a phenomenon called *psychotypology* (Kellerman, 1977, 1979, 1983, 1986). If there were psychotypological effects, the extent of transfer would vary with the perceived similarity between L1 and L3 (and indeed between L2 and L3, but that aspect is not investigated here). This potential relationship was explored by means of correlational analyses between the word order data obtained in the elicited imitation task and the data on suffixation of adjectives in attributive position, on the one hand, and measurements of the participants' psychotypological estimates of German versus Swedish as obtained by means of a questionnaire, on the other.

7.1 Learners' Perception of Language Similarity

The concept of psychotypology was introduced by Kellerman (1977, 1979, 1983, 1986) to highlight the fact that the perceived distance between two languages does not necessarily correspond to the typological distance between them, which is assessed on more objective linguistic grounds. Kellerman suggested that psychotypology, rather than typology proper, is what affects transfer (Kellerman, 1986). Psychotypological estimates are assumed to change as a person obtains additional information about and more knowledge of the languages involved (Kellerman, 1979) and to vary depending on the level at which the degree of similarity of two languages is established (De Angelis, 2007). For example, learners may perceive an overall similarity between two languages that belong to the same language family. The perception of similarity may also be more restricted, confined to specific similar components or features of the languages, and it may also be experienced on item level. Rast (2008) links the concept to learners' metalinguistic strategies and awareness. Accordingly, to generate hypotheses about the similarity of two languages, a learner will consult his or her linguistic knowledge and formulate working hypotheses about the target language that will subsequently be tested and reformulated as appropriate.

More recent research into the effects of psychotypology on transfer has been carried out in relation to L3 acquisition (De Angelis & Selinker, 2001; Foote, 2009; Ionin, Montrul, & Santos, 2011; Kirkici, 2007; Leung, 2003; Ó Laoire & Singleton, 2007; Rothman, 2011; Sağın Şimşek, 2006; Sercu, 2007). Given that these studies all deal with multilingualism, and that the sources of transfer can therefore be complex, psychotypology has been used to explore which of the languages involved would be the expected source of transfer. However, even though participants' perceptions are often assumed to be pivotal, they are actually seldom measured. Instead, it is implicitly or explicitly presupposed that psychotypological estimates are identical with the conclusions of linguistic typology (e.g., Ionin et al., 2011; Leung, 2003; Ringbom, 2001; Rothman, 2011; Sercu, 2007). This may indeed be the case when some of the participants' languages are more obviously typologically close (e.g., Swedish and English) than others (e.g., Swedish and Finnish). However, it is not self-evident that all learners will make equal or equally strong psychotypological estimates of any language pair. Moreover, it may even not be clear on objective typological grounds which two languages are overall closest when both language family and shared lexicon are taken into account (as in the case of English, Dutch, and French in Sercu, 2007). Hence,

psychotypological estimates might differ substantially from typological assessments. It is therefore essential to measure learners' perceptions rather than inferring what they might perceive on the basis of other data. In fact, if psychotypology is not measured in its own right but equated with typology, then it actually is nothing but typology and there is no need for it as a separate concept. So far, there is no consensus on how psychotypological estimates should be operationalized or what the best methods for measuring them are. The few studies that have undertaken to measure psychotypology have used a one-item questionnaire (Letica & Mardesic, 2007) or introspective interviews (Ó Laoire & Singleton, 2007; Singleton & Ó Laoire, 2006).

7.2 The Present Study

For the present study, a multi-item questionnaire was designed to measure psychotypological estimates of Swedish versus German. Correlational analyses between the psychotypological estimates thus obtained and L3 production were used to explore possible transfer effects.

7.2.1 Method

7.2.1.1 Participants

The learner groups' psychotypological estimates of German versus Swedish were measured at Time 2 (see Table 3.1).

7.2.1.2 Task and material

A questionnaire in Swedish was designed in accordance with the guidelines of Dörnyei (2003). Besides questions targeting psychotypological estimates of the distance between German and Swedish, there were also demographic questions relating to issues such as sex, age, and personal language background (see Chapter 4).

Psychotypology was measured by means of seven items, of which four were general and three targeted word order, phonology, and vocabulary, respectively (Table 7.1). A six-point Likert-type scale (see Chapter 4) was used to measure the respondents' level of

agreement with the statements. A total score was calculated for each participant, and this was taken to be a measure of his or her psychotypological estimate of German versus Swedish.

7.2.1.3 Procedure

During the researcher's last visit to each class, paper questionnaires were distributed. They were filled out individually, which took approximately 10 minutes. The participants were asked not to work together and not to copy each other's answers, and invited to ask any clarification questions they might have. All such questions were answered by the researcher in class so that everyone could benefit from the answer.

7.2.1.4 Predictions

According to the general hypothesis of psychotypological effects on transfer, learners who perceive German and Swedish as being typologically close would be more likely to transfer similar structures from L1 to L3 in production than those learners who perceive the two languages as more distant. Below follow hypotheses for the production of specific structures (a–c) that should be more frequent in participants perceiving the two languages to be typologically close.

(a) XVS structures

Learners perceiving German and Swedish as being typologically close should produce more XVS structures than learners perceiving German and Swedish as being typologically less close, since they should be more likely to transfer XVS structures, which occur in both L1 and L3.

(b) Topicalization structures

Learners perceiving German and Swedish as being typologically close should produce more topicalization (Tp) structures than learners perceiving German and Swedish as being typologically less close, since they should be more likely to transfer Tp structures, which occur in both L1 and L3.

(c) Suffixed adjectives in attributive position

Learners perceiving German and Swedish as being typologically close should produce more suffixed adjectives in attributive position than learners perceiving German and Swedish as being typologically less close, since they should be more likely to transfer suffixation of adjectives in attributive position, which occurs in both L1 and L3.

7.2.2 Analyses

7.2.2.1 Internal Consistency and Reliability

Item responses were coded from 1 for complete disagreement to 6 for total agreement. To ensure that all items measured the same construct, each item was correlated with the total score of the remaining items (Cronbach's Alpha: Cronbach, 1951). The Cronbach's coefficient Alpha of .89 indicated high internal consistency (Dörnyei, 2003, p. 112). In other words, a participant who responded with "strongly agree" on one item was highly likely to do so on the other six items as well.

Table 7.1

Items Measuring Respondents' Psychotypological Estimates of German vs. Swedish

1. ***Tyska och svenska har otroligt många lika ord.***
'German and Swedish have an incredible number of similar words.'

instämmer helt ::::_: instämmer inte alls
'strongly agree' 'strongly disagree'
2. ***Jag tycker svenska och tyska är mycket lika varandra.***
'I think Swedish and German are very similar to each other.'
3. ***Tyskan låter egentligen mycket som svenskan.***
'German actually sounds a lot like Swedish.'
4. ***Tyskan och svenskan bygger sina meningar likadant.***
'German and Swedish build sentences in the same way.'
5. ***Om man kan svenska är det lätt att lära sig tyska.***
'If you know Swedish, learning German is easy.'
6. ***Svenska och tyska har otroligt många likheter.***
'Swedish and German are similar on an incredible number of points.'
7. ***När man pratar tyska är det lite som om man pratar konstigt svenska.***
'Speaking German is a bit like speaking funny Swedish.'

It has been claimed that any item whose correlation with the remaining items is lower than .3 should be eliminated from further analyses (de Vaus, 2001, p. 184). Item 4 had a

correlation of just above .3 (Table 7.2), but eliminating it would not have greatly increased the overall Cronbach's Alpha. In addition, this item targeted similarities in word order, an important aspect of the present thesis. Hence all seven items were retained. However, as word order was of particular interest, separate correlation analyses were conducted for Item 4.

7.2.3 Results

The total score for each participant was deemed to represent his or her individual psychotypological estimate of German versus Swedish. Spearman's Rho correlation was used to describe the relationship between the participants' psychotypological estimates and their L3 production as measured by the elicited imitation task (Chapters 4 and 5) and the communication task (Chapter 6). To explore possible changes in psychotypological estimates with increasing exposure to German, Spearman's Rho correlation analyses were used to analyze the relationship between these two measures across Years.

Table 7.2
Cronbach's Alphas for the Multi-Item Psychotypology Scale

Item	Item correlation	α when removed
1	.72	.87
2	.82	.86
3	.81	.86
4	.31	.91
5	.81	.87
6	.66	.88
7	.71	.88

Note. "Item correlation" refers to the correlation of the specific item to all other items. The column " α when removed" gives the overall Cronbach's Alpha with the specific item removed from the data. α = Cronbach's Alpha.

