FINITENESS IN ADULT AND CHILD GERMAN

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FINITENESS IN ADULT AND CHILD GERMAN

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ABSTRACT

This thesis addresses the fact that two-year-old children acquiring German and other Germanic languages productively use *finite* sentences with correct verb inflections and word-order, but also frequently produce *non-finite* root clauses where adults would use finite constructions. This behavior in learners has presented a challenge to acquisition theory.

The solution proposed here is based on two main claims: First, root infinitivals (RIs) are an adult phenomenon as well. Second, adult and child RIs differ not in their form but primarily in their conditions of use.

These points are established by a discussion of naturally-occurring adult German RIs, and by a corpus study comprising over 5000 root clauses from two German adults, and approximately 2000 root clauses from two German two-year-olds. The data reveal that while adults produce RIs with lower frequency than children, they use them in a much wider variety of interpretations than has previously been assumed.

A comparison of child and adult RIs shows that the children mainly disobey pragmatic constraints (e.g. that subjects, temporal interpretation, and illocutionary force be recoverable from discourse context). A proportion of child RIs are such that, if the pragmatic constraints had been respected, they would be well-formed sentences of German which could have been uttered by an adult in discourse.

A careful linguistic analysis of finite sentences indicates that an intricate system of interpretive properties of the *entire sentence* determines which particular morphological verb form is appropriate in each context. This implies that even complete knowledge of verbal inflections and verb-placement constraints is insufficient to ensure correct verb use. Rather, a learner has to acquire subtle relationships between interpretive aspects of sentences and verbal morpho-syntax. Since these relationships differ even across typologically close languages, a considerable amount of learning is required for correctly expressing finiteness on verbs.

The RI phenomenon in children looks to be a heterogeneous one, deriving from a number of different finiteness-related deficits in learners. It is suggested that RIs are favored by learners whose abilities of marking finiteness are not yet complete. RIs are suitable default constructions, because non-finite forms are the least specified with respect to finiteness and also with respect to other interpretive properties of the sentence.

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ROOT INFINITIVES: A PUZZLE IN LANGUAGE ACQUISITION THEORY

CHAPTER 1

This thesis explores why children learning German and other languages, for some time, produce sentences like those in (1):[1]

(1) a. Mein Kakao hinstelln. S 2;02
my chocolatemilk put-*inf*

b. Mal alles wieder reintun. S 2;06
part everything again in-put-*inf*

c. Max auch Pudding kochen. S 2;08
Max also Pudding cook-*inf*

d. Ich erst ma das Buch angucken. S 2;11
I first part the book look-at-*inf*

The reference code next to each child example gives the child's first name's initial and age (years; months). The examples in (1) are from a German child, named Simone, whose productions are analyzed in more detail in Chapter 7. The relevant characteristic of these utterances is that they constitute main (non-dependent) clauses which contain only a non-finite verb form, namely an infinitive, but no finite verb form. In keeping with some of the recent literature on this construction type, I will refer to such sentences as "child root infinitives" (child RIs).[2]

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[1] In all the examples, verb forms are underlined. In the glosses, relevant grammatical morphemes are represented by abbreviations in italics (e.g. *inf* for "infinitival affix"). Terms which have no direct English translation are also represented by a gloss in italics. For instance, a German discourse particle which does not exist in English would be glossed as *part*. A complete list of the abbreviations used in the glosses and of the terms they stand for can be found in Appendix 1.

[2] The term "optional infinitive" is also used in the acquisition literature but will be avoided here. It will be argued in Chapter 8 that Root Infinitives are not genuinely optional.

RIs have been documented as a wide-spread phenomenon among two-year-old children learning various Germanic "Verb-Second" languages, (for a summary, see Wexler 1994). The figures reported for Germanic children around age 2 range between 100% (Wijnen 1994b) and roughly 15% (Poeppel and Wexler 1993). I address this wide range in proportions in Chapter 5, where I also give a detailed review of the literature on child RIs.

Longitudinal and cross-sectional data have shown that with increasing age the proportion of RIs decreases gradually (Bol and Kuiken 1988, Wijnen and Bol 1993, Haegeman 1993). Generally speaking, the proportion of RIs in a particular child's utterances with verbs depends on her age and developmental status, and presumably on the language acquired.

For some children it has been shown that they produce RIs until after their third birthday (Wijnen and Bol 1993, Haegeman 1995).[3] This prolonged nature of the "root infinitive stage" (Wexler 1994) has been perceived to constitute a potential difficulty for language acquisition theories. One problem is connected to the so-called Continuity Hypothesis, which states that "the child's grammatical rules should be drawn from the same basic rule types, and be composed of primitive symbols from the same class, as the grammatical rules attributed to adults in standard linguistic investigations" (Pinker 1984; see Atkinson, 1995, for discussion of Continuity in the context of RIs). The acquisition literature has assumed that in natural languages, root utterances with verbs must be finite. If this is true, the Continuity Hypothesis would predict that RIs are not generated by a child's grammar.

The second challenge posed by child RIs is that children produce RIs when they already have acquired finite verbal morphology[4], and when they place finite and non-finite verbs in their correct positions (see section 1.2.1 below)[5]. This behavior of children seems to fly in the face of a second pillar of

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[3] To date, not many children past the age of 3 have been studied with respect to RIs.

[4] When *productivity* of finite verbal morphology can be assumed to be present in a child is controversial. However, even on a strict criterion, the RI stage exceeds the onset of productivity. For instance, Clahsen and Penke (1992), studying the same child on which I report below in Chapter 7, take a rather conservative approach, and determine productivity of the agreement paradigm in the present tense to occur some time in the 26th or 27th month. However, the child continues to produce RIs past the 30th month, as is evidenced from their Table IVb (p. 193), and from the data presented below in Chapter 7.

[5] Most researchers agree that knowledge of the *distribution* of finite and non-finite verb forms is present before the end of the RI stage.

standard learning-theoretic assumptions, namely the Subset Principle. It states that given two input languages, one of which is a subset of the other, if both are compatible with the input data, the learning function must pick the smaller one (Anglin 1978, Berwick 1985, Manzini and Wexler 1987). If children's grammars allow RIs as well as finite clauses, but adult grammars do not, children's grammars would generate a superset language. Under standard assumptions (particularly that learners lack negative evidence), children could not retreat from this situation. It is these problems which the present thesis addresses.

It is argued here that with respect to their *verbal morpho-syntax*, child RIs are syntactically grammatical structures, for two reasons. First, they do not violate any constraints on word-order, neither universal ones nor language-particular ones. Second, contra wide-spread assumptions, adult grammars, and in particular the grammar of German, permit RIs as a construction type in a broad set of contexts. In addition it will be demonstrated that what I will term the "well-formedness status" of a RI depends on a variety of *semantic* and *pragmatic* factors. This is not a special property of RIs, as the same holds for finite constructions.

