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Topics in the Acquisition of Complex Constructions in German

by

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Abstract

This theses contributes to the growing body of research on the acquisition of complex syntax by young children. Relying on naturalistic and experimental data, I consider the acquisition of complex constructions in German. I assume a weak continuity approach in which the child's phrase marker is gradually expanding and phrase structure trees are built up in a bottom-up fashion, in accordance with current minimalist assumptions. The child's grammar is viewed as both minimal and economical, the phrase marker being projected only as far as is necessary to licence elements within it. Once feature values of a functional category become fully specified, it becomes associated with a lexical item. It is argued that the familiar Verb Second (V2) phenomenon in German involves movement to the functional category IP, rather than CP, contrary to what is often assumed. I assume that what has traditionally been referred to as CP is comprised of features relating to logical mood and subordination, and that verbal inflectional features are located in the node immediately lower in the tree, namely IP. The analysis is supported by the spontaneous speech data of two twin monolingual German-speaking children, for whom it is observed that V2 is acquired relatively early, yet constructions involving the C-system continue to present difficulties.

The acquisition of subordinate constructions, particularly relative clauses, is examined in the spontaneous speech data of three children, for whom subordination is more developed than the twins. I argue that CP is accessible to these children, however, not all the lexical elements which occupy this position have been acquired. It is argued that when tense is used and finiteness is identified as a feature of C, C is accessible, and may be used for

subordination. At this point, however, other features of CP [operator], [wh], [question], [reference], may still be underspecified, and consequently, need not be lexically filled.

A cross-linguistic examination of the early acquisition of relative clauses centers on the issue of movement versus non-movement. Early relative clauses in the German spontaneous speech data are adult-like from the time they appear, which can be taken to support a *wh*-movement analysis of early relative clause formation, as in the adult grammar. The results of the experimental data with respect to early relative clauses in German differ somewhat from the spontaneous speech data, revealing a preference for subject relatives over object relatives, and a surprising absence of *wo* (where)-relatives, which were very common in the naturalistic data. The experimental data revealed that differences between children and adults are largely quantitative rather than qualitative. An experiment considering the issue of sensitivity to restrictiveness in relative clauses in English yielded inconclusive results. An examination of *who*- and *that*-relatives revealed no significant distinction; however, some children showed sensitivity to the use of proper names as possible antecedents for relative clauses, indicating that restrictiveness may play a role in children's interpretation of Object-Subject relatives. However, it is not clear that children's early relative clauses are in fact restrictive, or that restrictiveness should facilitate interpretation.

I assume throughout this thesis that grammar develops with age, always conforming to the dictates of UG. However, it is not the case that grammar develops in precisely the same manner and time frame for all children. This does not mean that principles of UG are being violated. UG tolerates variability in patterns of language acquisition as it does in the considerable variation both between and within languages.

*This thesis is dedicated to
the loving memory of
Otto Joseph Mayr
and Renate Rosa Mayr Napier.
To the one for giving me life,
and to the other for showing me how to live it.*

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Chapter One

The Acquisitional Path

1.0 Introduction

There is a growing body of research on the acquisition of syntax by young children. Although the acquisition of syntax is a much studied topic, determining the nature of the child's earliest grammatical system has proven to be a difficult task. Complicating the issue are discussions of the distinction between competence and performance, i.e., determining the child's implicit knowledge of syntactic rules and principles, as compared with his/her actual comprehension and production of language. In the following chapters, these issues will be touched on with respect to the acquisition of German, though the main thrust of this thesis is not the earliest syntactic system of the child, but the acquisition of complex syntactic constructions, such as question formation and subordination.

I adopt a weak continuity approach to first language acquisition. Under a weak continuity account, all the components of universal grammar (UG) are available to the child from the outset, however, the grammar of the particular language being acquired develops gradually. Although the child's grammar may deviate from the adult grammar s/he will ultimately acquire, his/her grammar will nonetheless be a 'possible human grammar'. Errors that the child may produce are not random, rather they are governed by the acquisition device. Thus while the child's grammar may not match that of the adult's, it will not violate principles of UG. This approach is not incompatible with a maturational account of acquisition, and the

empirical data reported in this thesis would also support such a view. Just as the child must mature in other biological functions before becoming adult-like, it may be that certain aspects of the child's brain must mature before certain constructions can be fully acquired.

I follow roughly the Minimalist Program of Chomsky (1993, 1995a,b). Particularly crucial to this approach is the notion of Merge. The operation of merge combines 'syntactic objects', forming larger units out of those already constructed. Extending this idea to acquisition, the child's phrase marker gradually expands, his/her phrase marker trees being built in a bottom-up fashion, in accordance with the notion of merge. The idea that trees are built up from lexical items in a bottom-up fashion is certainly not new, nor is it unique to the minimalist approach. The minimalist framework and its consequences for acquisition will be examined in further detail later in this chapter and in Chapter Two.

Languages contain both lexical and functional categories. Lexical categories are contentive, (i.e., they have idiosyncratic descriptive content), whereas functional categories essentially carry information about grammatical function. The number of functional categories and the features they comprise in a given language is a matter of much debate. In keeping with the spirit of minimalism, I adopt the view that functional categories are to be minimized. That is, I posit a separate functional projection only when there is direct structural evidence for such a position. For example, when there is evidence that a construction carrying a certain feature would result in a different word order in a given language, we have positional evidence for a separate functional projection in that language. I assume that in German verbal inflectional features (tense, mood, aspect) are associated with one functional position, namely an Inflectional Phrase (IP), given that the inflected verb remains in either its main clause or

subordinate clause position regardless of its modal or aspectual features. Moreover, I posit that the functional category of Complementizer Phrase (CP) is comprised of features such as logical mood (declarative, interrogative, imperative), subordination and finiteness.

I proceed on the assumption that there is no fixed set of functional categories which hold for all languages, nor that there is a fixed set of formal features associated with specific functional categories cross-linguistically. While UG makes available an array of features, which characterize the functional projections, specific categories and their associated features are language particular. Thus the child learner must identify and integrate features associated with, for example, features of CP in his/her target grammar, and will produce errors on the way to a full adult-like grammar

It is interesting to note that a particular functional projection such as CP is used before all its relevant features have been acquired. During the early stages of the acquisition, the child will be exposed to many sentences which s/he will not have a sufficient grammar to analyze, particularly complex constructions involving CP. One could imagine that this would prevent the child from using CP until all or most of its features have been identified. This does not appear to be the case, however. Children do use certain constructions involving CP before others, though not necessarily in a strictly adult-like fashion. The child may recognize that his/her grammar is deficient in some respects, i.e., there may be differences between the child's linguistic capacity and his/her cognitive ability. For example, the child may recognize that structures carry an illocutionary force (e.g., interrogative), but lack the grammatical structure to accommodate such constructions. The child might therefore form wh-questions without wh-words, which nevertheless carry interrogative force, and are recognized as

questions by his/her interlocutors.

The difficulty for the linguist then is how to characterize this distinction between language and cognition, and by extension, how to determine the nature of the child's early syntactic representation. That is, how much of the child's cognitive abilities must be syntactically represented? These are some of the issues which will be addressed in the following pages.

The remainder of this chapter comprises a general introduction to various theoretical approaches to acquisition, outlines my position with respect to the theories presented, and proposes an analysis of clause structure in German. In Chapter 2, I look specifically at the acquisition of clause structure as it relates to the development of CP. I identify potential problems with the dual position theories from an acquisitional point of view, and argue that child language may offer support for an analysis in which verb movement is to a position lower in the clause than CP.

Chapter 3 is dedicated to the acquisition of relative clauses. The discussion begins with a brief outline of some theoretical analyses of the structure of relative clauses. I then present some cross-linguistic analyses of relative clauses, particularly from studies of French, English, and Serbo-Croatian speaking children. The discussion focuses on a current debate as to whether children's early relative clauses are formed with or without movement. In light of the theory outlined in Chapter 2, I analyse the development of predominantly restrictive relative clauses for three German children, with respect to the movement/non-movement debate, i.e., whether the German data supports the claim that children's early relative clauses are formed without movement, as has been argued for a number of languages (French: Labelle

1990, 1996; Serbo-Croatian: Goodluck and Stojanović 1996; English: Goodluck 1997). I focus on spontaneous speech production data of three monolingual German speaking children, Daniel, Marianne and Martin.¹ In light of the early acquisition of one type of relative marker, I argue that there is little support for a non-movement analysis of the acquisition relative clauses in German.

Chapter 4 concentrates on the spontaneous speech data of the three children, Daniel, Martin and Marianne. I consider the notion of a subject/object asymmetry with respect to the acquisition of *wh*-clauses, as compared to the pattern found in the acquisition of relative clauses, in order to determine whether an apparent object first phenomenon is particular to relative clauses, or is characteristic of *wh*-clauses in general. I then examine the acquisition of embedded questions, which Limber (1973) suggests are developmentally related to the acquisition of relative clauses in English. I also consider the production of other *wh*-introduced complement clauses, comparing these to the production of free relative clauses.

Chapter 5 focuses on some experimental data in the acquisition of relative clauses. In particular I report on two acquisition studies, an elicitation experiment in German, which examines children's and adults' elicited production of relative clauses, in which various positions are relativized, and an English comprehension experiment which compares the acquisition of relative clauses to that of temporal clauses. I consider some potential difficulties in comparing experimental and spontaneous speech data. Chapter 6 provides some concluding remarks.

¹ I am very grateful to Monika Rothweiler for generously allowing me access to her speech production data. Rothweiler (1989, 1993) also considered the acquisition of relative clauses, as part of a more general analysis of the acquisition of subordinate clauses.

There are two appendices. Appendix 1 provides background information on the children used in the spontaneous speech production data. Appendix 2 lists materials used in the experimental tasks.

1.1 The Acquisition of Functional Categories

The acquisition of CP, and indeed functional categories in general, has received a great deal of attention in the acquisition literature of late. Functional projections have come under considerable scrutiny in current syntactic analyses as well. Iatridou (1990), Van Gelderen (1993), among others, have suggested that not all of the functional categories available to UG are selected in every language, i.e., that languages may vary with respect to the functional categories they instantiate and evidence for specific categories will have to be found in each language separately. Moreover, it appears that functional projections vary in their properties across languages. It has been suggested that German and Dutch do not make use of the Inflection (I) projection (Haider 1993, van Gelderen 1993), and that features such as tense and agreement may not necessarily be attached to the same categories across languages.² Thus the child is faced with the formidable task of determining not only which functional categories are present in the target language, but also what the specific properties of a particular functional category are in that language (cf. also Lasser 1994).

The possibility of cross-linguistic variation in the availability of functional categories would suggest that the child language learner, on the basis of the language encountered, must select certain functional categories and their specific properties as part of that language. The

² Van Gelderen (1993) argues that in Dutch and German Agr and Tense are in V and C. Furthermore, Zanuttini (1990) suggests that Neg is sometimes a functional head as in English, and sometimes a VP adverb (*pas* in French).

development of functional categories has become a topic of some considerable debate in the area of first language acquisition research. Given that functional projections are apparently absent from early child speech, the question arises as to whether they are in fact absent from the child's grammar altogether. That is to say, does the child begin with a grammar which does not include functional categories, which would then develop at some point during acquisition, perhaps through maturation, or does the child start with full UG competence? A number of solutions have been proposed. At one end of the current debate is the argument that the child starts out with lexical projections only and must acquire functional projections in the target language (Lebeaux 1988, Radford 1990, Felix 1992). At the opposite end of the debate is the strong continuity hypothesis, which maintains that all UG, including functional projections, is available to the child at the onset of acquisition (Whitman 1994, Hyams 1992, Valian 1992, Poeppel and Wexler 1993). The strong continuity hypothesis in its strictest sense holds that there is a fixed set of functional categories and that children immediately have the full range available to them. This hypothesis is problematic in light of the proposals that languages vary with respect to which functional categories they instantiate, and that features may not necessarily be attached to the same categories across languages, as well as the possibility that the order of projections may differ. Another possibility is that functional projections are underspecified at the onset of grammatical acquisition (Deprez 1994, Lasser 1994, Armon-Lotem 1997, among others) and their specific properties are triggered by relevant input data. Between the two extremes is the proposal that at least some functional projections, CP for example, must be learned (Meisel 1990, Penner 1992, Weissenborn 1994).

1.1.1 No Functional Categories or Underspecification?

With respect to the apparent absence of functional projections, we can assume one of two things: either functional projections are initially underspecified or the child's grammar lacks functional projections altogether (Ouhalla 1993, Powers 1996). Recent proposals of underspecification suggest that functional categories are available; however, they are not specified for features, allowing the nature of the features, and their values to be identified and fixed gradually. Armon-Lotem (1996, 1997) assumes that functional heads, being featureless initially do not participate in the derivation. However, it may be rather that functional heads are not only featureless, but are simply not projected, which suggests weak continuity. Powers (1996, to appear), assumes a gradual expansion of the phrase marker, which can expand by a single position (an adjunct) or an entire projection (IP, CP). The child's production reflects his/her stage of grammatical development at any given time. What changes then, is the child's structural representation, the phrase structure tree.

Either of the two approaches, underspecification or the no functional categories hypothesis, are compatible with the language acquisition data, and posit similar paths of acquisition on the surface. When a child begins to produce, for example, object-verb strings in German, it is difficult to determine whether he/she has functional projections which are underspecified, available to him/her, or whether these functional projections are initially absent from his/her grammar. The two analyses are difficult to distinguish empirically. Grimshaw (1993, 1994) has argued that even in the adult grammar projections are only legitimate when they are motivated. From a learner standpoint, Grimshaw suggests that learners "will construct the smallest extended projection that is consistent with the well-

formedness conditions that they respect.” (1994: 133) Demuth (1995) makes a similar argument for Sesotho speaking children, suggesting that before the age of 3, they may treat relative clauses as IP, rather than CP. She notes that between 2 and 3 years of age, relative complementizers are often missing or take a form which is ambiguous between a subject agreement marker and a head noun modifier. Demuth argues that children at this age “could have the capacity to produce CP-structures, but would not do so without the features appropriate for a CP head.” (Demuth 1995: 67)

I will proceed on the assumption that the child has available to him/her the knowledge that phrase structures project in a binary branching manner, and thus has the potential to project functional categories, when there is a need to do so. It follows that these potential categories are underspecified. I assume that the fundamental principles of universal grammar are available from the onset of grammatical development and these are what guide the child’s progress.

Following Grimshaw (1993, 1994), among others, I assume that the clause is expanded only as far as is necessary to licence the elements contained within it. Doherty (1993) assumes such an analysis for English, arguing for an IP-hypothesis of the structure of finite subordinate clause without complementizers. Thus the embedded complement in (1) and the contact relative clause in (2) are treated as IP, rather than a CP with a phonologically null head.

- 1) I said [it was true]
- 2) the chest [the key opened]

In contact clauses such as (2), Doherty proposes that the relative head is in an A'-position

which directly binds into the relativized position. Doherty argues that IP and CP denote the same semantic entity (proposition), allowing the free alternation between them. The proposal is compatible with Grimshaw (1991, 1993), that the clausal categories VP, IP and CP are categorially non-distinct and form an extended (verbal) projection.

Although German does not allow contact relative clauses, it does allow that-deletion in complement clauses, with the result that these embedded complement clauses show up as verb second, rather than verb final. The structure I adopt for German clauses is outlined in §1.3, and its implications for acquisition will be taken up in Chapter 2.

An approach which assumes that the clause is expanded only as far as is necessary to licence elements in it would be accommodated under either the gradually expanding phrase marker analysis or a Truncation analysis (cf. Rizzi 1993 and references therein). The Truncation Hypothesis suggests that the child has the adult phrase marker, but this phrase marker may be truncated at some point. As Powers (1996, to appear) notes, Truncation faces problems if the order and type of functional categories is not universal. Following Chomsky (1995a, b), I assume that functional categories are comprised of bundles of features, which may vary cross-linguistically.³ How would the child know then from the outset what features are associated with what functional categories? The identification of features and assignment of values to those features is assumed to be part of the acquisition process. The issue of Truncation will be considered further in the following chapter.

³ A description of the nature of these features in German will be discussed later in this chapter, and will be taken up again in Chapter 2.

1.1.2 The Lexical Learning Hypothesis

It has been argued that the acquisition of morphology drives the acquisition of functional heads. Given that the acquisition of morphology is lexically driven, the theory which I am advocating is compatible with the Lexical Learning Hypothesis (LLH) which has been extensively developed for German by Clahsen and his colleagues (Clahsen 1990, Clahsen and Penke 1992, Clahsen, Penke and Parodi 1993, Clahsen Kursawe and Penke 1995, Clahsen, Eisenbeiss and Penke 1996).

According to the LLH the principles of universal grammar are available to the child at the onset of language development, and the learning of new lexical and morphological items and their features triggers syntactic development. Clahsen Eisenbeiss and Penke (1996) identify three essential elements of this approach: weak continuity; head-driven projections and structural economy, and morphological bootstrapping. Under weak continuity assumptions, principles of UG are available at the onset of acquisition; however, language particular aspects of grammar develop gradually through the interaction of abstract knowledge of, for example, X-bar principles and the learning of the lexicon. The notion of head-driven projections is taken from Chomsky (1995) and assumes that there is no fixed set of labels for functional projections, but rather that functional projections are comprised of bundles of features whose properties are determined by their head features. The notion of structural economy, which Clahsen et al. take from Safir (1993) is essentially the same as that of Grimshaw (1993, 1994). Safir (1993, 12) states that, "At any point in a derivation, a structural description for a natural language string employs as few nodes as grammatical principles and lexical selection require." These two assumptions are also crucial to the theory

outlined in Chapter 2, based on the grammatical development of two monolingual German speaking children. The idea behind morphological bootstrapping is that the child's learning of morphological affixes has direct consequences for his/her phrase-structure representations.

1.2 Theoretical Assumptions

The framework in which I will focus in the following chapters is the Minimalist framework of Chomsky (1993, 1995a,b). Chomsky (1993) assumes that lexical heads are taken from the lexicon fully inflected. These inflected forms carry a feature associated with the inflectional affix. Functional heads are also occupied by features, which are associated with inflectional morphology. It is these features in the functional head, which trigger both head movement and XP movement. Features associated with inflectional morphology of lexical categories must match those in the functional heads. Inflectional elements are licenced when they are moved to the functional domain, matching features.

Derivations are restricted by rules of economy. The derivation should take as few steps as possible; this is economy of derivation. Movement is triggered by the need for morphological feature checking and takes the shortest possible route. Moreover, the resulting representation should have as few symbols as possible; this is economy of representation. Associated with economy of representation is the principle of Full Interpretation. This principle requires that every element of an output representation provide a meaningful input to another part of the cognitive system. Those elements which obey Full Interpretation, are legitimate objects. Derivations must consist of only legitimate objects in order to converge, otherwise the derivation crashes. Features associated with inflectional morphology are only relevant to the syntax and must be eliminated during the derivation. Matching features are

eliminated as soon as they are checked.

There are two interface levels: PF, which represents the articulatory-perceptual performance system, and LF, which represents the conceptual-intentional performance system. While PF varies from language to language, LF is consistent across languages. The point at which instructions to the articulatory-perceptual system are issued is called Spell-out. The part of the derivation which takes place before Spell-out is overt and that which takes place after Spell-out is covert.

Consider now the creation of the phrase marker within the Minimalist framework. A fundamental aspect of the theory is the operation Merge. Merge applies to an array of elements selected from the lexicon, known as the Numeration. Merge is essentially a reformulation of the old notion of generalized transformations. A generalized transformation combines two phrase markers by expanding one (the target phrase marker) so as to include an empty position. Thus added to the target phrase marker is a projection of that phrase marker such that the projection now has two daughters: the target phrase marker and an empty position. The other phrase marker then substitutes into the empty position. This process is illustrated in Epstein, Thráinsson and Zwart (1996: 10-11)

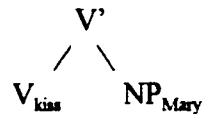
3a) Two independent phrase markers

V_{kiss} NP_{Mary}

b) Expansion of the target phrase marker V

$$\begin{array}{c}
 V' \\
 / \quad \backslash \\
 V_{\text{kiss}} \quad e
 \end{array}
 \qquad
 NP_{\text{Mary}}$$

- c) Substitution of NP into the empty position in the projection of the target phrase marker



There are no intermediate representations and the projection has the same categorial features as the target. Chomsky (1993, 1995b) suggests that computation proceeds in parallel, meaning that several phrase markers may be constructed simultaneously. Lexical access/insertion may apply throughout the course of the derivation before Spell-out.

Chomsky (1995b: Chapter 4) abandons the old notion of generalized transformations in favour of that of merge. Merge, rather than creating empty positions into which something is moved, is simply a concatenation operation, i.e., it combines 'syntactic objects' already formed. Given a particular numeration, the computational system recursively constructs syntactic objects from objects in that numeration and other syntactic objects already formed. These syntactic objects are rearrangements of properties of the lexical items of which they are created. "A derivation converges only if this operation has applied often enough to leave us with just a single object, also exhausting the initial numeration." (Chomsky 1995b: 226) At the time of Spell-out certain information is split off and sent to PF and the derivation proceeds to LF. After Spell-out, there is no longer access to the lexicon.

The operation of Merge is a binary operation, combining only two phrase markers at a time. Chomsky (1995b: 243) states:

... one such operation is necessary on conceptual grounds alone: an operation that forms larger units out of those already constructed, the operation Merge. Applied to two objects α and β , Merge forms the new object K. What is K? K must be constituted somehow from the two items α and β ; the only other possibilities are that K is fixed for all pairs (α, β) or that it is randomly

selected, neither worth considering. The simplest object constructed from α and β is the set $\{\alpha, \beta\}$, so we take T to involve at least this set, where α and β are *constituents* of K.

... The operation Merge (α, β) is asymmetric, projecting either α or β , the head of the object that projects becoming the label of the complex formed.

Lexical elements in the Numeration are accompanied by features, including the substantive features such as nominal and verbal, as well as Formal Features, such as Agreement and Tense. Formal features are characterized as either Strong or Weak. Strong features may be generated directly on functional nodes, whereas Weak features may be lexically generated and moved at LF. The third person singular *-s* suffix on English verbs, for example, will be lexically generated on the verb and moved to a Tense Phrase at LF to be ‘checked off’. Formal features must be checked off before the interface levels PF (Phonetic Form) and LF (Logical Form). Checking then becomes the motivation for movement. I will have more to say about the application of the operation Merge, as it relates to the development of the phrase structure marker, throughout the following chapters.

1.2.1 Minimalism and Acquisition

I adopt the notion that the child comes equipped with the knowledge that structures are built up (merged) in a binary branching hierarchical tree structure. Roeper (1996) points out that applying merger theory to acquisition has a number of desirable consequences. It allows one to represent lexical stages in acquisition, and may account for potentially unique maximal projections and subcategorizations. Dutch Children, for example, might go through a short-lived stage in which they project a node which has both auxiliary and negative adverb (cf. Hoekstra and Jordens 1994). During this time words like *kannie* ‘cannot’, *magnie* ‘want

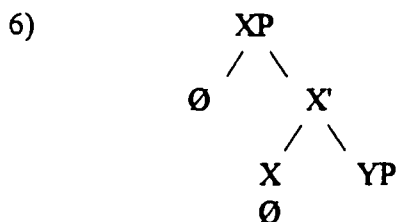
not' and minne 'want' are used exclusively in initial position.

- 4) *kannie zitten*
cannot sit

The child's phrase markers reflect the smallest possible trees which accommodate the strings produced at any given point along the acquisitional path, and in this way they are both minimal and economical. Roeper (1996: 415) suggests that "the child's grammar is a radical instance of Economy of Representation". Grimshaw (1993) argues for a Minimal Projection Principle, which requires that a projection not be empty. Either its Specifier or its head must be filled. Similarly, Speas (1994) proposes a principle for the economy of projections.

- 5) The Principle of Economy of Projection
Project XP only if XP has content.

Speas claims that X has no content if it does not dominate a distinct phonological or semantic matrix.

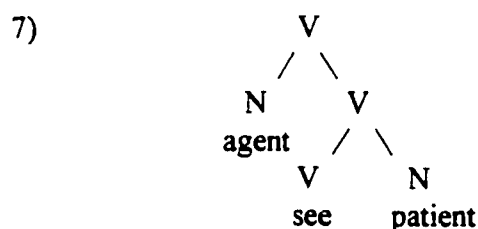


In the above structure there is no reason to project XP, given that XP does not dominate phonological nor semantic material, other than YP. The projection, therefore, is not licenced, and in the child's grammar, such a functional projection is not motivated.

Many children go through a stage in their language development in which they produce utterances consisting of single words. The majority of these single word utterances are content words corresponding to the lexical categories, N(oun), V(erb), A(djective) and

P(reposition)⁴. For this reason, children's single word utterances have been characterized as acategorical (Bowerman 1973, Radford 1990). Radford claims that children lack the syntactic categorization necessary for applying inflectional morphology until the first word combinations appear. No phrase marker is projected in the single word stage. If children's knowledge of syntactic categories is lacking, however, it is not at all clear why they systematically lack one class of such categories, namely the functional categories.

Lebeaux (1988) proposes a lexical account in which children initially begin with the lexical projections (VP, NP, PP, AP). He argues for a "pre-project- α stage in which the child is equipped only with "lexical syntax". The lexicon contains small tree representations of the theta-grid, referred to as theta-subtrees. The lexical representation for the verb *see*, for example, is given in (7).



This lexical representation is identical to that of the adult. Powers (1996) identifies a problem with Lebeaux's analysis, which she calls the problem of "Too Many Trees". She suggests that too many trees are potentially compatible with, for example, a single word utterance, such as "ball". The tree might be projected with the word "ball" in [Spec IP] or as a complement to VP. For Lebeaux, this is not problematic in the single word stage, at which point it does not matter what position a single word will be mapped onto in the phrasal syntax. However,

⁴ Specifically, I refer to lexical prepositions, which convey meaning (for example, *down*, *under*) as opposed to prepositions such as *of*, which serve a functional purpose.

Lebeaux runs into difficulties in the stage of early multiword speech. When project- α maps lexical syntax onto phrasal syntax, Powers suggests, that “the data do not allow us to distinguish the point in the derivation when Project-alpha has applied thus producing a phrase marker which differs from the Pre-project- α representation (the lexical theta subtree).” (Powers 1996: 51)

Powers adopts an approach to children’s early grammars which falls between that of Radford and Lebeaux. Like Radford, she assumes that at the single word stage, there is no phrase marker tree, however, like Lebeaux, she claims that single word speech reflects syntactic categories. As soon as syntactic heads are identified, phrases can be projected according to the X-bar schema given by UG to form the phrase markers NP, VP, AP, PP. This is accomplished through Project- α , which takes a word of syntactic category X and projects it to the XP level. Powers gives the following definition for project- α .

- 8) Project- α
 For a given word of syntactic category X, project X to XP
 where $X = \{N, V, A, P\}$
 output = $\{NP, VP, AP, PP\}$ (Powers 1996: 58)

The notions that there is a lexical stage in acquisition, and that the child’s phrase marker is an example of radical economy of projection are appealing, and find empirical support in production data from a number of languages.

1.2.2 Comprehension and Production

While production data may provide evidence in support of a gradually expanding phrase marker, it may only provide us with one side of the equation. From these production data it may be difficult to tap the child’s comprehension ability at a given time. While what

children say may reflect their competence, it does not necessarily do so. A particular choice of utterance may reflect a preference, rather than grammatical limits. There may also be performance factors which influence the child's production. Phillips suggests that errors of omission made by two-year-olds may be explained by a difficulty in implementing certain aspects of knowledge, rather than indicating a deficit. Performance factors will be considered in the following chapter.

Hirsh-Pasek and Golinkoff (1996) attempted to tap the comprehension of very young children using an intermodal preferential looking paradigm. In their experiments, they used English-speaking children ranging in age from 13 to 16 months, who were at the one word stage in their production. The preferential looking task allows the researcher to look at grammatical development in a way that does not require overt action on the part of the child. Hirsh-Pasek and Golinkoff considered whether young children are capable of finding constituents larger than the single word and determining which words go together to denote meaning. They also considered whether infants comprehend word order. Hirsh-Pasek and Golinkoff used sets of English-speaking infants in each of their experiments. The children showed comprehension of ordered speech, suggesting that they might have the ability to use ordered speech in production. Furthermore, one-word speakers were capable of performing distributional analyses and were sensitive to order in the input.

The results of the experiments Hirsh-Pasek and Golinkoff carried out imply that English-speaking children's early productions may observe word order, and that the children are sensitive to grammatical criteria such as word order. The authors suggest that "sensitivity to word order is in place to assist language learning as early as the one-word stage of

language production.” (Hirsh-Pasek and Golinkoff 1996: 121) They argue that children appear to be using some grammatical devices even in the one word stage, which makes “syntactic bootstrapping” a plausible hypothesis. Syntactic bootstrapping refers to the notion that children used syntactic patterns in the input to make inferences about the meaning of linguistic utterances. The authors argue that from very early on in the acquisitional process, children can pick out and use syntactic cues which will be of use to them in learning the grammar of their language.

Hirsh-Pasek and Golinkoff show that children have knowledge of syntactic phenomena such as word order in the very early stages of acquisition. They do not, however, make any prediction as to whether functional projections, such as TP, IP/AgrP or CP are available to the child from the outset. Neither do they rule out the possibility of a gradually expanding phrase marker, which is the approach I will adopt throughout this thesis. I concentrate, however, on a somewhat later stage of development. In particular, I focus on the emergence of complex syntactic constructions such as relative clauses, and other dependent clauses in the development of German. The analysis relies on the gradual emergence of functional categories. But first let us consider the structure of German clauses.

1.3 Clause Structure in German

Within the research on the acquisition of German, much attention has been given to the acquisition of word order in main and subordinate clauses, and acquisition of the CP system. The development of the CP system consists of the acquisition of various types of embedded clauses, adverbial, complement and relative clauses, as well as the acquisition of Wh-movement and polarity question formation, given that these all involve movement to the

CP level. The acquisition of wh-question formation has been investigated by Tracy (1994), and Penner (1993, 1994), among others, and that of embedded clauses in German has been examined by Rothweiler (1993), d'Avis and Gretsche (1994), Clahsen, Kursawe and Penke (1996) among others.

A potential source of difficulty for the child acquiring German is the number of possible positions for verbs.