7.2.3.1 Correlations between psychotypology and L3 production within groups

A weak negative relationship between psychotypological estimates and Year ($\eta = -.33$; $p < .01$) indicated a tendency for participants to estimate German and Swedish as less similar with increased exposure (Figure 7.1) (Year 6: $M = 3.1$; Year 9: $M = 2.1$).

Interestingly, this tendency was more pronounced for word order ($\eta = -.57, p < .001$) (Year 6: $M = 2.7$; Year 9: $M = 1.2$).

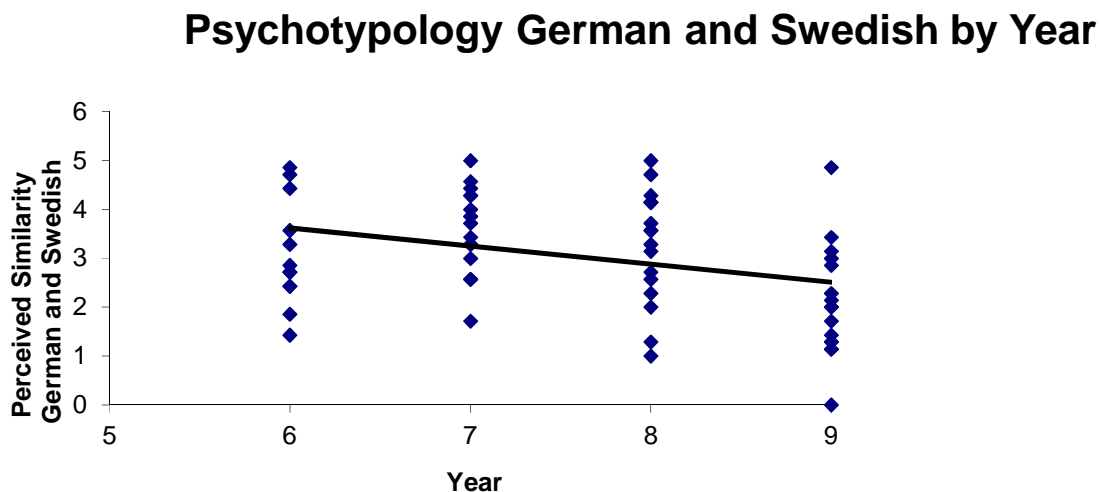


Figure 7.1 *Psychotypology of German vs Swedish, by Year*

This graph visualizes how the psychotypological estimate for German versus Swedish decreased with more exposure to German

7.2.3.2 *Correlations between psychotypology and L3 production within participants*

There were no statistically significant relationships between psychotypological estimates and rates of correct repetition of XVS or XSV structures (all p 's $> .102$) or between the perceived level of word order similarity and rates of correct imitation of XVS or XSV structures (all p 's $> .128$) at either time (T1 or T2).

There were also no statistically significant relationships between psychotypological estimates and correct repetition of topicalization (Tp-XSV) or subject-first (Sf) structures (all p 's $> .365$) or between the perceived level of word order similarity and correct repetition of either type of structure (all p 's $> .129$).

However, there was a weak negative correlation between psychotypology estimates and the number of suffixed adjectives in attributive position at Time 1 ($\eta = -.26; p < .05$)—but not at Time 2 ($p > .208$). This means that more suffixes were produced when the estimated level of similarity was low. There was a corresponding weak and negative correlation between the perceived level of word order similarity and the production of suffixed adjectives in attributive position, which approached significance at T1 ($\eta = -.24$;

$p = .069$) and was statistically significant at T2 ($\eta = -.31$; $p < .05$). However, since increased exposure was also associated with lower levels of estimated similarity, the reason for these tendencies could be the higher proficiency that comes with increased exposure rather than psychotypology as such.

7.3 Discussion

The participants' psychotypological estimates of German versus Swedish were assessed using a questionnaire with an internally reliable seven-item scale in a cross-sectional study. The correlational analyses showed that the ratings of the similarity between German and Swedish were higher in participants who had had comparatively little exposure to German. This supports suggestions that perceptions of typological distance vary with the level of knowledge of the target language (Kellerman, 1979). The participants in the present study thus seem to start out with the preconception that Swedish and German are fairly similar but then progressively reassess this judgment as they are increasingly exposed to German. An alternative explanation is that older and more mature participants may have greater metalinguistic awareness and that this may have caused them to arrive at a different estimate of the similarity between German and Swedish. As the data are cross-sectional, there is a need for future longitudinal studies to explore this pattern further. However, it does not seem unreasonable to assume that learners are initially guided in their judgment by an assumption of great similarity between German and Swedish but reassess this evaluation when faced with the—at times tiresome—task of actually learning German.

Importantly, however, whether participants perceived German and Swedish as being more or less similar did not affect their German L3. Their general psychotypological estimates and their more specific perceptions of word order similarities between German and Swedish did not correlate with word order in their German production.

There were some indications of a weak negative relationship between psychotypology and suffixation of adjectives in attributive position. The results suggested that the higher the perceived similarity between German and Swedish, the less suffixation of adjectives in attributive position occurred, even though both languages actually suffix attributive

adjectives. However, it should be kept in mind that correlation is not causation. This relationship could be related to the correlation between perception of similarity on the one hand and exposure—and thus proficiency—on the other. The participants who had had more exposure to German, and who were therefore probably also more proficient in the language (and thus more likely to place a suffix on adjectives that should have a suffix), rated the two languages as less similar. According to the results presented in Chapter 6, exposure is associated with more attributive adjectives being suffixed. Exposure/proficiency could thus be the third common factor in this context.

In sum, there did not seem to be any interaction between the participants' perceptions of the typological similarity between their L1 and L3 and their L3 production or imitation. Consequently, according to earlier chapters and the results presented here, there are no indications that developmental trajectories are affected by structural similarities between L1 or L2 and L3, regardless of whether such similarities are perceived or established on objective grounds.

CHAPTER 8

GENERAL DISCUSSION

This thesis has studied the acquisition of morpho-syntactic structures in L3 German by native speakers of Swedish with English as L2. The similarities and differences among these three languages have made it possible to explore the interaction between language-specific factors—transfer from L1 and L2—and learner-general developmental trajectories in L3 acquisition. Participants at and beyond the initial stage of L3 acquisition were divided into four groups by school year, as a proxy for length of L3 exposure. They performed several different tasks enabling the collection of both spontaneous speech data and more controlled elicited imitation data targeting the same structures.

In the following, the results from the different tasks will be discussed in the light of two types of transfer hypotheses—Initial L1 Transfer Hypotheses and Initial L2 Transfer Hypotheses (so named based on the language expected to be the source of transfer in the acquisition of a certain structure)—as well as in the light of the Developmentally Moderated Transfer Hypothesis (DMTH, Håkansson et al., 2002), which assumes that transfer is constrained by developmental trajectories.

8.1 Initial L1 Transfer Hypotheses

The overall pattern of results described in this thesis could not be explained by initial L1 transfer. First, this is true for the elicited imitation data. The learners were better at repeating L3 sentences that did not match L1 sentence structure (XSV) than L3 sentences that did (XVS). Further, when asked to repeat two structures that were equally grammatical in their L1 (subject-first sentences and topicalizations), the beginners differed in their rates of correct repetition in L3.

The spontaneous speech data also confirmed that initial L1 transfer was not an adequate explanation for the pattern of results. The vast majority of the topicalized sentences produced by the learners did not match L1 sentence structure, in line with the findings from an earlier study (Håkansson et al., 2002). Further, the frequency patterns for two sentence structures (topicalizations and subject-first sentences) found for the participants' telling of a picture-based story in L1 were not mirrored when the same participants told the story in L3.

The pattern was the same for morphology: there was no support for initial L1 transfer. Neither the form nor the function of inflectional morphology initially transferred from L1 to L3, irrespective of whether the outcome would have been positive transfer (suffixation of attributive adjectives) or negative transfer (suffixation of predicative adjectives). However, the majority of the adjectives produced were not suffixed, irrespective of their structural position.

To sum up, the results presented are thus not compatible with transfer hypotheses suggesting that L1 grammar is the basis on which the target grammar is constructed (e.g., Hawkins & Chan, 1997; Lado, 1957; Na Ranong & Leung, 2009; Schwartz & Sprouse, 1994, 1996). Nor are these results compatible with transfer theories expecting L1 transfer to occur when L1 and L3 are typologically close or perceived as being close, as suggested in the Typological Primacy Model (Rothman, 2011; Rothman & Cabrelli Amaro, 2010). This was particularly evident as the results indicated that higher ratings of psychotypological proximity between Swedish and German did not increase the learners' propensity to produce syntactic or morpho-syntactic structures that are similar in L1 and L3.