It is perhaps because adult RIs have only occasionally figured in linguistic analysis, that their existence has never before been *systematically* brought to bear in an acquisition theory. An empirical analysis of 15 hours of adult speech, reported below, shows that Simone heard a RI spoken by one of her caretakers once every six minutes. With respect to German children's RIs, I will show that some of them fully conform to the constraints on RIs in the target language. In other words, they could have been uttered by an adult in the same discourse. Example (1b) at the beginning of this chapter is such an example (for more examples see the end of Chapter 7).

The question which is most urgent for language acquisition theory is then not why children use RIs *at all*, but rather why they use them *so frequently*. We would also like to know why children sometimes (but not always) use RIs inappropriately (i.e. in cases where an adult would have to use a finite construction). For this purpose, a comparison of child and adult RIs was carried out. Similarities as well as differences were found. Although such a comparison had to be limited, the results argue for two main points: First, it is untenable to treat child RIs as ungrammatical across-the-board. And second, those child RIs which are ill-formed are mainly pragmatically illicit in various different ways, but semantically and syntactically well-

formed. In other words, children mainly violate conditions of use. In Chapters 7 and 8 I explore why this may be so.

I present a short précis of the thesis at this point in the exposition, before I go on to outline the background assumptions.

1.1 PRÉCIS

Chapter 2 discusses the syntactic, semantic and pragmatic properties of RIs in adult languages in order to provide an adequate description of the target RI construction. I will show that in particular for German it is not the case, as all of the acquisition literature has assumed, that RIs cannot have a declarative meaning (Rizzi 1994). The conclusion of Chapter 2 will be that RIs are licensed by Universal Grammar, and that they are, like any other construction type, subject to numerous linguistic restrictions. It will turn out that, more so than for finite clauses, these restrictions are contextual in nature, in that the appropriateness of a RI depends on the particular discourse situation in which it is uttered. Without such discourse context, the grammaticality of a RI cannot be judged. This is because, unlike finite clauses, RIs have no default interpretation with respect to, for instance, temporal properties and illocutionary function. A comparison of RIs from different languages will show that some of the constraints on RIs are language-particular.

Chapters 3 and 4 serve mainly as background for the learning-theoretic conclusions in Chapter 8. Chapter 3 is concerned with the theoretical notion of finiteness. While the linguistic literature on finiteness-related issues is vast, the implications of this work for language acquisition have so far not been studied in any detail. The main focus will be the issue of how finite forms and interpretive aspects of finiteness are related to each other. It will become clear that these relationships, or mappings, are largely language-particular in nature, and must be learned independent of word-order and inflectional paradigms. These mappings are vital for using finite verbs correctly. In Chapter 4 it is shown specifically for some German finite forms how they are interpreted. This chapter also contains information useful for understanding the empirical analysis presented in Chapters 6 and 7.

Chapter 5 reviews and evaluates previous work on the phenomenon of child RIs, and shows how this body of literature is related to the present discussion. I conclude that while existing work on the topic provides essential and valuable information about child RIs, our perspective on child RIs is still limited. This is mainly because research goals and methods have

varied across studies, and because interpretive characteristics of child RIs have been investigated only very recently. Concerning the existing proposals for learning mechanisms which would explain why children stop using RIs, I will show that they do not predict certain semantic and pragmatic patterns which are now emerging to exist in child RIs. A criticism that applies to all proposals is that they have not taken into account the *systematic properties of RIs* in the target languages.[6]

Chapters 6 and 7 report a quantitative study of naturalistic language use carried out to compare how finiteness is realized in adult and child language. The study had two main purposes. One goal was to establish, for one sample of discourse between a child and her parents, what the proportion of RIs in the input language was, and how this proportion would compare to the child's at different ages. The other purpose was to investigate whether children's and adults' RIs exhibit any interpretive differences. Such a direct comparison between adult and child behavior has not previously been presented for RIs. The results will further support the idea that with respect to their verbal morpho-syntax child RIs should be considered appropriate target utterances. At the same time, child RIs differ from adult RIs in that many of them would not have been uttered by an adult in the same discourse context. Deviant child RIs can be classified according to the particular way in which they differ from adult RIs. As far as could be determined, few child RIs show a semantic difference. A considerable proportion of deviant child RIs can be attributed to pragmatic deviance.

Chapter 8 addresses the consequences of the findings of this thesis for learning theory. I suggest reasons for why some child RIs are deviant. The argumentation will be based on *the language-particular nature of finiteness-marking*. Chapter 8 will also specify directions for further research.

In the remainder of this introductory chapter I give some background material which I will be assuming without further discussion. At the end I recapitulate why child RIs present a puzzle to language acquisition research.

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[6] Two notable exceptions are the very recent dissertations by Schütze (1997) and Boser (1997) (see Chapter 5), who point out that adult languages permit non-finite constructions in a variety of contexts, and who note that declarative meanings can be assigned to certain non-finite constructions in adult languages, and specifically in German. Both authors also note that there are particular conditions of use for adult non-finite constructions which children will have to acquire. In investigating these conditions in greater detail, the present work extends ideas similar to those of Boser and Schütze.

1.2 BACKGROUND ASSUMPTIONS

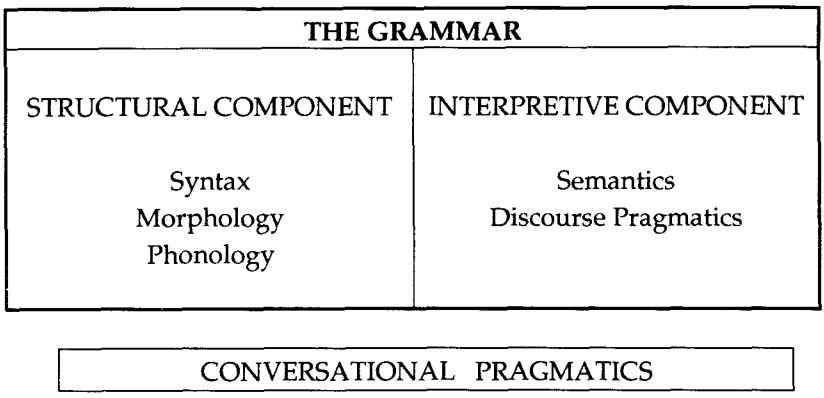
The approach taken here combines assumptions from learnability theory, and from various areas of linguistic theory with results from empirical studies on child language. The basic assumptions for each of these fields of study are outlined briefly in the following three subsections.

1.2.1 Linguistic theory

Linguistic theory identifies the target property, or set of properties, which learners are to arrive at as a result of a hypothesized learning procedure. In order to give a maximally complete illustration of the notion of finiteness with which a learner is confronted, I will need to bring together several different lines of linguistic research, dealing with *structural, semantic* and *pragmatic* aspects of sentences. Most of the linguistic facts which I will rely on are not new and have been cast in many frameworks. However, they have not previously been integrated in one place and brought to bear on language acquisition theory. I must be concise in discussing relevant notions, but I will refer in the exposition to the theoretical literature which can be consulted for further detail. As relatively little research exists on the role of Root Infinitives in adult languages, Chapter 2 is dedicated specifically to a discussion of their grammatical properties.