9) **Verb second (V2)** [XP V+fin ... (V-fin part)]

V2 occurs typically in root declaratives or Wh-questions (10a,b), though it may also be used in embedded clauses as complements to certain verbs in the absence of a complementizer, (11a) (*glauben* 'think, believe', *hoffen* 'hope', *sagen* 'say', *wünschen* 'wish', among others), also echo questions with Wh-word in situ (11b), and polarity questions without inversion (11c).

10a) *Er kennt schon diese Geschichte*
he knows already this story

b) *Was hast du ihm gegeben*
what have you him given

11a) *Peter sagte [der Kaffee ist zu kalt]*
Peter said the coffee is too cold

b) *Du hast WAS gemacht?*
you have what done
'You did WHAT?'

c) *Du wartest auf IHN?*
you wait for him
'You're waiting for HIM?'

12) **Verb end (VE)** [... C ... V+fin]

VE is the typical structure of subordinate clauses introduced by a complementizer and

embedded questions (13a,b). VE may also occur in main clauses introduced by a complementizer, such as exclamation marks (14).

- 13a) ... [*daß die Geschichte zu lang ist*]
 that the story too long is
 b) *Sie fragte [wen du gesehen hast]*
 she asked who you seen have

- 14) *Wenn er doch endlich hier wäre!*
 If he part finally here were
 ‘If only he were finally here!’

- 15) **Verb first (V1)** [Op V+fin ... (V-fin part)]

V1 is typically used for polarity questions and imperatives (16a,b). Discourse-licensed ellipsis or the so-called “topic drop” constructions also appear to be V1.

- 16a) *Hast du das Buch schon gelesen?*
 have you the book already read
 b) *Gib es ihm zurück!*
 give it him back
 ‘Give it back to him!’
- 17) *Habe ich schon gesehen*
 have I already seen
 ‘I’ve already seen it’

The traditional view of V2 according to GB Theory is that the verb occurs in second position with only one clausal constituent preceding it, the final landing site of the finite verb being C°. Recently, a number of other analyses have been proposed. Zwart (1993), following Travis (1985) argues for a non-uniformity hypothesis for Dutch, in which the landing sites for the verb and preceding element in subject initial and non-subject initial clauses are not identical. In subject initial clauses, the final landing site of the verb is AgrS, whereas in non-subject initial clauses the landing site is C, with a topicalized element in [Spec CP]. Te Velde

(1994) presents a similar argument for German. Brannigan (1996) identifies problems with both C-position theories, which require both subjects and topics to occupy the same position, and dual position theories which distinguish subject and topic by locating subject in the Spec of AgrS. Brannigan proposes a dual C-position (CP recursion) analysis with the lower CP or “primary” CP being the locus for V2 subjects (and non-V2 subjects), and the higher or “secondary” CP being the locus for topic-initial V2 clauses.

In Ling (1995, 1996), I argued against such a dual position account of V2 in German. Relying primarily on evidence from the nature and distribution of subordinate V2 clauses and use of the subjunctive, I argued that declarative V2 clauses in German involve V movement to a lower functional head, namely M^0 , M^0 being the head of a mood phrase. Following Müller and Sternefeld (1993)⁵, I adopted the following structure:

$$18) \quad [_{CP} C^0 [_{MP} M^0 [_{XP} \alpha]]]^6$$

In light of recent minimalist assumptions, I propose a different analysis of German

⁵ Müller & Sternefeld (1993) argue for a structure in which a Topic Phrase may be merged or matched with CP, with only one functional head being activated or designated.

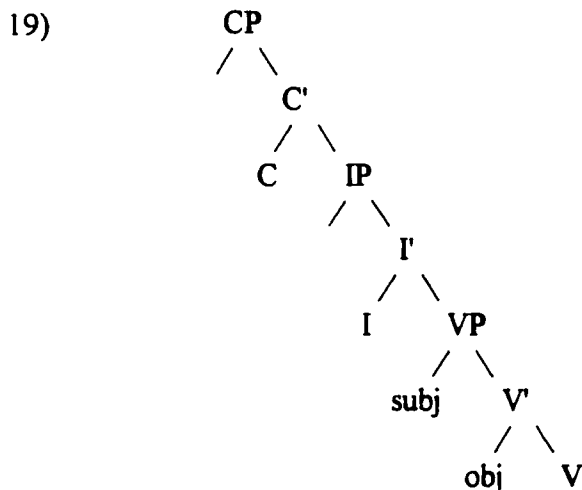
i) $[_{CP} C^0 [_{TP} T^0 [_{XP} \alpha]]]$

⁶ As noted above, German allows V2 complements in certain contexts, however, with the restriction that V2 cannot occur in the presence of a complementizer, as shown in (i). In particular, embedded V2 is possible only in contexts in which the complement clause bears no independent tense or truth value. Hence the prohibition against V2 complementation with factive matrix verbs, as in (ii).

i) *Maria glaubt (*daß) er habe das Buch gelesen*
 Mary believes that he have_{subj} the book read
 ‘Mary believes (that) he has read the book’
 ii) **Ich bedaure der Fritz hat das letzte Buch gekauft*
 I regret the Fritz has the last book bought
 ‘I regret that Fritz has bought the last book’

In Ling (1995) it was argued that in the absence of a complementizer, the finite verb moves to the highest available functional head, namely M^0 . In main clauses movement is overt, resulting in V2 order, whereas in subordinate clauses, V2 may or may not be possible, depending on whether the complementizer may be deleted, i.e., whether it carries features which necessitate its presence for interpretation at LF. Since only one functional head is designated, both C^0 and M^0 cannot be filled at the same time, which accounts for the complementary distribution of a complementizer and V2.

clause structure here. I maintain that V2 movement is to a position lower in the clause than CP. I do not, however, refer to this position as MP. As previously mentioned, I assume that functional projections are composed of bundles of features, whose properties are determined by their head features. Specifically, I assume that the features of what has traditionally been referred to as CP is comprised of features relating to logical mood and subordination (question, imperative, and complementizers), and that verbal inflectional features (tense, mood, aspect) are located in the node immediately lower in the tree. Although the labels that we attach to such functional categories are unimportant, for the sake of ease of reference, I maintain the label CP for the higher projection and IP to refer to the lower projection⁷. The resulting phrase structure tree, therefore, resembles that of a pre-minimalist structure.



⁷ I maintain the label IP because I consider the head features of such a position to be verb related, i.e., inflectional features such as for example tense, morphological mood, aspect, as opposed to the presumed nominal features associated with, for example, a Topic Phrase, as is suggested by Müller and Sternefeld (1993).

1.3.1 Clause Structure Issues in Acquisition

The theoretical discussions of German clause structure have naturally spilled over into the acquisition literature. Weissenborn, Höhle, Kiefer and Cavar (1998) investigate the possibility that although children produce embedded clauses introduced by the complementizer *daß* relatively late, (between 3;0 and 4;0), they should show adult-like knowledge of the CP domain from early on. Weissenborn et al. tested knowledge of verb placement with children aged 2;7 to 6;2 on a repetition task, which presented children with grammatical and ungrammatical sentences such as the following.

- 20a) *Bert sagt, daß Lisa Oma hilft*
Bert says, that Lisa grandmother helps
- b) **Bert sagt, daß Lisa hilft Oma*
- c) *Bert sagt, Lisa hilft Oma*
- d) **Bert sagt, Lisa Oma hilft*

In addition to this they tested similar constructions with younger children (average age 20 months) using a head-turn paradigm. Their results indicated that older children are aware of the complementary distribution of a complementizer and V2, and prefer corrections of complementizer insertion/deletion for ungrammatical sentences. Adults, on the other hand prefer corrections which give the unmarked Comp+VE structure. That is, in the ungrammatical sentences with a complementizer, they moved the verb to the final position, and in VE constructions without a complementizer, they inserted *daß*. The authors suggest that children prefer corrections which maintain a structure closest to the input; complementizer insertion/deletion is the most conservative correction.

The 20 month olds showed no significant preference for grammatical over ungrammatical constructions, suggesting that they are not yet aware of the different structures

(i.e., the +Comp-VE / -Comp-V2 alternation), or that the task is simply not tapping this knowledge. They did, however, show a significant preference for structures without a complementizer. Weissenborn et al. suggest that this indicates that young children are sensitive to the presence/absence of a complementizer, they have identified it, and that “sentences without complementizers are different for them at some formal level of representation.” (Weissenborn et al. 1998: 9) They suggest that the difficulty may arise from a limitation on the size of the processing window, following Santelmann and Juscyk (1997).

If, however, 20 month old children fail to make a distinction between grammatical and ungrammatical constructions, preferring sentences without a complementizer (both grammatical and ungrammatical), and are unaware of the verb placement requirements in relation to the complementizer, this may be an indication that they are not sensitive to the presence or absence of Comp. It would appear that they have not related the complementizer and verb. This may reflect an underspecification of C features as Weissenborn et al. also note. It may also indicate that children do not yet have CP in their grammar, but are sensitive to the possible positions for the verb. This may offer support for the notion that V2 is to a position lower in the clause than C, in that the distribution of the verb is not directly related to the C position. Later, children insert or delete the complementizer depending on the position of the verb. This would suggest that the position of the finite verb does not depend on the presence or absence of the complementizer, but rather that the presence or absence of the complementizer depends on the position of the verb. These issues will be taken up again in Chapter 2.

Chapter Two

The Acquisition of V2 and CP

2.0 Introduction

The acquisition of word order by German children is a much studied topic. Mills (1984) presents an outline of the acquisition of German relying on a number of sources from both spontaneous speech data and experimental data. Some of her findings are sketched briefly below. Mills notes, as do many others, that the dominant word order at the two (and perhaps early three word) stage is verb final, the verb in most cases having the non-finite *-(e)n* ending. When the agent is expressed before the verb, the verb often displays the third person singular *-t* ending, indicating “the development of the link between subject and verb.” (Mills 1984, 154) Auxiliaries and modals are rare at this stage. At around age 2;6, the personal pronouns *ich* ‘I’ and *du* ‘you’ appear. The verb final rule becomes less prevalent around age 3;0. Two developments take place at this stage: children begin to place the verb more frequently in second position, and subject verb agreement is usually correctly marked.

With respect to the emergence of questions, one of the first question words to appear is *wo* ‘where’, as has also been noted for English. Use of a question word requires the inversion of subject and verb. Wode (1971) notes that the two children in his study initially used *wo* without a verb, then later produced well-formed *wo* questions. One of the children had a lengthy stage using the order *wo*-subject-verb. Later other question words appear: first *was* ‘what’, then *wer* ‘who’, *wie* ‘how’ and *warum* ‘why’. Relative clauses are said to be rare

in early stages, but when they are produced, correctly have the verb in final position. The relative pronoun is frequently omitted, or a form of the relative pronoun is used which is unmarked for Case and gender. The development of relative clauses is discussed in some detail in Chapter 3.

Having presented a very cursory overview of the course of acquisition of German, the remainder of this chapter will focus on the gradual development of the functional categories CP and IP. Of particular interest is the fact that children acquire V2 relatively early, and yet continue to experience difficulty with constructions involving the C-system, particularly questions and subordinate clauses, which I claim supports the notion that V2 involves movement to a position other than CP. I examine the development of CP in the spontaneous speech data of two monolingual German speaking children. The theoretical assumptions are sketched in §2.4. These assumptions will provide the framework in which the relative clause data in the following chapters will be examined.

2.1 Development of the CP System

Numerous attempts have been made to establish boundaries dividing patterns of acquisition into phases, stages or levels by such criteria as age or MLU. It may be difficult, however, to establish clear lines delimiting the various phases given that there is a certain degree of variability between learners. (Cf. Tracy 1994, Penner 1994, d'Avis and Gretsche 1994.) Tracy reports on the emergence of question formation in one child, Valle, from the Tübingen acquisition project⁸, who showed very rapid progress in his acquisition of wh-

⁸ The Tübingen acquisition project was carried out at the University of Tübingen from 1988 to 1993. Ten children took part in the research project which was designed to study the development of complex sentences in monolingual and bilingual children.

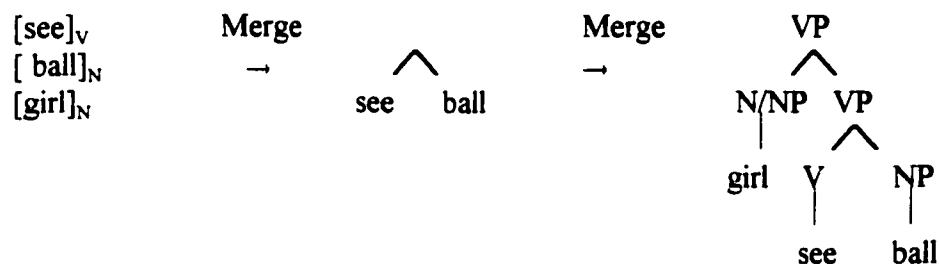
questions. Tracy notes, as does Penner (1993, 1994), that children may follow different developmental paths in their acquisition of wh-questions. Children may produce a number of intermediary patterns on their way to producing well-formed wh-questions. Penner discusses three possible non-adult-like patterns, which are not mutually exclusive: particle questions, such as [vo:zə] *ball?* '[where's-the] ball'; zero questions, such as *ist das?* '(what) is that?', and VE questions, such as *die mama macht?* '(what's) mummy doing?'. Tracy adds to these the possibility of a fourth pattern, V3 questions, such as *warum weiter geht nicht?* 'why further goes not?'. More will be said about these constructions with respect to the two children discussed in §2.2.

D'Avis & Gretsch (1994) examine the acquisition of subordination of four monolingual German speaking children. They propose a building block model of language acquisition in which new structural layers are not simply added one on top of the other, but are gradually integrated on a number of levels. They suggest that learning proceeds along two developmental axes: process orientation and level orientation. With respect to process, they propose two types of learners: type (top-down) and token (bottom-up). The type learner begins with a place holder and plugs in specific values, whereas the token learner is lexically oriented and initially acquires single tokens and generalizes across them to derive the type. With respect to level, the child is initially oriented towards one of three grammatical levels: phonetic, syntactic or semantic, "with each supplying individual building blocks for the construction to be acquired". (d'Avis and Gretsch 1994: 97)

An analysis which allows for the possibility of top down learning would seem to be in conflict with the minimalist assumptions presented in Chapter 1, particularly the notion of

Merge. Recall that the phrase marker is built solely via Merge. Merge is a binary concatenation operation whereby phrase structure trees are constructed and expanded in a bottom-up fashion from an array of elements selected from the lexicon (the numeration). Chomsky (1995b: 326) suggests that Merge is the simplest operation which “takes a pair of syntactic objects (SO_i , SO_j) and replaces them by a new combined syntactic object SO_{ij} .” Powers (to appear) proposes that in single word speech, an utterance such as *ball* has the structure, $[ball]_N$. This item is both an X^0 and an XP, having the desirable consequence that the representation is both minimal, but at the same time maximal as longer utterances do not appear. She argues that these single word utterances are merged in the early multiword stage in the following manner.

1) *Single Word Speech Early Multiword Speech Late Multiword Speech*



Restricting merge operations to bottom-up is an efficient way to prevent derivations from crashing, as it reduces the risk of the generation of material at the top of a structure which is incompatible with structures created at the bottom of the tree.

2.1.1 The Emergence of Subordinate Clauses

With respect to the development of subordination, d'Avis & Gretschi propose three phases of acquisition: Phase A is the period immediately before the appearance of

complementizer introduced strings or of precursor structures⁹, i.e., the initial grammar. Phase B is the period during which precursor structures are attested. Of the many types of precursor structures discussed by d'Avis and Gretsche, I am mainly concerned with two types: unintroduced embedded clauses¹⁰ (2a,b), and clauses introduced by phonologically undifferentiated filler syllables¹¹ with subordinating function and salient semantic connection, as in (3).

- 2a) *das immer hinfällt hat's draußen scherben*
 '[whenever] that falls down there's broken glass outside'
- b) Adult: *Warum gehört das so?*
 Why belongs that so
 Child: *das nich rausfällt*
 '[so that] it doesn't fall out'
- 3) Adult: *Warum - was is da passiert?*
 Why what is there happened
 Child: *?ənə fisch tot ist*
 '[because] the fish is dead'

Phase C begins at the point at which complementizers are produced productively in accordance with the target grammar. At this level the child has a target-like type and a representative selection of tokens.

There seems to be some degree of inter-individual variability among the four children studied by d'Avis and Gretsche, who focus on the stage in the grammar in which subordination

⁹ The term precursor structures refers to a number of clause types which prepare for and accompany the acquisition of complementizers. See d'Avis & Gretsche (1994, 60-63) for a complete list of the types of structures they consider. Cf. also Rothweiler (1989, 1993) and Fritzenschaft et al. (1990).

¹⁰ These correspond to Rothweiler's (1989, 1993) preconjunctive clauses.

¹¹ Müller and Penner (1995) refer to these filler syllables as dummy place holders.

begins to emerge, their Phase B.¹² For the child Valle, this period is relatively short and early (1;11 to 2;2); for the children Benny and Max it covers a longer period of time and begins much later (2;9 to nearly 4;5 for Benny and 2;11 to 4;10 for Max); the fourth child, Paul's Phase B begins even later, but is shorter in duration (3;6 to 4;2). Of the four children, they suggest that only the child Benny uses a bottom-up strategy. He seems to experience difficulty with functional verb position, and lacks lexical complementizers. The authors suggest that Benny abstracts 'types' from 'tokens' very late. D'Avis and Gretsche argue that top-down learners appear to proceed faster. They account for Max's lengthy Phase B by attributing it to interference from the second axis, the manner in which building blocks are assembled. Max, they suggest, initially has a phonetic orientation, and later syntactic.

Let us consider more closely the notion of 'type' within the boundaries of the Minimalist approach, i.e., where learning proceeds in a bottom-up manner. In one sense we might argue that the 'type' is already available to them at the onset of acquisition, if we take type to be the innate knowledge that structures project hierarchically in a binary branching tree. It is true that there is some degree of variability in the acquisition process and some children seem to progress faster than others and follow somewhat different patterns. It may be that some children are more structurally oriented, that is, they find it easier to integrate new material learned into a hierarchical structure, however, there is no evidence that they are working in a top-down fashion. While it is evident that some children have more difficulty in integrating functional projections, it is nevertheless not likely the case that a child will have acquired, for example, the functional category CP, and not the lower projections in the tree,

¹². The initial systems of these four children are discussed in Fritzenschaft et al. (1990).

(IP/AgrP, TP, or whatever we assume those functional projections to be).

Consider now utterances such as [*vo:zə*] *ball* ‘where’s the ball’, which Penner (1993, 1993) calls particle questions. Tracy (1994) interprets [*vo:zə*] in such utterances as monomorphemic, that is, they are not analyzed as a wh-pronoun + inflected copula. Thus, they would seem to have the structure C+VP. Such constructions, however, are not really evidence that the child has acquired CP, without the intervening functional projections. These may in fact be adjunction structures, in which the child has adjoined a question word to, for example, VP. Since Merge subsumes both projection and adjunction, such an analysis is plausible. Hoekstra & Jordens (1994) suggest that there are two ways some element X can combine with some projection YP: adjunction or X is a functional head taking YP as complement. Hoekstra and Jordens examine aspects of negation and modality in Dutch child language and argue that these are initially treated as adjunction. They propose that the child may start with adjunction in some cases and later reanalyze to a head-complement structure.

I assume, as do a number of other acquisitionists working within the minimalist framework, that learning proceeds in a bottom-up fashion, as mentioned in the preceding chapter. Further details of this analysis will be presented in §2.4. I leave aside for the moment issues such as truncation (Rizzi 1993), and performance limitations (Phillips 1995); these issues will be taken up in §2.4.2.

Despite the apparent differences in relative age and duration, if we look at the overall picture, we see an important similarity in the pattern of emergence of subordination among the four children. That is, that all children go through a phase in which V2 is available to them in main clauses, while the CP system continues to develop.

In addition to the acquisition of adverbial, complement and relative clauses, the development of the CP system also consists of the acquisition of Wh-movement and polarity question formation, given that these also involve movement to the CP level. There is evidence for an overlap between the acquisition of subordination and question formation. D'Avis and Gretsche's Phase B seems to overlap with the period of acquisition of Wh-phrases, at least in the one child, Valle, who was also studied by Tracy (1994) with respect to the development of Wh-questions. Tracy maintains that the "fact that the integration of wh-elements goes hand in hand with the emergence of complementizers suggests a connection." (Tracy 1994, 20) She notes that Valle produces utterances which function as constituent questions, and are clearly interpreted as such in that they elicit answers, even though they lack a Wh-operator. Tracy refers to these as 'gap formats'. These gap formats correspond also to Penner's zero questions mentioned above.

- 4) V. looking at a picture:
der mann macht?
 the man makes
 'what's the man doing?'

 - 5) V. upon hearing an airplane:
das da war?
 that there was
 'what was that?'
- M.: *das war ein Flugzeug*
 that was an airplane

These gap formats and V-end questions still occur at a time when V2 is well established in Valle's declarative clauses. This is also true of the two children whose speech is discussed in this chapter.

Tracy suggests that there is more to the acquisition of question formation than the

discovery and integration of wh-operators, possibly the creation of a new syntactic position. This assumption is crucial to the analysis and discussion in the following sections. Of particular interest is the fact that by the time Phase B begins, children have acquired V2, which is already productive in Phase A, suggesting perhaps that declarative V2 structure does not involve movement to the CP level. During Phase A children vacillate between V2 and (non-finite) VE clauses, indicating that it is not simply the case that they have determined German clause structure to be V2. VE structures are generally assumed to appear first, followed by V2, which is an indication of movement.

2.2 Spontaneous Speech Data of Daniel and Mathias

The goal of this section is to show that the development of the CP system does not include the acquisition of V2. In particular, I present evidence from acquisition which suggests that V2 is already well established by the time constructions involving CP appear in the grammar. In the previous chapter, it was argued that the V2 phenomenon involves movement to a lower functional projection, namely IP. Here I examine the spontaneous speech data of two twin¹³ monolingual, German speaking boys, Daniel and Mathias, who were video recorded on a monthly basis by H. Clahsen between the ages of 2;9 to 3;6 and are now available on the CHILDES data base (MacWhinney and Snow 1995). Table 1 provides the number of two or multi-word utterances with a verb and verb placement for each of the

¹³ Mogford (1993) reports on studies of twins aged 2 to 5 years, which have shown that in twins the onset of speech and vocabulary are often delayed, sentence construction is relatively immature, and their expressive language is relatively impoverished in conceptual content as compared to singletons. As the children get older, language development comes closer to that of singletons. While this might contribute to the late acquisition of complex constructions, the pattern of acquisition for the children studied by Clahsen does not differ significantly from that of other German children.

recordings for the two children. Table 1, and subsequent tables in this chapter, represent my analysis of Clahsen's data as recorded in the CHILDES database.

Subject+Verb strings were included in the total number of two or multi-word utterances, but not analyzed as either V2 or VE, since this is impossible to determine. A small number of V3 constructions in the early recordings were also counted in the two or multi-word utterances column only. Object+Verb utterances were analyzed as VE along the lines of Clahsen, Penke and Parodi (1993). V1/V2 are grouped together since all involve movement to a functional head above VP.

Age		MLU		two/multi-word utterances with V		V2/V1		VE	
Dan	Mat	Dan	Mat	Dan	Mat	Dan	Mat	Dan	Mat
2;9.28	2;9.07	2.35	2.38	28	59	11	38	14	13
2;10.14	2;10.14	2.26	2.73	39	66	19	41	14	18
2;11.14	2;11.14	2.94	2.83	51	48	32	22	17	15
3;0.21	3;0.21	2.98	3.16	69	68	60	46	7	17
3;1.21	3;1.21	3.17	3.17	72	97	67	89	4	4
3;2.14	3;2.14	3.3	2.58	34	13	31	13	2	2
3;3.21	3;3.21	2.46	3.15	44	65	39	53	5	8
3;4.21	3;4.21	3.77	4.01	107	98	97	92	7	6
3;5.21	3;5.21	3.94	4.07	70	89	67	81	2	8
3;6.28	3;6.28	4.02	4.53	61	105	58	100	1	5

Table 1 Data for the children Daniel and Mathias

Note that in the first few months of the recordings, both boys produce many main clause verb final constructions. That is, they vacillate between V2 and VE. These VE constructions decrease dramatically at age 3;0 for Daniel and 3;1 for Mathias, at which time their main clauses are primarily V2. Based on the argument that V2 is to a position other than

CP, the prediction is that we will find evidence that constructions involving CP are still “under construction” at a time when V2 is well established in the grammar. This prediction is in fact borne out in the data.

2.2.1 Wh-questions

Daniel’s early Wh-questions do not have Wh-pronouns (6a,b). In this way they resemble the ‘gap formats’ of Tracy (1994). Daniel produces his first Wh-pronoun at 3;0.21 (7). For some time he produces only adverbial Wh-pronouns with a copula verb, *wo is* ‘where is’. It is not until 3;5.21 that argument Wh-pronouns appear, though they are often not adult-like (8a,b).

- | | | |
|-----|---|---------------|
| 6a) | <i>is das?</i>
is that | (Dan 2;11.14) |
| b) | <i>die da holt?</i>
she there gets
'(what is)she getting there' | (Dan 3;0.21) |
| 7) | <i>wo is denn die brücke?</i>
where is then the bridge | (Dan 3;0.21) |
| 8a) | <i>was das denn?</i>
what that then | (Dan 3;5.21) |
| b) | <i>wo das is?</i>
where that is | (Dan 3;5.21) |

Daniel only begins to use target-like Wh-questions productively with a variety of verbs in final month of recording (9).

- | | | |
|----|--|--------------|
| 9) | <i>was steht da drauf?</i>
what stands there on | (Dan 3;6.28) |
|----|--|--------------|

A similar pattern emerges with Mathias, who also tends to omit Wh-pronouns, however, unlike Daniel he produces early *was is* ‘what is’ structures.

- 10a) *hier machen schiffe?* (Mat 2;9.7)
 here do ships
 b) *was is dadrauf?* (Mat 2;9.7)
 what is there-on
- 11a) *das is das?* (Mat 2;11.14)
 that is that
 b) *das is?*
 c) *was is denn das?*

Mathias continues to leave out the Wh-pronoun with any verb other than the copula (and sometimes with copula), and uses various ungrammatical forms.

- 12a) *macht das denn?* (Mat 2;11.14)
 does that then (= what does that do then?)
 b) *die machen denn da?* (Mat 2;11.14)
 they do then there (= what are they doing there?)
 c) *das hier is?* (Mat 3;0.21)
 this here is (=what is this here)

Hickey (1993) suggests that early *wo ist* 'where is' and *was ist* 'what is' are formulaic expressions i.e., unanalyzed chunks. Furthermore, Clahsen et al. (1993) suggest that adverbial conjunctions (*weil* 'because', *wenn* 'if') and adjunct Wh-questions (*wo* 'where') are not clear evidence for a CP because Wh-elements and adverbial clauses might be generated as adjuncts to some lower projection, rather than being raised to CP. This is ruled out with argument Wh-questions and the complementizer *daß* 'since these may not be generated in adjunct position in German.^{14 15}

¹⁴ It has been suggested that in languages which allow multiple Wh-movement such as Bulgarian, argument Wh-pronouns may adjoin to IP (cf. Rudin 1988). This is not the case in German.

¹⁵ Radford (1994) considers an adjunct analysis for wh-questions in English. He argues that such an analysis would make for developmental discontinuity, in that it would give no straightforward account for the ultimate landing site for Wh-moved phrases. Moreover, it is generally assumed that a moved wh-phrase is 'attracted' to an interrogative head in some way, which is not the case with adjunct positions. Radford suggests instead that wh-questions are in [Spec CP] from the earliest stage.

At 3;5.21 Mathias remains inconsistent with argument Wh-questions (13a,b), but consistently uses adverbial Wh-pronouns with a variety of verbs (14a,b). At 3;6.28 he also correctly produces argument Wh-questions with a variety of verbs (15a,b).

- 13a) *das denn* (Mat 3;5.21)
 that then (= what is that then)
 b) *was das denn*
- 14a) *wie sieht das denn aus?* (Mat 3;5.21)
 how looks that then PART
 ‘how does that look?’
 b) *wo liegt das?*
 where lies that
- 15a) *was bedeutet das?* (Mat 3;6.28)
 what means that
 b) *was willst du?*
 what want you

Thus we see evidence that Wh-question formation is still in the developing stage during most of the period covered by these recordings, although we must bear in mind the possibility of a language delay arising from the fact that these two boys are twins. (Cf. note 4)

It has been noted that English children also experience difficulties with structures involving inversion (cf. Radford 1990, Roeper 1992). Root questions in early child English may lack subject-auxiliary inversion, and early wh-words used are limited to a small set, *what*, *where*, *why*. This pattern may be an indication that CP is not fully specified. More will be said about underspecification in §2.4. These observations lend cross-linguistic support for the assumption that children have difficulties with question formation.

2.2.2 Polarity questions

Like Wh-questions, the correct structure for yes/no questions is still developing for Daniel and Mathias. Daniel produces his first recorded polarity question at 3;1.21, and this is the only one recorded until 3;5.21, at which time he begins to use them productively with a variety of verbs.

- 16a) *kann das das das mach put?* (Dan 3;1.21)
can that that that make broken
b) *hat Julia das eben gehabt?* (Dan 3;5.21)
has Julia that just had
c) *geht so eine hexe?* (Dan 3;5.21)
goes so a witch

Mathias produces more polarity questions than Daniel, however, in early recordings they are generally not well-formed, involving, for example, VE structure (17). He regularly produces well-formed yes/no questions at 3;4.21, though he may still leave off proper inflection on finite verb or non-finite VE particle (18a). At 3;6 his yes/no questions are very productive and generally well-formed (18b).

- 17) *ich neues buch hol?* (Mat 2;11.14)
I new book get
18a) *weißt du # was wir noch machen könn(en)?* (Mat 3;4.21)
know you what we also do can
b) *siehst du jetzt gar nix?* (Mat 3;6.28)
see you now part nothing

Penner (1993) and Tracy (1994) note that target-like yes/no questions are late to emerge. This is unexpected since yes/no question formation simply requires that the forefield be left unfilled, which children do in any case in simple root declaratives. It is not unexpected, however, under an analysis in which the CP system is still developing, and the argument that

polarity questions, like Wh-questions, involve movement to CP, unlike declarative V2 clauses.

2.2.3 Subordination

There is little evidence of subordination in the recordings from Mathias and Daniel. Both children produce very few of the precursor structures outlined in d'Avis and Gretsch (1994). Mathias' first recorded precursor structure shows up at 3;4.21, at the same time as two well-formed *weil* 'because' clauses.