Still, there are aspects of the data that could be explained by the Cumulative-Enhancement Model (Flynn et al., 2004), which expects L1 transfer of a structure to occur only when it leads to positive transfer. For example, the participants suffixed German adjectives in attributive position but not—initially—in predicative position. In other words, it could be claimed, in line with the Cumulative Enhancement Model, that positive transfer from L1 Swedish occurred (attributive suffixation) but negative transfer from L1 Swedish did not (predicative suffixation). However, this explanation falls short in several ways. First, there are two other studies that have obtained similar results (Spinner & Juffs, 2008; Weerman et al., 2006). They tested participants with various different L1s that differed in whether adjectives in attributive and/or predicative position were suffixed or not. Those authors in question therefore—rightly—did not suggest that their results could be explained by reference to L1 transfer. Second, the Cumulative Enhancement Model would have also predicted other instances of transfer from L1 of similar syntactic structures that did not occur (e.g., subject-verb inversion). That model thus cannot account for the overall pattern of results, only for parts of it. Further, it is important to note that the number of participants who suffixed adjectives in attributive position increased over time. This contradicts any predictions based on initial L1 transfer.

These explanatory limitations of the Cumulative Enhancement Model entail three conclusions when it comes to the investigation of transfer phenomena. First, to show that transfer has occurred, results from learners with different L1s should be compared—transfer should be defined by reference to intergroup heterogeneity (Jarvis & Pavlenko, 2008). This can be accomplished either by including learners with different language backgrounds in the same study or, as in the present case, by comparing results with those from other studies. Second, the fact that the Cumulative Enhancement Model could explain some aspects of the results but not the overall pattern implies that it is crucial to examine several different language structures, not just one, as evidence may be found for isolated predictions but not overall patterns. Third, it is important to not only examine learners at the initial state but to take a developmental perspective and examine the acquisition of a structure across learners of different proficiencies.

In sum, the data analyzed in this thesis did not support Initial L1 Transfer Hypotheses as regards L3 acquisition of word order and morphology. This was the case irrespective of whether L1 was expected to have a privileged role as transfer source, and irrespective of whether overall language similarities or specific structural similarities were expected to

affect transfer (Flynn et al., 2004; Montrul et al., 2011; Na Ranong & Leung, 2009; Rothman, 2011).

8.2 Initial L2 Transfer Hypotheses

It has been suggested that L2, rather than L1, is the primary source of transfer to L3 (Bardel & Falk, 2007; Bohnacker, 2006; Falk & Bardel, 2011; Hammarberg, 2001; Williams & Hammarberg, 1998). In particular, the occurrence of XSV structures in the spontaneous speech production of Swedish native speakers learning German L3 with English L2 (Håkansson et al., 2002) has been attributed to transfer from L2 English, suggested to block L1 transfer (e.g., Bardel & Falk, 2007). However, if L1 is indeed blocked, L2 transfer is to be expected in various cases other than XSV structure, and this was not supported by the data of the present thesis because the overall pattern of results could not be explained by reference to initial L2 transfer.

This was particularly evident in the elicited imitation data. Even though initial L2 transfer could account for the imitation pattern in relation to verb placement (a preference for XSV—grammatical in L2, ungrammatical in L1), it could not explain the pattern found as regards repetition of the first position of sentences. In that context, the beginners apparently could not profit from the presence of topicalizations in L2 when repeating L3 topicalizations, preferring instead subject-first sentences.

As regards the spontaneous speech production data, the lack of topicalizations has been ascribed to an initial absence of adverbials in the lexicon (Bardel & Falk, 2007). However, this was not the case in the present study, as the participants produced both prepositional phrases and adverbials—but only in sentence-final position. Topicalization is an optional word order in German, meaning that the lack of topicalizations in the spontaneous speech data could not be interpreted as conclusive evidence that the participants lacked these structures in their L3 German grammar. However, the lack of topicalizations in the elicited imitation task designed to force the production of such structures supported the findings from the spontaneous speech task (see above). The beginners imitated subject-first sentences better than topicalizations, supposedly reflecting their grammatical knowledge. Further, there was a tendency, above all in

beginners and lower-intermediate learners, to interpret adverbials that phonologically resembled proper names as subjects, which supported the suggested preference for subject-first sentences but could not be explained by initial L2 transfer.

Similarly to the results from the tasks exploring word order, the results in relation to the acquisition of inflectional morphology did not support L2 as the primary source of transfer. Even though English marks subject–verb agreement, only a few advanced learners displayed such agreement patterns in L3. On the other hand, the lack of adjectival inflections could be explained by reference to initial L2 transfer. Again, however, this can provide only a partial explanation for the pattern of results found in this thesis. Moreover, there is no theoretical explanation for why certain L2 structures would initially transfer to L3 while others would not do so. This once more underscores the usefulness of examining several different language structures instead of a single one when comparing the explanatory power of various hypotheses.

It has also been suggested that there is a proficiency threshold that must be attained for L2 transfer to become stronger than L1 transfer (Hammarberg, 2001; Williams & Hammarberg, 1998). In the light of this, the lack of L2 transfer in the present studies could be related to low levels of L2 proficiency. However, a lack of L2 transfer due to low L2 proficiency should entail additional L1 transfer, which was not found in these studies. Thus, even if L2 proficiency was not measured in the present thesis, there were no indications of low L2 proficiency having caused the absence of L2 transfer.

In sum, Initial L2 Transfer Hypotheses could not explain the pattern of results found in this thesis.

8.3 Developmentally Moderated Transfer Hypothesis

The Developmentally Moderated Transfer Hypothesis (DMTH; (Håkansson et al., 2002) takes a developmental perspective on transfer. It expects L1 or L2 transfer to occur to the extent allowed by the constraints on the learner’s language at a given time. Only when a learner is developmentally ready will he or she transfer a structure. Learners are

expected to follow learner-general developmental trajectories in language acquisition despite structural similarities between target and source languages.

The overall pattern of results in this thesis can be explained by reference to the consistency of the learner-general developmental trajectories found for German L3 acquisition (e.g., Jansen, 2008; Meisel et al., 1981; Pienemann, 1998). This is true, first, for the elicited imitation data. The higher rates of correct repetition of supposedly earlier-acquired structures (subject-first and XSV) compared with supposedly later-acquired structures (topicalizations and XVS) for beginners and intermediate learners were indicative of development, as the rate of correct repetition was assumed to reflect syntactic preferences shaped by grammatical knowledge (Schimke, 2011; Verhagen, 2005, 2009, 2011). The equal rates of correct repetition of supposedly successively-acquired structures (XSV and XVS) found for the most advanced learners could be explained as a step toward the preference for grammatical structures displayed in the control group consisting of native speakers.

The results from the elicited imitation data were supported by those from the spontaneous speech data, forming perfect implicational scales where the beginners produced only the supposedly earliest-acquired structures (subject-first) while the advanced learners produced the supposedly latest-acquired structures (XVS). More specifically, the implicational scaling suggested that subject-first sentences were acquired before topicalized sentences, and that non-inverted topicalized sentences (XSV) were acquired before inverted topicalized sentences (XVS), replicating earlier findings of developmental trajectories for L3 German acquisition (e.g., Jansen, 2008; Meisel et al., 1981; Sayehli, 2001). These similarities in trajectories compared with the findings from earlier studies of adults' L2 and L3 acquisition suggested that the results reported in the present thesis were related to development in L3 rather than to maturational factors, although cognitive development, in terms of participants' age, was positively correlated with length of exposure and, more importantly, with L3 developmental trajectories.

As regards the acquisition of inflectional morphology, the pattern observed could be explained by reference to a developmental trajectory, suggested by Processability Theory (PT; (Pienemann, 1998, 2005a, 2005b), that depends on the distance across which grammatical information exchange takes place. Specifically, an implicational order was found to obtain between the production of phrasal morphemes, which rely on information exchange within a phrase (e.g., agreement between a noun and an adjective

in attributive position), and the production of inter-phrasal morphemes, which rely on information exchange across phrases (e.g., subject–verb agreement). Further, at the point when suffixed adjectives appeared in production, they did so only in attributive position, not in predicative position. As mentioned above, this pattern cannot be explained with reference to language-specific factors, because similar patterns of production have been found across learners with various different L1s (Spinner & Juffs, 2008; Weerman et al., 2006). The results also suggest that the participants distinguished structural positions, as revealed by suffixation appearing in attributive position but not in predicative position, which supports the existence of learner-general developmental trajectories based on grammatical information exchange (Pienemann, 1998, 2005a, 2005b).