I assume that the grammar of a language has a structural component on the one hand, and an interpretive one on the other. The general model of grammar that forms the background for the chapters to follow can be illustrated by the diagram in (2):

(2) Model of the Grammar



Every module of grammar, i.e. syntax, morphology, phonology, semantics, and discourse pragmatics, contains formal constraints, some of them universal, some language-specific. Thus every grammatical module has an autonomous status, in that it has principles which are independent from those of the other modules. At the same time, the modules interact with each other.

The structural component deals with matters of form, i.e. the syntactic, morphological, and phonological shape of sentences. The semantic component deals with the interpretation of utterances in so far as it is independent of discourse context. Pragmatics is a wide field of research (see Lambrecht 1994, Chapter 1, for an overview on different schools of pragmatics). What unites pragmatic research is that it is concerned with *conditions of use* of linguistic expressions. The two subfields of pragmatics which are stated in the model above -- discourse pragmatics and conversational pragmatics -- are both connected to finiteness.

The module of *discourse pragmatics* is taken to be a part of the grammar because it interacts with matters of sentence form in systematic and principled ways. It is concerned with interpretive aspects of utterances which interact with the discourse context. In contrast, the module of *conversational pragmatics,* although it is also linguistically relevant and influences the felicitous use of utterances, is taken to be outside ot the grammar, because it involves also other aspects of human cognition and action, and it seems unlikely that formal constraints can be formulated for it in the way in which this is done for the other modules.[7]

Following Lambrecht (1994), and others who work in the same spirit, the discourse-pragmatic interpretation comes about "via a particular association between a sentence form and a discourse context, as determined by rules or principles of grammar, both language-particular and universal" (Lambrecht 1994:5). Seminal research in this area goes back to, for instance, Halliday (1967), Halliday and Hasan (1976) and Chafe (1976). More recent

[7] These explicit assumptions concerning the relationship between pragmatics and the grammar are stated in order to provide a framework for discussion. The exact boundaries of the interpretive component of the grammar are not important for the general conclusions in this thesis. As will be shown, the expression of finiteness in adult languages is sensitive to language use. This fact is sufficient as an underlying assumption for the claims made here.

treatments in this area are provided, for instance, by Prince (1981), Vallduví (1990), and Lambrecht (1994).

I will also draw on some basic concepts from the area of conversational pragmatics. This research is closely associated with the pioneering work of Austin (1962), Grice (1975), Searle (1979), and it is concerned with inferences which a hearer can draw on the basis of the relationship between the form of a sentence and the particular conversational context in which the sentence is uttered. As Grice has made clear, these inferences are determined by general principles of goal-oriented behavior (which are applicable to language as well as to other domains of mental activity).

The necessity for distinguishing the two areas of pragmatics in language is highlighted by Lambrecht's observation:

> "Oversimplifying a little, one could describe the difference between conversational pragmatics and discourse pragmatics as follows: while conversational pragmatics is concerned with the question of why one and the same sentence form may express two or more meanings, discourse pragmatics is concerned with the question of why one and the same meaning may be expressed by two or more sentence forms." (Lambrecht 1994:5)

For the discussion of finiteness, both areas of pragmatics are relevant, because principles from each of them determine the conditions of use of both finite and non-finite constructions. These regularities are important for language acquisition, because, as I will show, natural languages differ in the exact mappings which relate finite and non-finite constructions to their respective uses. At the end of Chapter 7, the merits of taking discourse-pragmatic and conversational-pragmatic concerns into account in analyzing child language will have become clear.

As a basic syntactic framework, Principles and Parameters Theory (Chomsky 1986) will be used. This is for concreteness and in order to minimize differences with previous acquisition work on RIs. One feature of Principles and Parameters Theory, which it shares with other linguistic theories and which I do assume as crucial for learnability reasons (see below), is the difference between universal principles and language-particular constraints.

Principles and Parameters Theory has concerned itself almost exclusively with syntactic aspects of language, and far less with interpretive

aspects. While there are other generative frameworks which place more emphasis on interpretive matters (e.g. Head-Driven Phrase-Structure Grammar; see Pollard and Sag 1994), there is as yet no unified theoretical framework which has covered all the grammatical notions which are relevant to a discussion of finiteness. I will therefore need to draw on a variety of theoretical sources. In the interest of clarity and brevity, I will refrain as much as possible from framework-specific technicalities, and introduce relevant notions as needed.

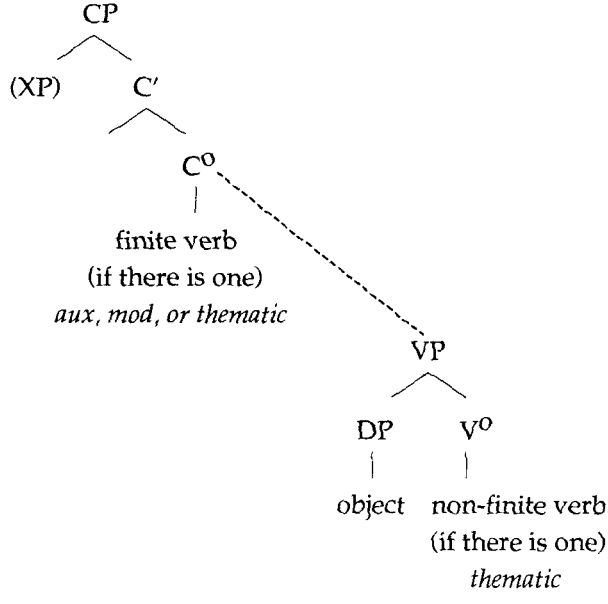
Some further syntactic assumptions must be specified for concreteness. First, with respect to word-order I assume that each language has a fixed base order[5] and that other orders are derived by the application of a movement rule. I will assume as background the general aspects of "verb-second" syntax, as first described by Behaghel (1932) and Drach (1939). The regularities of verb-second syntax were first treated in a transformational framework by den Besten (1989). Many authors have elaborated on the implications of this work, for instance Holmberg (1986), Vikner and Schwartz (1989), Bayer and Kornfilt (1991), Travis (1991), Haider (1993), Bobaljik and Jonas (1995), and Bobaljik and Thráinsson (1997), among many others. For treatment of German verb-placement in Head-Driven Phrase-Structure Grammar (HPSG) see Uszkoreit (1987), Kathol (1995), and Nerbonne, Netter and Pollard (1995). All of this syntactic work captures, among other regularities, a generalization which applies to finite root verbs. The generalization has become known under the label "Verb-Second Constraint", which can be stated in modern, but general terms as in (3):

(3) The Verb-Second Constraint
Finite verbs in root clauses appear in the top-most head of the clause.