- 19) *XXX tisch nicht richtig geht* (Mat 3;4.21)
table not right goes
- 20) *weil ich das schön finde* (Mat 3;4.21)
because I that nice find
'because I like that'

In (19) Mathias begins with an undifferentiated filler. By this point his finite verbs in root clauses are almost exclusively in second position, with VE being reserved for subordinate clauses and non-finite verb particles. By 3;6 Mathias' subordinate clauses are generally well-formed and he has a variety of complementizers at his disposal (*weil* 'because', *ob* 'if/whether' *wenn* 'if/when').

- 21a) wenn die größer is (Mat 3;6.28)
when she bigger is
- b) ob das schwarz is (Mat 3;6.28)
if that black is

The first recorded precursor structure for Daniel occurs somewhat earlier, at 2;11.14. A few more of these structures are recorded throughout the data. During the recordings, Daniel produces no well-formed subordinate clauses. He tends to produce instead what Rothweiler (1989, 1993) calls preconjunctive clauses, i.e., subordinate clauses without a complementizer.

- 22a) Adult: *und der junge putzt die räder von der kutsche* (Dan 2;11.14)
 and the boy polishes the wheels of the coach
 Dan: *dieser auch gleich weiterfährt*
 this-one also immediately further-drives
 ‘(so that) this one can also drive on right away’
- b) Adult: *Jetzt müssen wir aber noch ein segel da dranmachen* (Dan 3;1.21)
 now must we but still a sail there on-put
 ‘but now we must still put a sail on it’
 Dan: *das schiff schon gleich abfährt*
 the ship already immediately off-goes
 ‘(so that) the ship can sail away immediately’
- c) *ich sag das auch # du was runterschmeiß* (Dan 3;4.21)
 I say that also you something down-throw
 ‘I’m telling that also, (that) you’re throwing something down’

Mathias’ precursor structures show up at the same time as target-like subordinate clauses, and at 3;6 he produces quite a number of these well-formed subordinate clauses (7 are recorded), thus his Phase B is likely relatively short. He correctly places the finite verb in final position in subordinate clauses and he has available a number of elements to introduce them (*weil, ob, wenn*). Daniel also employs the correct word order pattern for subordination, though he tends to omit the complementizer. Thus his subordinate clauses resemble Rothweiler’s preconjunctival clauses.

2.2.4 The Subject/Non-Subject Distinction

In this section, I examine one further piece of evidence which supports the argument that V2 is movement to a position lower in the clause than CP, and argues against a non-uniformity account of V2, which was discussed briefly in Chapter 1. There it was noted that Travis (1985) and Zwart (1993), among others, have argued for a distinction between subject initial and non-subject initial clauses in German and Dutch. If early V2 clauses were primarily subject initial, then we would have an explanation for the apparent early acquisition of V2

while CP appears to remain incomplete. Recall that according to a non-uniformity hypothesis, subject initial V2 clauses involve movement to a functional projection lower than CP (AgrS, according to Zwart 1993). Non-subject initial V2 clauses on the other hand, involve fronting of some element to [Spec CP]. Under the gradually expanding phrase marker analysis being advocated here, the prediction for a non-uniformity analysis is that subject initial V2 clauses will be acquired earlier given that they involve movement to a lower functional head. Non-subject initial V2 clauses, which require movement to a higher functional head, namely CP, will be acquired later. A similar prediction is made by the CP recursion analysis of Brannigan (1996), assuming that the two CPs host different features. Features of the primary CP would trigger subject movement and those of the secondary CP would trigger non-subject movement. It must be determined, therefore, whether early V2 clauses are primarily subject initial in the early stages.

In order to test this prediction, I determined the number of subject and non-subject initial declarative V2 clauses in the earliest recordings (at 2;09) for the children Daniel and Mathias. The data are presented in Table 2.¹⁶

	Subject initial	Non-subject initial
Mat 2;09	7	17
Dan 2;09	1	7

Table 2 Subject versus Non-subject Initial V2 Clauses

Note that both boys produce many non-subject initial declarative V2 clauses even in the earliest recordings, at which time, I have argued above, CP is still under construction. For

¹⁶ Table 2 includes only those utterances which are clearly V2, i.e., V1 and V3 utterances were not included, nor were two word utterances.

Mathias, many of these begin with *hier* 'here'. For example, *hier is er* 'here he/it is' is a frequent construction, however, Mathias also produces a number of other non-subject initial sentences in the first recording at 2;09.

- 23a) *tot is er*
dead is he
- b) *hoch # so oben is es*
high so ontop is it
- c) *so is se sauber*
so is she clean
- d) *die schere hat julia*
the scissors has julia
'Julia has the scissors.'

Similarly, many of Daniel's early V2 sentences begin with *da* 'there', however, he also produces a few other non-subject initial clauses.

- 24a) *da suche jetzt vogel*
there looks now bird
- b) *da reinspring wauwau*
there in-jumps doggie
- c) *aus is es gleich*
out is it immediately
'It will go out immediately'

At the beginning of the recordings for these two boys, V2 is gradually emerging as the dominant word order pattern (from an earlier stage at which VE is the dominant pattern), and CP is just beginning to develop. If non-subject initial V2 clauses involve movement to CP and subject initial clauses involve movement to a lower functional projection, then under a bottom-up, gradually expanding phrase marker analysis, subject initial clauses should appear first. The higher number of non-subject initial clauses as compared to subject initial does not support this prediction. In fact we find more non-subject initial utterances for both boys, supporting a single position for subject and non-subject initial clauses, namely IP.

Because the available data for these two boys goes back only as far as 2;9, at which time V2 is already well established, I also determined the occurrence of subject/non-subject initial utterances in one younger child, Julia¹⁷, aged 2;3.21 to 2;5.28. At 2;3.21, Julia has an MLU of 2.44, and her utterances containing verbs are still mainly two word utterances of the type X+Verb. Since it is impossible to determine whether these are V2 or VE, they are left out of the calculations.

Julia		V2		VE
Age	MLU	Subj-initial	Non-subj-initial	
2;3.21	2.44	5	3	11
2;4.21	2.73	9	9	25
2;5.28	2.94	24	11	7

Table 3 Subject versus Non-subject Initial V2 Clauses for the Child Julia

At 2;3.21, Julia has a total of eight V2 utterances, of which five are subject and three are non-subject. Thus even when she first begins to produce V2 utterances, she includes among these sentences which begin with some element other than the subject. All of her subject initial utterances have *ich* 'I' subjects, which children of many language backgrounds reportedly produce very early. The lexical limitation of subject to *ich* may suggest that initially [Spec IP] is identified specifically for the feature first person, rather than simply person. Still at 2;4, many of her subject initial utterances begin with *ich*.

25a) *ich kann auch*
I can also

(Jul 2;3.21)

¹⁷ The child Julia is in fact the younger sister of the boys Daniel and Mathias, and was also recorded by H. Clahsen. Again, the numbers reflect my analysis of the data.

- b) *ich schaff das nich*
 I manage that not
 'I can't do that'

(Jul 2;4.21)

All of Julia's *ich* subject initial strings at 2;3 and 2;4 are similar in that they involve being able or not being able to do something. All of her non-subject initial strings at 2;3 and some at 2;4 are missing subjects (26), however, at 2;4, she begins to include subjects in some of these (27).

- 26a) *das kann auch reinstecke*
 that can also in-stick
 '(One/I) can also stick that in'
- b) *das will zumachen*
 that want closed-make
 '(I) want to close that'
- 27a) *noch ein baby hab ich*
 another baby have I
- b) *hier is das baby*
 here is the baby

At 2;5, V2 is the predominant structure, and most of Julia's non-subject initial strings now have subjects. At this point, we see many more subject initial than non-subject initial utterances. This pattern is not unexpected. It has been reported that, despite the freedom of word order in German, the unmarked order is subject before object.¹⁸

While the child, Julia, does not produce as many non-subject initial utterances as subject initial, she nevertheless does seem to begin to produce both at more or less the same time. Both subject and non-subject initial clauses show up at a time during which V2 clauses are just beginning to emerge as the dominant pattern for main clauses. Thus Julia's data also

¹⁸ Cf. Schlesewsky, Fanselow, Kleigl and Krems (to appear), who found a subject preference in a study of randomly selected articles from one edition of *Der Tagesspiegel* (a daily newspaper).

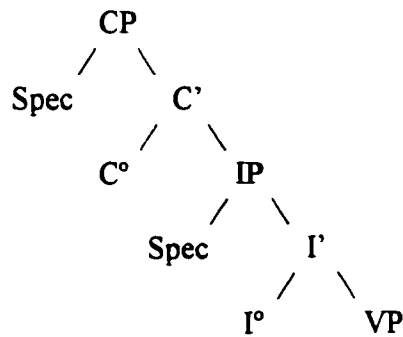
lend support to the notion of a single position for subjects and non-subjects in initial position.

2.3 Some Previous Analyses

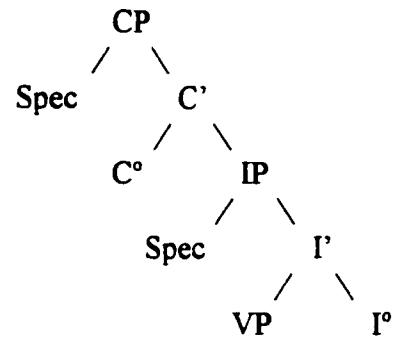
Most studies agree that there is at least one functional position above VP by time V2 is acquired. Clahsen, Penke and Parodi (1993) argue that there is evidence for only one functional position above VP in early child grammar (their Stage I). They argue that there is no concrete evidence in the early grammar for a CP level.

Gawlizek-Maiwald et al. (1992) assume at least one functional position above VP, which they suggest is not CP, but IP for two reasons. First, for several months after he has mastered simple sentences, the child, Paul, produces no finite VE structures. Assuming an analysis of German clause structure with an initial CP and head final IP, we would expect at least some finite VE strings to occur. Secondly, even when complementizers appear which are semantically and pragmatically appropriate in Paul's speech, finite embedded verbs do not immediately appear in the head final IP position. Paul either omits the verb and most of the subordinate clause, or breaks off and restarts with a main clause pattern. The other child in their study, Benny, uses finite VE as well as V2, which leads to the assumption that "the head of IP is free to appear either to the right or left of its complement." (p. 163) The authors propose the following two structural options for the German clause, which accounts for the two possible positions for the finite verb in the German clause.

28a)



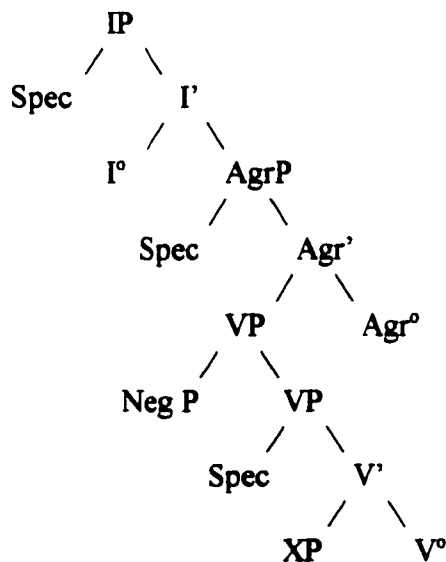
b)



Rothweiler (1993) also argues for two possible **IP** structures, suggesting that a head initial **IP** generates main clauses, and a head final **IP** generates dependent clauses. A lexical head may govern to the right under certain conditions and to the left under others. **INFL** governs to the right when it carries categorial features of main clauses and to the left otherwise.

Clahsen (1990), suggests that the acquisition of agreement triggers construction of a head final Agreement Phrase.

29)



Clahsen suggests that the split **INFL** is an intermediate step and **I°** is later recategorized as **C°**. when lexical complementizers are acquired.

Similarly, Meisel and Müller (1992) argue for a split INFL structure (following Pollock 1989) with a head initial TP and a head final AgrP. While such an analysis is able to handle most of the data, it is unable to account for the apparent V3 constructions of the children Benny or Simone or those of the child Ivar in Meisel and Müller's own data.

- | | | |
|------|---|----------------|
| 30a) | <i>daß du hast net die meerjungfrau</i> | (Benny 3;1.4) |
| | that you have not the mermaid | |
| b) | <i>was ich kann machen?</i> | (Benny 3;1.26) |
| | what I can do | |
| 28) | <i>warum das fenster is nich putt?</i> | (Simone 2;2.4) |
| | why the window is not broken | |
| 29a) | <i>wenn die sind reif ...</i> | (Ivar 3;3.12) |
| | when they are ripe... | |
| b) | <i>daß die fische sind tot</i> | (Ivar 4;3.16) |
| | that the fish are dead | |

In order to account for these, one would have to posit two maximal projections above VP. Meisel and Müller argue that C in this case adjoins to TP, and TP is later recategorized as CP. While recognizing that reanalysis may account for certain changes in the child's emerging grammar, I argue that CP is still developing at this stage of acquisition, and that V2 does not involve movement to CP even in the adult grammar, eliminating the need for reanalysis in the case of V2 constructions.

2.4 A Minimalist Account

Under Minimalist assumptions (Chomsky 1993, 1995b) there is no need to assume two I° positions, since the verb comes into the syntax already inflected. Elements such as nouns and verbs enter the numeration accompanied by their morphological features such as Case and [phi]-features. Features of lexical categories must 'match' features of the functional

head, triggering movement of lexical elements to functional positions, as inflectional elements must be licensed outside the lexical domains. Differences in word order among languages then are reduced to whether checking occurs before Spell-out, or at LF. Weak features may wait to be checked at LF, which is less ‘costly’ on the system. Thus the verb in German may remain in the VP in the syntax, or raise to a higher functional position, depending on feature checking requirements.

An alternative minimalist approach is that of Armon-Lotem (1997). Armon-Lotem extends the analysis of Grimshaw (1991), who notes that functional projections are extended projections of lexical projections, and that functional heads, unlike lexical heads, may be neutral with respect to a feature. This distinction is strengthened in Armon-Lotem’s analysis. She suggests that it is not the case that functional categories may be neutral with respect to some feature, but that they are neutral with respect to all features (Armon-Lotem 1997, 5). Armon-Lotem uses the notion of an “empty slot” ([_ feature]) to refer to neutral features. Underspecified features require specification. A [_ feature] shares the value of that feature with the lexical head of which it is an extended projection.

33) Value Sharing

The values of features of a lexical head are shared with the extended projection under feature matching with the extended functional heads. (Armon-Lotem 1997, 6)

Value sharing automatically follows any Merge operation. That is, when a lexical phrase marker and a functional phrase marker are merged into an extended projection, features of the functional head become specified by virtue of being shared with the lexical head.

Armon-Lotem addresses problems with checking and the notion of ‘strong’ and ‘weak’ features, converting them to an output constraint, a PF ban on fully specified empty

functional heads.

34) PF-ban on empty functional heads:

When the head-features of a functional head are fully specified, the head needs to be associated with a lexical item. (Armon-Lotem 1997, 8)

The idea is that when all the empty slots of a functional head are filled, the head takes on the appearance of a lexical head, and therefore, must have overt lexical content.

In order to account for the values of specifier features, Armon-Lotem assumes that these are copied from their head features and lexically filled if required by a PF ban.

35) PF-ban on empty functional nodes:

i) When the head-features of a functional head are fully specified, the head needs to be associated with a lexical item.

ii) When at least one spec-feature of a functional head is specified, its specifier needs to be associated with a lexical item. (Armon-Lotem 1997, 11)

Armon-Lotem assumes that functional heads are underspecified with respect to features values and lexical heads are fully specified. When the two are merged into an extended projection, features of the lexical head are shared by the functional head.

2.4.1 German Clause Structure and the PF Ban

Recall that under a *Bare Phrase Structure* (Chomsky 1995a) analysis, functional categories are composed of feature bundles. I used the labels IP and CP to refer to the V2 position and the position of question phrases and complementizers respectively. Thus the CP head-features include logical mood features (question, imperative) and subordination (complementizers). The IP head features include verbal features (such as tense, morphological mood and perhaps aspect). Additionally, I propose that IP also has a focus feature which, when specified, causes the need for the specifier to be lexically filled in V2 constructions, though it does not matter what type of constituent fills it. I suggest then that in main clause

declaratives the head features of IP, which enters into an extended projection with the VP, are fully specified, making them look like lexical heads, and thus by the PF ban must be lexically realized. Verb movement into the head of IP satisfies this requirement. Suppose further that the [focus] feature of that head position is also realized and copied to the specifier position. The specifier position must then also be associated with a lexical item. Movement of virtually any constituent into that position is sufficient to satisfy this requirement, which accounts for the heterogeneous nature of the first position in a V2 clause.

In matrix wh-clauses, C is specified [+question, +wh] and must therefore be lexically realized at PF, resulting in verb movement to C. In wh-constructions, the [+wh] feature is specified for the specifier position, requiring it to be lexically filled. Similarly in polarity questions and imperatives, either the specifier position remains unspecified, or it is filled by a null operator.

In embedded clauses a [+subordinator] feature is specified in C, and must be satisfied at PF, and somehow this precludes the need for IP to be specified at PF. It is possible that when CP is identified and projected, the focus feature of the IP remains unspecified, and thus the IP need not be associated with a lexical item at PF.

2.4.2 Implications for Acquisition

As was mentioned in Chapter 1, I assume that children construct minimal trees which are consistent with their grammar at that stage of acquisition. Furthermore, I assume in keeping with the minimalist notion of merge as well as the empirical data, that these trees are constructed in a bottom-up fashion. Thus CP can only become accessible once IP has been mastered. Armon-Lotem suggests that functional categories are initially underspecified. The

potential is always there for a lexical item to merge with another item and project into an extended projection. It must be determined by lexical and morphological cues that a functional projection exists which enters into an extended projection sharing features with a lexical head. That is, a functional projection must first be identified before the values for its features can become specified. This does not happen all at once. The child might identify some features of a functional projection before others. Armon-Lotem (1996) argues that CP becomes the locus for wh-movement when it has been marked with the [Operator] feature. Later other features of C, such as [Finite], are identified and specified, and the position becomes available for verb raising and subordination. The emergence of lexical complementizers indicates that CP has been acquired.

Consider now the development of German. There is evidence that the German child begins with an OV structure (e.g., *Buch lesen* 'book read') and gradually builds structure (Clahsen and colleagues assume, according to the Lexical Learning Hypothesis, that V2 is triggered by the acquisition of agreement). The lexical head is merged into an extended projection with a dominating functional projection and features of the lexical head are shared by the functional head. At the stage where V2 is produced in child language, there must be an appropriate fully specified functional category above VP. Features of the functional head being fully specified, take on the guise of a lexical head, and therefore must be associated with a lexical item. There is still no need for CP at this point. When children begin to form questions (WH and polarity), imperatives, and embedded clauses, C becomes specified, and therefore must also be associated with a lexical item at PF.

Penner and Müller (1992) argue that in children's early production of preconjunctional

clauses, they do not seem to know how to relate clauses, and there is little evidence that two clauses are linked by a CP. At this point, only verb-argument structure plays a role, i.e., only those verbs which take sentential complements are used with preconjunctive complement clauses. Penner and Müller suggest that preconjunctive clauses are full-fledged CPs with a gap in the complementizer position. The explanation given in Penner (1995) is the underspecification of the [Infl-in-C] feature. The child knows that subordination is licensed by UG, but does not know how C is filled. The operator feature of C, however, is partially specified in order to license a gap in C, and determine the type of embedded clause. Armon-Lotem (1996) suggests that [$\pm$ finiteness] seems to be a universal property of C, and the German Infl-to-C might be a language particular manifestation of [finiteness], though there is no reason to assume the same holds for other languages. Armon-Lotem argues that Infl-to-C correlates with finiteness and finiteness correlates with tense. Therefore, before tense is used productively, finiteness is underspecified or inaccessible. When tense is used and [finiteness] is identified as a feature of C, C is accessible and can be used for subordination. However, other features of C, [operator] [wh] [reference] still have no value, therefore, C is not fully specified and need not be lexically filled. When all the features of C are identified and specified, the child begins to use complementizers in subordinations.

Armon-Lotem's analysis obviously implies verb raising to Infl, then to C, which runs contrary to my proposal that verb movement is to a position lower than C, namely IP. There is empirical support for the notion that V2 is to a position other than CP in the stages of acquisition prior to the productive use of question formation and subordination. Many studies argue that this position is later reanalyzed or recategorized as CP. I argue instead that such

a reanalysis is unnecessary if in the adult grammar, V2 in declarative sentences is also to a position lower than CP. As for the need for a head-final AgrP analysis, as that of Clahsen (1990) or Meisel and Müller (1992) or two possible positions for Infl (Gawlizek-Maiwald et al. 1992) in order to account for finite verb-final structures, this simply does not arise within a Minimalist framework, given that verbs are taken inflected from the lexicon and need only move for the purpose of feature checking, or satisfying the PF ban on fully specified empty functional categories. With respect to the CP system, the child's knowledge of CP appears to be incomplete in the early stages of acquisition. This is not unexpected if we assume that functional heads are underspecified, and need only be associated with a lexical item when they are fully specified. The child may, however, use CP (though not necessarily in an adult-like manner) when it is only partially understood, i.e., before the full range of features are present.

2.4.3 Advantages Over The Truncation Hypothesis

Let us consider now what Wexler (1994), among others, has referred to as the optional infinitive stage. In the early recordings of Daniel and Mathias, we find many root clauses with a non-finite verb in final position occurring alongside V2 clauses. Three possibilities have been suggested as to why optional infinitives are allowed in the child grammar, but not in the adult grammar: (i) The child lacks functional projections which are required in the adult grammar and are responsible for finite V; (ii) Wexler (1991) suggests that infinitive clauses occur until the child distinguishes past/present. Clauses have a tense value which must be fixed and the fact that the child is not sensitive to tense values is an indication that no substantive tense variable exists at this stage of development and therefore, there is no need for a tense binder which allows for the option of a root infinitive. The third

possibility (iii) is that CP is available, but in VE structures modals and auxiliaries (i.e., the functional layers) have been dropped. (Cf. Rizzi 1993, Weissenborn 1992, Crisma 1992). Weissenborn (1992) for German and Crisma (1992) for French both independently reach the conclusion that main clause infinitives are not full CPs but truncated structures, possibly bare infinitival VPs. The absence of Wh-root infinitives offers support for this hypothesis. Structurally, root infinitives are only possible in a category lower than TP, where the higher layers are stripped off. Thus no CP is projected, and Wh-infinitives are ruled out.

Rizzi (1993) suggests that root infinitives are a product of truncated structures. If finiteness, which follows from the presence of a tense variable and is required in the adult language, is missing in the child's grammar, then the child is free to create root clauses with bare infinitival VPs. The child may choose VP as root in which case no tense variable is present and the verb is non-finite. Truncation accounts for the failure to raise verbs in V2 languages. It may also account for the absence of root infinitive modals and auxiliaries. Use of auxiliaries necessitates projection of a higher node than VP as root, and since any root higher than VP has a tense variable, auxiliaries and modal verbs always appear in finite form¹⁹.

The analysis, however, is not unproblematic. First of all, on a conceptual level, the truncation approach would add complexity to the child's grammar. Lebeaux (1988) points out that postulating that the child has a full phrase marker, as well as some sort of reduction operation which accounts for the simplified output, would actually make the child's grammar more complex than the adult's. Phillips (1995) provides an alternate account. He considers performance limitations with respect to root infinitives, claiming that performance systems

¹⁹ Clahsen et al. (1993) also note that modals and auxiliaries are almost always finite.

for production may have the ability to influence linguistic computations. A robust finding in the child literature is that once children begin to use the morphological system of their language, they use it correctly. Clahsen and Penke (1992) also note that failure to use agreement in German child data is much more common than actual agreement errors. Phillips suggests that the infinitive form of the verb is often the default form, therefore, use of the infinitive form is not to be taken as a substitution error, but as an error of omission. When children begin to use tense and finite markings they are usually used correctly. Like Rizzi, Phillips suggests that children's syntactic knowledge is complete, however, children may violate the requirement that V and I merge. This may be due to a problem in the implementation of their morphological knowledge. Thus Phillips distinguishes the form of the child's morphological knowledge from the process of accessing that knowledge. He suggests that automatizing takes place gradually, and the use of root infinitives decreases proportionately. Root infinitives disappear earlier in languages with richer inflectional paradigms, since the automatization process is speeded up.

An empirical problem with the truncation hypothesis comes not from the presence of root infinitives, but rather from the appearance of finite VE structures. Such constructions appear in the data from Daniel and Mathias, particularly in the early recordings, and must also be accounted for. The presence of finite VE strings is unexpected, under the truncation analysis outlined above. Table 4²⁰ indicates the percentage of non-finite root VE utterances

²⁰ Tabel 4 includes declarative strings only. Not included in the analysis were utterances with uninterpretable material which would lead to ambiguity between V2 or VE, such as:

i)	<i>ich xxx schiff machen</i>	(Mat 3;0.21)
	I ship make	

in which case the uninterpreted material represented by xxx might have been the finite verb.

which are unambiguously marked with [-finite] morphology (i.e., *-(e)n*), those unambiguously marked [+finite], and other VE utterances²¹. The table covers the period from 2;9 to 3;0, where the majority of root VE strings occur.

Child	Total # VE	VE [-finite] morphology	VE [+finite] morphology	Other
Mathias	51	n=16 31.4%	n=10 19.6%	n=25 49%
Daniel	48	n=26 54.2%	n=3 6.2%	n=19 39.6%

Table 4 Finiteness and VE

If we assume that a child has an equal chance of choosing finite or non-finite morphology for each VE utterance, then the pattern for the child Mathias falls within the expected distribution ($p > 0.16$), however, the pattern for the child Daniel would be completely unexpected ($p > 0.0003$). In fact, we know that the likelihood of choosing finite or non-finite morphology is not chance, given that in the adult grammar, verbs in verb final constructions appear with non-finite morphology. Thus it is the pattern displayed by the child Mathias which is noteworthy.

While some degree of performance errors should be allowed for, the high percentage of finite VE (19.6%) for the child Mathias cannot easily be dismissed as performance errors. In fact the percentage of VE structures which are clearly non-finite seems rather low, especially for Mathias (31.4%). These percentages, however, may be somewhat misleading, and the data warrant closer scrutiny. Daniel and Mathias produce a number of two word utterances with finite VE.

²¹ This last column includes both two word Non-subject + V utterances and multiword utterances with no distinct inflectional marker. Cf. examples (36) and (37) respectively.

- 36a) *sik mach* (Dan 2;11.14)
(mu)sic make
b) *sand reintut* (Dan 2;10.14)
sand in-put
c) *wieder weint* (Mat 2;10.14)
again cries

These in themselves are not significant, as they might simply be V2 structures with a post verbal subject omitted.²² There are, however, a number of multiword utterances throughout the recordings which are clearly not V2.

- 37a) *gleich wauwau suche* (Dan 2;9.28)
immediately dog look-for
b) *jetz ein dorf baue* (Dan 3;0.21)
now a village build
c) *ich Julia helf* (Mat 3;0.21)
I Julia help
d) *ja # nich mehr sik mach* (Mat 2;10.14)
yes not more (mu)sic make

One could argue that in such cases the infinitive '(e)n' marker has been left out, however, other examples are clearly inflected, as the third column of Table 3 indicates. The examples in (38) illustrate this point.

- 38a) *dieser auch gliech weiterfährt* (Dan 2;11.14)
this-one also immediately farther-drives
b) *sand auch ich reintut* (Dan 2;10.14)
sand also I in-put
c) *der auch singt* (Dan 3;0.21)
he also sings
d) *schiff jetzt fährt* (Mat 3;0.21)
ship now drives
e) *hier wieder regnet* (Mat 2;9.7)
hier again rains

²² Note, however, that these two word utterances may also occur with non-finite morphology, and in this case we would not want to claim that they are V2, since non-finite V2 utterances are otherwise virtually non-existent in the data.

The structure in (38a) may represent a precursor to subordinate structure, as was discussed in §2.2.3. The others (38b-e) can not be considered to be precursors in any semantic sense.

Recall that Rizzi assumes that finiteness follows from the presence of a tense variable, which is required in the adult grammar but is missing in the child's. This allows the child to create root clauses with bare infinitival VPs. The analysis, therefore, cannot account for the presence of a tense variable (which would have to be generated above VP) in truncated structures.

Let us now consider these data in light of the minimalist approach I am advocating. We saw from the structural options for the German clause, that the child is confronted with conflicting evidence in the input for the correct position of the inflected verb, given that the possibility exists within the grammar for the use of finite VE structures. Initially the child might assume that main clause [+finite] VE is a possible outcome. Clahsen, Kursawe and Penke (1995) argue that, unlike in the adult grammar, the final verb position is not yet specified for finiteness. I suggest instead that it is not the VE position, but the functional projection IP which is not yet fully specified for its features (in this case finiteness), and therefore, need not be lexically filled by virtue of the PF ban on empty functional nodes. Thus the finite verb may remain in its base position.

With respect to the acquisition of wh-questions, a similar argument may be made. Rizzi, among others, accounts for the absence of wh-root infinitives, by claiming that root infinitives are truncated structures in which the higher layers have been stripped off. Thus no CP layer would be projected, ruling out wh-infinitives. Under minimalist assumptions made in the previous section, a functional projection must be identified before the values for its

features become specified. It is only when the values of the features [$\pm$ question, $\pm$ wh] have been specified, that CP must be lexically filled. If trees are built up in a bottom-up fashion, and CP only becomes accessible once IP has been mastered, we would not expect to see wh-infinitives in child language.

Consider again Phillip's (1995) performance account of errors of omission. Phillips argues that there is no evidence for a syntactic or morphological deficit, that errors of omission reflect problems in the implementation of certain aspects of the child's knowledge. The apparent discrepancy between what the child seems to know about language and how reliably he/she deploys this knowledge reflects an interaction between the cost of accessing morphological information before it becomes automatic and cross-linguistic differences in the behavior of main verbs. Phillips presents evidence from a number of languages (French, German, Dutch and Swedish), which show that root infinitives never occur with wh-questions (Crisma's effect). Poeppel and Wexler (1993) note that for the German child Andreas, almost all inflected verbs are in V2 position, while most infinitive verbs are VE. Moreover, root infinitives are restricted to subject initial clauses, and not topic initial, which they suggest, like wh-movement, require movement to C. In English, where main verbs do not move to C, unlike German, Crisma's effect is not found. Phillips argues, therefore, that Crisma's effect is due to verb movement rather than the presence of CP, supporting the notion that cross-linguistic differences in head movement determine where there is an interaction between finiteness and question formation. German, Dutch and Swedish children know that in their language main verbs must move to C, and therefore move V to I to C, picking up inflections on the way. English and colloquial French, on the other hand, do not require V to C, and can

therefore behave like declaratives and allow root infinitives.