Adjectives were more often suffixed in plural than singular contexts, replicating earlier results relating to the acquisition of Scandinavian languages (Glahn et al., 2001). The results also provided evidence in support of the assumption that the gradual development of morpho-syntax is guided not only by structural factors but also by semantic ones (Hammarberg, 1996; Klein & Perdue, 1992); however, PT does not take semantic factors into account.

In the analyses presented, the developmental progression was mainly reflected in the differences observed between beginners (Year 6) and advanced learners (Year 9). Across the whole learner group, the length of exposure to L3 (as measured by school year) did show the expected positive linear relationship with developmental stage, but the learners in one group—Year 7—manifested a generally higher proficiency than the older learners in Year 8, as evidenced by production at a higher developmental level. This higher proficiency in the younger students could be due to the use of different sampling methods for this group than for the others. In fact, the majority of the learners in Year 7 had a German teacher other than the one who taught all of the students in Years 6, 8, and 9, and the Year 7 students who had this other teacher were sampled on a first-come, first-served basis. To this should be added, however, that L2 acquisition is typically characterized by large variability in proficiency. The same amount of exposure and instruction does not necessarily result in the same proficiency (Bardovi-Harlig, 1992, 2000). Statistically significant differences in proficiency are therefore not generally expected to obtain between successive school years (e.g., Rule & Marsden, 2006).

The DMTH not only predicts that learners will follow developmental trajectories, it also predicts that L1 or L2 transfer will occur only as and when allowed by developmental

constraints. The unexpectedly low rates of production and imitation of grammatical XVS structures and the high rates of production and repetition of ungrammatical XSV structures in Year 9 were compatible with developmentally constrained L2 transfer. Once a learner is developmentally ready to accommodate a given structure in his or her L3 production, that structure may transfer; in the case of negative transfer, this may actually slow down acquisition (Pienemann & Håkansson, 2007). Thus it is possible that developmentally constrained English L2 transfer caused the participants to produce XSV structures for a long time.

Some of the learners produced suffixed predicative adjectives (inter-phrasal morphemes), which can be interpreted as instances of negative L1 transfer. In support of the DMTH, these learners all produced phrasal morphemes at the time when they produced inter-phrasal ones. However, the evidence in favor of the DMTH was not conclusive, because only a few learners produced suffixed predicative adjectives and because only native speakers of Swedish were studied. This means that the effects of transfer could not be distinguished from those of development, since inflection of adjectives in predicative position could be an instance of overgeneralization. Future studies should compare these results as regards the acquisition of German adjectival inflections with results obtained for a group of native speakers of a language, such as English, where adjectives are not inflected, so as to make it possible to distinguish the effects of transfer from those of development. If such an English group displayed a production pattern for predicative adjectives that differed significantly from that of the present Swedish group, positive evidence of L1 transfer would have been found, since L1 transfer could then be defined by reference to inter-group heterogeneity, as pointed out above (Jarvis & Pavlenko, 2008).

Taken together, the overall pattern of results suggests that learners follow learner-general developmental trajectories despite structural similarities between target and source languages. The DMTH's developmental perspective thus accounts best for the results presented in this thesis. The DMTH expects L1 or L2 transfer to occur when a learner is developmentally ready. In other words, potential L1 and L2 transfer is suggested to be constrained by the learner's development in the language that would be the recipient of the transfer.

8.4 Elicited Imitation and Spontaneous Speech Data

When elicited imitation data showed that the rates of correct imitation were higher for certain structures, this was assumed to reflect the participants' syntactic preferences as shaped by previously acquired knowledge. Similarly, when structures were equally well correctly repeated, it was assumed that the participants had not (yet) formed any preferences. These assumptions were confirmed by the German native speakers' patterns of repetition: their preferences overlapped with the grammaticality of German structures, replicating previous results showing that native speakers repeat grammatical structures better than ungrammatical structures (e.g., Love & Parker-Robinson, 1972).

A comparison of elicited imitation data and spontaneous speech data shows that the former consistently overestimated the learners' proficiency: participants were able to imitate structures that they were not (yet) able to produce spontaneously, but never vice versa, replicating the results of several other studies (Kuczaj & Maratsos, 1975; Schimke, 2011; Smith, 1973; Verhagen, 2011). It is therefore assumed that learners are able to imitate structures that they cannot yet produce but are on the verge of acquiring. If this is so, elicited imitation data can be used to reveal knowledge that is not yet visible in spontaneous production (Schimke, 2011). In this thesis it has been argued that a further advantage of elicited imitation data is that it forces participants' production and hence makes it possible not only to generate sufficient data to conclude what knowledge learners have acquired, but also to test learners' knowledge of optional structures. Further, as pointed out by R. Ellis (2008), elicited imitation tasks are well suited for the assessment of L2 learners' grammatical proficiency. In sum, this dissertation has shown that elicited imitation tasks are useful tools in research on second language acquisition. Such tasks are therefore recommended for use in future research.

8.5 Variation, Optionality, and Lexically Driven Acquisition

Quantitative and qualitative analyses of spontaneous speech and elicited imitation data suggested a gradual development of the production of the structures examined. Developmental trajectories manifested variation in terms of seemingly incompatible

structures (e.g., XSV and XVS) being produced simultaneously by the same learner in spontaneous speech data. However, extensive phases during which learners produce structures representing several developmental stages are common and expected in second language acquisition (Pienemann, 1998; Sorace, 2000) and are referred to as “phases of optionality” (Parodi & Tsimpli, 2005; Robertson & Sorace, 1999). Evidence of phases of optionality was also found in the elicited imitation data, as intermediate and advanced learners did not differ in their rates of correct repetition of ungrammatical XSV structures and grammatical XVS structures. This was interpreted as indicating a step toward the preference for grammatical structures displayed in the native control group.

A comparison of spontaneous speech and elicited-imitation data showed that phases of optionality were in evidence for more learners in the elicited imitation data than in the spontaneous speech data. This finding suggested that receptive and expressive elicited imitation tasks might reveal the presence of linguistic knowledge that is not yet visible in entirely expressive spontaneous production (R. Ellis, 2008; Schimke, 2011).

Optionality and variation can be difficult to reconcile with representational approaches to language, as a change of developmental stage has been assumed to indicate a change of syntactic representations entailing that structures generated from earlier representations could no longer occur. However, this phenomenon when observed has often been treated as mere “performance noise” and as a by-product of acquisition. From the emergentist perspective, by contrast, variation such as that found in “phases of optionality” is key to language acquisition. Language is considered to be dynamic, and grammatical rules are expressed in terms of statistical probabilities. It is assumed that the acquisition of language is “lexically driven” or “usage-based”—the learner acquires specific words in specific constructions, which will later be generalized to other lexical items and form item-based schemas and constructions (e.g., Bybee, 2008; Bybee & Hopper, 2001; Tomasello, 2003). The constructions are assumed to be under constant influence by frequency and item effects from the learners’ input and output. Hence, variation is a necessary consequence of this process, and it is constitutive of language acquisition as such.

Interestingly, there was evidence in this thesis that the acquisition of XVS structures in imitation was lexically driven by the adverbial *dann* ‘then’. This lends support not only to several emergentist language theories but also to PT, which—although not an emergentist theory—assumes that syntactic environments are initially annotated per item

in the lexicon before later being generalized to the word's (sub-)category (Pienemann, 1998). Future longitudinal studies of the progression of XVS acquisition could possibly determine whether this acquisition is indeed initiated first by a specific lexical item such as the adverbial *dann* and explore the issue of generalization to structures with other adverbials.

This thesis has found not only variation in the production of individual participants but also great variation within groups. This was expected, considering that the learners were grouped according to time of exposure and amount of instruction, which is known to not necessarily result in the same proficiency (Bardovi-Harlig, 1992, 2000; Rule & Marsden, 2006). Further, although the expected positive linear relationship between exposure to L3 (as measured by school year) and proficiency was found across the learner group as a whole, one of the groups—the students in Year 7—manifested a generally higher proficiency than expected (see above). The variation found in the data is of interest in and of itself, because it can help us better understand the processes at work in second language acquisition. Future research should further investigate the variation found in language acquisition in relation to both language-specific and learner-general factors.