[5] For concreteness, I assume that base word-order is parameterized. A number of syntacticians have recently explored Kayne's (1995) proposal that head-complement order in lexical projections is not parameterized, but universally the same (see, for instance, Zwart, 1993, or the contributions in van Riemsdijk, LeBlanc, and Berman, 1997). For the present purpose, the issue does not need to be resolved, because during the time when children use RIs there is evidence that children know the target surface order of verb and object (see Brown 1973, Roeper 1973), and thus set the head-complement parameter in the VP. How learners acquire this knowledge is not pertinent here.

In Principles and Parameters Theory, the "top-most head" heads a functional phrase, generally held to be C^0 (see below). As the Verb-Second Constraint applies to finite root verbs only, non-finite root verbs remain in their base position inside the VP. Non-finite verbs occur to the right of any (non-extraposed[9]) objects; the VP is head-final in German. The schematic tree-diagram in (4) summarizes the distribution of finite and non-finite verbs in German root clause.

(4) Schema of the distribution of finite and non-finite verbs in German root clauses



This schema illustrates only those aspects of German root-clause syntax which are relevant for this work, namely the placement of verbal elements with respect to other constituents in the sentence. The label CP is standardly used for the root projection of a German sentence. I remain impartial with

[9] Extraposition involves the rightward movement of a constituent to a position adjoined to VP or some higher phrase. There are restrictions on what phrases can be extraposed. Languages (e.g. Dutch and German) differ in these restrictions (for discussion of extraposition in German see, for instance, Altmann 1981, and contributions in van Riemsdijk, LeBlanc and Berman, 1997).

respect to a number of theoretical issues not relevant to present concerns and involving the number and kind of functional phrases. Sentential modifiers (adverbs, discourse particles, negation) would appear in various different positions between C^O and V^O.[10] These constituents will play a limited role in the discussion, and their exact location in the structure is not important. The position preceding a finite verb is the specifier of CP and can contain maximally one constituent. Another issue which the representation in (4) is silent about is whether any inflectional head must be posited to the right of the VP in German. More recent theorizing tends to assume that universally all functional projections are left-headed, in which case V^O is the rightmost position in a German clause (again barring extraposed elements).

For illustration of the essence of verb-placement in German, consider the examples in (5), all of which are German main clauses complying with the Verb-Second Constraint:

(5) a. Jetzt mußt du ins Büro gehen.
now must-*fin* you to-the office go-*inf*
"You must now go to the office."

b. Du warst schon ins Büro gegangen.
you were-*fin* already to-the office gone-*pp*
"You had already been gone to the office."

c. Jetzt gehst du ins Büro.
now go-*fin* you to-the office.
"You are now going to the office."

d. Ins Büro gehen.
to-the office go-*inf*
"Go to the office!"

In (5a) there is a finite modal (*mußt*) in second position and an infinitive (*gehen*) in final position. In (5b) there is a finite auxiliary (*warst*) in second position and a participle (*gegangen*) in final position. Sentence (5c) has only

[10] Jacobs (1991) provides convincing reasons for base-generating negation in German inside VP.

one verb form (*gehst*), which is finite and in second position. (5d) has only a non-finite verb form (*gehen*) in clause-final position. (5d) is an example of a RI. Note that (5d) satisfies the Verb-Second Constraint in (4) above vacuously, as the constraint does not apply to non-finite verb forms. Chapter 2 will discuss the construction type of RIs in more detail.

In sum, a verb form is correctly placed in a German root clause either when it bears a non-finite marking and occurs clause-finally to the right of (non-extraposed) arguments and sentential modifiers, or when it bears a finite affix and occurs in "second" position to the left of all constituents, except for one topicalized constituent which may precede the finite verb. (This topicalized constituent is represented in (4) as "XP" with parentheses around it to indicate that it does not occur in all sentences.)

For a full understanding of the notion of finiteness, a treatment of the temporal semantics of sentences will be necessary. The notions tense and aspect will be the topic of some discussion. The literature on tense and aspect is immense. Overviews can be found in Comrie (1976, 1985), and Binnick (1991), for instance. I will discuss tense and aspect mainly in terms of Klein's (1994, 1995a) theorizing, which is formal, but based on traditional approaches to tense and aspect, and accessible to the general linguist. Klein's example language is English, but his terminology can be smoothly transferred to other languages (see Klein 1995b, 1997a). It will be shown that modality is another notion relevant to finiteness, but theoretical treatment will be more limited in this area.

1.2.2 Learnability Theory

Learnability theory states general principles and mechanisms according to which learning procedures operate. Most previous accounts of child RIs have been formulated against the background of the learnability requirements of Principles and Parameters Theory. While I believe that none of these particular accounts has been fully successful or is comprehensive enough, I do not think that this is due to any assumptions in the domain of learnability theory. The last decade has produced a variety of versions of Principles and Parameters Theory as it applies to learning language. All of these versions share certain core assumptions, but differ non-trivially in specific ways. Readers who wish to be informed about such differences are referred to the pertinent literature (see Meisel 1995 for an overview).

As mentioned, Principles and Parameters Theory has been applied mainly to syntactic phenomena, but, as I show, the acquisition of finiteness-

marking requires the linking of morpho-syntactic forms with a variety of interpretive aspects, some of which pertain to entire sentences. At the same time, no formal learnability theory has dealt with the interface between the structural and the interpretive components. In attempting to explain a phenomenon of child language it is however advisable to assume a relatively fleshed-out learning-theory, in order to be sure of avoiding inconsistency or circularity. To be consistent with previous literature, and for concreteness, I will therefore continue to assume the fundamental aspects of Principles and Parameters Theory. In what follows I specify the most important features of this learnability theory.

- Universal Grammar: Children are born with Universal Grammar (UG). UG is the mental capacity which enables a child to learn his native language. UG is a knowledge base which contains linguistic universals and all grammatical options which are potentially part of the learner's target grammar. UG places syntactic, semantic and pragmatic constraints on utterances, as well as on the relationships between them.

- Principles: Principles are the linguistic universals which do not vary across languages. They are not learned from input. They are either part of the learner's competence at all times, or become part of the learner's competence through a maturational process (see Borer and Wexler 1986, Bertolo 1995). Principles cannot be overridden. An example of a principle is perhaps a (version of) the Empty Category Principle (e.g. "Empty categories must be properly governed.").

- Parameter Values: Language-particular grammatical knowledge in UG is available to the learner in the form of parameter values. Two or more parameter values which relate to a specific phenomenon are collected in a parameter. The learner must select the parameter value that applies in his target language to the (possible) exclusion of the other parameter values in the parameter. Whether a given parameter value actually applies in the target language is something which the learner has to find out by taking into account the language input.