Phillips proposes that all declarative clauses are finite and contain all elements of finite clauses, even when these are spelled out as root infinitives. He argues that root infinitive clauses “only differ from the adult clause in that V and I have failed to merge. In the absence of a verbal host, there is no spell-out for the feature of INFL, and so they are not realized. Meanwhile, since the verb lacks inflectional features, it is spelled out as a default form, an infinitive.” (Phillips 1995: 346-7) Phillips notes, however, that his analysis relies on a non-lexicalist approach, that is an analysis whereby the verbal stems and inflectional features enter the syntax as independent syntactic elements (cf. Phillips 1995: note 26). This is not the approach adopted in this thesis. Following Minimalist assumptions, I assume that verbs are taken from the lexicon with their morphological inflections attached.

Phillips also makes a connection between root infinitives and null subjects, noting that in many languages the majority of root infinitives are subjectless. Languages which show this correlation (German, Dutch, Swedish, French), Phillips argues, are all verb raising languages, i.e., languages that raise finite verbs, but not non-finite verbs. He suggests, therefore, that null subject clusters with ‘unmoved’ rather than non-finite. The argument is that movement is necessary to licence overt subjects. In verb raising languages, finiteness is not sufficient to licence overt subjects, these languages also require verb movement. Phillips suggests that verb raising causes I features to be spelled out on the verb, thereby giving the appearance of an interaction between null subjects and [+finite]. He suggests that English may provide the crucial determining factor, since English is not a verb raising language. If it is the form of the infinitival verb which makes it cluster with null subjects, then we should see the same

interaction in English, however, if it is the position of the verb, then no interaction would be found. This is in fact what Phillips found, i.e., that there was no correlation between null subjects and non-finiteness. Phillips concludes that the child's syntactic representations are complete and that they have a detailed understanding of head movement and its motivation in the target language. The fact that they violate the requirement that V and I merge is attributed to problems with the implementation of morphological knowledge.

Wexler (1994) suggests that the extreme rarity of errors within the morphological paradigm (not omissions) is a mystery under the view that knowledge is gradually growing in strength. Phillips agrees, but suggests that it is not knowledge of inflection that changes, but processes that affect the child's use of inflectional knowledge. However, it is clear that knowledge and understanding of the morphological paradigm of any language must be learned in any event, and it is not learned all at once, and is therefore changing. The fact that errors are mainly errors of omission may indicate that before children learn the full morphological paradigm, they use what is available to them, and is likely to cause the least amount of problems in interpretation. As Pinker (1995) notes, children must have sufficient exposure to something before its retrieval becomes automatic. While I concur with the notion that performance factors play a role in the child's ability to implement certain aspects of their knowledge, particularly with respect to the interaction between syntactic and morphological systems, I do not believe that these factors alone can explain what the child does not produce, particularly as concerns functional projections. Given the argument that functional projections vary across languages and features associated with functional categories are not universal, it is not likely that the child can have knowledge of the full functional paradigm from the onset.

I suggest that performance factors only partially explain children's productions and omissions.

2.5 Concluding Remarks

Based on observations regarding the development of CP in child German, I have argued for a modified minimalist approach to acquisition like that of Powers (1996), which involves a gradually expanding phrase marker, constructed in a bottom-up fashion. The analysis is empirically supported by the production data from the two children, Daniel and Mathias. An analysis which allows for the possibility of top down learning would conflict with these assumptions. Also incompatible is a Full Competence approach to acquisition, such as that of, for example, Weissenborn (1990), who argues that preconjunctional clauses are full CPs with an abstract feature in COMP. Such an analysis would conflict with the Minimal Projection principle (Grimshaw 1993, 1994), the principle of Economy of Projection (Speas 1994) or Safir's (1993) notion of structural economy, since the child would be expanding the phrase marker more than is necessary to licence elements within it. All of these principles assume that the structural description of a language string includes the minimum number of projections required.

Thus we can establish a parallel between the acquisition of phrase structure, and the construction of individual phrases and clauses in the adult grammar. According to Chomsky's minimalist program, phrase markers are expanded in a bottom-up fashion from an array of elements selected from the lexicon. One of the major differences between the child's grammar and the adult's is the amount of information contained in the lexicon. The child's expanding phrase marker reflects his/her expanding lexicon. My analysis is compatible, therefore, with the Lexical Learning Hypothesis of Clahsen and colleagues discussed in the preceding

chapter, according to which principles of universal grammar are available to the child at the onset of language development, and the learning of new lexical and morphological items and their features triggers syntactic development.

Chapter Three

The Acquisition of Relative Clauses

3.0 Introduction

This chapter focuses specifically on children's acquisition of one type of embedded construction, the relative clause, and in particular, the restrictive relative clause. Some syntactic analyses of relative clauses are outlined in §3.1. In §3.2, I focus in on the debate centering around the issue of whether children's early relative clauses are formed with or without movement. In particular, I discuss some previous studies of the acquisition of relative clauses in French, Serbo-Croatian and English (Labelle 1990, Goodluck and Stojanović 1995, Goodluck 1997), which have been argued to show support for a non-movement analysis of early relative clause formation. In contrast, I discuss arguments for a movement analysis of relative clause formation based on Modern Greek and Hebrew (Varlokosta 1997, Varlokosta and Armon-Lotem 1997). In §3.3, I present the structure of relative clauses in German, and in § 3.4, I discuss the acquisition of relative clauses in German, analyzing the spontaneous speech data of three children, Daniel²³, Martin and Marianne. I suggest that there is evidence in support of movement approach to the acquisition of relative clauses in German. A discussion of free relative clauses follows in Chapter 4.

²³ Daniel is not the same child as was discussed in the previous chapter.

3.1 Syntactic Analyses of Relative Clauses

3.1.1 The Restrictive/Non-restrictive Distinction

While languages like English clearly distinguish between restrictive and non-restrictive or appositive relative clauses, some languages make no such distinction. Fabb (1990) argues that restrictive relatives are modifiers of a host, the relationship between the restrictive relative and the host being one of predication. Non-restrictive relatives, on the other hand, are not modifiers and in fact have no syntactic relation to their antecedent. The co-indexing requirement between a non-restrictive relative clause and its antecedent holds at the level of discourse. Fabb points out that the only similarity between the two types of relative clauses is that they must have an antecedent. There are, however, a number of differences, one of which is their possible antecedents: restrictive relatives may only take nominal antecedents, whereas non-restrictive may take a projection of N, P, C, V, Adj, and Adv. The relative operator in a restrictive relative may only be a pronoun or a null element, where that of a non-restrictive relative may be a full NP. Furthermore, it is difficult to find a hierarchical location at which the non-restrictive relative can be attached since they are not c-commanded by anything in the NP, nor by the NP itself. The place of attachment is unproblematic for restrictive relatives, which are c-commanded by their antecedents. Emonds (1979) also argues for differences between restrictive and non-restrictive relatives. He follows Ross (1967) in assuming that appositive relatives are derived from clauses which are d-structure coordinate right sisters to clauses containing the modified antecedent. Emonds calls this the Main Clause Hypothesis (MCH). According to Emonds, a non-restrictive relative clause, such as that in (3) is derived from the coordinate structure in (1).

- 1) The girls couldn't even spell, and their fathers claimed they had all passed.

A rule of Parenthetical Formation then gives the following:

- 2) The girls, and their father claimed they had all passed, couldn't even spell.

A further rule of S-Attachment then gives the non-restrictive relative:

- 3) The girls, whose father claimed they had all passed, couldn't even spell.

In (2) the clause is asserted, whereas in (3) the appositive relative is presupposed.

Safir (1986), on the other hand, suggests that all relative clauses have the structure of restrictive relatives, i.e., that in (4).

- 4) $[_{NP} [_{NP} \text{a man}] [_{S'} [_{Comp} \text{who}_i] [_s \text{Bill knows } [e]_i]]]$

Safir assumes that the relation between the head 'a man' and the operator in [Spec CP] 'who' is one of coindexing. He makes a distinction between R-binding, which is binding by a relative head, and X-binding, which is binding by the contents of the relative Comp. Thus R-binding locally binds the relative pronoun (the X-binder), and for the most part non-locally binds that which the X-binder does.²⁴ The distinction between a restrictive and a non-restrictive relative is one of the level of coindexing. Safir proposes that for non-restrictive but not restrictive relatives, coindexing between a relative operator and a relative head holds at a syntactic level later than LF, namely LF'. Restrictive relatives must R-bind something in the clause that follows at LF, i.e., R-binding cannot be vacuous. Thus the reference of restrictive heads is dependent on the modifying clause. A non-restrictive head, on the other hand, has a reference

²⁴ A notable exception is the case of pied-piped relatives:

i) That picture, the owner of which Mary knows, is on sale.

The local R-bindee is the wh-word *which*, whereas the local X-bindee is the embedded clauses, which is the trace of the X-binder *pictures of which*.

independent of the modifying clause, and therefore, R-binding can be vacuous at LF.

Like Emonds, I treat non-restrictive relatives on par with parentheticals. I suggest that the distinction between restrictive and non restrictive relative clauses has to do with the point at which the clause is merged within the target phrase structure. While restrictive relative clauses are merged with their head NP or DP, at the point at which that NP or DP is formed, non-restrictive relative clauses are inserted later in the derivation, i.e., they are “spliced” into the derivation only at the time of Spell-out. Allowing fully constructed syntactic objects, such as non-restrictive relatives and parentheticals, to freely splice into the structure would result in a greater risk of having the derivation crash. I propose a general principle of Delay Splice, which has the effect of avoiding a potential crash from premature insertion of the parenthetical.

- 5) Delay Splice
 Delay the insertion of parentheticals until the point of Spell-out.

Let us consider the acquisition of relative clauses within the notion of economy discussed in the previous chapters. We have assumed thus far, that the child’s grammar is both minimal and economical. Given this syntactic economy, however, there is in principle no reason to assume that the child could not have non-restrictive relatives at the same time as restrictive, if CP is available within the child’s grammar. That is, there is no reason the child could not perform merge operations at the point of Spell-out, just as easily as at the time of construction of DP. In order to account for an apparent early acquisition of restrictive relatives as compared to non-restrictive, we might extend the notion of economy to the domain of pragmatics. That is, we assume that the child will provide only as much information

as is necessary to convey the intended meaning of the utterance. If the child's grammar is pragmatically economical, then relative clauses will be used when there is a need for clarification in identifying a specific thing or concept, rather than simply to provide supplementary information regarding that thing or concept. Hence the preponderance of restrictive relative clauses, as opposed to non-restrictives.

3.1.2 The Structure of Relative Clauses

The syntactic structure of relative clauses has been approached from a number of points of view. Chomsky (1981, 1982, 1986) proposes that the relative NP head is base-generated outside the relative clause which is adjoined to it. Relative clause formation involves wh-movement of either an overt wh-operator (6a), or a null operator (6b) into [Spec CP]. The relative operator is coindexed with the relative head under predication.

6a) $[_{NP} [_{NP} \text{the thing}_i [_{CP} \text{which}_i [_{IP} \text{he liked } t_i]]]]$

b) $[_{NP} [_{NP} \text{the thing}_i [_{CP} \text{Op}_i (\text{that}) [_{IP} \text{he liked } t_i]]]]$

More recently, Kayne (1994) suggests an analysis which is a variation on Vergnaud's (1974) head raising approach. In Kayne's theory of phrase structure, asymmetrical c-command maps onto linear precedence, which Kayne refers to as the Linear Correspondence Axiom. A major implication of Kayne's theory is that it allows for neither base generated, nor derived right adjoined structures. Thus the analysis of relative clauses discussed above, which involve right adjunction to N' or NP are ruled out. While Vergnaud argues that the relative head NP is moved from its base position inside the relative clause to a position outside the clause, Kayne proposes that the determiner of the relative head is base generated outside the relative clause and takes the relative clause CP as its complement, as is illustrated in (7a). He

assumes that UG makes the structure 'D° CP' available for relativization. In that-relatives the relative head N, which is base-generated inside the relative clause, is moved within the relative clause to [Spec CP] (7b). In *wh*-relatives, the DP *which thing* is moved to [Spec CP], and within that DP, the NP *thing* moves to the specifier (7c).

- 7a) [DP D [CP]]
 b) [DP the [CP thing_i that [IP he liked t_i]]]
 c) [DP the [CP [DP_j [NP thing_i] which t_i]] [IP he liked t_j]]

Borsley (1997) argues that Kayne's analysis of relative clauses is unsatisfactory. He points out a number of problems with Kayne's analysis, which would require the addition of special mechanisms or stipulations in order to make the theory viable.²⁵ Borsley argues that it is unlikely that independently motivated principles will be found to cover all of these stipulations.

Although nothing in the analysis of the acquisition of relative clauses in this chapter hinges on which syntactic analysis we accept, support for Kayne's analysis may be found in another type of construction found in German. In particular, I am speaking of the participial construction, which may be used as an alternative to a relative clause. In German, the determiner may be separated from its NP complement by a present or past participial, which

²⁵ Borsley (1997: 646) suggests that at least the following mechanisms are necessary:

- a. A mechanism to allow DPs with an empty D in [Spec, CP] in a relative clause but not elsewhere
- b. A mechanism to prevent overt D in a DP in [Spec, CP] in a relative clause
- c. A mechanism to ensure movement of NP within a DP or PP in [Spec, CP] in a relative clause
- d. A mechanism to allow some but not other overt phrases to appear in [Spec, CP] followed by an overt C
- e. A mechanism to ensure that all sentence constituents are moved out of VP
- f. A mechanism to prevent the stranding of a relative clause in an intermediate position
- g. A mechanism to allow some but not other cases of movement from an $\bar{A}$ -position to an A-position
- h. A mechanism to allow a relative CP but not an ordinary CP as the complement of *be* and *have*

may be preceded by an indefinite number of modifiers. Compare the following relative clause constructions with their corresponding participial constructions.

- 8) *Der Brief, der seit vielen Stunden gesucht wurde, lag unter den Büchern.*
the letter which since many hours looked-for was lay under the books
- 9) *Plötzlich sah ich ein Kind, das im Schatten eines Baumes schlafte.*
Suddenly saw I a child who in-the shade of-a tree slept
- 8') *Der seit vielen Stunden gesuchte Brief lag unter den Büchern.*
the since many hours looked-for letter lay under the books
- 9') *Plötzlich sah ich ein im Schatten eines Baumes Schlafende Kind.*
Suddenly saw I a in-the shade of-a tree sleeping child

The participial constructions in (8') and (9') also have the structure $[_{DP} D [_{CP}]]$. Kayne suggests that participial constructions in English have the structure:

- 10) the $[_{CP} \text{book}_i [C^\circ [_{IP} [e]_i \text{sent to me}]]$

in which the participial IP is embedded in a CP. These differ from the German constructions in that they cannot precede the NP they modify. The noun 'book' cannot simply raise to IP, since $[\text{Spec CP}]$ would then remain empty.

- 11) the $[_{CP} [C^\circ [_{IP} [\text{book}]_i [I^\circ [_{XP} [e]_i \text{sent to me}]]]]$

If we then moved XP to fill $[\text{Spec CP}]$, the result would be:

- 12) the $[_{CP} \text{XP}_j [C^\circ [_{IP} [\text{book}]_i [I^\circ [e]_j]]]$

which would yield the ungrammatical 'the sent to me book'. $[\text{Spec CP}]$ is filled by a phrase whose head has an overt complement. Presumably such constructions are very restricted in English. Not so in German. Participial constructions in German, therefore, involve precisely the derivation seen in (11) and (12). In fact such participial constructions must precede the NP; if they follow, they must be expressed as a relative clause. Thus, where NP raises to

[Spec IP] and the participial phrase raises to [Spec CP], we get participial constructions such as those in (8') and (9'), whereas when only the NP raises to [Spec CP], we have a relative clause construction, which must be accompanied by an overt relative pronoun.

Kayne's analysis is supported for child English in Powers and Musolino's (1997) analysis of precursor relative clause constructions. Powers and Musolino follow Hamburger (1980) in assuming that structures such as 'my did it', which have been attested in the speech production data of young children, are precursors to the relative structure 'my thing, which I did'. Hamburger proposes that these constructions have the structure:

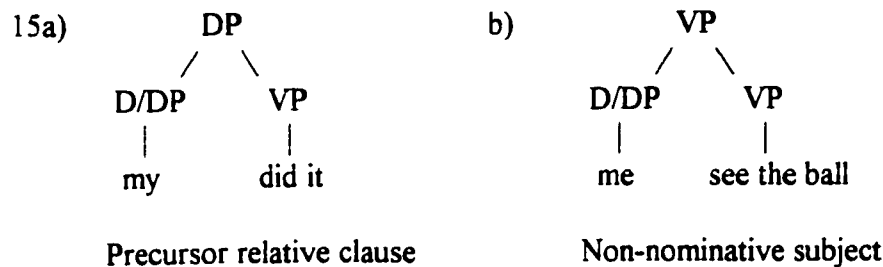
13) NP → Det VP

In Kayne's analysis, the determiner is generated independently of the head NP. Powers and Musolino argue that this is why there is no overt head in these constructions. Rather there is only the pronoun *my*, which is a determiner. The authors point out that if there is a stage in which the child's maximal verbal phrase is either IP or VP, then a relative clause at that stage will be either [D° IP] or [D° VP]. Powers and Musolino prefer the latter, since utterances with subject, either nominative ('I my did it') or non-nominative ('My me did it'), are not attested. The child's precursor relative clauses are [D° VP], a simplified child version of Kayne's relative clause structure.

14) [_{DP} my [_{VP} did it]]

In this structure, no *wh*-movement is possible, as there is no position available within the phrase marker for the *wh*-phrase to move into. As the phrase marker develops, the structure changes until it resembles that of the adult grammar. That is, [D° VP] becomes [D° CP] when the functional projection CP becomes obligatory in his/her phrase marker. Powers and

Musolino suggest that this type of analysis allows for parallels between these precursor relatives and other non-nominative subjects , as in constructions such as, ‘me see the ball’, which are attested at the same time.



These possible phrase marker types are allowed by the binary operation Merge, which concatenates two phrase markers in each application. Only one node projects giving its label to the resulting structure; if it is the DP, the result is a precursor relative structure, if VP projects, the result is a non-nominative subject.

3.2 Acquisition of Relatives Cross-linguistically

It is often noted that children’s early relative clauses may not be adult-like. The acquisition of relative clauses cross-linguistically has become a topic which has come under considerable scrutiny recently. The question of whether children’s early relative clauses are formed with or without movement is one of the issues currently under debate.

3.2.1 The Movement/Non-movement Debate

3.2.1.1 A Non-movement Analysis

A number of tendencies in children’s production of relative clauses have been taken as evidence that early relative clauses are formed without wh-movement. Among these are the overuse of resumptive pronouns and the absence of overt relative operators and pied-piping. The structure of children’s relative clauses has been examined using a number of

research techniques, including elicited production tasks and recorded spontaneous speech.

3.2.1.1.1 Elicited Production Tasks

An elicited production experiment enables the experimenter to elicit sentences corresponding to complex syntactic structures such as relative clauses, which may be infrequent in spontaneous speech production data. It forces the child to use constructions which, in spontaneous speech, the child might express using simpler constructions. Moreover, an experiment in which the context is controlled avoids the problem of attempting to interpret the child's meaning. In an elicited production experiment, Labelle (1990) studied French speaking children aged 3 to 6 years in the Ottawa region. In Labelle's study, children were shown a pair of pictures of similar persons or objects; one of which might depict, for example, a box with a girl sitting on it and the other a box with a boy sitting inside it. The child was asked to place different coloured stickers on each of the two objects. In order to elicit relative clauses, the experimenter then asked the question:

- 16) *Sur quel [X] est-ce que tu vas mettre ton collant?*
'On which [X] are you going to place your sticker?'

Labelle reports two major findings: i) that the children used resumptive pronouns and resumptive NPs where these would be ungrammatical in the adult speech (17a,b), and ii) that children avoided pied piping, which is required for indirect object (IO) and oblique (OBL) positions in French, and tended to omit prepositions. Thus children produced forms such as (18a), rather than the correct (18b).

- 17a) *Celle-la que le papa lui montre un dessin*
that one that the dad her shows a drawing
b) *Sur la balle qu'i(l) lance la balle*
on the ball that he throws the ball

- 18a) *sur la boîte que la petite fille elle embarque*
 on the box that the little girl she climbs
 b) *sur la boîte dans laquelle la petite fille embarque*
 on the box in which the little girl climbs

Labelle (1990, 1996) argues in favour of a non-movement analysis of early relative clauses, suggesting rather that the child forms predication structures through lambda abstraction. She suggests that use of resumptive pronouns is characteristic of a non-movement strategy, and notes that pied piping, which is assumed to be indicative of movement, is absent. Labelle views relative clause formation as a double process: a) construction of a semantic predicate out of a clause, and b) coindexation of this predicate with its subject of predication at LF. A predication operator is adjoined to the clause either by Wh-movement to Spec CP, or the introduction of an abstraction operator adjoined to the clause. Labelle assumes the latter. A lambda operator at the beginning of the clause causes the relative clause to be interpreted as a property and binds a variable inside the relative clause. Thus the construction in (19a) has the interpretation in (19b).

- 19a) *La balle [qu'i(l) dessine e]*
 the ball that he draws
 b) $\lambda(x)$ [ball (x)] and [he draws (x)]

The relative is a predicate and has a semantic variable resumptive pronoun or gap. Labelle (1996) argues against Guasti and Shlonsky's (1995) head raising analysis of the French data.²⁶

Such an analysis would give the following derivation for (20a):

²⁶ Guasti and Shlonsky follow Kayne's (1994) head raising analysis of relative clause formation, postulating wh-movement of a null operator. They argue that the DP which ends up in the antecedent position is base generated in the relativization site in the relative clause and moves to [Spec CP], where it is interpreted as head. Guasti and Shlonsky account for the lack of relative operators and pied-piping in Labelle's data, by suggesting that children simply do not have "linking operators" (operators which are coindexed with both an antecedent and a variable) available at this stage.

- 20a) L'homme [[avec le fils de la soeur de qui] je suis allé au collège se présente
 the man with the son of the sister of whom I went to college is running
 aux élections municipales
 for the elections municipal.
- b) [_{CP} [_{TP} je suis allé au collège avec le fils de la soeur de qui homme]]
- c) [_{CP} [avec le fils de la soeur de qui homme]_i [_{TP} je suis allé au collège t_i]]
- d) [_{CP} [homme]_k [_{CP} [avec le fils de la soeur de qui t_k]_i [_{TP} je suis allé au collège t_i]]]

Labelle argues that there is no evidence for the existence of PPs of the type *de qui homme* 'of whom man', and that the extraction in (20d) should constitute a subjacency violation.

Support for an initial stage in which children produce relative clauses without movement is also found in Goodluck and Stojanović (1996). Goodluck and Stojanović adapted Labelle's elicited production test plus an act out test, which were administered to 42 Serbo-Croatian speaking 4 to 6 year olds. Serbo-Croatian has three types of relative clauses. These are introduced by: (1) the wh-pronoun *koi*, which inflects for the position relativized; (2) the complementizer *što*, and (3) the accusative form of *koi* with the preposition *za* (*za koga*). The authors argue that *koi* and *što* relatives both permit relativization from a full range of argument positions, permit long distance relativization, and are subject to island constraints. Thus relative clauses introduced by these elements are derived by movement. On the other hand, *za koga* relatives, which occur only with a small number of verbs as matrix of the relative and are blocked from the highest subject position of the relative clause, are formed by pronominal linkage. Goodluck and Stojanović assume *za koga* is generated in the Topic position selected by the matrix verb of the relative clause, and moved to Spec CP of the relative. Pronominal linkage takes place between the trace of *za koga* and the position relativized in the embedded clause.

- 21) [_{CP} za koga_i [NP VP [_{TP} e_i [_{CP} ...]]]]

This short distance move accounts for why *za koga* relatives are disallowed in relative clauses with relativization into the highest subject, as this would result in a strong crossover violation. It would require the coindexation of a pronominal element in the highest subject position with an element (i.e., *za koga*) which has moved over it.

The results indicate that *što* relatives are the first type of relative acquired, and *za koga* is used only by older children. Relatives with missing prepositions, an index of non-movement (cf. Klein 1993), are more frequent with *što* than with *koji* relatives, as are island violations (although the difference is not large in this case). Overt resumptive pronouns are more frequent in long distance *koji* relatives than short distance *koji* relatives, and are most frequent when the relative pronoun refers to a position inside a *wh*-clause, suggesting that *koji* is a movement relative, and that the child uses resumptives to rescue a construction he/she knows is ungrammatical. Goodluck and Stojanović conclude that children begin with a grammar in which relative clauses are formed without movement, using the complementizer *što*. Movement relatives are introduced at around age 5 with the acquisition of *koji* relatives. Around age 6, children begin to acquire *za koga* relatives and subsequently *što* relatives are reanalyzed as movement constructions.

Fragman (1996) criticizes the elicited production technique as a measure of children's grammatical competence with respect to relative clause formation, suggesting that the methodology may underestimate their grammatical competence. Fragman used an elicited production task to elicit relative clauses from French speaking children and adults, noting that the technique leads children to produce errors that they might not normally produce. She suggests that the errors may be attributed more to peripheral processing limitations, than

deficiencies within their grammar. Nevertheless, if it can be shown that errors pattern in a way suggestive of non-movement, as was the case in both the Labelle and the Goodluck and Stojanović data, then this pattern must still be accounted for.

3.2.1.1.2 Relative Clauses in Spontaneous Speech Data

An analysis of spontaneous speech data may offer new insight into the controversial movement/non-movement issue. Speech production data may provide further evidence for an early stage of relativization without movement. If we assume, as Chomsky (1986, 50) does, that “the language learner assumes that there is syntactic movement only where there is overt evidence for it”, then one might expect subject relatives and *wh*-questions, in which there is no overt evidence of movement, to appear in the child’s grammar before object relatives and *wh*-questions. This does not appear to be the case, however. On the basis of spontaneous speech production data, it has been observed that children tend to acquire object relative clauses before subject relatives (Limber 1973, Goodluck 1997). Limber studied longitudinal spontaneous speech data of a number of English speaking children in the Boston area between the ages of 1;6 and 3, considering relative clauses as part of the overall acquisition of *wh*-constructions. He notes a curious gap in the distribution of relative clauses during this time frame, namely, an absence of subject relatives and relative clauses attached to subject NPs. Children appear not to apply syntactic operations to any subject NPs, which rules out the production of subject relatives as well as object relatives attached to subject NPs.

Goodluck (1997), who noticed a similar tendency in the child Adam (CHILDES data base) provides a syntactic explanation for the apparent lack of early subject relatives. The

observation that object relatives appear before subject, coupled with the claim that children's early relative clauses are formed without movement may find an explanation in McCloskey's (1990) analysis of relative clauses and resumptive pronouns in Irish. McCloskey notes that resumptive pronouns may occur in object position, or embedded subject positions, but are banned from the highest subject position. This restriction, which McCloskey refers to as the Highest Subject Restriction (HSR), "bars the appearance of resumptive pronouns in relative clauses in the subject position immediately subjacent to the head." (McCloskey 1990, 214) Relatives with an agreeing (wh-) COMP, however, are not subject to this restriction.

- 22) **an fear a raibh sé breoite*
 the man that was he ill
 'the man that (he) was ill'

McCloskey claims that, unlike wh-movement, binding of resumptive pronouns is not constrained by subjacency or the ECP. Thus where application of wh-movement is blocked by subjacency or the ECP, the construction may surface as a resumptive pronoun structure, although resumptive pronouns may also surface in cases where wh-movement is also free to apply.

The restriction barring resumptive pronouns from the highest subject position has to do with syntactic distance. Structures in which a pronoun is too close to its antecedent will result in ungrammaticality. Thus resumptive pronouns are permitted in direct object, prepositional object and possessor position within a NP, since these are separated from their antecedent by the intervention of at least one maximal projection boundary, VP, PP, and NP respectively. The fact that resumptive pronouns are permitted in embedded subject positions, also suggests that syntactic distance plays a role in the HSR.

- 23) *an fear ar dhuirt mé go dtiocfadh sé*
the man that said I COMP would-come he
'the man that I said (he) would come'

What are the implications of the HSR for the acquisition of relative clauses? If children initially construe relative clauses as pronominal binding (of an overt pronoun in the case of resumptives, or a null pronoun) rather than movement, and this binding may be barred from the subject position immediately subjacent to the head because the pronoun is too close to its antecedent (i.e., there is no intervening maximal projection boundary), then we have an explanation for the apparent lack of relative clauses in which the subject position is relativized. The child avoids relative clauses in a position which would violate principles of their grammar at that stage.

3.2.1.2 A Movement Analysis

The proposal that children's early relative clauses are initially formed without movement is not uncontroversial. Pérez-Leroux (1995) elicited relative clauses from English speaking children aged 3;5 to 5;5, as well as Spanish speaking children aged 3;5 to 6;8. She found that both the English and Spanish children produced relatives with resumptive pronouns. Pérez-Leroux suggests that resumptives in child language are universal. Young children are seen to follow a true resumptive strategy in which resumptives receive a bound variable interpretation and alternate freely with gaps, rather than an intrusive resumptive pattern in which resumptives are interpreted referentially and are restricted to extractions from islands or inaccessible positions.²⁷ Pérez-Leroux argues for a movement analysis, in

²⁷ The use of resumptives by English children in Pérez-Leroux's study may have been a consequence of the elicitation task, as there is little support for the use of resumptives by English children from spontaneous speech data. Their absence, however, may also be an accident of recording.

which the element in the extraction position is not a trace, but an empty category not specified for the feature [+variable].

Varlokosta (1997) challenges not only Labelle's and Guasti and Shlonsky's analyses, but also Pérez-Leroux's argument that a true resumptive strategy is used cross-linguistically. Like Labelle, she found an absence of relative operators in Greek, noting that children tended to use the complementizer *pu* instead. However, she does not interpret this to indicate a lack of wh-movement, as a control group of 10 adults also produced relative clauses of various sites with complementizers but not relative operators. Based on the Greek data, Varlokosta argues that clitics found in children's relative clauses are not resumptives, rather they are cases of clitic doubling, a very productive process at this stage of child Greek. If they were resumptive pronouns, she argues, one would expect the proportion of clitics in locative/oblique cases would be as high as that in direct and indirect object cases.²⁸ She argues that interpreting these are resumptives would constitute a learnability problem. Children would correctly produce a high proportion of clitics in indirect object relatives, and would interpret them as resumptives. Later they would reduce this proportion for no apparent reason, only to figure out later that resumptive clitics must appear in indirect object relatives. Varlokosta and Armon-Lotem (1997) argue that in Hebrew, which they suggest is a true resumptive pronoun language²⁹, children use resumptive pronouns from the start in indirect

²⁸ This does not necessarily follow. There are languages in which resumptives are optional in direct object/indirect object positions, but obligatory in oblique positions.