CHAPTER 9

CONCLUSION

This dissertation investigated the interaction between learner-general developmental trajectories and language-specific factors in the form of transfer to L3 from L1 and L2 (the second previously learned language). It thus brought together two concepts—developmental trajectories and transfer—that are often defined as mutually exclusive and have rarely been studied in relation to each other (Perdue, 2006; Whong-Barr, 2006). The results obtained in the various analyses presented were compared with the predictions yielded by transfer hypotheses and the predicted course of morpho-syntactic developmental trajectories in L3 acquisition. The transfer hypotheses differed in the expected constraints on transfer, such as the language status factor of either L1 or L2 (Bardel & Falk, 2007; Bohnacker, 2006; Falk & Bardel, 2011; Na Ranong & Leung, 2009; Rothman & Cabrelli Amaro, 2010) and perceived or objective cross-linguistic similarities (Flynn et al., 2004; Kellerman, 1986; Montrul et al., 2011; Rothman, 2011). These transfer hypotheses were divided into Initial L1 Transfer Hypotheses and Initial L2 Transfer Hypotheses, depending on the expected source language of transfer in the acquisition of a certain structure. All of these hypotheses have in common that they consider the learner’s initial or final state. By contrast, the Developmentally Moderated Transfer Hypothesis (DMTH, Håkansson et al., 2002), which was also explored in the

thesis, specifies how transfer affects the development of L3 beyond the initial state, assuming transfer to be constrained by developmental trajectories such that a structure cannot transfer until the learner's L3 acquisition process has progressed far enough for the learner to be developmentally ready for that structure.

The analyses showed that positive or negative transfer from previously learned languages, be it L1 or L2, did not modify the developmental trajectories for L3 syntax and morphology acquisition. The results thus supported the DMTH. More specifically, native Swedish speakers did not profit from similarities between L1 or L2 and L3 structures in their repetition and production of L3. Contrary to expectations, this pattern was not influenced by the learners' perception of the degree of similarity between L1 and L3. Further, language status—regardless of whether L1 or L2 was assumed to be the privileged source of transfer—did not entail transfer.

Although there were some limitations to the design of the thesis, the thorough analyses exploring the acquisition of word order and inflectional morphology in different production and imitation tasks yielded converging results. However, future studies should compare the results for groups with different L1 and L2 combinations, because conclusive positive evidence for transfer can be found in a single study only if different groups display significantly dissimilar production patterns (inter-group heterogeneity).

The developmental perspective taken in this thesis—as evidenced by the investigation of the interaction between learner-general developmental trajectories and language-specific factors in the form of L1 and L2 transfer, and by the study of learners at different levels of L3 proficiency—made it possible to obtain a more detailed picture of the L3 acquisition process. It was shown that those hypotheses that focused solely on language-specific factors and made claims about L3 acquisition without taking the dynamic process of language acquisition into account could not explain the overall pattern of results found in this thesis. Language acquisition is transient and essentially takes place over time. To capture factors that affect its development, it is therefore crucial to consider the factors of time and development.

Further, the thesis showed the importance of examining a wide range of linguistic structures when evaluating the explanatory power of different transfer hypotheses, as the study of isolated phenomena may easily yield evidence in favor of certain hypotheses, which are then generalized on insufficient grounds but fail to capture overall patterns in language acquisition. This thesis has also underscored the advantages of collecting both

elicited imitation and spontaneous speech data in relation to the same structures, which enables the comparison of data across tasks. The convergence found between results from different tasks or data types strengthened the internal validity of the analyses and enabled a more precise description of L3 development.

The findings that developmental trajectories were not susceptible to modification by positive or negative transfer of structures from L1 or L2 to L3 and that there was no relationship between positive transfer and learners' psychotypical estimates of the similarity between the native and the target language have implications for teaching. Language teachers and textbooks often expect learners to be able to take advantage of their prior knowledge of languages, particularly when they are made aware of similarities between them. The results of this thesis may therefore be particularly useful to prevent frustration, helping teachers and learners understand that if proficiencies are not instantly transferred, this may be because the structures in question are developmentally constrained. Future research should target efforts to translate the basic understanding presented in this thesis into teaching methods that facilitate language learning. This will be an important goal for an increasingly global future with ever-increasing demand for people proficient in multiple languages.

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Appendices

APPENDIX A

LISTS OF LEXICAL ITEMS USED IN THE TASKS

Table 1

Verbs, Auxiliaries, Nouns and Adverbials Used in the Elicited Imitation Task with Their Translations

S	AUX	ADV	O	V
Lena (proper name)	will <u>vill</u> 'wants'	heute <u>idag</u> 'today'	Hunde <u>hundar</u> 'dogs'	hören <u>höra</u> 'hear'
Henrik (proper name)	kann <u>kan</u> 'can'	morgen <u>imorgon</u> 'tomorrow'	Suppe <u>soppa</u> 'soup'	kochen <u>koka/laga</u> 'cook'
Hund <u>hund</u> 'dog'	hat <u>har</u> 'has'	dann <u>sedan/sen</u> 'then'	Jacke jacka 'jacket'	waschen tvätta 'wash'
		manchmal <u>ibland</u> 'sometimes'	Wasser <u>vatten</u> 'water'	trinken <u>dricka</u> 'drink'
			Kaffee <u>kaffe</u> 'coffee'	malen <u>måla/rita</u> 'paint'
			Musik <u>musik</u> 'music'	singen <u>sjunga</u> 'sing'
			Bild <u>bild</u> 'picture'	machen <u>göra</u> 'make'/'do'
			Melodie <u>melodi</u> 'melody'	baden <u>bada</u> 'bath(e)'
			Mama <u>mamma</u> 'mom'	treffen <u>träffa</u> 'meet'
			Buch <u>bok</u> 'book'	lesen <u>läsa</u> 'read'

Table 1 continued.

Brot	backen
<u>bröd</u>	<u>baka</u>
'bread'	'bake'
Eis	essen
<u>glass</u>	<u>äta</u>
'ice-cream'	'eat'
Boot	sehen
<u>båt</u>	<u>se</u>
'boat'	'see'
	kommen
	<u>komma</u>
	'come'
	sagen
	<u>säga</u>
	'say'

Note. S = Subject, AUX = Auxiliary, ADV = Adverbial, O = Object, V = Lexical verb. Each German word is given with its Swedish (underlined) and English (in single quotes) translations.

Table 2

Nouns and Adjectives Used in the Communicative Task with their Translations

	Adj	Noun
German	<i>blau</i>	<i>Haus</i>
	<i>grün</i>	<i>Blume</i>
	<i>rot</i>	<i>Lampe</i>
	<i>gelb</i>	<i>Hund</i>
	<i>braun</i>	<i>Fisch</i>
		<i>Mann</i>
		<i>Schlange</i>
Swedish	'blå'	'hus'
	'grön'	'blomma'
	'röd'	'lampa'
	'gul'	'hund'
	'brun'	'fisk'
	'man'	
		'orm'
English	'blue'	'house'
	'green'	'flower'
	'red'	'lamp'
	'yellow'	'dog'
	'brown'	'fish'
	'man'	
		'snake'

Note. Adj = adjective. The items are listed in the same order for each language.