- Learning Mechanism: UG is a declarative statement of knowledge, so for the learning process, an acquisition mechanism is required. This mechanism specifies how learning must proceed. At least two general

kinds of learning activities are specified: choosing correct target parameter values (parameter-setting), and learning the lexicon of the target language (lexical learning).

- Triggering: As part of the learning mechanism it must be stated what causes (or "triggers") a change in the learner's grammar. Most researchers have assumed that learners acquire language-specific grammatical constraints in an error-driven way (Wexler and Culicover 1980, Gibson and Wexler 1993). This implies that grammar change occurs only when a learner tries to parse an input string, but fails. Valian (1993) points out that an error-driven learning mechanism is problematic. This is because input strings can sometimes be ambiguous. First, the same input string will receive different analyses, depending on the current grammar of the learner. Secondly, two different input strings in a language can be contradictory in that they seem to point to two mutually incompatible parameter values. Fodor (1998) suggests circumventing these problems by restricting the learning mechanism, so that it sets parameters on the basis of "unambiguous triggers". In other proposals, such as those of Kapur (1995) and LeBlanc (1995), the impact of ambiguity is minimized by means of statistical learning. In different models, inapplicable parameter values either remain inactive, get overridden, or eventually wither away.

- Lexical Learning: Lexical facts are assumed to be less systematic than grammatical facts. Nevertheless learners have to generalize across items without negative evidence, and much research effort has gone into how learners manage this without overgeneralizing. While there are few agreed-upon principles according to which lexical learning might occur, the literature contains various proposals (see, for instance, Bowerman 1983, Pinker 1989, Randall 1992, Fodor 1992b, and references there). Borer (1984) suggested that all language learning happens in the lexicon, including acquisition of grammatical facts. Chomsky (1995) has proposed that all syntactic learning involves the features of functional categories, which may be regarded as residing in the lexicon. I will not discuss these proposals further here.

- Subset Principle: Stated informally, the Subset Principle (see above) requires that a learner hypothesizes that grammar which generates the smallest language which is compatible with the input data. The Subset

Principle's significance depends on one's theory of Triggering. In statistically-based models, the Subset Principle is not required (for discussion see LeBlanc 1995). A standard assumption is that the Subset Principle is imposed in the form of a default which is pre-specified by Universal Grammar and favors the subset value. The default is overridden in languages which give evidence for the superset value.

- Evidence: The particular Triggering theory one hypothesizes also determines the types of evidence which are necessary for bringing about grammar change. All theories assume positive evidence to be relevant. Explicit negative evidence (i.e. explicit information about the ungrammaticality of a string) is usually not assumed by any theory to contribute to the learning process (Chomsky 1981). A matter of dispute is whether negative evidence could play a role in language acquisition in the form of linguistic feedback (e.g. extensions, partial or complete repetitions, expressions of understanding or failure to understand) by children's conversational partners. This type of evidence is highly problematic in a formal theory of learning, mainly because such feedback is unreliable in its informational content (see Valian, in press, for discussion). In statistically-based models, negative evidence is incorporated indirectly in that the absence of a string (either over time or relative to the presence of another string) is statistically relevant and ultimately constitutes evidence in favor of the ungrammaticality of a linguistic phenomenon.

While some important theoretical and practical problems concerning parameter setting remain (see Bertolo, in press), the learning theory outlined above will be powerful enough to explain the learner's ultimate convergence on correct use of finite and non-finite verb forms, as long as the relevant facts to be learned can be placed either in the lexicon or stated in terms of parameters. I will try to make as clear as possible throughout, that this can be done.

1.2.3 Data

A hypothesized learning procedure must explain why the behavior of the learner differs from that of the mature speaker, and it must ensure that the learner arrives at the target behavior exhibited by the mature speaker. The

theory must therefore accommodate the linguistic behavior of both the learner and the mature speaker.

In previous work on child RIs, as in much other work on the acquisition of syntactic phenomena, assumptions about the target language have been based on judgments about utterances which are dissociated from any discourse. This is in part because acquisition researchers mainly refer to linguistic theories which take context into account only to a very limited extent. Ignoring contextual conditions can be a legitimate methodological decision for theoretical syntacticians, but for the language acquisition researcher it poses unwelcome limitations.

First, surely children must learn language from utterances which rely on context for their interpretation. So it is important for any learning theory to get a grip on the extent that learners must take context into account for learning particular phenomena. More importantly, and more relevant to the present problem of RIs, neglecting context means neglecting the fact that many adult utterances which occur in discourse may appear to be ill-formed when judged in isolation.[11] Thus, one must not judge children's utterances as ill-formed either, just because they give that appearance in isolation. Providing an analysis of naturalistic input which incorporates conditions of felicitous use, results in a much more suitable standard against which child language can be measured.[12]

To illustrate this point, consider research by Valian, Lasser and Mandelbaum (1992). They found that English-speaking parents addressing their children inverted yes-no questions on average only approximately 60% of the time. The three-year old children in the study showed proportions of inversions in yes-no questions similar to those of the parents. The children had thus attained adult performance levels in terms of proportion of inversion. With the parents' data at hand for comparison, one does not

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[11] For instance, C. Heeschen (p.c.) reports that in spontaneous speech of German adults, typically 30% of all uttererances lack a finite verb. In isolation, and without recourse to linguistic and non-linguistic context, some of these utterances would be judged ungrammatical. In context, however, they are flawless utterances. In fact, a person who spoke only in "full" sentences would be considered to use language in an aberrant way.

[12] This thesis exemplifies how much easier it is to state this program than to carry it out. Nevertheless, the importance of incorporating more full-fledged analyses of adult language into language acquisition theory cannot be stressed enough.

expect the children to invert yes-no questions at any higher rates than 60%. (In fact one would be surprised if they did.) However, without the adult data to compare one would surely have interpreted the children's figures quite differently; the target criterion for inversion in yes-no questions would most likely have been set, inappropriately, at 90% or even 100%. This example shows clearly that for some phenomena, a feasible quantitative target criterion can be set for a learner only by directly analyzing discourse data from adults.[13]

It is therefore important to consider naturalistic data from adults and to analyze them according to the same criteria as the child utterances. Such an analysis with respect to child RIs will be presented below. In the domain of finiteness I know of no previous study which permits this comparison.

Concerning children's performance, I will rely on results from previous quantitative studies on two- and three-year-old children's spontaneous utterances with verbs, and presuppose the validity of the following two claims: 1. Children place finite and non-finite verb forms correctly in root clauses. 2. Children's errors do not involve the substitution of one affix for another.