²⁹ Shlonsky (1992) notes that in Hebrew pronouns and gaps vary freely in direct object and embedded subject positions, resumptives are obligatory in oblique object positions, but may not appear in the highest subject position of the relative clause. Shlonsky argues, however, that the full distributional paradigm of resumptive pronouns can be assimilated to a "last resort" strategy.

object and locative/oblique dependencies, and do not reanalyze them later. They argue that the pattern of resumptive pronouns and resumptive NPs found in the Greek child data is not an indication of lack of movement, but a ‘salvaging mechanism’, whereby young children salvage structures which will result in a violation of UG principles.

It should be noted, that elsewhere in the literature (cf. Klein 1993 and references therein) it has been argued that in Greek, complementizer introduced *pu* relatives are non-movement in the adult grammar. If this is the case, it casts doubt on the use of such relatives as evidence for a movement analysis. The movement/non-movement issue will be taken into consideration in the analysis of the acquisition of relative clauses in German.

3.3 The Structure of Relative Clauses in German

Relative clauses in Standard High German have the structure of dependent clauses in general, i.e., they are introduced by an element in CP, and have verb final word order. In the orthography, they are always set apart from main clauses by commas. Relative clauses are of two types: those introduced by an inflected d-relative pronoun and those introduced by a w-relative pronoun. In headed relative clauses, the d-pronoun is generally preferred.³⁰ (Some exceptions are discussed below.) The d-pronouns corresponding to *who*, *which* and *that* are identical to the definite article *der*, *die*, *das* and plural *die*, with the exception of the Dative plural and the Genitive forms.

³⁰ The analysis presented here reflects a prescriptive description of German relative clauses, not necessarily colloquial usage. More will be said about patterns of colloquial usage in §3.4.3.2, particularly with respect to the use of w- and d-pronouns.

24)		Masc.	Fem.	Neut.	Plural	
	Nom	der	die	das	die	(who, which, that)
	Acc	den	die	das	die	(whom, which, that)
	Dat	dem	der	dem	denen	(to/for whom, which)
	Gen	dessen	deren	dessen	deren	(whose, of which)

Gender and number are determined by the antecedent and Case is determined by use in the clause. If the relative clause is object of a preposition, the preposition always precedes the relative pronoun, that is, it is pied-piped.

- 25a) ... *die Frau, mit der ich arbeite*
the lady, with whom I work
b) *...*die Frau, der ich arbeite mit*

The w-pronouns, *was/wer* 'what/who' correspond to interrogative pronouns and have fewer morphological distinctions than d-pronouns. The relative pronoun *wo* 'where' remains constant. Free relatives are almost always introduced by w-pronouns; a d-pronoun may only be used when the reference of the free relative clause is specific.

26)		Masc.	Neut.
	Nom	wer	was
	Acc	wen	was
	Dat	wem	-
	Gen	wessen	wessen

Wer used as a relative pronoun expresses 'he who' or 'whoever'.

- 27) *Wer nicht warten will, darf gehen*
whoever not wait wants, may go
'Whoever does not want to wait, may go'

In headed relatives the w-pronoun *was* follows antecedents such as *das* 'that', *etwas* 'something', *nichts* 'nothing', *viel* 'much, many', *wenig* 'few' and *alles* 'everything'.

- 28a) *Alles, was er gesagt hat, ist falsch*
everything what he said has is wrong
'Everything that he said is wrong.'

- b) *Gibt es noch etwas, was Sie brauchen?*
gives it still something what you need
'Is there something else that you need?'

Was is also used after an adjectival noun, or when the antecedent is a clause.

- 29) *Das ist das Beste, was wir haben*
that is the best what we have
'That is the best we have.'
- 30) *Rita hat sich verlobt, was ich nicht verstehen kann*
Rita has refl engaged what I not understand can
'Rita has gotten engaged, which I cannot understand.'

3.4 The Acquisition of Relative Clauses in German

3.4.1 A Previous Spontaneous Speech Study

In a study of embedded clauses using spontaneous speech production data of eight monolingual German children, Rothweiler (1993) notes that relative clauses are relatively late acquired, later than complement and adverbial clauses and are less frequent.³¹ A similar tendency is noted in the spontaneous speech data from the two children discussed in Chapter 2, whose monthly recordings between the ages of 2;9 and 3;6, revealed only one relative clause, while there is evidence for other types of embedded clauses. That relative clauses are acquired later than complement and adverbial clauses is also reported for English (Bowerman 1979, Limber 1973) and Hebrew (Kaplan 1983). Rothweiler's explanation is that relative clauses are more complex in that they require an introducing relative particle which agrees in Number and Gender with a matrix element and which requires Case marking. Bowerman and Kaplan's account follows an accessibility hypothesis, that structures which are less

³¹ As noted earlier, in the four children studied by d'Avis and Gretsch (1994), for two of the children relative clauses were acquired at the same time as adverbial and complement clauses. Relative clauses are reported earlier in the speech of the child Valle. These will be discussed further in §3.4.2.2.

complex in terms of embedding emerge first. Complement clauses are selected by the verb and require one layer of embedding; adverbial clauses are generally not selected, and also require only one layer of embedding; relative clauses are also not selected, but require a further layer of embedding. That is to say that, while complement clauses have the structure, $V[CP]$, relative clauses are CPs embedded within an NP, thus a relative clause modifying the object would have the structure $V NP[CP]$, or $V D[CP]$, following Kayne's analysis.

Rothweiler notes a preference for *w*-pronouns, in which there is no Number and Gender marking and not many Case distinctions, and *wo* 'where' is preferred in a relative clause in which a preposition + *d*-relative pronoun is stylistically better in the adult grammar.

- 31) *gib mir den stift wo rot oben ist* (= *an dem rot oben ist*)
 give me the pencil where red on-top is
 'Give me the pencil which has red on top'

Such 'where' relatives are also found in the French data of Labelle, and the Serbo-Croatian data of Goodluck and Stojanović. More will be said about *wo*-relatives in §3.4.3.2.

Rothweiler makes a number of generalizations based on the collective data from 8 children aged 2;09 to 5;06. She does not consider specifically the progression of acquisition of various types of relatives (roughly translated from Rothweiler 1993, 139).

- 32) 1. Relative clauses are acquired later than complement and adverbial embedded clauses and are less frequent.
 2. Errors in relative clauses are no more frequent than in other types of embedded clauses.
 3. The sequence matrix clause < embedded clause is clearly dominant.
 4. The relative phrase in the embedded clause has the function subject, direct object, or locality or instrumental adverbial. There are no Dative or Genitive relatives.
 5. Children have no trouble with coreference between the referent element and the relative pronoun; there are almost no number or gender errors.
 6. Children are able to handle complex morphological marking and know the importance of marking Case through their choice of relative pronoun. They make few errors in

this respect.

7. Free relative clauses are late acquired because of their complex derivation³².

3.4.2 Analysis of Spontaneous Relative Clauses

In this section, I examine the spontaneous speech data of three monolingual German speaking children, Daniel, Martin and Marianne, who are included among the eight children in Rothweiler's study. The data from the child Daniel consists of three bi-monthly recordings each 120 minutes in length, covering a period of 6 months (3;02 - 3;06); the data from the child Marianne consist of twelve recordings, 60 to 155 minutes in length, covering a period of 9 months (3;03 - 3;10), and the data from Martin is comprised of nine files, 60 to 120 minutes long, covering a period of 11 months.³³ These data were made available to me by M. Rothweiler. A glance at the relative clauses produced by these children has revealed some evidence of a similar pattern in German as was reported by Limber (1973) and Goodluck (1997) for English children, i.e., that object relatives (particularly with the object *w*-pronoun, *was*), along with *wo* 'where' relatives tend to appear before subject relatives and are preferred. The distribution of relative clauses is shown in Table 5.

³² This is not necessarily true for English. In the data from the child Adam (Goodluck 1997), free relatives are fairly early acquired.

³³ The MLU for each of these children is given in Appendix 1.

	W-pronouns					D-pronouns		
DA	Object	Subject	Wo	Womit	Other	Object	Subject	Other
3;02								
3;04	2			1				
3;06								
MT								
2;09	3*				1			
2;10	3		1				2	
2;11	1	2	5					
3;01	1		3					
3;02			1					
3;03			2				1	
3;04	2	1	2	1				
3;04								
3;08	1						1	
MA								
3;03						1 e=die		
3;03								
3;04			1					
3;04								
3;05			1					
3;05							1 e=der	
3;06								
3;07								
3;07								1
3;08								
3;09								
3;10							1	

Table 5 Distribution of Relative Clauses

The data for Daniel cover a relatively short time period. However, during this time we note that Daniel produces two object w-pronouns, but no object d-pronouns and no subject relatives of either sort. The child Martin produces by far the highest number of relative clauses during the time period covered. While his w-pronouns are object first, at 2;10 he produces two subject d-pronouns of the type in (33), which are not clearly headed relatives.

- 33) Adult: *Für die Good-Night-Tante? Tante Nächla?*
 MT: *hm* - Adult: *un hierdat?*
 MT: *die immer mir bonbons gibt.*³⁴
 Adult: For the Good-Night-Aunt? Aunt Nächla?
 MT: *hm* - Adult: and here this?
 MT: who always me candies gives

Martin does not produce any object d-pronouns. However, of the 3 object w-pronouns produced at 2;09, one should have been a d-pronoun, for which Martin has substituted *was*.

- 34) *un wat is hiedat hier?* - Adult: *en turm? - enäh en treppe wat is baue (= die ich baue)*
 and what is here-this here? a tower? no a staircase what I build

'What'-relatives have also been observed with some frequency in the data from English speaking children (Cook 1979, Flynn and Lust 1980). Flynn and Lust found that in a repetition task given to children aged 3;06 to 7;07, the relative pronoun 'which' was often replaced by 'what'. For example, a sentence such as 'Ernie touches the balloon which Big Bird throws' might be replaced by 'Ernie touches the thing what Big Bird throws.'

Marianne produces one object d-pronoun in the first recording at 3;03, and her first subject relative at 3;05 and again one at 3;10. Aside from the relative pronoun *wo*, Marianne's early relative clauses until 3;07 are mostly introduced by an undifferentiated filler syllable or

³⁴ While Martin does not actually produce the relative head, it is clear that he is referring to the adult's previous mention of the aunt.

dummy place holder (*e* = *die*, *der*). Aside from her *wo* relatives then, Marianne's relative clauses resemble the precursor structures discussed in Chapter 2.

The data show an early preference for the uninflected *w*-pronouns in general (in particular, object relatives and *wo*-relatives). However, of the relatives introduced by a *d*-pronoun, we see more subject relative clauses.

3.4.2.1 A Comparison with Adult Data

In order to determine whether input was a factor in the types of relatives produced by the children, and when each type appears, I compared the child data with that of their adult interlocutors. The results are shown in Table 6.

	W-pronouns					D-pronouns		
DA	Object	Subject	Wo	Womit	Other	Object	Subject	IO+prep
3;02	3		2					
3;04						1		
3;06	1		2				1	
MT								
2;09			1			1	1	1
2;10							2	
2;11						1		
3;01	1							
3;02	1							
3;03								
3;04	1		2					
3;04		1		1				
3;08	1						1	
MA								
3;03	6							
3;03	1		1					
3;04	1							
3;04	3							
3;05						3		
3;05	1							
3;06	2		1				1	
3;07							2	
3;07	1		2			1		
3;08			2				1	

Table 6 Adult Relative Clauses

Of the headed relatives produced by the adult speakers, w-pronouns were far more common than d-pronouns, and those were almost exclusively object relatives. With respect

to the use of the d-pronouns, subject and object relatives occur with more or less equal frequency (9 and 7 respectively). The tendency toward the uninflected object w-pronouns, which was slight for the children, is in fact more pronounced in the adult data. This is particularly evident in the adult interactions with the child Marianne, although Marianne herself produces no such relatives. Marianne's relative clauses are sporadic throughout the data and, aside from the relative pronoun *wo*, she produces no well-formed relative pronouns until late in the recordings (3;07).

Data for the adult interaction with the child Martin are more varied, with 3 subject d-pronouns being produced in the first two recordings, 1 object d-pronoun, and several object w-pronouns in the later recordings. Aside from numerous *wo* pronouns, however, Martin's relative clauses are predominantly object *was* (realized as *wat* in his dialect).

As was also noted in the child data, there were numerous occurrences of *wo*-relatives, some of which might also have been expressed as a preposition + d-pronoun. In a recording of Marianne at 3;08, the adult uses *wo* in (35), where she might just as well have used a d-pronoun and pied-piped preposition.

35a) *Oder 'n Wasser mal 'n, wo das Schiff drauf fahr 'n kann*
 or a water draw, where the ship thereon ride can

The preponderance of w-introducers, *was* and *wo*, shows a tendency toward the uninflected forms in both the child and the adult data. It may be that there is a general trend towards the less inflected *wo/was* relative markers, even in the adult grammar. On the basis of the analysis of adult relative clauses in these recordings, however, there is no way we can determine this. This would require a comprehensive study of the use of relative clauses by adults in various

situational contexts. Such a study goes beyond the scope of this thesis. For our purposes here, suffice it to say that in many respects, the adult data do not differ significantly from the child pattern. Thus we cannot rule out the possibility of influence from the input on acquisition.

3.4.3 Discussion

Daniel, Martin and Marianne produce few errors in their early relative constructions. Their relative clauses have an adult-like structure from the outset, being introduced by a relative pronoun, and having the finite verb in final position.

3.4.3.1 Movement or Non-movement?

Recall that Labelle (1990) argued that French children use both a gap strategy and a resumptive strategy in the formation of relative clauses. The French children produced no relative operators, using instead the complementizer *que*, nor did they produce pied-piped relatives in indirect and oblique positions, where these are obligatory in the adult language. On this basis, Labelle argued that there is no movement in the case of the resumptive strategy, but that these relatives are formed by a rule of predication which coindexes the clause with the antecedent. Similarly, in the case of the gap strategy, the empty element in the gap is coindexed with the antecedent.

We find a different pattern in the German spontaneous speech data. German does not have that-relatives or contact relatives, rather relative clauses in German are always introduced by a relative pronoun. Even in the earliest relative clauses produced by the three children studied here, these relative pronouns are almost never omitted. Daniel and Martin produce no unIntroduced relative clauses, and Marianne produces only one at 3;05. Resumptive pronouns do not appear in the data from these children, instead the children

overwhelmingly follow a gap strategy in all relativization sites, as in the adult grammar. This may be construed as an indication of movement. Furthermore, although they are rare, pied-piped relatives do exist in the data where appropriate.³⁵ Daniel and Martin both produce one pied piped relative clause with the relative pronoun *womit* 'with which', which may be a further indication of movement.

36) *das is so ein päckträger, womit die autos nich -* (DA 3;04)
that is so a package carrier, with which the cars not -

37) *de soldaten haben wat womit mer de gewehrs mit ganz macht* (MT 3;04)
the soldiers have something with which one the guns with whole make

One might argue that these represent in fact an unanalyzed form, however, there is one further instance of pied-piping in the data from Marianne. She produces one relative clause with *mit der* (= mit dem) 'with which'.

38) *wo's er mit der ma wasser reinschütten kan?* (MA 3;07)
where's it with which one water in-pour can
'where's the thing with which one can pour water in'

We see that the German relatives do not resemble those of Labelle's French children. Bear in mind, however, that we are comparing two different types of data, spontaneous speech data versus elicited production data. More will be said on the issue of experimental data in Chapter 5. The English speech production data of the child Adam (Goodluck 1997) reveal a pattern similar to that of the German children, in that relative clauses are well-formed

³⁵ Although the absence of pied piped constructions is offered as evidence supporting a non-movement analysis, as in Labelle's French data, Goodluck and Stojanović (1996) argue that this is not necessarily indicative of lack of movement.

and adult-like from the start.³⁶ As was reported for the English data, however, Adam shows an early preference for relative clauses in which the object is relativized, subject relatives showing up later in his grammar. Object relatives are also slightly more dominant in the German data, though there were also early instances of subject relatives, particularly with the less frequent d-pronouns. Furthermore, the preference for object relatives was also characteristic of the adult speech.

3.4.3.2 The Use of *wo*-relatives

There is one prominent type of relative construction in the data that warrants further scrutiny, namely the *wo*-relatives. Both the child and adult data show a preponderance of relative clauses introduced by the less inflected forms. In particular, the children show an early preference for the use of *wo* to introduce a relative clause (36% of children's total relatives produced, and 24% for the adults). Thus far I have treated the *wo* introducer in High German, which I have translated as 'where'-relatives, on par with the *w*-pronouns, i.e., involving *wh*-movement to [Spec CP]. The question now is whether this is in fact the case, or whether *wo* is a relative marker occupying the C-position, as is argued for certain dialects of German, particularly Swiss German and Bavarian. Van Riemsdijk (1989) notes that in Swiss German,

³⁶ In the Adam data, there are a number of constructions which might be construed as contact subject relatives. An example of such a contact relative in English is given in (i).

(i) The man gave me the book left.

Although awkward-sounding to some speakers of English, they are quite acceptable in certain situations, perhaps more so in some varieties of the language than others. German does not have contact relatives, relative clauses always being introduced by a relative pronoun. Moreover, in German, relative clauses, unlike main clauses, have verb-final word order. Therefore, even should they occur without the relative pronoun, they would be recognizable as subordinate clauses. Thus in order to argue for the possible occurrence of such contact relatives in the German data, one would have to assume that the child has made two errors, i.e., s/he has omitted the relative pronoun, and used the wrong word order for the relative clause. The issue of potential contact relatives in German is left for future consideration.

relative clauses are introduced by the invariant relative marker *wo*; Swiss German does not have relative pronouns. The position relativized is usually occupied by a resumptive pronoun.

- 39) *de vrÜnd wo ich immer mit em gang go suuffe*
the friend that I always with him go (to) drink

That the relative particle *wo* is in C and not [Spec CP], is perhaps more evident from its use in Bavarian, where it may in fact be preceded by a relative pronoun.

- 40) *Der Mo, den wo i gseng hob, ...*
the man who that I seen have

In (40) the relative pronoun, *den*, is in [Spec CP] and the relative particle, *wo*, is in C. Van Riemsdijk argues that there is no movement in the formation Swiss German relative clauses. Either C=*wo* has no specifier, or its specifier is incapable of containing wh-phrases. He argues that this is plausible, given that the complementizer *wo* is homophonous with the locative wh-word. Van Riemsdijk suggests the possibility that “*wo* has absorbed the morphological wh-features of its specifier.” (Van Riemsdijk 1989: 352)

Consider now the use of *wo*-relatives in High German. The early use of *wo* to introduce relative clauses is also documented in d’Avis and Gretsche (1994). The child Valle, for whom it was noted that relatives appear before adverbial and complement clauses, produces two early *wo*-relatives.

- 41) *dæs is ein dal (=Stall) wo man drauf sitzen kann* Valle 1;11.25
this is a barn on which one thereon sit can
‘this is a barn on which one can sit’
- 42) talking about the barn
wo so die kühe rein können\ wo die kühe rein können Valle1;11.25
where so the cows in can where the cows in can
‘where the cows can go in like this’

D'Avis and Gretsche note Valle produces three such early relatives introduced by the relative particle *wo* at a time when actual relative pronouns are still nonexistent. Early relative clauses reported for the other children in their study are also of this type.

- 40) *honig rauszulecken\ ha wo dem bienen gehört* (Benny 4;04.30)
 honey out-to-lick PRT where to-the bees belongs
 'to lick out the honey that belongs to the bees'

As was noted earlier, *wo*-relatives are also quite productive in the speech of Martin, and in the case of Marianne, these are the only instances of well-formed relatives. Her relative pronoun introduced relatives are mainly precursor structures introduced by an undifferentiated filler syllable. These High German *wo*-relatives sometimes have a locative reading (63%), but also are used where a *d*- or *w*-relative pronoun or a *d*-pronoun + preposition might have been more appropriate. Resumptive pronouns are not found in the High German data.

Goodluck and Stojanović (1996) also found many 'where'-relatives in their elicited production data. However, in their experimental task, they presented the child with two pictures. A 'where'-relative response in referring to one picture or the other (for example, 'the one where') might have been more appropriate in this context. This is not the case in the natural speech data, in which case 'where' is not used to pick out one object over another.

If the High German *wo*-relatives are in fact non-movement relatives, as they are in Swiss German, we may in fact have some evidence in support of a non-movement strategy in the formation of early relative clauses. These *wo*-relatives are often the earliest relatives children produce, as was the case with three of the children in d'Avis and Gretsche's study³⁷, and are quite prevalent in the speech of at least one of the children (Martin) in the present

³⁷ No examples of early relative clauses are given for the fourth child in their study.

study. The question remains, however, as to how the child would associate non-movement with *wo*. If the child initially followed a non-movement strategy, s/he might simply use the same lexical items as adults, but interpret them as non-movement.

One possibility is the child treats *wo*-relatives on par with those in the Swiss dialect or that-relatives in English, and that actual relative pronouns have not yet been identified. There are, however, a number of noteworthy differences between the Standard High German *wo*-relatives and those used in Swiss and Bavarian German. *Wo*-relatives in the Standard High German data generally have a locative reading, indicating that a locative adjunct position has been relativized, which would indicate wh-movement to [Spec CP], rather than a particle in C. Unlike in the Swiss and Bavarian dialects, there are no resumptive pronouns in the Standard High German data. Furthermore, unlike Bavarian, we never find a relative pronoun + *wo*, neither for the children, nor for the adults in the present study. *Wo*-relatives were also common in the adult data; 24% of the relative clauses produced by the adults were *wo*-relatives. Again we see that children's relative clauses resemble those of adults. Therefore, unless there is evidence to suggest that in the adult grammar *wo*-relatives are non-movement relatives, which is not at all clear at this point, there is no reason to assume that this is the case for the children.

How then do we account for the early appearance of *wo*-relatives in the child data? We may find an explanation in the fact that the *wo* marker is an uninflected form, unlike the *d*-relative pronouns, and thus requires less feature specification. Thus like the less inflected *w*-relative pronouns, *wo* is identified early as an introducer of relative clauses.

3.4.4 A Pragmatic Approach

Limber (1973, 1976) suggests pragmatic considerations may suffice to explain the lack of subject relatives, or indeed the lack of complex sentences in which syntactic operations involve the subject NP of either the matrix or embedded clause. He suggests that “extensive use of names, pronouns or demonstratives in a given environment very much reduces the possibilities of observing a relative or complement clause in that environment.” (Limber 1976: 313) If we see a higher proportion of names or pronouns (i.e., non-expandable NPs) in subject NPs than in object NPs, this would be compatible with a pragmatic explanation of the distribution of relative clauses in children’s speech. This accounts for the lack of relatives modifying the subject, but what of the lack of relatives in which the subject has been relativized? Limber (1973) notes that the vast majority of object NPs carry more information and are less predictable than the constrained and predictable subject NPs. Thus one does not expect to see many subject relatives on object NPs, since this would require the matrix and constituent NP be coreferential. Limber suggests that “there is a greater chance of finding an appropriate coreferential NP in another object NP than among the predominately name and pronoun subject NPs.” (Limber 1973, 184)

Although Goodluck (1997) recognizes the potential appeal of a pragmatic explanation, she does not find Limber’s account convincing. It assumes that the distribution of NPs in main and subordinate clauses will be the same. However, relatives may by their nature favour different structures (e.g., predicate adjective structures) in which the subject is not more likely to be animate, for example. Thus Goodluck questions whether a strategy whereby relative clauses are formed by combining two canonical forms can be supported.

Limber may have been influenced by early transformational accounts in which a full NP was present at Deep-structure in the relativization site. Goodluck pursues instead an alternative pragmatic account, which focuses on the different roles of the adult and child communication process, whereby the adult interlocutor is a provider of information about the world and the child is the recipient. "If relativization of the subject is used characteristically to define and describe the head of the relative, then the absence of subject relatives in early child speech could reflect these different roles." (Goodluck 1997)

Goodluck considered whether the relative clauses the child Adam produced were descriptive/definitional as opposed to eventive. Relatives were classed as descriptive/definitional if they expressed a characteristic, or characteristic activity of the head, such as 'animals that perform', or 'the kind that you eat'. They were classed as eventive if they described a single event, such as 'the lion we saw'. Under this account, we should see a predominant use of descriptive subject relatives used by the adults in the early recordings, and little or no evidence of such relatives in the child data. This was not, however, what Goodluck found. Adam produced roughly the same proportion of descriptive relatives where the subject is relativized (69%) and where the object is relativized (46%) as was found in the adult data.

I examined the data files of the children Daniel, Martin and Marianne in terms of Goodluck's pragmatic explanation. The results are shown in Table 7.

	Descriptive/Definitional			Eventive		
DA	Subject	Object	Obj. of Prep.	Subject	Object	Obj. of Prep.
3:02						
3:04			1		2	
3:06						
MT						
2:09			1		3	
2:10	2	3				
2:11	1			1	1	
3:01					2	
3:02						
3:03	1					
3:04			1	1	3	
3:04						
3:08	1				1	
MA						
3:03					1	
3:03						
3:04						
3:04						
3:05						
3:05				1		
3:06						
3:07						
3:07			1			
3:08						
3:09						
3:10	1					

Table 7 Descriptive vs Eventive Relative Clauses

Daniel produces no descriptive subject relatives and Marianne produces only one in the final recording at 3;10. This follows the prediction of Goodluck's pragmatic account. However, we see a different pattern with the child Martin. In the majority of Martin's descriptive/definitional relative clauses the position relativized is a subject. His eventive relatives are primarily object relatives. Thus his relative clauses more closely resemble those of the English child, Adam, whose use of descriptive and eventive relatives did not clearly support the pragmatic account.

3.4.5 A Syntactic Account

It was suggested earlier that relative clauses are late acquired as compared to other dependent clauses. The explanation given was one of accessibility; relative clauses require a further layer of embedding than complement or adverbial clauses. Penner (1995), however, reports that for Swiss German relative clauses emerge first, and complement clauses appear last. This seems to be a striking contrast. As Armon-Lotem (1996) points out, however, the difference is one of emergence versus stabilization. Penner focusses on the emergence of embedded clauses, whereas Bowerman (1979) and Kaplan (1983) focus on stabilization (i.e., when the constructions are used in 90% of the relevant contexts). Armon-Lotem argues that the order reported for the Swiss German is in fact the order of emergence in Hebrew. She summarizes the findings from the longitudinal data of six children. Though there are individual differences, the children all start with relative clauses, whereas adverbial and complement clauses show up somewhat later.

Penner argues that relative clauses are adjuncts, and thus require less knowledge about the nature of C. Complement clauses, on the other hand, require a more precise specification

of C features, reflecting, for example, the subcategorization properties of the selecting verb. Armon-Lotem notes that in Hebrew, relative clauses are always [+Finite], whereas complement clauses may be either [+Finite] for a verb like 'say', [-Finite] for a verb like 'try', or both for a verb like 'want'. Moreover, whereas relative clauses are always [-wh], complement clauses may be [+wh] for a verb such as 'ask', [-wh] for a verb such as 'tell', or both for a verb such as 'know'. These C features are gradually identified. Armon-Lotem suggests that the identification of one feature of C is enough to make it accessible, however, it is the assignment of values to features which make it visible at PF, thereby requiring C to be lexically filled. In English, [-finite] complements emerge before tensed complements. Vainikka and Roeper (1995) note there is a fixed point before which complementizers are not used and wh-movement is not productive; constructions associated with CP are not used. They suggest, however, that once CP is available in the grammar, abstract operators block extraction for the child as they do for the adult. These operator chains are available before the relevant lexical items are used, so that, for example embedded questions may initially appear without a wh-word.

It would appear that C is accessible to the three children, Daniel, Martin and Marianne, given that some of its features have been identified, however, it is not necessarily the case that all the lexical elements which may occupy this position have been acquired. This is particularly evident in the case of Marianne, whose early relative clauses are generally introduced by undifferentiated filler syllables, and may be considered precursor structures.

3.5 Concluding Remarks

In this chapter, I have investigated whether there is evidence to assume a non-

movement analysis of the acquisition of relative clauses by German children. From the time they appear in the grammar, children's relative clauses resemble those in the adult grammar. Relative clauses have been argued to be late acquired in German, which is not surprising if relative clauses are full-fledged CPs their formation involves movement from the start. Movement of a relative operator to [Spec CP] satisfies the PF ban on fully specified empty functional categories. While it was noted that there was a slight tendency toward object relatives, as in the English data of the child, Adam, in Goodluck's study, examination of adult relative clauses in German also revealed a preference for object (and *wo* 'where') relatives. Therefore, we cannot rule out the possibility of influence from the input. The English data did not clearly indicate an effect of adult speech.

If we accept Kayne's analysis of the structure of relative clauses, we have a potential explanation for apparent difference in the order of acquisition of relative clauses as compared to that of other subordinate clauses in Swiss German, as opposed to High German. Recall that Penner (1995) argues that in Swiss German, relative clauses emerge before complement clauses, which he attributes to the amount of knowledge the child would require about the nature of C. I noted earlier, that in Swiss German, relative clauses are introduced by the invariant particle *wo* in C. On the surface then, they are similar then to English that-relatives. According to Kayne's analysis, that-relatives involve a derivation with fewer steps than wh-relatives, which should make them easier to acquire. Support for Kayne's analysis is found in McDaniel, McKee and Bernstein's (1998) study of children's production and judgement of relative clauses in English. The authors report that only 3% (6%, if the genitive whose-relatives are included) of the total relative clauses produced by children and adults in their

study were formed with “which” and “who”, children and adults alike preferring that-relatives. Recall that that-relatives were also reported to be preferred in the experimental studies of French (Labelle 1990, 1996), Greek (Varlokosta 1997) and Serbo-Croatian (Goodluck and Stojanović 1996). If we accept Kayne’s analysis, these experimental results support the notion that derivational complexity affects language production and acquisition. McDaniel et al. suggest that “speakers use such a distinction to decide among grammatically acceptable alternatives in language production.” (McDaniel et al. 1998: 331)

Note, however, that while children in the experimental studies of English, French, Greek and Serbo-Croatian showed a preference for that-relatives as compared to wh-relatives, these children are generally older than those in the spontaneous speech data. Therefore, we do not have a clear indication of the order of emergence. That-relatives, however, also appear early in English spontaneous speech data of Goodluck (1997)³⁸ and Limber (1976). Bavarian, which has both the Swiss-like *wo*-relative particles and wh-moved relatives pronouns, might provide an interesting comparison as to order of emergence.