APPENDIX B

TASKS

Table 1

Elicited Imitation Task: Model Sentences

Str	N ^o	Model sentence
Vend	1	<i>Lena sagt, dass sie den Hund baden kann</i> 'Lena say _{fin} that she the dog bath _{non-fin} can _{fin} '
SVO	2	<i>Lena will malen ein Bild morgen</i> 'Lena want _{fin} paint _{non-fin} a picture tomorrow'
SLIT	3	<i>Morgen will Henrik essen kaltes Eis</i> 'tomorrow want _{fin} Henrik eat _{non-fin} cold ice cream'
ADV	4	<i>Heute Lena kann hören die Hunde</i> 'today Lena can _{fin} hear _{non-fin} the dogs'
INV	5	<i>Morgen kann Lena Mama treffen</i> 'tomorrow can _{fin} Lena mom meet _{non-fin} '
SEP	6	<i>Dann der Hund kann kaltes Wasser trinken</i> 'then the dog can _{fin} cold water drink _{non-fin} '
SVO	7	<i>Henrik kann singen die Melodie schön</i> 'Henrik can _{fin} sing _{non-fin} the melody nicely'
SEP	8	<i>Dann Henrik will warmen Kaffee trinken</i> 'then Henrik want _{fin} warm coffee drink _{non-fin} '
ADV	9	<i>Heute Henrik will kochen Suppe</i> 'today Henrik want _{fin} cook _{non-fin} soup'
SLIT	10	<i>Dann kann Henrik sehen die Hunde</i> 'then can _{fin} Henrik see _{non-fin} the dogs'
INV	11	<i>Dann hat Lena ein Buch gelesen</i> 'then have _{fin} Lena a book read _{non-fin} '
Vend	12	<i>Lena kommt, wenn sie Henrik treffen kann</i> 'Lena come _{fin} if she Henrik meet _{non-fin} can _{fin} '
SVO	13	<i>Lena hat gemacht die Jacke schmutzig</i> 'Lena have _{fin} make _{non-fin} the jacket dirty'
ADV	14	<i>Dann Henrik hat gewaschen die Jacke</i> 'then Henrik have _{fin} wash _{non-fin} the jacket'
Vend	15	<i>Lena sagt, dass sie heute tanzen will</i> 'Lena say _{fin} that she today dance _{non-fin} want _{fin} '
INV	16	<i>Morgen will Lena ein Brot backen</i> 'tomorrow want _{fin} Lena a bread bake _{non-fin} '
SLIT	17	<i>Dann hat Henrik gemalt schön das Boot</i> 'then have _{fin} Henrik paint _{non-fin} nicely the boat'
SEP	18	<i>Manchmal Henrik will dumme Musik hören</i> 'sometimes Henrik want _{fin} silly music hear _{non-fin} '

Note. Str = model sentence structure (INV = subject-verb inversion, SLIT = Swedish literal translation, ADV = fronted adverbial, SEP = verb separation, SVO = subject-verb-object, Vend = finite verb in subclause final position), N^o = item number based on the order of presentation

Table 2

Questions Asked in the Communicative Task and Their Target Answers

N°	Question	Target Answer
1	<i>Was ist neben dem blauen Fisch?</i> 'What is next to the blue fish?'	<i>zwei grüne Blumen</i> 'two green flowers'
2	<i>Was ist neben der grünen Lampe?</i> 'What is next to the green lamp?'	<i>zwei blaue Lampen</i> 'two blue lamps'
3	<i>Was ist neben dem blauen Boot?</i> 'What is next to the blue boat?'	<i>ein roter Hund</i> 'a red dog'
4	<i>Was ist neben dem grünen Boot?</i> 'What is next to the blue fish?'	<i>zwei blaue Hunde</i> 'two blue dogs'
5	<i>Was ist neben den grünen Hunden?</i> 'What is next to the green dogs?'	<i>ein rotes Glas</i> 'a red glass'
6	<i>Was ist neben dem grünen Haus?</i> 'What is next to the green house?'	<i>eine blaue Blume</i> 'a blue flower'
7	<i>Was ist neben den zwei grünen Blumen?</i> 'What is next to the two green flowers?'	<i>ein blauer Fisch</i> 'a blue fish'
8	<i>Was ist neben dem blauen Haus?</i> 'What is next to the blue house?'	<i>zwei rote Fische</i> 'two red fish'
9	<i>Was ist neben den zwei roten Fischen?</i> 'What is next to the two red fish?'	<i>ein blaues Haus</i> 'a blue house'
10	<i>Was ist neben der roten Lampe?</i> 'What is next to the red lamp?'	<i>zwei rote Häuser</i> 'two red houses'
11	<i>Was ist neben den zwei roten Booten?</i> 'What is next to the two red boats?'	<i>zwei grüne Gläser</i> 'two green glasses'
12	<i>Was ist neben den zwei blauen Lampen?</i> 'What is next to the blue lamp?'	<i>eine grüne Lampe</i> 'a green lamp'
13	<i>Welche Farbe hat der Mann?</i> 'What color is the big house?'	<i>Er ist braun</i> 'It is brown'
14	<i>Welche Farbe hat das große Haus?</i> 'What color is the big house?'	<i>Es ist grün</i> 'It is green'
15	<i>Welche Farbe haben die kleinen Hunde?</i> 'What color is the small dogs?'	<i>Sie sind braun</i> 'They are brown'
16	<i>Welche Farbe haben die großen Fische?</i> 'What color are the big fish?'	<i>Sie sind blau</i> 'They are blue'
17	<i>Welche Farbe hat der kleine Fisch?</i> 'What color is the little fish?'	<i>Er ist gelb</i> 'It is yellow'
18	<i>Welche Farbe hat die kleine Lampe?</i> 'What color is the little lamp?'	<i>Sie ist rot</i> 'It is red'
19	<i>Welche Farbe haben die kleinen Blumen?</i> 'What color are the little flowers?'	<i>Sie sind gelb</i> 'They are yellow'
20	<i>Welche Farbe hat das große Glas?</i> 'What color is the big glass?'	<i>Es ist grün</i> 'It is green'
21	<i>Welche Farbe hat die lange Schlange?</i> 'What color is the long snake?'	<i>Sie ist blau</i> 'It is blue'
22	<i>Welche Farbe haben die kleinen Häuser?</i> 'What color are the small houses?'	<i>Sie sind rot</i> 'They are red'
23	<i>Welche Farbe haben die kurzen Schlangen?</i> 'What color are the short snakes?'	<i>Sie sind grün</i> 'They are green'
24	<i>Welche Farbe haben die kleinen Boote?</i> 'What color are the small boats?'	<i>Sie sind braun</i> 'They are brown'

Table 3

Unstructured Interview: List of Questions

Questions

Hast Du ein Haustier? Wäschst du das Haustier? Wie machst du das?

'Do you have a pet? Do you wash the pet? How do you do that?'

Was kannst du gut? Was kannst du nicht so gut?

'What are you good at? What are you not so good at?'

Was machst du gern? Was machst du nicht gern?

'What do you like doing? What don't you like doing?'

Was willst du machen, wenn du groß bist?

'What do you want to do when you grow up?'

Wo willst du wohnen wenn du groß bist?

'Where do you want to live when you are grown-up?'

Hast du einen Bruder oder eine Schwester?

'Do you have a brother or a sister?'

Was macht dein(e) Bruder / Schwester gern?

'What does your brother /sister like to do?'

Was machst Du gern mit Deinen Freunden?

'What do you like to do with your friends?'

Was hast du im Sommer gemacht?

'What did you do this summer?'

Was wirst Du Weihnachten machen?

'What will you do for Christmas?'

Was ist dein Lieblingsbuch? Wovon handelt das?

'What is your favorite book? What is it about?'

Welchen Film hast du zuletzt gesehen? Wovon handelt er?

'Which is the last movie you watched? What was it about?'

Was hast du am Wochenende gemacht?

'What did you do on the weekend?'

Was machst du morgen?

'What are you going to do tomorrow'

Was ist dein Lieblingsfach in der Schule?

'What is your favorite class in school?'

Was machst du am liebsten mit deinen Freunden zusammen?

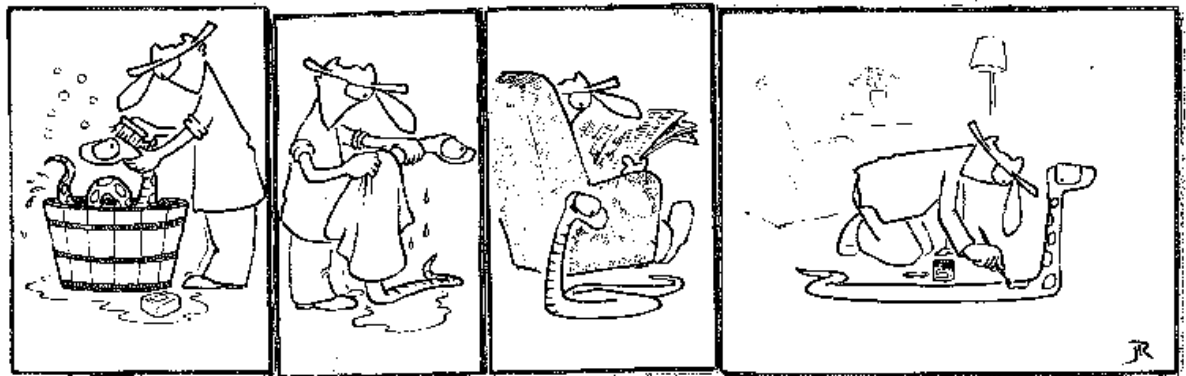
'What do you like best to do with your friends'

Was hast du in der Thema-Woche gemacht?