Concerning the first claim, studies by Behrens (1993, for German), Boser (1989, 1997, for German), Clahsen and Penke (1992, for German), Wijnen (1994, for Dutch), Rohrbacher and Vainikka (1994, for German), Poeppel and Wexler (1993, for German), Haegeman (1995, for Dutch), Santelmann (1995, for Swedish) and others, all observe that learners roughly between 18 and 40 months display knowledge of the distribution of verbs, i.e. that their productions predominantly obey the Verb Second constraint in (3) above (see Wexler, 1994, for a summary of data from children learning the V2-languages German, Dutch, Danish, Swedish, and Norwegian[14]). The RI

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[13] Of course there may be pragmatic rules of English that determine whether a yes-no question must be inverted or not. In that case the mere comparison of the proportion of inverted yes-no questions in adults and children would not indicate as to whether children had acquired all the rules governing *the use* of inversion in English yes-no questions. This does not weaken the general point made here, that *any* criterion for mastery of a certain target behavior is critically dependent on a precise definition of the target behavior.

[14] Wexler argues that also utterances from French and English children which contain infinitival forms, but no finite verb form, should be considered child RIs. However, in English, finiteness of a verb form can be established only on the basis of verbal morphology, and not on the basis of position. Likewise in French, the position criterion applies to a subset of utterances (those containing negation and certain adverbs).

stage prevails past the time when knowledge about the distribution of verb forms is in place, which indicates that correct distribution of verb forms and correct use of verb forms require different kinds of knowledge.

Concerning children's errors with verb forms, to the extent that they exist, they are in most cases of two kinds: They involve omission of a (finite or non-finite) affix, or the use of a RI construction (with appropriate verb placement) instead of a finite construction, but not the systematic or non-systematic substitution of an affix for another.

1.3 THE PUZZLE CONCERNING CHILDREN'S ROOT INFINITIVES

Children produce RIs for a period of months or even a year, even though they know the Verb-Second Constraint applies in the target, and even though they use finite verbal morphemes productively and correctly (modulo the remarks in fn. 4 and fn. 5 above). The fact that children produce RIs -- whether at considerable two-digit percentage-levels or at lower rates -- has been deemed puzzling from the vantage point of linguistic theory and from that of learnability theory.

It is usually assumed that in natural language, main clauses containing a verbal element contain at least one finite verb form. While this assumption is more often made implicitly than overtly, Hornstein (1990) contends that

> "[...]infinitival clauses are found only in embedded position, never as free-standing matrix clauses. This generalization is not an idiosyncratic property of English; it holds across all natural languages. Matrix clauses must be finite." (Hornstein 1990:146)

The origin of RIs in child language thus calls for an explanation from a theoretical perspective. The second reason that child RIs are an unexpected phenomenon is that children seem to violate the principle of conservative learning by using RIs. As the learner has no positive evidence that a non-finite main clause is acceptable in adult language, there has to be an explanation for why the child favors the non-finite form over a finite one --

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Furthermore the distinction in English between finite and non-finite verbs is limited to the progressive tenses and the third person singular in the simple present tense. Thus the data-base from which one can argue is even poorer for English and French than for the other languages, where one already has to cope with ambiguities stemming from the shortness of children's utterances (among other things). For this reason, I will set the acquisition of French and English aside here.

especially given that at the point in time when children produce RIs, they can be shown to know already a variety of finite verb forms.

The solution proposed in Chapter 8 is based on the two main findings to be defended in the following chapters. First, it will be shown that RIs are an adult phenomenon as well. Second, it will be argued that the differences between adult and child RIs can be explained in terms of differences in the conditions of use, and that child RIs are suitible linguistic default structure for some time.

ROOT INFINITIVES IN ADULT GERMAN: PRAGMATIC, SEMANTIC AND STRUCTURAL PROPERTIES

CHAPTER 2

In languages which use verbal inflections to express finiteness, most but not all, sentences contain a finite verb. The general tendency to mark finiteness on verbs does not imply that non-finite root clauses are ungrammatical.

It will be demonstrated in this chapter that RIs are grammatical structures of German. Examples will be given to show that RIs occur in adult German with a wide range of interpretations, and that these RIs have specific syntactic, semantic, and pragmatic properties. The discussion will be interspersed with RI examples from languages other than German. This is to show that RIs are not a phenomenon exclusive to German, and yet that the construction type does not behave in exactly the same way across languages.

Section 2.8 at the end of this chapter briefly discusses root participial constructions (RPs), which, like RIs, constitute a variety of non-finite root construction. In the literature on child language, RIs and RPs are sometimes treated together. I will point to some differences between RIs and RPs that exist in German. These differences are severe enough to preclude a treatment of RPs in one category with RIs, and I will therefore have to set RPs aside for the remainder of the thesis. I begin now with a more precise definition of the construction type "Root Infinitive" as it is considered here.

2.1 DEFINITION OF A ROOT INFINITIVE

As stated at the outset, Root Infinitives are main (non-dependent) clauses which have an infinitival verb form but no finite verb form. A further common property among all RIs discussed here is that the verb occurs in its bare infinitival form (e.g. *essen*), i.e. without the morpheme *zu*, which is the German equivalent of the English *to*-morpheme. This is true of adult RIs, as well as of child RIs.[1]

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[1] In adult German, zu occurs in some embedded and also some nominalized infinitival constructions (neither of which is the subject of the discussion here), but rarely in a RI which can stand alone. However, Fries (1983:55f) mentions a few examples with zu and states that they are mainly used to express strong dislike or offense about a situation, for instance:

Root Infinitives need to be dissociated from other types of infinitival constructions which are not of concern here. For instance, German infinitives can appear as the head of an NP-constituent of a clause:

(1) [Das anhaltende Schreien des Babys] macht mich verrückt.
[the constant cry-*inf* of-the baby] make-*fin* me crazy
"The constant crying of the baby makes me crazy."

(2) [Parties feiern] macht mir am meisten Spass.
[parties celebrate-*inf*] make-*fin* me at most fun
"Going to parties is what I like best."

The bracketed phrases in examples (1) and (2) are headed by an infinitive, and they serve as subjects to the respective (finite) main verb of the sentence.[2] In contrast, I will take it as a defining property of a RI that the infinitive must be the main predicate of the utterance, so that I will not regard main clauses like those in (1) and (2) as RIs. Note that the fact that the infinitival phrases in (1) and (2) are arguments does not preclude them from utterance status, as is illustrated by (3) and (4):

(3) A: Was stört Dich beim Arbeiten?
A: what disturb-*fin* you at work
"What is disturbing to you when you are working?"

(i) Hier zu rauchen! (Wie impertinent!)
here to smoke-inf ("how preposterous")
"To smoke here!" (What a preposterous idea!)

[2] Examples (1) and (2) represent distinct constructions, which differ in a number of ways. The bracketed phrase in (2) has VP-characteristics. In contrast, the nominal infinitive in (1) behaves more like an NP. See Reuland and Kosmeijer (1993) for a comparison of a variety of Germanic languages with respect to the construction in (1). The English equivalent in both cases is an *-ing* form, which can be used in the function of a nominalized verb. Reuland (1983), and Abney (1987) have treated English nominalized verbs in detail. In German and English, simple noun-headed NPs can appear in the same context as the bracketed phrases in (1) and (2), as well as in (3) and (4) below.