Swiss German relatives may also be acquired earlier for independent reasons. According to van Reimsdijk (1989), Swiss German relatives are formed without wh-movement. Recall that it was argued for French, Serbo-Croatian and English, that there may be a stage in the grammar in which children form relative clauses without movement. This might provide an explanation for the early acquisition of relative clauses in Swiss German.

³⁸ Goodluck (p.c.) points out that it is not entirely clear that that-relatives appear earlier than wh-relatives in child English. If wh-relatives are confined to who-subject relatives (for adults and children in the Adam data), the later emergence of wh-relatives could simply be an artifact of the lesser number of subject relatives

There is no direct support, however, for an early non-movement approach to the acquisition of relative clauses in the German empirical data presented here.

Chapter Four

Questions, Complements and Free Relatives

4.0 Introduction

In Chapter 3 I reported a slight trend towards an early preference for object relatives using the uninflected *w*-pronouns in the data from Daniel, Martin and Marianne. It has been argued for English that this object first tendency may reflect a non-movement strategy for early relative clause formation. This slight object-first tendency in the German data does not in and of itself tell us anything about whether early relative clauses in German are formed with or without movement, particularly in light of the fact that the adults also showed a preference for object relatives. At this point, it may be helpful to consider if this slight object first tendency noted for relative clauses is also characteristic of question formation, as is noted by Stromswold (1994) for some of the English children she examined, or is a particular phenomenon of early relative clause formation. I consider the development of matrix *wh*-questions for the children Daniel Martin and Marianne, and compare these with their production of relative clauses to determine whether a look at *wh*-questions might offer some insight into the movement/non-movement issue. I then turn to the development of embedded questions and other types of *wh*-introduced (*w*-introduced in German) embedded clauses, particularly complement clauses and free relatives.

4.1 The Acquisition of Wh-questions

Stromswold (1994), who analysed spontaneous speech data of twelve English

speaking children from the CHILDES data-base, noticed a slight tendency for children to acquire object wh-questions first. This result is unexpected, given the argument that subject questions are simpler than object questions for a number of reasons. The distance between the gap is shorter in subject questions, and should therefore be easier to process; subject questions tend to have fewer words, and have no overt subject-auxiliary inversion, and thus should require fewer resources to acquire; subjects do not require do-support, which children experience difficulty with, and subject questions look more like simple declaratives than object questions. Stromswold points out that the tendency toward object questions first does not correlate with frequency of object questions in the input³⁹.

Stromswold considered the acquisitional ordering of subject and object questions in the child language data with respect to the predictions made by a number of hypotheses⁴⁰. It has been argued that subject-object asymmetries with respect to wh-questions are consistent with an analysis in which the wh-phrases are in different positions at the level of syntax, the Wh-subject in Situ Hypothesis (WISH). The child therefore, would assume that there is no movement since there is no overt evidence for it. If the subject does not move and the object does, then subject questions should be simpler, and consequently acquired sooner. This hypothesis runs contrary to the Principles and Parameters approach, which assumes a [$\pm$ syntactic wh-movement] parameter. The Vacuous Movement Hypothesis (VMH) assumes

³⁹ Goodluck (1997) also noted for relative clause acquisition that frequency of object relatives in the adult input was not a factor in the child's preference for object relatives.

⁴⁰ I discuss some of these hypotheses briefly. For a more detailed description of the hypotheses regarding subject-object asymmetries in wh-questions, the reader is referred to Stromswold (1995, §2.2) and references therein.

one setting for the movement parameter in a given language. According to such an approach the child learns a specific language without direct evidence for every aspect of that language. The prediction then is that the child should acquire object and subject questions at the same age. This does not rule out the possibility, however, that there might still be an asymmetry in terms of actual performance.

Other analyses take into account the government of subject and object traces. According to what Stromswold refers to as the Rizzi-Manzini hypothesis (based on Rizzi 1990 and Manzini 1992) subject and object traces are governed in the same way, and this is different from the government of adjunct traces. Subject and object wh-phrases are both arguments, thus subjects should pattern with objects, rather than with adjuncts. Thus the child would assume movement for both subjects and objects and both should be acquired at roughly the same time. Contrary to the Rizzi-Manzini hypothesis the Antecedent Government Hypothesis (AGH) suggests that objects are governed one way and subjects are governed another way. Lasnik and Saito (1984), for example, argued that traces may be properly governed in either of two ways, through θ -government or antecedent government. Object traces are θ -governed, and thus governed in a more local and direct fashion than subject traces, which are antecedent governed. Adjunct traces are similar to subject traces in that they also must be antecedent governed. If children acquire the more direct process first (i.e., θ -government before antecedent government), then the prediction is that object questions will be acquired first. Likewise, the Noticeability Hypothesis suggests that object question gaps are more conspicuous or noticeable, and assuming that the child knows the argument requirements of a verb, he/she may notice that the post verbal argument is missing. The child

would then search for an object, notice the wh-word at the beginning of the sentence and make the connection.

The WISH and Small Clause Hypothesis predict that subject questions should be acquired before object; the Rizzi-Manzini Hypothesis and the VMH predict simultaneous acquisition, and the Antecedent Government and Noticeability hypotheses predict that object questions should be acquired first. The slight tendency Stromswold found toward object questions appearing first in the data supports either the AGH or the Noticeability hypotheses. In further analysing obligatory versus optional objects and long-distance questions, Stromswold found that there is no correlation between the obligatoriness of an object question and the acquisitional order, and children acquire long distance object questions before long distance subjects. Stromswold argues, therefore, that the data are most consistent with AGH.

4.1.1 Wh-questions of Daniel, Martin and Marianne

In this section, we look at the acquisition of main clause wh-questions of the three children discussed in the previous chapter and relate this to the subject/object asymmetries discussed in relation to the acquisition of relative clauses. Table 8 shows the distribution of wh-questions for the three children. The table is divided into subject and object argument questions and adverbial questions.

	Subject		Object		Adverbial				
DA	wer	was	was	wen/wem	wo	warum	wie	wann	other
3;02	3	2			5, 1x Ø		3		
3;04			's		2				
3;06			8		1		3		2
MT									
2;09	7	3	24		4	1			1
2;10	1		9		5		1		4
2;11			20		4		9, 1x Ø		5
3;01	3	1	14		5	4	6	4	7
3;02		2	9		11, 1x Ø	4		wenn	2
3;03		2	3		2				2
3;04	1	1	12, 1x Ø	1				wenn	5
3;04	2		6		8	22	11		2
3;08			2		2		wat		4
MA									
3;03			3, 1x ø						
3;03			7		6				
3;04			10		7		Ø		
3;04	wen		19		2		was		
3;05	1		23		7				
3;05		1	15		10		2		
3;06			19		6	5		2	
3;07		3	10		6	1		1	
3;07	1	4	14		7		1	1	
3;08	1, 2	1	3		14				

Table 8 Children's Matrix Wh-Clauses

4.1.1.1 Subject-Object Asymmetries

Daniel produces 5 subject questions in the first recording at 3;02, but no object

questions. Thus he does not show the same early preference for object wh-questions as he does for object relative clauses. However, given that there are only three recordings for Daniel, and the fact that in the other two recordings, he produces a small number of object questions, but no subject questions, this may simply be an accident of recording. The child Martin, although he shows a preference for object wh-questions (24 in the first recording), he nevertheless also produces 10 subject questions in the first recording at 2;09.

As in the Stromswold data, we notice a preference for object wh-questions in the recordings of the child, Marianne. This object preference was also prevalent in Marianne's relative clauses. We cannot assume, therefore, that the object-first strategy is particular to relative clauses. A comparison between the acquisition of wh-questions with that of relative clauses for Daniel, Martin and Marianne, therefore, does not set apart the early object preference for relative clauses. This supports the notion that there is no basis for a non-movement analysis of the acquisition of relative clauses by German children. Given that the pattern of acquisition does not differ significantly from that of questions, I suggest that the same mechanism is at work both in the formation of questions and relative clauses. However, it is not clear whether the correlation between the two is one of movement, or non-movement.

4.2 Acquisition of W-introduced Dependent Clauses

Numerous examples of embedded clause constructions introduced by a w-element may be found throughout the data. These w-elements, although they have the same morphological form as question words (*was*, *wie*, *wo* etc.), do not necessarily have the semantic interpretation of question markers, i.e., they may not have a [+wh] feature. Recall that relative clauses may also be introduced by a w-element, particularly free relatives, and

relatives where the head is non-specific (cf. Chapter 3, § 3.3)

- 1) *Alles, was er sagt, ist falsch*
everything which he says is untrue

Relative clauses are [-q], while complement clauses may be either; they are [+q] with a verb like 'ask', [-q] with verbs such as 'tell' or 'say', and may be either with a verb such as 'know'.

- 2) *weiß du wo mein mütz is?* (DA 3;02)
know you where my hat is

If we treated 'where', in this case as [-q], i.e., as referring to 'the place in which my hat is', then an appropriate answer to the question would be 'yes' or 'no'. However, it is unlikely that the child wants to know if the adult knows where the hat is, but rather is asking where the hat is. Thus a yes/no answer is not likely to satisfy the child. A more appropriate answer to the question would be 'It's on the table'. In this case, the w-word may be interpreted as [+q], whereas if the main clause were declarative, as in, 'You know where my hat is', the w-word is [-q].

4.2.1 Embedded Questions

As noted above, few of the complement clauses introduced by a w-element may be interpreted as embedded questions. Embedded interrogatives typically follow such main verbs as 'ask' or 'wonder'. They resemble relative clauses in that they are dependent VE clauses which involve movement of a (question or relative) particle to [Spec CP].

- 3) *Er fragte [_{CP} wen, du t, gesehen hast]*
he asked who you seen have
- 4) *... der Mann [_{CP} den, du t, gesehen hast]*
the man who you seen have

The embedded questions that we find in the data from these three children are almost

all *ob* 'if, whether' embedded questions. Marianne produces only two of these *ob*-clauses, omitting *ob* in one of them. Daniel produces four, at least one in each recording, substituting *ol* for one of them in the second recording. Martin produces 13 *ob*-clauses throughout the recordings.⁴¹

A few examples of *w*-introduced embedded questions may be found in the data, most of which are repetitions of V2 questions.

- 5) P: *wo is denn de sieb martin?* M: *wo d sieb is?*
 where is then the sieve martin? where the sieve is?

Martin repeats the question his father asks, apparently checking for confirmation that this is in fact what his father has wanted to know. Such stand-alone embedded questions are also found in the adult grammar, and are similar to the VE exclamatives mentioned in Chapter 1.

- 6) *Ob ich ihn gesehen habe?*
 if I him seen have
- 7) *Wenn er doch endlich anrufen würde!*
 if he PART finally call would
 'If only he would call!'

Although they appear to be main clauses in that they stand alone, these clauses are introduced by a complementizer and have the embedded VE structure. Moreover they have the interpretation of an embedded clause as in '(You are asking) if I have seen him?' or '(I wish)

⁴¹ Although Martin does not omit the complementizer *ob* anywhere else, Rothweiler (1993) suggests one questionable utterance at 3:04.

i) *gleiche wie unsers is? (= (ob das das) or (Ist das das) gliche wie unsers ist?)*
 same as ours is if that the is that the

In this utterance, Martin is referring to the tape recorder. Rothweiler suggests that this could be either an embedded question *ob das das gleiche wie unsers ist* 'if that the same as ours is', or a main clause polarity question *ist das das gleiche wie unsers ist?* 'is that the same as our is?'. Since the front matter is missing, it is difficult to determine, however, since it stands alone and there has been no previous mention in the discourse of the tape recorder, I think it is more likely the latter.

he would finally call!'. I treat these as stand-alone embedded clauses, in which the main clause has been elided. These constructions are discourse dependent.

4.2.2 W-introduced Complements and Free Relatives

In the data from these three children, we find a number of embedded clauses which are introduced by a w-element. Rothweiler (1993) groups these into a single category, which she refers to simply as w-introduced embedded clauses. She includes in this category, the w-introduced embedded questions of the type discussed above, and w-introduced complement clauses which are [-q]. Table 9 shows the distribution of these w-introduced complement clauses and free relative constructions. The table shows a large number of subordinate clauses introduced by a null ($\emptyset$) element. These $\emptyset$ introducers represent a number of w-words (*was*, *wie*, *wo*), therefore, I have placed them in the columns in which they would be most appropriate. That is to say, if the missing w-word is best interpreted as *was* as in (8), it is shown in that column.

- 8) *Guck ma ch hier ma* (=Guck mal, (was) ich hier mache) MA 3;08
 look PRT I here do
 'Look what I am doing here'

DA	was	wie	wo	wer	warum	other	Free Rel
3;02	2		6				
3;04	5	8, 1x Ø	1, 1x Ø				
3;06	2	3	1				1was
MT							
2;09	5, 1x Ø	1					
2;10	2		3				
2;11	6	4					3wo
3;01	9	1	1		1		
3;02	4	4					2wo
3;03	2	1, 1x Ø	2				
3;04	5	2					1was
3;04	1	1	1				
3;08	3		2	2		1	
MA							
3;03	2x Ø						1 Ø=was
3;03	1x Ø						
3;04	3, 3x Ø		2, 2x Ø			1	
3;04	1x Ø						
3;05	3x Ø		2x Ø	1			1 Ø=wer
3;05		1x Ø					
3;06	1, 3x Ø	1x Ø					
3;07	1x Ø						
3;07	3x Ø						
3;08	2x Ø		1x Ø				
3;09	10	3					
3;10			2				1was, 1wo

Table 9 W-introduced Complements and Free Relatives

4.2.2.1 W-introduced Complement Clauses

W-introduced complement clauses include constructions such as those in (9) and (10).

- 9) *ich muß mal lesen da was steht* Adult: *Ja, lies mal was da steht.* (MA 3;04)
I must PART read there what stands yes read what there stands
'I must read what it says there' 'Yes, read what it says'
- 10) *guck mal wat ich hier gefunden hab* (MT 3;01)
look PART what I here found have

Although introduced by a w-word, the clauses in (9) and (10) are not interpreted as questions.

In fact the w-word behaves more like a w-relative pronoun. Thus in some ways, these constructions are reminiscent of free relatives. Rothweiler (1993: 58), however, makes a distinction between the two types of constructions, citing the following examples.

- 11) *Peter wußte, wen er zuerst grüßen würde.*
Peter knew who he first greet would
- 12) *Peter grüßte nur, wen er grüßen wollte.*
Peter greeted only who he greet wanted

In (11), the embedded clause has a syntactic function as complement to the verb 'knew', i.e., it satisfies the theme argument of the verb, whereas in (12), although the embedded clause takes the position of the object argument, it in fact has the form of an attributive clause. Rothweiler suggests that free relatives have the status of headed relatives, but in free relatives the introducing element describes a missing gender and number neutral antecedent and thus must be introduced by a w-relative pronoun.⁴²

Rothweiler suggests a three-way classification of embedded clauses, assigning each

⁴² Pitner (1995), who examines the structure of relative clauses in German, argues that the missing element in the free relative clause is in fact a *pro*. This *pro* is identified through coindexation of its features with those of its identifier, in this case, the relative pronoun. The Case of the relative pronoun in both headed and free relatives is that required by the relative clause, and in the majority of cases, also fits into the Case frame of the matrix clause.

a value. The first of these deals with the syntactic relation between the matrix and the embedded clause. If the embedded clause is an element of the main clause, that is, if it serves a syntactic function within the main clause, it is assigned the value /G/ for *Glied* 'member'. If the embedded clause represents an attribute of an element in the matrix clause, then it is assigned the value /A/. A-clauses are dominated by N or a projection of N, whereas G-clauses are dominated by a predicate adjective or a verb. The second value has to do with whether the embedded clause is obligatory or not. If it is obligatory, it is assigned the value /-f/ (*facultativ* 'optional'); if it is optional, it is assigned the value /+f/. The third distinction has to do with whether or not the introducing element has a syntactic function within the embedded clause itself (as an argument or free adverbial). If it does, then it is assigned the value /rel/ (*relativum*, for example, relative pronouns and pronominal adverbs); if it does not, then it is assigned the value /sub/ (*subordinierenden Konjunktion* 'subordinating conjunction', for example, complementizers and adverbials). Returning now to the examples in (11) and (12), the embedded clause in (11) has the value /G,-f,rel/, whereas that in (12) has the value /A,+f,rel/-/G,-f,rel/, meaning that it is an attributive clause which has taken on the syntactic function of an element in the matrix clause.

In terms of the development of w-complement clauses again we see a different pattern between Daniel and Martin on the one hand and Marianne on the other. Daniel and Martin rarely omit the w-pronoun, whereas Marianne is more likely than not to leave it out until age 3;09, at which time she begins to use them quite regularly. For all three children the object pronoun *was* is the most common, although Daniel and Martin also use *wie* and *wo* with some frequency.

It is interesting to note that while Marianne always uses the relative pronoun in her headed relative clauses⁴³, she tends to omit the obligatory w-pronoun in her production of w-introduced complement clauses. Although not as frequently, Daniel and Martin also leave out the w-pronoun twice in their w-complements, whereas they never do so in relatives (either headed or free), and only very rarely do so in other types of dependent clauses.

- 13) *kuma ich jetzt emalt hab* (MA 3;06)
 look I now drawn have
 'Look (what) I have drawn now.'
- 14) *siehstet jetzt darauf is?* (MT 2;09)
 see-you-it now there-on is
 'Do you see now (what) is on there?'
- 15) *hase eje hasit der blitz tat?* (=Hast du gesehen x, wie der geblitzt hat) (DA 3;04)
 have-you seen ? it lightning has
 'Did you see (how) the lightning flashed?'

What is it then about these types of clauses which allows deletion of the w-word? Recall that Vainikka and Roeper (1995) noted that before complementizers and wh-movement are productive, constructions associated with CP are not used. They suggest, that once CP is available in the grammar, abstract operators block extraction for the child, just as they do for the adult. These operator chains are available before the relevant lexical items are used, so that embedded wh-constructions may initially appear without a wh-word. Wh-expressions, however, carry additional information in terms of morphological features, which is lost when the wh-word is not explicit.

4.2.2.2 Free Relatives

A number of analyses have been suggested for free relatives in German. Because the

⁴³ Recall that Marianne tends to use undifferentiated filler syllables to introduce headed relatives.

relative pronoun fulfills the Case requirements of the matrix clause (the so-called “matching effects”), one possibility is that the relative pronoun occupies the head position outside of the relative clause.

- 16) *Hans hat zurückgegeben was [_ er gestohlen hat]*
 Hans has returned what he stolen has

Bausewein (1991) notes, however, that Modern Standard German, as opposed to earlier versions of the language, is not the strict matching-language it is often assumed to be. This argues against the hypothesis that the relative pronoun is directly governed by the matrix verb. She argues instead for a head analysis with the empty category *pro* occupying the head position⁴⁴. This analysis is taken up by Pitner (1995: 208), who points out a number of exceptions to the matching phenomenon, such as those in (17).

- 17a) Dative instead of Accusative:
Sie lädt ein, wem sie zu Dank verpflichtet ist
 She invites whom-DAT she to thanks obliged is
 ‘She invites whom she is obliged to.’
- b) PP instead of Nominative:
Wonach sich fragen läßt, ist eine Konstituente
 what-after-PP refl ask lets is a constituent
 ‘What can be asked after is a constituent.’

Pitner suggests that *pro* is assigned Case by the matrix clause, and its content is identified by the relative pronoun. The relative pronoun has the Case assigned by the relative clause, which is not necessarily the Case which would be assigned by the matrix verb to *pro*. In (17a), for example, the matrix verb assigns Accusative Case to its object (*pro*), whereas the *w*-pronoun receives Dative Case, as is required by the Case frame of the relative clause.

An alternative analysis of free relatives is that of Kayne. Kayne (1994, 154 n. 13)

⁴⁴ See also Harbert (1983), Suñer (1984), Hirschbühler and Rivero (1983) and Grosu (1988).

analyses headless relatives in a similar manner as he does headed relatives, except that in headless relatives the NP sister of the wh-determiner has not raised. Thus the relative clause in the sentence, 'We gave him what little money we had.' has the structure:

18) [DP [CP [IP we had [DP what little money]]]]

Wh-movement then derives the representation:

19) [DP [CP [DP what little money]_i [IP we had t_i]]]

In the free relative, the NP 'little money' need not move further to the Spec of DP. Kayne suggests that the terminology headed or headless is inappropriate in an analysis in which there is no head external to the relative clause CP. Recall that in Kayne's analysis of restrictive relatives the only element external to the CP is the D° that selects the relative clause.⁴⁵

Free relatives are rare in the child data, particularly in that of Daniel and Marianne. Daniel produces only one in the last recording at 3;06, and Marianne produces only four, one in the first recording at 3;03 and one at 3;05, in which she omits the relative pronouns. She produces her only two well-formed free relative clauses in the last recording at 3;10. This supports the claim that free relative clauses are late acquired in German. Martin, however, uses more free relatives throughout the data and these are generally well-formed. He also produces several adverbial relatives in which the antecedent *da* 'there' is omitted, resulting in a free relative construction.

⁴⁵ Kayne's analysis finds support in Pashta, an Indo-Iranian language spoken in Afghanistan and Pakistan. Roberts (1997) argues that Kayne's raising analysis of relative clauses may be able to derive some puzzling distributional correlations among wh-words. It also accounts for the apparently headed nature of free relatives in that language.

- 20) *papa du has ja net wo n loch rein is gemalt* (MT 2;11)
 papa you have PRT not where a hole in is drawn
 'Dad, you have not drawn (there) where there's a hole'

Martin's grammar appears to be more advanced than the other two children in his mastery of subordinate clauses, and structures involving CP in general.

The question arises as to why *w*-introduced complements appear to be produced and acquired earlier than free relatives, given their apparent similarities. Consider again the accessibility hypothesis that structures which are most accessible, i.e., less complex in terms of embedding, are first to emerge. If we assume either of the analyses described above, free relatives either have the structure $D[CP]$ (Kayne's analysis) or *pro* $[CP]$, (Pitner's, Bausewein's analysis), whereas *w*-introduced complement clauses are CP complements, which are directly selected by the matrix verb. Thus free relatives, like their headed counterparts, require one further layer of embedding.

4.3 Other Dependent Clauses

Two other types of embedded clauses have not been considered thus far: complementizer introduced complement clauses and adverbial clauses. These will be considered briefly here. Adverbial clauses throughout the data from the three children are mainly *wenn* 'if, whether' clauses; *weil* 'because' clauses also occur frequently. Martin often substitutes *wenn* in clauses where another adverbial would have been more appropriate (*als* 'as', *weil* 'because', *für den Fall, daß* 'in the event that', 'in case')

- 21) *heb mir dat auf - gabretten wenn fisch krank sin* (MT 2;11)
 pick me that up - tablets if fish sick are
 'Pick the tablets up for me in case the fish are sick'

Martin does not omit the adverbial element in C, and Daniel does so only once. Daniel's

adverbial clauses are mostly introduced by *wenn*, though he also produces a number of *weil* and *damit* ‘so that’ clauses, in which the adverbial is shortened to simply *mit*.

- 22) *dann muß ma in einen wald gehn mit der dich nich sieht* (DA 3;06)
then must (you) Part. in a forest go so-that he you not sees
‘then you must go into a forest so that he doesn’t see you’

Adverbials are still developing for Marianne. Her early *wenn* and *weil* clauses (until 3;07) are mostly either preconjunctive or are introduced by some form of the adverbial not fully articulated, i.e., an undifferentiated filler.

Complement clauses introduced by *ob* ‘if whether’ have already been discussed above with respect to embedded questions. Complement *daß* ‘that’ clauses are not common throughout the data. Martin produces only two, leaving out the complementizer in one of them, and Daniel produces only three, also omitting the complementizer once. Of Marianne’s seven that clauses, only one is well formed. She substitutes a filler in one and omits the complementizer in the remaining five. Thus, as with her *w*-introduced clauses, Marianne’s complement and adverbial clauses are frequently precursor structures, being either unintroduced, or introduced by a dummy place holder. Daniel and Martin produce more target-like structures from the beginning of the recordings.

Unlike Martin, who seems to have developed faster with respect to the acquisition of CP, Marianne continues to show signs of a developing CP system. Her early embedded constructions are often precursors in the sense of d’Avis and Gretsche (1994). In particular, Marianne produces a great many preconjunctive subordinate clauses as well as subordinate clauses introduced by undifferentiated filler syllables or dummy place holders. We saw that such was the case in her production of relatives (headed and free), and it is also evident in her

production of adverbial clauses. Until age 3;07, she produces many unIntroduced or preconjunctive adverbial clauses. These are primarily *wenn* 'if' and *weil* 'because' clauses (23), though she also sometimes leaves out *damit* 'with it/that' and *bis* 'until'. Furthermore, many of Marianne's early *weil* and *wenn* clauses until age 3;06 are introduced by undifferentiated filler syllables (24).⁴⁶

- 23a) *wir wasserfarben malen mußt - muß das mit rübernehmen* (MA 3;04)
 we watercolours draw must-you must-you that with take-over
 '(if) we draw with watercolours, you must take that over with you'
- b) *ich mußweinen du - ganz weg bis* (MA 3;05)
 I must cry you completely gone are
 'I must cry (because) you are really gone'
- 24) *e du aufstehen muß (= weil du aufstehen muß)* (MA 3;03)
 because you stand-up must
 'because you must stand up'

Fillers were also seen in her production of relative clauses. These fillers or dummy place holders function as complementizers and w-words. Thus at this stage in development, we can assume that the CP position is in fact specified. (cf. Clahsen, Kursawe and Penke 1995, CP is available in Stage II, but not in Stage I) This suggests that the CP layer is specified before all the relevant lexical elements (complementizers, question and relative operators) have been learned.

Rothweiler (1993) characterizes Marianne's speech as elliptical. In the first recording, she tends to omit other elements besides those in CP, such as the *ich* 'I' subject and function words, especially prepositions. She sometimes also omits the verb or copula. This pattern is not so evident with Daniel and Martin.

⁴⁶ In place of *weil*, Marianne often uses such forms as, *me*, *ne*, *ve*, and for *wenn* she substitutes *e*, *em*, *ene*, *n* as well as *t* and *r*.

4.4 Unintroduced Embedded Clauses

Rothweiler notes that with respect to introducing pronouns, it is only w-pronouns which are omitted, not d-pronouns. These are generally late acquired and show up after the preconjunctional phase. D-pronouns relate more specifically to a matrix element. They agree in number and gender and are Case-marked from the embedded clause, and Theta-marked if they are arguments of the verb. These features could not be marked if there were no relative d-pronoun. It was argued earlier that when at least one feature of a functional specifier is assigned a value, it must be lexically filled at PF. Since they are more fully specified, it may be that d-pronouns are more likely to be assigned a value when they are first used.

W-pronouns, if they have an argument status, receive a Theta-role and Case. If they are omitted, an argument of the verb is missing. Nevertheless, even these are sometimes omitted by young children. Rothweiler suggests that they are most often omitted following such phrases as *Guck mal* 'Look!' or matrix verbs such as *sehen* 'see', *sagen* 'say', *wissen* 'know' or *zeigen* 'show'. In free relatives and subcategorized embedded clauses, if the w-pronoun represents the object, then the embedded clause is itself an argument with a Theta-role. Therefore, the pronoun is redundant on semantic and pragmatic grounds, if syntactically it is an argument. Embedded clause w-pronouns are wh-moved elements, located in [Spec CP]. The w-pronoun cannot take the place of an argument in a declarative clause, only in questions or embedded clauses, and must be moved to the first position.⁴⁷

Complementizers and subordinating conjunctions may be omitted if they carry no logical semantic function, i.e., they are semantically redundant. In the case of the

⁴⁷ An exception, would be echo questions, such as: *Du hast WEN gesehen?* 'You saw WHO?'

complementizer, this is also evident in the adult language, where it is possible to omit the complementizer *daß* 'that', in which case the subordinate clause is V2. In fact those verbs which seem to allow complementizer deletion in child language are among those which most easily allow it in the adult language. It would seem that in these clauses, C need not be fully specified.

4.5 Concluding Remarks

Consider the argument that CP is initially underspecified. Penner (1995) proposes an underspecification of the feature [Infl-in-C], which is strongly linked to finiteness. Armon-Lotem (1996) suggests that I-to-C movement might be a language particular manifestation of finiteness, and finiteness correlates with tense. I have suggested, however, that the finite verb in a V2 clause does not end up in C, but in IP, where features such as tense and mood are checked. This does not mean that C is not linked to finiteness. Finiteness has been argued to be a property of C and I-to-C is only one possible language particular manifestation of this. We could argue that finiteness is in fact associated with two functional positions. The verb checks its finite features in association with Tense in IP and the [finiteness] feature in C assigns a value to the complementizer. This may be illustrated in English by the complementizers 'that' [+finite] and 'for' [-finite]. In German, finiteness is indicated either in C or by the presence of the verb in IP.

Armon-Lotem notes that before Tense is used productively, finiteness is underspecified or inaccessible. When tense is used and finiteness is identified as a feature of C, C is accessible and can be used for subordination. At this point, however, other features of CP, [operator], [wh], [q], [reference], may still not be assigned a value. Thus C is not fully

specified, and does not look like a lexical head, and consequently need not be lexically filled.

It is not until all the features of C are identified and specified that the child begins to use complementizers and pronominal elements in [Spec CP] productively.

Chapter 5

Experimental Relative Clause Data

5.0 Introduction

In Chapter 3, I touched on experimental data concerning the acquisition of relative clauses in comparison with spontaneous speech production data. In this chapter, the focus is specifically on some experimental data from English and German. Rothweiler (1993) criticizes early comprehension experiments in German which use sentences such as those of Grimm and Wintermantel (1975), which are pragmatically unnatural for the child in that there is no contextual basis. Such experiments require the child to use more than grammatical knowledge or capabilities.