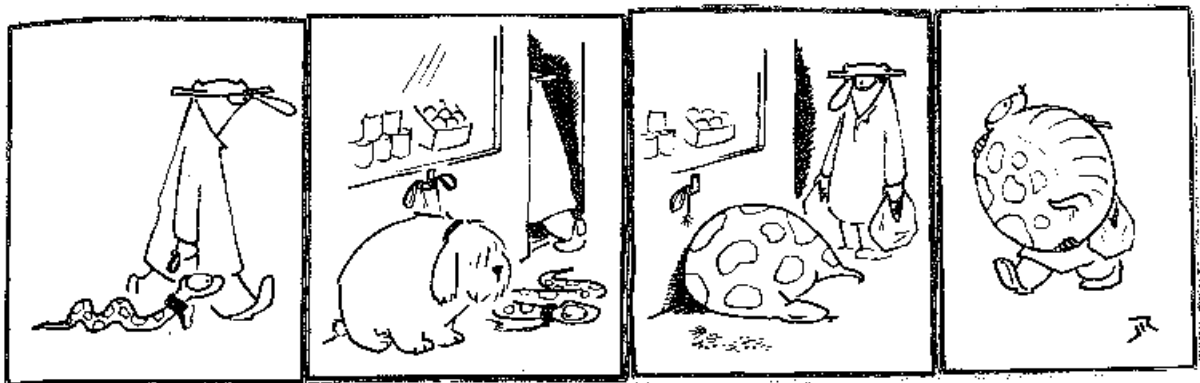
'What did you do during the theme-week?'

1) Picture Stories by Jan Romare Used in the Picture-based Storytelling Task

Picture Story A: The man washes the snake



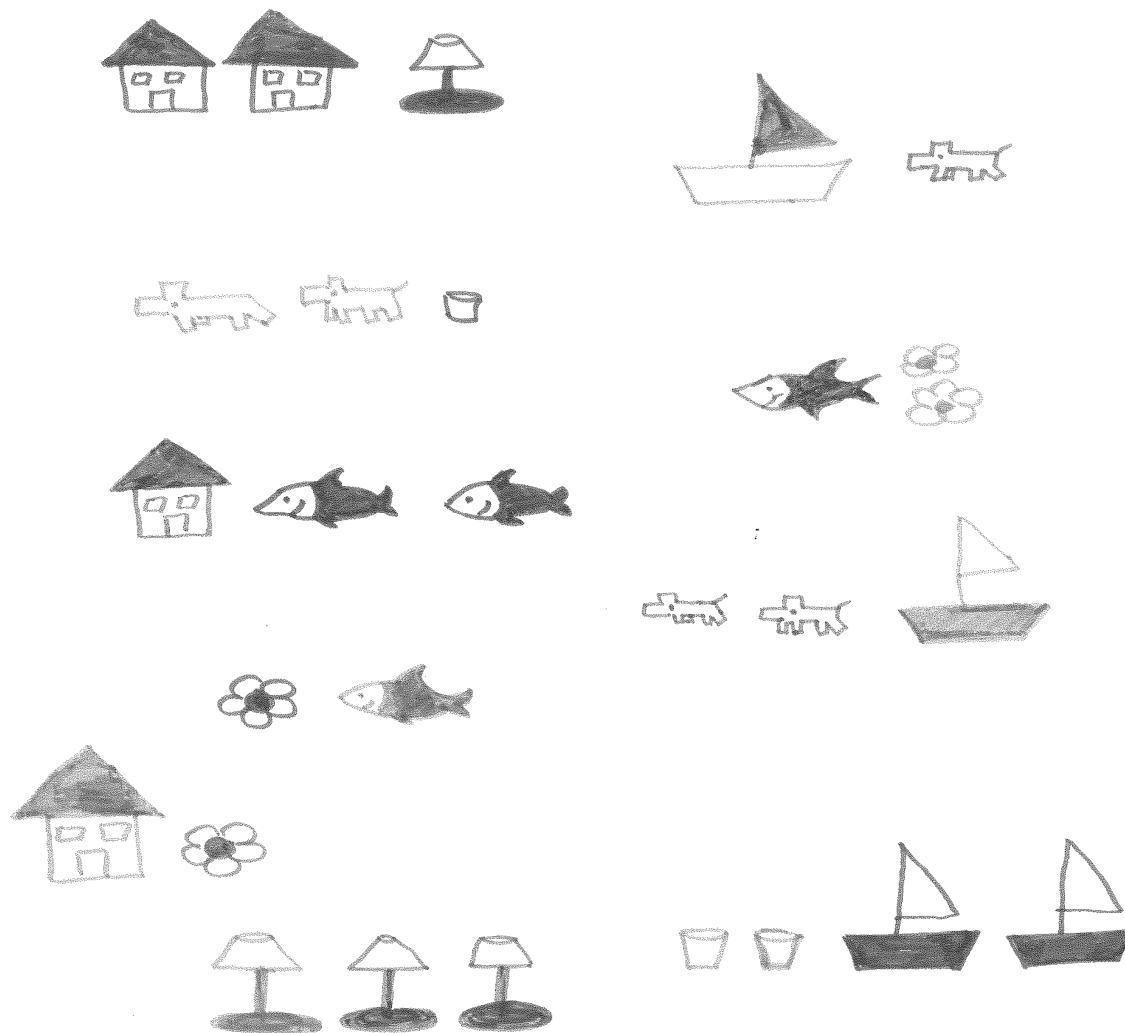
Picture Story B: The man goes shopping with the snake



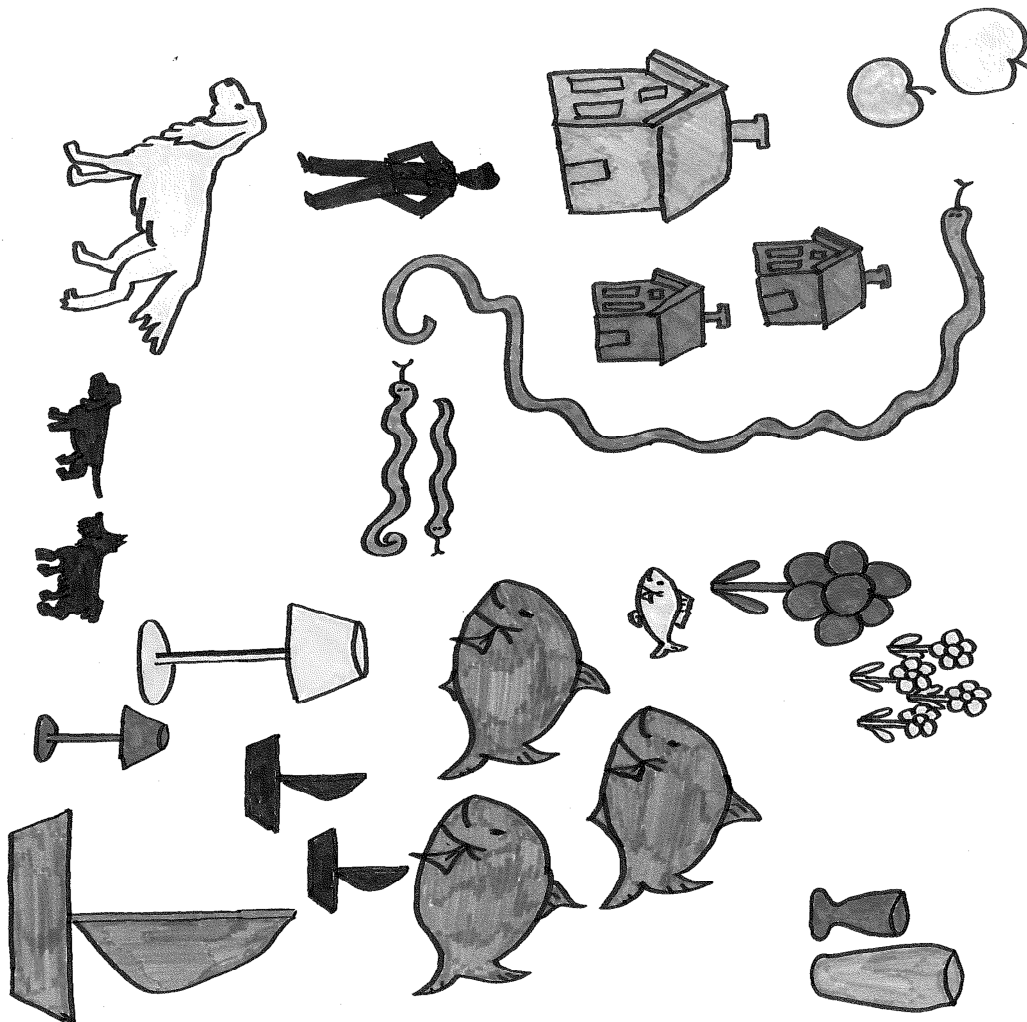
All pictures printed with kind permission by Jan Romare.