B: [Das anhaltende Schreien des Babys].
B: [The constant cry-*inf* of-the baby]
"The baby's constant crying."

(4) A: Was macht dir am meisten Spass?
A: What make-*fin* you at most fun
"What do you like best?"

B: [Parties feiern]
B: [parties celebrate-*inf*]
"Going to parties."

As the examples illustrate, the infinitival replies rely for their interpretation on the lexical content of a predicate in a preceding sentence. This is also the case when the VP-complement of a modal is queried, as in (5). The reply will be an utterance headed by an infinitive:

(5) A: Was willst du jetzt machen?
A: What want-*fin* you now do-*inf*
"What do you want to do now?"

B: [Kuchen essen].
B: cake eat-*inf*
"Eat some cake"

The infinitival replies in (3), (4), (5) share with the infinitival arguments in (1) and (2), that their interpretation is parasitic on the lexical content of a finite predicate in the same or another sentence. I will not consider such infinitival utterances autonomous ("free-standing") sentences.[3] The term "RI", as it is used here, refers exclusively to infinitival constructions which do not depend

[3] Examples (3) - (5) demonstrate that a learner who hears an infinitival utterance should not immediately conclude that independent clauses can in general be infinitival. This shows that learners must not analyze an utterance in isolation, but need to take the linguistic context into account.

on the lexical content[4] in preceding *linguistic* context. Keep in mind that the term "RI" refers to the entire construction, not just the infinitival verb form.

2.2 ON THE GRAMMATICALITY STATUS OF ROOT INFINITIVES

Although, as mentioned, RIs have not attracted much attention in the theoretical literature, a few authors have specifically discussed them. Akmaijan (1984) and Lambrecht (1990) have treated so-called "Mad-Magazine" sentences in English. Fries (1983) and Weuster (1983) have described observations about German RIs, and, more recently, Kondrashova (1993) and Avrutin (1997) have discussed RIs in Russian. Avrutin also provides some insights about infinitival headlines[5] in English. The discussion below is interspersed with observations and examples which these authors have provided. Other examples will come from the Miller Corpus[6] and from a diary in which I have been collecting spontaneous examples by adult native speakers of German and Dutch.

As mentioned in Chapter 1, it is assumed in the existing acquisition literature, that in adult languages root clauses must be finite. Although the literature on child RIs usually does acknowledge that certain kinds of adult

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[4] By "lexical content" I refer to the meaning of the words contained in an expression, without their grammatical markers.

[5] Headlines, and also captions (in German), are an interesting context in which infinitival constructions occur. There are clearly differences across languages concerning what meanings can be expressed by infinitival constructions in this context. This is shown by the English headlines in (i), and their German translations in (ii).

(ii) a. President to visit Russia (Avrutin 1997:3)
b. Unions to go on strike
c. McDonalds to serve beer.

(ii) a. (Präsident) Ruβland besuchen
(president) Russia visit-*inf*
b. (Gewerkschaften) streiken (anfangen)
(unions) strike-*inf* (begin-*inf*)
c. McDonalds Bier ausschenken
McDonalds beer serve-*inf*

Under no circumstances can the German examples express the meaning of the English examples. Adding the morpheme *zu* (the equivalent of the English "to") does not improve the construction. Headlines will not be discussed in this chapter, due to their very specific pragmatic properties, and because they presumably play no role in first language acquisition.

[6] See Chapter 6 for more information on this corpus.

RIs exist, these are usually set aside, apparently under the assumption that their interpretation is fundamentally different from that of child RIs. Two types are typically illustrated: exclamatives of a specific kind, and imperatives (see Rizzi 1994, Haegeman 1995). Some exclamative examples from different languages are in (6) and (7). The examples in (6) are headed by a wh-phrase, whereas the examples in (7) are not.

(6) Adult RIs with exclamative function (wh-initial)

a. Comment lui expliquer cela?! (French, Haegeman 1995)
how to-him explain-*inf* this
"How to explain this to him?!"

b. Che cosa dire in questi casi?! (Italian, Rizzi 1994)
what say-*inf* in these cases
"What to say in these cases?!"

c. Wie ihm das erklären?! (German)
how him this explain-*inf*
"How to explain this to him?!"

d. But how to get there?! (English)

(7) Adult RIs with exclamative function (non-wh-initial)

a. Moi partir?! Jamais. (French, Haegeman 1995)
I leave-*inf*?! Never.
"Me leave? Never."

b. What, me worry?! (English, Akmaijan 1984)[7]

c. What! John get a job?! Fat chance. (English, Akmajian 1984)

[7] Example (7b) has inspired Akmaijan to use the term "Mad-Magazine register" for the sentence type in (7). "Me worry?" is the motto of Alfred E. Newman, the character associated with the magazine entitled "Mad".

d. Ich (und) ins Studio gehen?! (German)[8]
I (and) to-the gym go-*inf*
"What! Me go to the gym?"

e. Henry (und) heiraten?! Wirklich nicht. (German)
Henry (and) marry-*inf* really not
"Henry getting married? I don't think so."

A unifying characteristic about the interpretation of the infinitival sentences in (6) and (7) is that they contain the specific presupposition that, from the point of view of the speaker, the proposition expressed is false or at least debatable. Such sentences may, but need not, involve rising intonation (I indicate this by *?!*). Although their *form* can be that of a question, they are not information-seeking questions, but rhetorical questions which, in the view of the speaker, have either no likely answer, or an obvious negative answer. For brevity I will refer to sentences with such an interpretation as "rhetorical exlamatives". Like in the examples in (6), the proposition contained in the sentences in (7) is presented as "not true".

The acquisition literature also notes that RIs can be used in many languages in imperative function, as illustrated in (8).

(8) Adult RIs with imperative function

a. Partire immediatamente! (Italian; Rizzi 1994)
leave-*inf* immediately
(no translation given)

[8] The optional presence of the word *und* ("and") in German sentences of the type in (7d,e) has not been explained. I suggest to analyze it as a kind of optional focus marker. It is a characterstic of the construction that the phrases on either side of *und* are focused. This is exceptional in that normally it is not the case that both the subject and the VP are focused. Even when other focus particles are present in a German sentence (e.g. *nur*, *auch*), they focus constituents to their left, or to their right, but not both. The element *und* in sentences like that in (7d,e) might conceivably mark their specific interpretation with respect to focus.

b. Ne pas le toucher! (French; Haegeman 1995)
not it touch-inf
"Don't touch it!"

c. Bitte hier nicht rauchen! (German)
Please here not smoke-*inf*
"Please do not smoke here."

d. Hier geen fietsen plaatsen! (Dutch; Wijnen 1997)
here no bicycles place-*inf*
"Do not park your bicycle here!"

I discuss imperative RIs in more detail in section 2.4.3 later in this chapter.