- 1) *Der Bär beißt den Igel, der den Vogel streift*
the bear bites the hedgehog, that the bird pets
'The bear bites the hedgehog that pets the bird'

The child must imagine a hedgehog-biting bear and a bird-petting hedgehog, which would add to the complexity of the task⁴⁸. It is hardly surprising, therefore, according to Rothweiler, that children continue to produce errors in such tasks even at 5 years of age and older. She argues that such tasks test the child's ability to analyse grammatical structure. However, like spontaneous speech data, the experimental data also suggest that relative clauses are late

⁴⁸ Goodluck and Tavakolian (1982) point out that when the internal content of the relative is manipulated for animacy of the object, the error pattern is reduced, i.e., animate objects lead to more errors than inanimate. This suggests that it is not the act of imagining X that is at issue, but the processing load of the structure.

acquired in German.

There is, however, a lack of concrete evidence from which to conclude that pragmatic unnaturalness per se affects error rates. Goodluck (1990) points out citing a number of studies that, “there is little positive evidence in the literature to support the view that children’s interpretation of relative clauses is highly sensitive to discourse related conditions on the use of restrictive relatives” (Goodluck 1990: 378). The high error rate in the early comprehension experiments may derive from factors other than pragmatic naturalness. Goodluck, following Forster’s (1979) processing model, suggests that pragmatic and discourse factors may take a back seat to syntactic computation. That is to say, that it is not pragmatic unnaturalness per se which leads to errors, but the fact that pragmatic and discourse-based information are not initially integrated into the syntactic parse.

Rothweiler (1993) points out that the generalizations concerning the acquisition of relative clauses in German based on experimental data of a number of researchers (Grimm and Wintermantel 1975, Park 1976, Mills 1977) sometimes reveal conflicting results. Most studies agree that constructions with matrix clause before relative clause order are easier to imitate or understand than the reverse, and that relative clauses in which the relative pronoun is subject are easier to understand than those with object relative pronouns. However, while Grimm and Wintermantel (1975) suggest that initial relative clauses in which the relative pronoun is subject are easier to understand than final, and final relative clauses in which the relative pronoun is object are easier than initial, Mills (1977) argues that final relatives in which the relative pronoun is subject are easier than initial. Mills’ study also shows that even seven and eight year olds still have trouble using Case relations. Since it is the first NP in the

sentence, the relative pronoun (in ambiguous sentences) will be interpreted as subject.

According to many of these experiments children even at 5 years and older have not mastered relative clause formation. If we assume that comprehension of a construction precedes production, then we would have to assume that children are even older than this when they begin to produce meaningful relative clause constructions. This does not appear to be the case, as spontaneous speech data reveals that German children typically begin producing relative clause constructions at around 2;6 to 3 years of age.

5.1 German Relative Clause Experiment

The following German experiment is designed to gather production data on relative clauses. The method used is an elicited production task. This type of task allows us to elicit structures which may be infrequent in spontaneous speech. Thornton (1996) points out a number of advantages to using such an experimental procedure. An elicited production experiment enables the experimenter to elicit sentences corresponding to complex syntactic structures such as relative clauses, which are infrequent in spontaneous speech production data. An elicited production experiment forces the child to use constructions which, in spontaneous speech, the child might express using simpler constructions.

5.1.1 Experimental Design

The experiment is designed along the lines of Fragman (1996). Fragman presented twenty-five Francophone children (and an equal number of adults) with a sentence involving a pair of children who differed only in their respective activities.

- 2) *Une fille s'amuse avec un chat et une autre fille court après un chien*
One girl is playing with a cat and another girl runs after a dog.

Immediately after presentation of the stimulus sentence, the experimenter asked the child which of the two children he or she would rather be. The subject was required to respond with a restrictive relative clause. The expected response was either, “the girl who is playing with the cat,” or “the girl who runs after the dog.” Likewise direct object relatives and indirect object relatives were elicited with sentences such as:

- 3) *Une maman embrasse son garçon et une autre maman chatouille son garçon*
One mother hugs her son and another mother tickles her son.
- 4) *Un papa téléphone à sa fille et un autre papa donne un dessin à sa fille*
one dad telephones his daughter and another dad gives a drawing to his daughter.

The expected responses might be: “the boy that the mother hugs/tickles” or “the daughter to whom the dad gives a drawing”. Fragman’s French children experienced far less difficulty in producing subject relatives than direct or indirect objects. However, in her study, stimulus sentences used to elicit subject relatives all had animate (human) subjects and inanimate objects, whereas the direct and indirect object stimulus sentences were animate-animate.

As in Fragman’s study, the German stimulus sentences involve ordinary situations, which would be familiar to the child, and are designed so as to elicit subject, direct object and oblique object relative clauses. It was hoped that presenting the child with a single sentence with only two options would not place too great a memory burden on the child. Furthermore, by avoiding the use of two pictures and requiring the child to produce a relative clause which chooses between the two (cf. Labelle 1991), we avoid the problem of the child simply pointing to one of the pictures and responding, “That one.”

5.1.1.1 Subjects

The subjects consisted of 18 monolingual German speaking children who were tested

in Berlin and Potsdam. The children tested were between the ages of 3;8 and 6;11. Relative clauses have been argued to be rare before the age of three, according to studies of spontaneous speech data. As a control group, 13 native German speaking adults were also tested⁴⁹.

5.1.1.2 Method

The methodology is similar to that used by Fragman (1996, 1998). The experiment consists of four categories of stimulus sentences, with three tokens of each type. Two types of stimulus were designed to elicit subject relatives, one with an animate subject and object, and the other with an animate subject and inanimate object, as well as one type of stimulus designed to elicit a direct object relative, and one to elicit an object of preposition relative. Since previous studies have indicated that sentences with animate subjects and inanimate objects are easier for children, a resulting subject bias that Fragman found may to some extent reflect the fact that her subject stimulus sentences all involved inanimate objects, whereas object stimulus sentences had both animate subjects and objects. In order to test the effect of animacy, I added a second subject condition, using both an animate (human) subject and object. Thus the experiment consisted of the following four conditions.

⁴⁹ I am very grateful to Susan Powers, her research assistant, Marita Böning., and the students of her empirical methodologies class, for conducting the testing in kindergartens and homes in the Berlin/Potsdam area. 5 of the adults were also tested in Potsdam, and 8 in the Ottawa area. Although native speakers of German, the 8 adults tested in the Ottawa area were immigrants to Canada and spoke English as a second language. While the adults were a heterogeneous group, representing various dialectal backgrounds, there is no indication that this affected their responses, since their response patterns were highly similar. Regardless of dialectal background, all adults gave responses in Standard High German.

- 15a) Condition 1: Subject (animate - animate)
Ein Mädchen/Junge spielt mit seiner Freundin, und ein anderes/er Mädchen/Junge
 one girl/boy plays with his/her friend and another girl/boy
redet mit seinem Bruder.
 talks with her/his brother
- b) Condition 2: Subject (animate - inanimate)
Ein(e) Tochter/Sohn singt ein Lied, und ein andere(r) Tochter/Sohn wirft einen Ball.
 one daughter/son sings a song and another daughter/son throws a ball
- c) Condition 3: Direct Object
Eine Mama umarmt ihr/en Mädchen/Jungen, und eine andere Mama kitzelt ihr/en
 one mother hugs her girl/boy and another mother tickles her
Mädchen/Jungen.
 girl/boy
- d) Condition 4: Object of Preposition
Eine Mama bäckt einen Kuchen mit ihre(r/m) Tochter/Sohn, und eine andere Mama
 one mother bakes a cake with her daughter/son and another mother
bäckt Brot für ihre/n Tochter/Sohn.
 bakes bread for her daughter/son

If the subject was female, then *Mädchen* 'girl' or *Tochter* 'daughter' was used in the stimulus, if the subject was male, then *Junge* 'boy' or *Sohn* 'son' was used in the stimulus.

Subjects were first given two practice sentences, one designed to elicit a subject relative and one designed to elicit an object relative. During the practice, subjects were encouraged to answer in a sentence. For example,

- 6) *Ein Kind hat lange Haare, und ein anderes Kind hat kurtze Haare.*
 one child has long hair and another child has short hair
Welches Kind möchtest du lieber sein?
 which child would you rather be

If the subject answered with simply '*kurze haare*' 'short hair', then the experimenter said, for example, *So, du möchtest lieber _____* 'So you would rather be _____?', or *So du willst lieber das Kind sein _____* 'So you want to be the child _____?', providing the antecedent. To adult subjects, it was explained that they were to give more information than simply one or two words. If at some point during the testing the subject went back to giving

short answers, the experimenter again prompted for a longer answer as with the practice sentences.

Subjects were presented with the twelve test sentences. The stimulus sentences were presented in Standard High German by a native speaker of German. Subjects responded to one of four questionnaires, each beginning with a different category of stimulus. In each of the questionnaires, sentences were randomized so that no two of the same category appeared consecutively.

5.1.1.3 Scoring

The scoring of results follows that of Fragman (1996, 1998). All responses received a number score. The assignment of a number value was dependent on the nature of the response given. The scoring ensures a consistent measure of the different responses given by a single individual subject, as well as those of different subjects. That is, each response given by each subject was measured according to this strict coding procedure. The comparison with adults allows us to determine statistically whether certain syntactic tendencies of children also show up in the responses of adults.

The response attributes coded for include whether or not the response given is: a) an intelligible response; b) a restrictive response; c) a relative clause; d) a grammatical relative clause; e) a relative clause which conforms to the information given in the stimulus, and f) a relative clause which has the same grammatical function as the targeted element in the stimulus.

A scale of eight points forms the basis of the scoring system. Each point represents a combination of specific attributes listed above. The different combinations of attributes and

the corresponding scores are given in Table 10. The maximum score of 8 applies an optimal response, i.e., a responses which include all of the following attributes: a) is an intelligible response (rather than, for example, a series of hesitations), b) has a restrictive structure, c) is a relative clause, d) is a grammatical relative clause, e) is a relative clause which conforms to the information given in the stimulus sentence, and f) is a relative clause which has the same grammatical function as the targeted element in the stimulus.

Score	Combination of Attributes
8	Intelligible structure, restrictive clause, relative clause, grammatical, conforms to information presented in the stimulus, and has the same grammatical function as the targeted element in the stimulus.
7	Intelligible structure, restrictive clause, relative clause, grammatical, conforms to information presented in the stimulus, but <i>does not have the same grammatical function as the targeted element in the stimulus.</i>
6	Intelligible structure, restrictive clause, relative clause, grammatical, <i>does not conform to information presented in the stimulus</i> , but has the same grammatical function as the targeted element in the stimulus.
5	Intelligible structure, restrictive clause, relative clause, grammatical, <i>does not conform to information presented in the stimulus, and does not have the same grammatical function as the targeted element in the stimulus.</i>
4	Intelligible structure, restrictive clause, relative clause, <i>is not grammatical</i> , and has the same grammatical function as the targeted element in the stimulus.
3	Intelligible structure, restrictive clause, relative clause, <i>is not grammatical, and does not have the same grammatical function as the targeted element in the stimulus.</i>
2	Intelligible structure, restrictive clause, but <i>is not a relative clause.</i>
1	Intelligible structure, but <i>not a restrictive clause.</i>
0	<i>Non-intelligible structure.</i>

Table 10 Scores for Combinations of Attributes

For example, given a stimulus such as 7), responses would be scored as those in (8a-h).

- 7) *Eine Mama bäckt einen Kuchen mit ihrer Tochter, und eine andere Mama bäckt Brot für ihre Tochter.*
 One mom bakes a cake with her daughter, and another mom bakes bread for her daughter.
Welche Tochter möchtest du lieber sein?
 Which daughter would you rather be?
- 8a) *Die Tochter, mit der die Mama einen Kuchen bäckt*
 The daughter with whom the mom bakes a cake (8)
- b) *Die Tochter, die mit der Mama einen Kuchen bäckt*
 The daughter who bakes a cake with her mom (7)
- c) *Die Tochter, mit dem die Mama Brot esst*
 The daughter with whom the mom eats bread (6)
- d) *Die Tochter, die ihre Mama Kuchen gibt*
 The daughter who gives her mom cake (5)
- e) *Die Tochter, die ihre Mama mit ihr einen Kuchen bäckt*
 The daughter who her mom bakes a cake with her (4)
- f) *Die Tochter, die mit dem Kuchen backen*
 The daughter who with the cake baking (3)
- g) *Die Tochter mit dem Kuchen/ Die Kuchen backende Tochter*
 The daughter with the cake/The cake baking daughter (2)
- h) *Eine Mama bäckt ihre Tochter einen Kuchen*
 A mom bakes her daughter a cake (1)

In the case of an object of preposition (OP) stimulus, such as (7), a score of 8 would be given to a response which gives a grammatical relative clause which conforms to the information in the stimulus and in which an OP is relativized (8a). If the response does not correspond to an OP, but all other attributes are satisfied, it would receive a score of 7 (8b). A score of 6 would be given to a response which is a grammatical relative and has the same grammatical function as the targeted element in stimulus, but does not conform to the information in the stimulus (8c). A score of 5 would be given to structures which do not conform to the information in the stimulus and do not have the same grammatical function (8d). A score of 4 would be given to ungrammatical relatives which nevertheless have the same grammatical function as the stimulus (8e). A score of 3 would be given to

ungrammatical relatives which do not have the same grammatical function as the stimulus (8f). A score of 2 corresponds to restrictive clauses which are not relatives (8g). A score of 1 would be given to an intelligible response which is not a restrictive clause (8h). Responses which lack all six attributes would receive a score of 0. This last category includes responses in which the child has made a few attempts and failed to give a coherent response, or gives a response which is incomprehensible. Also included in this category are single word answers.

A relative clause is judged ungrammatical if: it contravenes subcategorization properties of the verb (e.g., if the response is a direct object and the verb requires an indirect object); it uses the wrong form of the relative marker; it contains a resumptive pronoun; it does not pied-pipe the preposition; it has verb-second, rather than verb-final structure.

5.1.1.4 Results

The frequency of each score (0-8) was measured across the four conditions.⁵⁰ The results are given in Figure 1 for the children and Figure 2 for the adults.

⁵⁰ The four conditions are given in (15a-d) above. Cond1 refers to the subject condition in which both the subject and object are animate in the stimulus sentence; Cond2 refers to the animate-inanimate subject condition, Cond3 refers to the direct object stimulus condition, and Cond4 refers to the object of preposition condition.

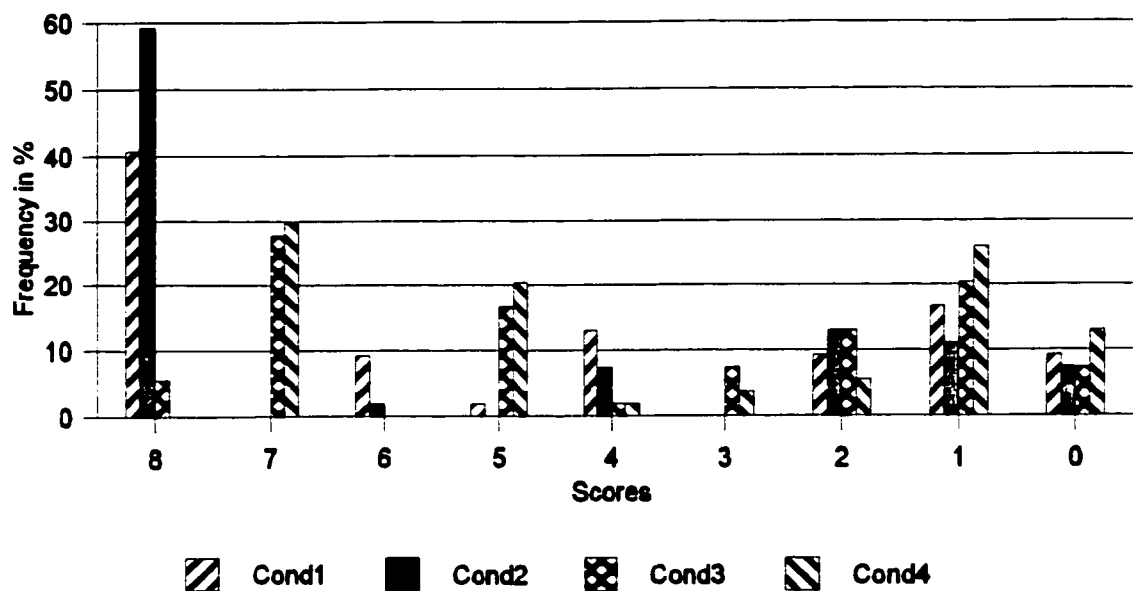


Figure 1 Frequency of Response Scores for Children

The fact that responses with a score of 1 and 0 have a similar frequency across the four conditions for the children reflects the fact that three of the children failed to give any relative clause responses, producing instead a simple non-restrictive sentence (score of 1) or a one-word response (score of 0). Note that a perfect score of 8 is observed for the subject stimuli which contains an animate subject but inanimate object more than half of the time (59.26%), whereas a score of 8 for subject stimuli which contain both animate subject and object is only observed 40.7% of the time. The animacy distinction will be discussed further in the next section.

We see a somewhat different response pattern for the adults in Figure 2.

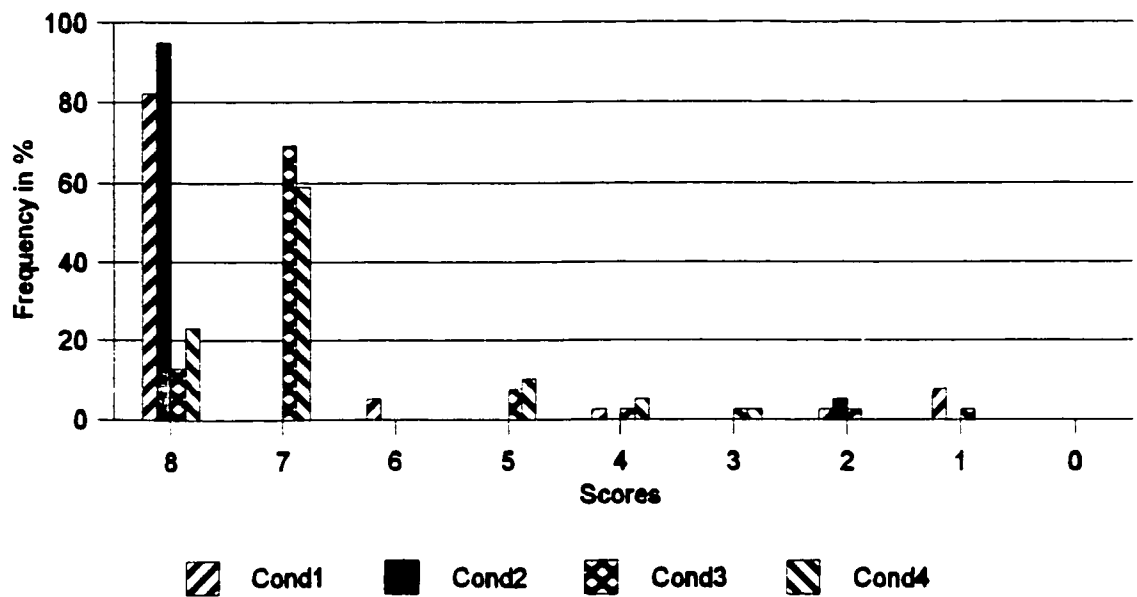


Figure 2 Frequency of Response Scores for Adults

Adults scored mostly 8 in the two subject conditions, and 7 in the object conditions. The score of 7 in the object conditions reflects the fact that object stimuli often prompted a subject relative response. Very few responses lower than 7 were recorded for adults in any of the four conditions.

Since subjects responded to three tokens of each stimulus type, I used a repeated measures ANOVA to determine the interactions. Three of the 18 children tested were omitted from the statistical analysis, since they failed to give any relative clause responses in any of the four conditions. The ANOVA revealed a main effect of condition type for the children ($F=3.557, p<.02$), however this effect only approached significance for the adults ($F=2.565, p<.07$). This analysis, however, does not reveal anything about the actual performance of children and adults in each of the four conditions. In order to determine where there were significant differences, I reanalyzed the data providing multiple comparisons between the

conditions⁵¹. The results are given in Table 11.

	Children		Adults	
Interactions	Mean Diff.	P-Value	Mean Diff.	P-Value
Cond 1, Cond 2	-0.867	0.4816	-0.564	0.4898
Cond 1, Cond 3	1	0.3512	0.564	0.4818
Cond 1, Cond 4	1.333	0.1228	0.385	0.7698
Cond 2, Cond 3	1.867	.0109 S	1.128	.0238 S
Cond 2, Cond 4	2.2	.0016 S	0.949	0.0803
Cond 3, Cond 4	0.333	0.947	-0.179	0.9697

Table 11 Multiple Comparisons Between Conditions

We see a significant effect between conditions 2 and 3 for both adults and children. This result was not unexpected, given that previous studies of relative clauses have revealed that subject relatives are easier to process and produce than object. Fragman also found such a distinction in her French data. Recall, however, that Fragman used only one subject condition in her experiment, in which the subject was animate and the object inanimate (the equivalent of my condition 2). The effect of animacy of the object will be taken up in the following section.

5.1.2 Discussion

As Fragman also notes for the French children and adults in her study, the German children and adults produce subject relatives and tend to avoid object relatives, changing them to subject relatives instead. Because of the similarity between child and adult responses, Fragman (1996) argues that problems with relative clause formation in elicited tasks are not

⁵¹ The analysis uses the very conservative Scheffe's F procedure, with a significance level of 5%. Significant differences are indicated by an 'S' in Table 11.

due to deficiencies in the learner's grammar, as Labelle suggests for French children. Fragman proposes that the differences observed in the relatives produced by children are context-tied (i.e., in response to object relatives), and are not truly unilateral, since they are also reflected in the adult grammar, however to a lesser extent. She suggests that differences between children and adults elicited relatives are quantitative, rather than qualitative. According to Fragman, it is not likely, therefore, that a component of UG is lacking or inoperative. She argues instead for an explanation based on peripheral processing limitations.

Fragman notes that the subject-object asymmetry in relatives follows from formal accounts of wh-trace processing. An object relative must be kept in memory longer than a subject relative. The processing cost of object relativization would explain the preference for subject relatives in both the children and adults. The quantitative differences between child and adult errors is then attributed to the child's more limited global computational power.

As previously noted, however, while Fragman's direct and indirect object stimulus sentences all involved an animate (human) subject and object, her subject relative stimulus sentences involved an animate (human) subject and mostly inanimate objects. Goodluck and Tavakolian (1982) show that animacy in the direct object of the embedded clause increases the processing load for the child, which accounts for an increase in their subject coreference errors for subject relatives modifying the matrix object. Goodluck and Tavakolian report that such an animacy effect was also found in the results of Chapman and Miller (1975) and Chapman and Kohn (1978), who found that children around 2 years of age have more difficulty comprehending sentences with animate direct objects than those with inanimate direct objects.

In the German experiment, children did appear to perform somewhat better in the subject condition when the object was inanimate. Table 11 shows that a comparison of the animate/inanimate subject conditions (1 and 2), revealed no significant difference for the children ($p < .49$), nor for adults ($p < .49$). However, when each of the subject conditions are compared to the direct object condition (Condition 3), we see an interesting pattern. A significant difference was found between the subject animate/inanimate condition (Condition 2) versus the direct object (Condition 3) for both children ($p < .01$) and adults ($p < .03$). Recall that Fragman also found such a distinction in her French data. However, no significant difference was found when comparing the subject animate/animate condition (Condition 1) and direct object (Condition 3), which is also animate/animate ($p < .36$ for children and $p < .49$ for adults). This suggests that it is not simply the case that subject relatives are easier to process and produce than object; there is also an effect of animacy.

We turn now to those relatives in which the experimental context encourages the production of an object relative. Both children and adults tended to produce subject relatives in response to direct object stimuli, however, they use different strategies. The adults tended to use a passivization strategy, producing passive subject relatives, rather than object relatives. This passivization strategy was also found among children by Ferreiro, Othenin-Girard, Chipman and Sinclair (1976) (as cited in Pérez-Leroux 1995), who tested elicited production of French and Spanish children aged 4 to 7 years. Ferreiro et al. note that the children avoided object relatives, producing instead relatives with passives or relatives with a resumptive pronoun or resumptive NP in the relativization site. In the German study, passivization was common strategy employed by the adults, but was not so common among

the children. For example, in response to a sentence such as (9),

- 9) *Eine Mama umarmt ihr Mädchen, und eine andere Mama kitzelt ihr Mädchen.*
one mom hugs her girl and one other mom tickles her girl

adults responded with relative clauses such as that in (10).

- 10) *Das Mädchen das von ihr Mama umarmt wird.* (Adult 8)
the girl who by her mom hugged gets
'the girl who is hugged by her mom'

When presented with direct object stimuli, adults gave passive responses 56.4% of the time. Children, on the other hand, used passive constructions only 20.4% of the time. Fragman observed the same pattern for the French children and adults in her study. The manipulation of the verb from active to passive voice proved difficult for the French children, whose attempts at passivization often resulted in ungrammaticality. Most of the German children rarely attempted passives (only two of the children gave more than one passive response). Instead they were more likely to give a simple active subject response. Thus when asked to respond to a stimulus such as that in (11), children gave answers such as (12).

- 11) *Eine Mama schaukelt ihre(n) Tochter/Sohn auf dem Knie, und eine andere Mama küßt ihre(n) Tochter/Sohn auf die Backe*
one mom rocks her daughter/son on her knee and one other mom
kisses her daughter/son on the cheek

- 12a) *der auf'm Knie schaukelt* (child 3 6;3)
who on the knee rocks
b) *die Tochter die auf den Knien sitzt* (child 1 4;5)
the daughter who on the knee sits

Another common practice was to produce subject relatives using the parent as the antecedent, rather than the child.

- 13a) *der den auf die Backe küßt* (child 4 4;7)
who him on the cheek kisses

- b) *die auf die Backe küßt* (child 9 3;8)
 who on the cheek kisses

Alternatively, children simply responded with a simple sentence such as:

- 14) *der wird - der wird gekitzelt* (child 5 4;9)
 he gets he gets tickled

With respect to relatives in which the experimental context encourages the production of an object of preposition relative, while the adults produced only a few, the children gave no such responses. Both adults and children tended to respond with a subject relative, rather than an object of preposition relative. Thus when presented with the stimulus in (15), both children and adults gave responses such as those in (16)

- 15) *Eine Mama bäckt einen Kuchen mit ihre(r/m)Tochter/Sohn, und eine andere Mama*
 One mom bakes a cake with her daughter/son, and another mom
bäckt Brot für ihre/n Tochter/Sohn.
 bakes bread for her daughter/son

- 16a) *die ein eh - ein eh - Kuchen backt* (child 2 5;8)
 who a uh a ah cake bakes
 b) *der Brot backt* (child 4 4;7)
 who bread bakes
 c) *die Tochter die Brot bäckt mit ihre Mama* (adult 7)
 the daughter who bread bakes with her mom
 d) *die den Kuchen bäckt* (adult 5)
 who the cake bakes

The other response pattern found for object of preposition relatives with both children and adults, although less so for adults, was to use the parent as antecedent.

- 17a) *die für seine Tochter das Brot bäckt* (child 1 4;5)
 who for her daughter the bread bakes
 b) *die Mama die ihre Tochter den Kuchen bäckt* (adult 6)
 the mom who her daughter the cake bakes

In all conditions, children, but not adults, often produced restrictive clauses which

were not relatives, using instead *mit* 'with' phrases or , in rare cases, participial constructions, which are also restrictive in nature (cf. § 3.1.2). Only one of the older children tested (6;11) produced these participial constructions with any frequency.

- 18a) *der gekitzelte Junge* (child 11 6;11)
the tickled boy
b) *der geküßte*
the kissed-one

The same child also produced a number of 'with' phrases.

- 19a) *der - der mit dem Ball* (child 11 6;11)
the-one with the ball
b) *der mit dem Fahrrad*
the-one with the bicycle
c) *der mit dem Bild*
the-one with the picture

The data show a general tendency amongst both children and adults to respond to direct object and object of preposition stimuli with a subject relative. For children direct object stimulus sentences as well as object of preposition elicited a subject relative response 64.4% of the time, for the total possible responses for those categories. If the percentages seem low, this reflects the fact that children often gave responses which were not relative clauses. Of the actual relative clause responses produced by the children for the direct object and object of preposition conditions, the percentages are much higher, 90.6% and 96.6% respectively. Thus object relative responses were virtually non-existent for the children. For adults the percentages for the total possible responses, and for the relative clause responses are the same, since adults always gave relative clause responses in these conditions. 76.3% of their direct object stimuli, and 69.2% of object of preposition stimuli elicited a subject response. While the adults did produce some object relative responses, like the children, they

showed a preference for subject relatives.

5.1.3 Concluding Remarks

As expected, the adults performed better overall, regardless of the position relativized. Both children and adults alike showed a definite preference for subject relatives and an avoidance of object relatives. The animacy distinction in the subject conditions revealed that children perform slightly better when presented with an animate-inanimate stimulus (cf. the percentages of perfect scores for the two subject conditions in Figure 1). This distinction is also revealed by the multiple comparison analysis in Table 11, which shows a significant difference between the animate-inanimate subject versus the direct object condition, but no such distinction between the animate-animate subject and direct object conditions. This suggests that it is not simply the case that subject relatives are easier to process and produce than object; animacy may also be a factor in the production of relative clauses. Note, however, that the effect is found for both children and adults, which may suggest a processing strategy, rather than a property of acquisition.

Mak, Vonk and Schriefers (1999) report on two experiments (self-paced reading and eye-tracking) which tested the effect of animacy of the object in the parsing of relative clauses among Dutch speaking adults. Both experiments revealed an interaction between clause type (i.e., subject or object position relativized) and animacy of the object. In both experiments, there was a significant difference between subject relatives and object relatives when the object was animate, but not when the object was inanimate.

The pattern of results in the German data supports Fragman's position, that children's errors in relative clause production are a reflex of performance, not of a non-adult grammar.

Fragman argues that differences between children and adults are quantitative rather than qualitative for the most part.

Adults, however, appear to have more options available to them when presented with direct object and object of preposition stimuli. They use strategies such as passivization, which the German children avoided, unlike children in previous cross-linguistic studies (cf. Pérez-Leroux 1995, Ferreiro et al. 1976). Also unlike the findings of Pérez-Leroux, who suggests that the early use of resumptive pronouns is common cross-linguistically, German children very rarely used resumptives in their object relatives. This lack of resumptive pronouns and resumptive NPs was also found in the spontaneous speech data. Once again, the avoidance of resumptives parallels the findings in the adult data, where resumptives were also extremely rare.