2) Pictures Used in the Communicative Task

Picture A: elicitation of adjectives in attributive position



Picture B: elicitation of adjectives in predicative position



APPENDIX C

EXAMPLES OF SCORING MATRIXES

Table 1

a) *Elicited Imitation Task Scoring Matrix (Abbreviated) for Cecilia, Year 8, at Time 1*

V pos	Str	Model			Response		
		N ^o	Aux	Adv	Response sentence	V pos	C
XVS	SLIT	3	will	morgen	<i>Morgen will Henrich essen kall Eis</i>	XVS	1
XSV	ADV	4	kann	heute	<i>(Heut eh) Heute Lena ></i>	XS	n.a.
XVS	INV	5	kann	morgen	<i>Morgen Lena kann Mama treffen</i>	XSV	0
XSV	SEP	6	kann	dann	<i>Dann der Hund kann kall Wasser trinken</i>	XSV	1
XSV	SEP	8	will	dann	<i>Dann Henrich will warm Kaffe trinken</i>	XSV	1
XSV	ADV	9	will	heute	<i>Heute Henrik will Soppa kuchen</i>	XSV	1
XVS	SLIT	10	kann	dann	<i>Dann Henrich der Hund kann Soche suchen</i>	XSV	0
XVS	INV	11	hat	dann	<i>Dann Lena hat ein Buch gelesen</i>	XSV	0
XSV	ADV	14	hat	dann	<i>Dann Henrik hat (gemacht eh) gewaschen die Jacke</i>	XSV	1
XVS	INV	16	will	morgen	<i>Heute Lena will ein Brach backen</i>	XSV	0
XVS	SLIT	17	hat	dann	<i>Dann Henrich will der ></i>	XSV	0
XSV	SEP	18	will	manchmal	<i>Manchmal Henrich will dumm Musik hören</i>	XSV	1

Note. Model = model sentence characteristics, Response = response sentence characteristics, V pos = verb position, Str = model sentence structure (INV = subject-verb inversion, SLIT = Swedish literal translation, ADV = fronted adverbial, SEP = verb separation, SVO = subject-verb-object, Vend = finite verb in subclause final position), N^o = item number based on its serial order, Aux = auxiliary/modal, Adv = adverbial, Response sentence = participant's full response sentence, C = correct repetition (1 = correct repetition, 0 = incorrect repetition, n.a. = not applicable because of not meeting the criterion of scorability), S = subject, V = lexical verb, O = object, X = any element other than the subject, here an adverbial, > = sentence was abandoned, () = sentence/word was rephrased.

b) *Correct and Incorrect Repetition of XVS and XSV sentences for Cecilia, Year 8*

V pos	Utterances	C	IC	%C
XVS	6	1	5	17%
XSV	5	5	0	100%

Note. V pos = verb position in model sentence, C = correct repetition, IC = incorrect repetition, %C = percentage of correct repetition across all scorable utterances. The Utterances column shows the number of scorable utterances.

Table 2

Adjective Scoring Matrix (Abbreviated) for Melchior, Year 8, at Time 1

T	Adj	Response	Sf	Nr	Gnd	Typ	Clr	Agr
T1	att	<i>ein blau-es fisch</i>	1	1	M/N	-es	blau	1
T1	att	<i>ein blau-es haus</i>	1	1	M/N	-es	blau	1
T1	att	<i>eine rot hund</i>	0	1	F	∅	rot	0
T1	att	<i>eine blau-e blume</i>	1	1	F	-e	blau	1
T1	att	<i>eine rot-e glas</i>	1	1	F	-e	rot	1
T1	att	<i>eines grün lampe</i>	0	1	n.a.	∅	grün	0
T1	att	<i>zwei rot-es fische</i>	1	0	n.a.	-es	rot	0
T1	att	<i>zwei rot-en häuser</i>	1	0	n.a.	-en	rot	0
T1	att	<i>zwei blau-e hunde</i>	1	0	n.a.	-e	blau	1
T1	att	<i>zwei grün-e blumen</i>	1	0	n.a.	-e	grün	1
T1	att	<i>zwei blau-e lampe</i>	1	0	n.a.	-e	blau	1
T1	att	<i>zwei grün-en glase</i>	1	0	n.a.	-en	grün	0
Total			10					7
T1	pre	<i>der mann bist eh braun</i>	0	1	M	∅	braun	0
T1	pre	<i>das große haust ist grün</i>	0	1	N	∅	grün	0
T1	pre	<i>die kleine fisch ist gelb</i>	0	1	F	∅	gelb	0
T1	pre	<i>die kleine lampe ist eh rot</i>	0	1	F	∅	rot	0
T1	pre	<i>das große glas ist grün</i>	0	1	N	∅	grün	0
T1	pre	<i>die lange schlange ist blau</i>	0	1	F	∅	blau	0
T1	pre	<i>die kleinen hunde sind eh braun</i>	0	0	n.a.	∅	braun	0
T1	pre	<i>die großen fische sind blau</i>	0	0	n.a.	∅	blau	0
T1	pre	<i>die kleinen blumen sind gelb</i>	0	0	n.a.	∅	gelb	0
T1	pre	<i>die kleinen häuser sind eh rot</i>	0	0	n.a.	∅	rot	0
T1	pre	<i>die kurzen schlangen sind grün</i>	0	0	n.a.	∅	grün	0
T1	pre	<i>die kleinen booten sind braun</i>	0	0	n.a.	∅	braun	0
Total			0					0

Note. T= Time (T1 = Time 1, T2 = Time 2), Adj = Adjective position (att = attributive position, pre = predicative position), Sf = Suffix (1= suffixed adjective, 0 = nonsuffixed adjective), Nr = Number of the determiner (1 = singular, 0 = plural), Gnd = Gender of the determiner (M = male, N = neuter, F = female), Typ = suffix type, Clr = color adjective used, Agr = agreement between adjective and determiner (1= agreeing, 0 = not agreeing). The Totals row shows the total number of suffixed adjectives in attributive and predicative position, respectively, as well as the total number of cases of agreement between adjectival suffix and determiner for each position.

APPENDIX D

DECLENSIONS OF GERMAN, SWEDISH, AND ENGLISH

Table 1

German Adjectival Suffixes in the Mixed Declension

Case	Singular			Plural ¹
	M	F	N	
Nominative	-er	-e	-es	-e
Genitive	-en	-en	-en	-er
Dative	-en	-en	-en	-en
Accusative	-en	-e	-es	-e

Note. The columns show German adjectival suffixes in the singular and plural across all cases and genders in the mixed declension. M = masculine, F = feminine, N = neuter.

¹ Gender is not marked in plural forms.

Table 2

Swedish Adjectival Suffixes

	Singular		Plural ²
	Uter	Neuter	
Indefinite ¹	-∅	-t	-a
Definite ²	-a	-a	-a

Note. The columns show Swedish adjectival suffixes in the singular and plural across genders and definite/indefinite contexts.

¹ It is only in indefinite contexts that gender is distinguished, through use of the base form in the uter gender and the suffix *-t* in the neuter gender.

² In the plural, the adjective always takes the suffix *-a*. The same suffix is also always used in definite contexts.

Table 3

German Verbal Inflectional Paradigm

Infinitive	Person	Singular	Plural
-n	1 st	-e/ø ¹	-n
	2 nd	-st	-t
	3 rd	-t	-n

Note. The columns show verbal suffixes in the singular and the plural across all persons.

Some verb forms are similar across number and person, e.g., -t in the second person plural and the third person singular.

¹ In speech, the suffix for the first person singular is often omitted.

Table 4

Inflection of the German Copula

Infinitive	Person	Singular	Plural
sein	1 st	bin	sind
	2 nd	bist	seid
	3 rd	ist	sind

Note. The columns show the present-tense forms of German copula *sein*, which are suppletive to some extent. The form *sind* is the same for the first and third person plural.

Table 5

Inflection of the English Copula

Infinitive	Person	Singular	Plural
be	1 st	am	are
	2 nd	are	are
	3 rd	is	are

Note. The columns show the present-tense forms of the English copula *be*, which are all suppletive relative to the infinitive. The form *are* is used in the plural and the second person singular.

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