The *wo*-relatives reported in Chapter 3, which were found in the spontaneous speech data of both children and adults, were conspicuously absent in the elicited data from the children and only one adult produced one such relative. Their absence is noteworthy, given that *wo*-relatives are argued to be early acquired, and they occurred with some frequency in the naturalistic speech especially of the children, but also of the adults. Moreover, the object of preposition stimulus sentences would have lent themselves to a *wo*-relative response. It is surprising, therefore, that they are virtually non-existent in the elicited data.

Note that the subject-object asymmetry goes in the opposite direction in the case of the elicited production data, as compared with the spontaneous speech data. The early preference for object relatives in the spontaneous data, however, was evident only with the less inflected *w*-relative pronouns. In the experimental data, the responses required (and

elicited) d-pronouns. It was suggested earlier that d-pronouns require a more precise feature specification than the less inflected w-pronouns. It is unclear, however, as to why the uninflected w-pronouns would show a preference for object relativization.

5.2 English Relative Clause Experiment

Limber (1973) argues that by 3 years of age English children have acquired the ability to generate complex syntactic constructions, such as complement and relative clauses. Nevertheless comprehension and elicited production experiments often show difficulties even among 5 and 6 year old children. In a comprehension task (act out) with 3-, 4- and 5-year-old English speaking children, Sheldon (1974) used sentences such as:

- 20a) SS: The dog that jumps over the pig bumps into the lion.
- b) SO: The lion that the horse bumps into jumps over the cat.
- c) OS: The pig bumps into the horse that jumps over the cat.
- d) OO: The dog stands on the horse that the giraffe jumps over.

The task proved difficult, with children producing numerous errors, particularly in the subject-object sentences (20b) and the object-subject sentences (20c), but also more errors in object-object (20d) than in subject-subject sentences (20a). Like the German experiments (Grimm and Wintermantel 1975) these sentences involve use of three animals and the child must keep straight in his/her mind which animal has done what to whom. It may be that such a task involves too great a cognitive-processing burden on the child, which may account for the high error rate often found in these studies. Although some studies have suggested that children have difficulty with relative clause constructions, others (Hamburger and Crain 1982, Goodluck and Tavakolian 1982) have shown that children's performance may be greatly improved if the tasks are modified.

Tavakolian (1981) reanalyzes Sheldon's data as well as her own, using a similar comprehension task. She also found children experienced difficulty with OS relatives, however, she attributes this to the child's initial misconstrual of a main clause-relative clause string as two conjoined simplex sentences. That is, children interpret the string:

21) NP ... V ... NP ... V ... NP

(where ellipses indicate material such as a relative pronoun or conjunction, but not NP or V) as two conjoined simplex sentences.

22) ,[,[NP _ V _ NP] ,[Δ _ V _ NP]]

The missing subject, Δ, in the second clause is interpreted as coreferential with the subject of the first clause. This conjoined clause analysis accounts for the high error rate with OS relatives, the subject of the relative clause being interpreted as coreferential with the main clause subject, rather than the main clause object (Cf. Lebeaux 1988).

5.2.1 Experimental Design

We (Ling and H. Goodluck) address the issue of children's interpretation of OS relatives, as compared with temporal constructions in a preliminary comprehension experiment. The comprehension task allows us to examine a number of variables, including children's sensitivity to restrictiveness. We designed an act-out experiment, similar to that of Goodluck and Tavakolian (1982), in which we compared 4 to 6 year old children's understanding of relative versus temporal clauses. Goodluck and Tavakolian used active and passive constructions in order to test their prediction that children treat temporals and relative clauses differently. In their study, the child was presented with four sentence types:

- 23a) Active matrix with OS relative (active-relative):
The boy hits the girl that jumps over the fence.
- b) Passive matrix with OS relative (passive-relative):
The boy is hit by the girl that jumps over the fence.
- c) Active matrix with temporal participial (active-participial):
The boy hits the girl after jumping over the fence.
- d) Passive matrix with temporal participial (passive-participial):
The boy is hit by the girl after jumping over the fence.

Goodluck and Tavakolian found that for relative clauses the percentage of object-coreferential responses remained constant for active and passive matrix clauses, but dropped substantially for passive matrix clauses in the case of temporal participial clauses. The account they give is a structural one, based on the c-command condition, which states that a lexical NP must c-command an empty NP node with which it is coindexed. They argue that the child may structurally misanalyze participial clauses as VP constituents, allowing the direct object to be interpreted as the subject of the complement in the case of active participials. However, in the case of passive participials, under the c-command condition, the passive PP node will prevent the object of the preposition from being interpreted as the complement subject. Goodluck and Tavakolian point out that, even if the participial is misanalyzed as a VP constituent, the object of PP would not c-command the participial S. By contrast, if relative clauses are construed as under the head NP, the lack of an effect of passive voice in the case of relatives is explained.

5.2.1.1 Subjects and Method

Twenty-four monolingual English speaking children, ranging in age from 4;0 to 6;1, participated in the experiment. Unlike Goodluck and Tavakolian, we used only active sentences, distinguishing between sentences with a direct object and a prepositional object.

We added a distinction between wh- and that-relatives, and definite NPs and proper names as potential antecedents for restrictive relative clauses. All relative clause sentences were subject relatives, i.e., the position relativized was the subject of the relative clause, and the antecedent was the object. Children received three tokens of each of the following sentence types.

- 24) Temporal clause:
 - a) The bear tickles the gorilla, before sitting on the block.
 - b) The lion jumps over the elephant before climbing into the box.
- 25) Wh-relative clause:
 - a) The gorilla chases the elephant, who jumps on the table.
 - b) The elephant walks around the bear, who runs around the fence.
- 26) That-relative clause:
 - The bear licks the elephant that walks around the chair.

In addition to the stimulus sentences with a direct object antecedent (24a, 25a and 26), we included sentences with an object of preposition antecedent in both the temporal and wh-relative constructions (24b, 25b). Our intent was to determine whether an object of preposition antecedent would have the same effect as Goodluck and Tavakolian's active-passive distinction.

In order to address a potential problem of intonation differences between temporal constructions and that-relative clauses used in the original Goodluck and Tavakolian experiment, we added the condition using non-restrictive who-relatives (25a). Non-restrictive relatives are more similar to temporal clauses than restrictive relatives in that neither non-restrictive nor temporals form a structural unit with the noun to which they are linked. A test for restrictiveness is the ability of the relative to modify a proper name; restrictive relatives

may not modify a proper name, whereas non-restrictives may.

- 27a) *I met Jane that I admire
- b) I met Jane, who I admire.

Who-relatives are optionally restrictive, whereas that-relatives are obligatorily restrictive, and therefore do not allow the use of a comma separating the relative from its main clause antecedent, unlike temporal participials and who-relatives, which may be separated from the main clause by the use of comma intonation. The use of comma intonation in non-restrictive who-relatives, eliminates the possibility of an intonation effect.

The experiment was also designed to determine whether children make a distinction between the use of definite NPs and proper names as potential antecedents for restrictive relative clauses. In addition to the restrictive that-relatives such as (26), we included a condition using proper names in both the restrictive that-relatives and the non-restrictive who-relatives.

- 28a) That-relative/Proper Name:
Leo chases the gorilla that jumps over the chair.
- b) Wh-relative/Proper Name:
Snowy tickles the elephant, who runs around the block.

In order to provide a comparison with the relative constructions, we added the same distinction between definite NPs and proper names in the temporal clauses.

- 29) Proper Name - Definite NP:
Leo tickles the bear after running around the block.

Children were predicted to make some degree of subject reference errors with end-placed relative clauses. (cf. Sheldon 1974, Tavakolian 1981) If they made fewer such errors in, for example, (27) than (24c), this can be taken as evidence that, although they have not

mastered the adult constraint blocking extraposition over an object NP, they are aware of the no-proper-name restriction on that-relatives, and by extension, have a grasp on the restrictive/non-restrictive distinction. Moreover, if children made more subject reference errors in (28) than (27), this would provide further evidence that they have grasped the restrictive/non-restrictive distinction, since non-restrictive who-relatives may modify proper names. The contrast with temporals (assuming that there is no effect of proper name for that clause type) would rule out an interpretation of an effect of proper name for relatives as simply a 'sorting' effect, i.e., that children tend to pick a full NP as antecedent.

5.2.1.2 Results

Two of the 24 children were excluded from the analysis, one because he had to be prompted to act out the subordinate clause in every sentence, and his responses were random as to which animal he picked up to act out the second clause. The other child was excluded because he did not meet the language background criteria, which required that children had at least one native English speaking parent and that English was the dominant language used in the home.

The distinction between a direct object and object of preposition antecedent in the matrix clause was analyzed separately. This distinction did not prove to be a factor in the children's interpretation of relative versus temporal clauses. We ran an ANOVA using subjects as a random variable to determine whether there was a main effect of clause type (relative vs. temporal) or type of object (DO vs. O-of-P), and whether there was any interaction between these two factors. The results showed that the effect for clause type approached significance ($F(1,20)=3.46$, $p>0.08$). However, no main effect was found for

object type ($p > 0.90$), nor was there any significant interaction between clause type and object type ($p > 0.39$). The results indicate that if the child made a distinction between clause types with a direct object antecedent, they tended to do so with object of preposition antecedent as well, and similarly, if they failed to make the distinction, they did so with both direct object and object of preposition antecedents. With respect to the temporal participial clauses, we do not see the distinction between direct object and object of a by-phrase found in the Goodluck and Tavakolian study.⁵²

The overall raw scores and percentages comparing responses for the Definite NP Subject/Definite NP Direct Object and the Proper Name Subject/Definite NP Direct Object conditions are given for each of the three clause types in Table 11. Table 11 indicates the choice of antecedent (subject or object of the main clause) for temporal, wh-relative and that-relative clauses for the 22 children.

⁵² More recent studies of the interpretation of the interpretation of temporal clauses show a variety of patterns of responses that render the c-command and structural misanalysis of Goodluck and Tavakolian inadequate. (Cf., for example, Goodluck and Behne 1992, and references therein.) Goodluck and Behne argue against the misattachment analysis since children in their study allowed the object of a passive by-phrase to be the controller of a temporal adjunct. This cannot be reconciled with an S-structure c-command condition on control. Furthermore, misattachment would not explain why children avoided control by the direct object.

Clause type	Subject type								
	Definite NP Subject/Object NP						Proper Name Subject/Object NP		
	⁵³ Subject %	Object %	Other %	Subject %	Object %	Other %	Subject %	Object %	Other %
Temporal	39 59.1	13 19.7	14 21.2	50 75.8	11 16.6	5 7.6			
Wh-rel.	39 59.1	18 27.3	9 13.6	36 54.6	22 33.3	8 12.1			
That-rel.	37 56.1	22 33.3	7 10.6	35 53.0	28 42.4	3 4.6			

Table 12 Raw Act-out Scores and Percentages

The results in Table 11 reveal only a slightly higher percentage of correct object responses in the wh- and that-relatives when the subject was a proper name, as compared to a definite NP subject. Thus the non-restrictiveness requirement on proper names does not appear to be a significant factor in the children's choice of antecedent in this study. Conversely, we see a higher number of correct subject responses in the temporals, when a proper name was used. There is a somewhat higher number of object responses with relatives, particularly that-relatives, than temporals, indicating that some distinction is being made between choice of antecedent depending on the clause type. The higher number of object responses with that-relatives as compared with wh-relatives may indicate that at least some of the children are aware of the restrictiveness requirement for that-relatives.

The raw scores in Table 11 do not give us an indication of the interaction between the individual subjects, the clause type and the type of clausal subject. We ran an ANOVA on the subject responses to determine whether there was a main effect of clause type (temporal/wh-relative/that-relative), and for main clause subject type (definite NP/Proper name). One of the

⁵³ A 'subject' response indicates that the child chose the matrix clause subject as the antecedent of the subordinate clause, and similarly, 'object' indicates a choice of the matrix object as antecedent. A response is labeled as 'other' if the child has used the wrong animals in his/her response, the subordinate clauses was not acted out, or if the sentence had to be read more than three times.

22 children whose scores are included in Table 11 had to be excluded from the ANOVA since he failed to produce any scoreable results in one of the conditions. Thus the results are therefore based on 21 children ($n=21$).

The results showed a main effect of clause type ($F(2,20)=6.62$, $p>0.004$), indicating that many of the children made a distinction between relative and temporal clauses. There was no main effect of subject type ($p>0.22$), though the interaction between clause type and subject type approached significance ($F(2,20)=2.70$, $p>0.08$).

5.2.2 Discussion

Some of the children we tested followed a 'first subject strategy' whereby they selected the first subject encountered as the subject of both clauses, making no distinction between temporal and relative clauses. It might be argued that this failure to make the distinction between clause types is due in part to the repetitive nature of the task. Children were faced with a battery of similar types of sentences (all either temporals or relative clauses), which they were asked to act out. Nevertheless, previous experiments of this nature have shown that children aged 4-6 are generally capable of distinguishing between relative and temporal clauses. The reason for the use of a first subject strategy by some of the children in our study remains unclear. Mills (1984) also notes that in the German comprehension experiments, children aged 4;0 frequently take the first noun in the sentence to be agent in both the main and relative clause, even when the relative clause occurs at the end of the sentence.

We ran the ANOVA again excluding 6 children who appeared to follow a strict first subject strategy, as indicated by the fact that they gave no object responses at all in any of the

clause types. In their scoreable responses they chose only the subject of the matrix clause as the antecedent for the subject of the subordinate clause. Again we found that the interaction between subject type and clause type only approached significance ($F(2, 14)=2.80$, $p>0.08$). We then separated the relative clause conditions from the temporal condition. The intent was to determine whether there were individual subjects who made subject reference errors for relatives, but showed a distinction between that- and who-relatives, and between proper name subjects and definite NP subjects. While the effect of main clause subject type (proper name vs. definite NP) approached significance ($F(1, 14)=4.78$, $p>0.05$), there was no significant interaction between clause type and subject type ($p>0.79$). Children were less likely to make subject reference errors when the subject of the main clause was a proper name, however, they did not make a distinction in this respect between that- and who-relatives. A test for an effect of subject type in the temporal condition revealed no such effect ($p>0.26$).

Only one child proved to be completely adult-like in her responses; temporals always referred to the main clause subject and relatives (wh- and that-) always referred to the main clause object. Six children showed both subject and object responses for relatives and temporals. We considered whether these six children showed a sensitivity to proper names for relatives (particularly that-relatives), but not for temporals, however, no interaction was found.

5.2.3 Concluding Remarks

By around 3 years of age, children produce relatives which appear to be restrictive in nature. However, they are also reported to misconstrue restrictive relatives as conjoined structures (cf. Tavakolian 1981). We might expect that certain aspects of restrictiveness

should be more accessible than others, particularly the proper name restriction, since it encodes the essence of restrictiveness. Problems we encountered in our experiment may be attributed to a number of factors. The use of both proper names and NP descriptors, with an animal sometimes being referred to as a definite NP and sometimes referred to by a proper name may have caused some confusion for the child. Moreover, given our experimental design, children would have to have given a wrong answer in order to show the restrictiveness distinction, i.e., they were expected to make more subject reference errors with a definite NP than with a proper name. Also, the fact that children can commit a subject reference error to reveal a difference between the proper name and definite NP conditions may have reduced our ability to tap this distinction. Our experiment did not provide us with conclusive insights into the syntax or semantics of restrictiveness.

The question arises as to why children appear to have difficulties in interpreting relative clauses in experiments at 4 and 5 years of age, when they are productively producing them at age 3. Two potential explanations have been presented in the literature: pragmatic factors and restrictiveness. The difficulty of using pragmatic factors as an explanation has already been addressed in §5.1. With respect to the use of restrictive relatives in comprehension studies, Hamburger and Crain (1982) argue that such relative clauses force the child to make use of redundant information; if three or four different animals are used, there is no reason to restrict the reference of the head noun. While such an explanation may account for a potential pragmatic difficulty, it cannot account for the varying degrees of difficulty children experience depending on the type of relative clause, i.e., depending on, for example, the position relativized, the position of the relative clause in relation to its

antecedent, as well as other factors which have been shown to influence the degree of difficulty. In Ling and Goodluck's experiment, we use both non-restrictive who-relatives and restrictive that-relatives. If, as Fabb (1990) argues, non-restrictive relatives have no syntactic relation to their antecedent and the co-indexing requirement between a non-restrictive relative and its antecedent holds at the level of discourse, then young children might have difficulty in interpreting these types of relatives. The argument would be that if children's relatives are initially restrictive, then we might expect them to perform better with restrictive, than with non-restrictive relatives. In our experiment, we would have expected to see a better performance with the restrictive that-relatives, and particularly when the main clause subject was a proper name. While the distinction between who- and that-relatives did not prove significant, children did appear to be sensitive to the use of proper names as possible antecedents, indicating that restrictiveness may play a role in children's interpretation of OS relatives. It is, however, by no means clear that children's early relative clauses are in fact restrictive, or that restrictiveness should facilitate interpretation.

Chapter Six

Summary and Conclusions

6.0 Continuity Revisited

I noted in Chapter 1 some problems faced by a strong continuity analysis, which assumes that children have the full phrase marker from the outset. In the following chapter, I suggested that some potential problems for the Truncation Hypothesis, are avoided under a weak continuity theory. The fact that languages vary with respect to which functional projections they select, as well as the order of these projections presents difficulties for an analysis in which all functional categories are available to the child from the outset. I have argued instead for an analysis of language development in which children begin with lexical projections and gradually expand their phrase marker, to eventually include all the functional projections of the target grammar. They do so based on lexical and morphological cues. The advantages of such an analysis is that it is both minimal and economical. It reflects the child's gradual learning, and an interaction of learning new lexical material and morphological elements of his/her grammar with the gradual building of structure. The analysis is empirically supported by the production data analyzed in Chapters 2 - 4.

This brings us to the question of what is universal about universal grammar. That is to say, what is the child's biological endowment with respect to language acquisition in the current minimalist framework? Knowledge of the principles and features made available by UG and structure-building are likely minimum requirements for the development of a

grammar. Another necessary part of the equation is input. The child must be exposed to language input in order to determine what the language specific characteristics of his/her grammar are. Input guides the development of language specific aspects of a grammar. The child must learn the lexical items of his/her particular grammar, as well as the morphological paradigms. These are the morphological cues which trigger the growth of the phrase marker.

The German experimental evidence reported in Chapter 5 revealed that, as in the French study (Fragman 1996, 1998), there are certain similarities between child and adult elicited production of relative clauses. Similarities between child and adult production of relative clauses was also reported for the spontaneous speech data in Chapter 3. A comparison of child and adult relatives in the spontaneous speech data indicated that children's production of relative clauses in German are very adult-like from the start. Fragan argues that the differences between children's and adults' production of relatives are quantitative, not qualitative, suggesting that children's errors in relative clause production are a reflex of performance, not of a non-adult grammar. This would support a strong continuity hypothesis. The results reported in the previous chapter support the argument for quantitative differences between children and adults. However, because relative clauses are argued to be late acquired in German and because they appear at a time when the child already has functional projections available to him/her, the observed similarities between child and adult relative clause production does not run counter to the weak continuity hypothesis being advocated here.

It was noted at the beginning of this thesis, and the empirically supported in the spontaneous speech data, that a particular functional projection may be used before all its

relevant features have been acquired. I suggested that the child will be exposed to many sentences which s/he will not have a sufficient grammar to analyze, but that this does not prevent the child from using such functional projections before all or most of its features have been identified. There may be a stage in which a functional category is used in a non-adult-like fashion. The child may be aware that his/her grammar is deficient in certain respects. The child's ability, for example, to produce structures which carry illocutionary force (e.g., interrogative, assertive, imperative), while s/he lacks the grammatical structure to accommodate such constructions may argue for differences between the child's linguistic capacity and his/her cognitive ability. That is, assuming that UG makes available an array of features, the child would be aware of these features, but s/he may not know how such features are manifested in his/her particular target grammar. The analysis is compatible with a weak continuity account, whereby properties of UG are available to the child from the onset, but the language particular aspects of the grammar will have to be learned.

How then do we determine the nature of the child's early syntactic representation? How much of the child's cognitive abilities must be syntactically represented? Chomsky (1998) argues that in the adult grammar clauses must project to the level of proposition, i.e., to CP. This would argue against the proposals of for example Grimshaw (1993, 1994) and Speas (1994), that a clause is projected only as far as is necessary to licence elements contained within it. This is the notion of economy of projection which have adopted in this thesis. The child has more leeway under an economy of projection analysis, given that Chomsky's proposal does not allow for the possibility of not projecting the clause to CP. It is not clear at this point, the implications Chomsky's proposal would have for child language,

or indeed whether such notions as proposition must be represented in the child's phrase structure. If this were the case, we would have to consider again the notion of full competence. That is, does the child always project the clause to the level of CP, as Chomsky proposes for the adult grammar? I leave the issue open for future research.

6.1 Varying Patterns of Development

Language variation is a topic often associated with sociolinguistic research, though it has also received attention of late in the field of language acquisition.³⁴ I have been assuming throughout this thesis that grammar develops with age, always conforming to the dictates of UG. We know that UG can account for the remarkable similarities among learners of very different languages, but how does it provide an explanation for variation among learners, especially learners acquiring the same target language? It is not the case that grammar develops in precisely the same manner and time frame for all children. This does not mean that principles of UG are being violated. UG tolerates variability in language acquisition as it does in the considerable variation both between and within (dialect, idiolect, register, etc.) languages. We assume that UG provides a set of hypotheses from which the child may choose. Different children may make different choices.

The naturalistic speech data and the experimental data reported in this thesis reveal varying patterns of development among children both cross-linguistically, and within languages. In the preceding pages I have considered a number of issues such as the acquisition of V2 and CP in German, the movement/non-movement debate with respect to the formation of early relative clauses, children's knowledge of restrictiveness. Conclusive answers to some

³⁴ Cf. Tracy and Lattey (1994) and references therein.

of these questions were not always evident in the data from the children, whether naturalistic or experimental. There is no reason to assume, however, that any one answer should hold across the board for all children. Thus it may be the case that some children learning a particular language go through a non-movement stage in their early formation of relative clauses, while others do not. Similarly, in the English experiment, some children exhibited awareness of restrictiveness, while others did not. It would be very difficult (perhaps impossible), therefore, to determine a methodology which would tap exactly the same knowledge in the same manner for all children, given the variability in their individual developmental patterns. Nevertheless, children's acquisitional patterns always fall within the realm of possibilities offered by UG.

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Appendix 1

A1.1 The children

The two children we focused on in Chapter 2 were video recorded by H. Clahsen (see Clahsen 1982, 1986a, b). Daniel and Mathias are two male fraternal twins learning German as their first language. The children come from an upper middle class family. Mathias is more demanding and sometimes aggressive, while Daniel is more introverted. The recordings consisted of unstructured play sessions at the children's home, usually with their mother present. Sessions lasted between 45 and 60 minutes. Both boys are recorded at monthly intervals between the ages of 2;9 to 3;6. The data have been made available on the CHILDES data base.

The three children whose speech is examined in Chapters 3 and 4 were initially studied by M. Rothweiler (cf. Rothweiler 1989, 1993). Two of the children, Daniel and Marianne, were audio recorded by Rothweiler herself, the recordings lasting between 60 and 120 minutes each. The child Marianne lived in Rothweiler's neighbourhood and attended a kindergarten in the mornings. She was recorded in Rothweiler's home beginning at 3;3, at which time she was just beginning to produce subordinate clauses. Daniel was recorded in his own home in three bi-monthly recordings, between 3;2 and 3;6. At this time he had already acquired the correct sentence structure for embedded clauses. Since he did not yet attend kindergarten, he welcomed the play sessions with Rothweiler. The third child, Martin, was audio recorded during ordinary everyday situations (eg., at play, at mealtimes, driving in the

car) by his father, who was a student at the time.⁵⁵ Martin's father is German and his mother is Jordanian, but speaks German fluently, and only German was spoken at home with Martin. Martin also attended kindergarten. Although he is the youngest of the three children when the recordings begin (2;09), he already produces many and varied complex sentences, and has already acquired verb placement in main and subordinate clauses.

The corpora consist of twelve files from Marianne (MA01-MA12), three files from Daniel (DA01-DA03) and nine files from Martin (MT01-MT09).

⁵⁵ The data from Martin were provided by Prof. Augst to M. Rothweiler, who allowed me access to them, along with the data from Daniel and Marianne.

File	Age	Duration in minutes	Researcher
DA01	3;02	120	Rothweiler
DA02	3;04	120	Rothweiler
DA03	3;06	120	Rothweiler
MA01	3;03	100	Rothweiler
MA02	3;03	100	Rothweiler
MA03	3;04	155	Rothweiler
MA04	3;04	120	Rothweiler
MA05	3;05	110	Rothweiler
MA06	3;05	120	Rothweiler
MA07	3;06	120	Rothweiler
MA08	3;07	95	Rothweiler
MA09	3;07	100	Rothweiler
MA10	3;08	105	Rothweiler
MA11	3;09	95	Rothweiler
MA12	3;10	60	Rothweiler
MT01	2;09	105	(Augst)
MT02	2;10	60	(Augst)
MT03	2;11	60	(Augst)
MT04	3;01	60	(Augst)
MT05	3;02	60	(Augst)
MT06	3;03	60	(Augst)
MT07	3;04	120	(Augst)
MT08	3;04	60	(Augst)
MT09	3;08	60	(Augst)

Table A1 File Numbers, Age and Duration

A1.2 MLU

The MLU for the children Daniel and Mathias, who were studied by H. Clahsen, are given in Table 1 in Chapter 2. (Similarly, MLU for three recordings of their younger sister Julia is given in Table 3.). MLU is calculated according to Clahsen (1986a). Clahsen identifies five phases of acquisition for German children:

Phase	MLU	Age	Utterance type
I	approx. 1		Single words dominate
II	1-2	ca. 18 months	One, two and multi-word
III	2-3	ca. 2-2;6 years	Multi-word strings dominate
IV	3-4	ca. 3 years	Multi-word strings dominate
V	>4	ca. 3;6 years	Multi-word strings dominate

Table A2 Clahsen's Phases of Acquisition

Clahsen's calculation of MLU differs from Brown (1973) in that it is based on words, not on Morphemes. Rothweiler (1993) uses this same criteria for determining the MLU of the children Daniel, Marianne and Martin. MLU calculations are based on 100 utterances, and not the entire transcript.

	DA01	DA02	DA03	MT01	MT03	MT04	MT09	MA01	MA03	MA06	MA07	MA11
Age	3;02	3;04	3;06	2;09	2;11	3;01	3;08	3;03	3;04	3;05	3;06	3;09
MLU	3.2	3.4	4.1	3.8	3.6	4.5	4.5	2.5	2.8	2.8	3.5	3.3

Table A3 MLU for Daniel, Martin and Marianne

Although they are of comparable ages, there is a considerable difference in MLU between the children Martin and Marianne. Already in the first recording at 2;09, Martin is approaching Clahsen's Phase V, having an MLU close to four words, whereas Marianne's MLU at 3;09 still falls short of four words.

Appendix 2

A2.1 German Relative Clause Elicitation Task

Stimulus Sentences by Category

Subject (animate - animate)

Ein Mädchen/Junge spielt mit seiner Freundin, und ein anderes/er Mädchen/Junge redet mit seinem Bruder.

Ein(e) Tochter/Sohn besucht ihren/seinen Freund, und ein andere(r) Tochter/Sohn küßt ihre/seine Schwester.

Ein Mädchen/Junge hilft seinem Bruder, und ein anderes/er Mädchen/Junge kitzelt seine Schwester.

Subject (animate - inanimate)

Ein(e) Tochter/Sohn singt ein Lied, und ein andere(r) Tochter/Sohn wirft einen Ball.

Ein Mädchen/Junge malt ein Bild, und ein anderes/er Mädchen/Junge liest ein Buch.

Ein(e) Tochter/Sohn fährt Fahrrad, und ein andere(r) Tochter/Sohn fährt im Wagen.

Direct Object

Eine Mama umarmt ihr/en Mädchen/Jungen, und eine andere Mama kitzelt ihr/en Mädchen/Jungen.

Ein Papa weckt seine(n) Tochter/Sohn auf, und ein anderer Papa ruft seine(n) Tochter/Sohn an.

Eine Mama schaukelt ihre(n) Tochter/Sohn auf dem Knie, und eine andere Mama küßt ihre(n) Tochter/Sohn.

Object of Preposition

Eine Mama bäckt einen Kuchen mit ihre(r/m) Tochter/Sohn, und eine andere Mama bäckt Brot für ihre/n Tochter/Sohn.

Eine Mama sitzt neben ihrem Mädchen/Jungen, und eine andere Mama tanzt mit ihrem Mädchen/Jungen.

Ein Papa redet von seinem Mädchen/Jungen, und ein anderer Papa spielt mit seinem Mädchen/Jungen.

Questions

Welche(s/r) Mädchen/Junge möchtest du lieber sein?

Welche(r) Tochter/Sohn möchtest du lieber sein?

Practice sentences

Ein Kind hat lange Haare, und ein anderes Kind hat kurze Haare.

Welches Kind möchtest du lieber sein?

Ein Hund beleckt ein Kind, und ein anderer Hund beißt ein Kind.

Welches Kind möchtest du lieber sein?

A2.2 English Relative/Temporal Experiment

Temporals

Def NP Subj - Def NP DO

The bear tickles the gorilla before jumping on the block.

The lion licks the gorilla after walking around the table.

The elephant bumps the bear before jumping over the chair.

Def NP Subj - Def NP IO

The lion jumps over the elephant before climbing into the box.

The elephant runs around the lion before hopping onto the box.

The gorilla stands on the bear after jumping over the fence.

Proper Name Subj - Def. NP DO

Leo hits the elephant after hopping over the table.

Dumbo kicks the gorilla after jumping over the fence.

Leo tickles the bear after running around the block.

Who-Relatives

Definite NP Subj - Def NP DO

The bear pats the lion, who climbs into the box.

The gorilla chases the elephant, who jumps on the table.

The lion licks the bear, who runs around the fence.

Def NP Subj - Def NP IO

The elephant walks around the bear, who runs around the fence.
The bear jumps over the lion, who sits on the chair.
The gorilla stands on the elephant, who jumps onto the block

Prop Name Subj - Def NP DO

George hits the lion, who jumps on the fence.
Dumbo pats the gorilla, who hops into the box.
Snowy tickles the elephant, who runs around the block.

That-Relatives

Def NP Subj - Def NP DO

The gorilla bumps the lion that sits on the block.
The bear licks the elephant that walks around the chair.
The elephant pats the gorilla that jumps on the table.

Prop Name Subj - Def NP DO

Leo chases the gorilla that jumps over the chair.
George tickles the lion that jumps on the block.
Snowy hits the gorilla that runs around the fence.