Authors writing on child RIs have considered only adult RI examples of the kind in (6) - (8), and have assumed that these examples exhaust the possible interpretations of adult RIs. Rizzi (1994:375) formulates the generalization that "adult languages don't seem to allow infinitivals as main-clause declaratives."

Most acquisition researchers have followed this assumption. Although Wijnen (1997:8) lists some adult Dutch RIs with declarative meaning, he labels them as belonging to an "anecdotal register". He deems them "marked", and does not provide further discussion. In contrast, the RI examples in this chapter as well as from the corpus analysis to follow in Chapter 7, show (a) that RIs, just like finite constructions, are a construction type whose grammatical properties can be defined (thus they cannot be considered mere slips of the tongue or of the brain), and (b) that declarative RIs cannot be relegated to a particular register. I will therefore conclude that the grammar of German licenses RIs not only syntactically (via compliance with all syntactic constraints), but also, counter to what is widely believed, semantically and pragmatically. The issue of markedness which Wijnen has addressed is an important theoretical issue, which is however entirely independent from the productivity and grammaticality status of the construction type of RIs. Therefore this issue deserves separate treatment.

In Chapter 1 I have already highlighted the fact that the Verb-Second Constraint regulates the distribution of finite and non-finite forms in German. It is important to realize that the Verb-Second Constraint does not rule out non-finite root clauses any more than it rules out non-finite embedded clauses. As has been noted by others, in syntactic terms, infinitival

root clauses are licensed. There could in principle be an independent constraint of syntax, or of another component of the grammar, which rules RIs out. It will be argued in Chapter 3 that there is no such restriction in UG, since there are languages which never mark finiteness on verbs.

However, it will also emerge from the discussion in this and the next chapter that there are interpretive restrictions on RIs (though not restrictions that rule out declarative RIs as a class). It is these interpretive constraints, and not any syntactic constraints, which limit the use of RIs to particular contexts. Similar interpretive restrictions exist also for finite clauses, as will be illustrated, so RIs are not special in this respect. What is special about RIs is that, for a given example, its use is more heavily constrained by discourse context than the use of a finite construction. The interpretation of RIs depends on context to a *higher degree* than that of finite clauses, as will become clear.

By saying that a RI is "grammatical" in German, I mean that it can comply with *all constraints in all modules of the grammar* just like a finite clause. I will refer to a particular example of a RI as "well-formed" when that is the case. I will say that a RI is "felicitous" or "felicitously used" when it fulfills, in the context in which it occurs, all pragmatic conditions and conventions, even those that are not inside the grammar (according to the model assumed here, see section 1.2.1). That is, a felicitous RI would be understood in context by an addressee who is native speaker, and it would be judged as a native-sounding utterance.

RIs can be illformed for many reasons, including a variety of semantic and pragmatic reasons. I will use the label "illformed" to cover RIs which are flawed for any reason, and reserve the term "infelicitous" or "infelicitously used" for emphasizing that a RI is well-formed according to the grammar, but not used in a felicitous context.

For the discussion of RIs to follow, it will be helpful first to establish a clear understanding of the terms *declarative, interrogative,* and *imperative.* I believe that lack of clarity about these terms may have been the reason for some confusion about what the interpretation of RIs can be.

2.3 ON THE RELATIONSHIP BETWEEN STRUCTURAL FORM AND PRAGMATIC FUNCTION

The linguistic literature uses the Latinate terms "declarative", "interrogative", and "imperative" ambiguously: Sometimes the terms refer to *sentence form* and sometimes to *sentence function.* It is, however, vital to keep

the morpho-syntactic notion of *sentence form* separate from the pragmatic notion *illocutionary function*, and also to distinguish those two from the speaker's *intended speech act*. That the three notions notoriously do not coincide is revealed by the examples in this section. It will be helpful to explain the three notions first for finite sentences. Section 2.4 will then illustrate how these notions apply to RIs.

It is unarguable that in using language, a speaker's motives go beyond the mere act of uttering something. Let me assume that there are three main reasons for speaking: conveying information, soliciting verbal responses, and soliciting non-verbal responses. A fourth purpose of speaking is to sustain verbal contact (i.e. to keep the conversation going). This latter purpose is perhaps normally not so frequent in adult-to-adult conversation, but it plays a role in adult-to-child speech and perhaps also in child-to-adult speech.

It is these pragmatic intentions with which the linguistic notion of illocutionary function of an utterance is associated. I will assume only three kinds of broad illocutionary functions: *declarative*, *interrogative*, and *imperative*.[9] Roughly, declarative utterances convey information, interrogative ones solicit a verbal response, and imperative ones solicit a non-verbal response. A (non-technical) definition for each of the three functions is given in (9):

(9) Definitions of three illocutionary functions[10]

a.	*Declarative*:	Asserts the propositional content of the utterance.
b.	*Interrogative*:	Solicits verbal information from the addressee with respect to some aspect of the proposition.
c.	*Imperative*:	Solicits action on the part of the addressee.

[9] I assume that the tri-partite classification in (9) is exhaustive, and that any other illocutionary functions are subcases of the ones listed. Certainly a much more fine-grained classification is possible. For instance, different types of imperatives can be distinguished (see section 2.4.3). The crudeness of the classification does not affect the arguments for language acquisition which I will make.

[10] I do not consider here exclamatives as a separate illocutionary function, but follow the arguments of Fries (1988) that the "exclamative" interpretation is the result of various different sources. For instance, the exclamative function requires a particular emotional state in the speaker. The exclamative function is one which can be laid *on top of* other illocutionary functions.

As mentioned, the terms *declarative, interrogative* and *imperative* are often also used to refer to structural forms of sentences. This is because illocutionary functions are characteristically associated with certain structural devices, i.e. syntactic and morphological expressions and phonological devices. For instance, in English the interrogative function is often marked by subject-auxiliary inversion and rising intonation: Similarly, imperatives, in many languages, can be expressed using special verbal morphology.

However, it is also clear that structure is not always predictive of illocutionary function. For instance, in the right context a declarative form can have an imperative function. Consider the example in (10):

(10) You haven't paid me yet.

Sentence (10) can be used to get the addressee to give money to the speaker. The speaker's intent is to inform the hearer of a situation and get him to change that situation.

There is an important characteristic that distinguishes between structural form and pragmatic function: Sentence form is defined exclusively in terms of the lexical and structural (syntactic, morphological, and phonological) content of the sentence. In contrast, what illocutionary function a given utterance can have depends on more than just its form, as we will see momentarily.

Not infrequently, the context facilitates more than one illocutionary function. The finite English sentence in (11) may illustrate this:

(11) Do you have your boarding pass?

Taking into account subject-auxiliary inversion, *do*-insertion, and intonation (indicated by ?), the *sentence form* of (11) can be said to be *unambiguously* interrogative. However, the illocutionary *function* of (11) is *ambiguous* between interrogative (seeking a verbal response, e.g. "yes" or "no"), or imperative (seeking a non-verbal response, e.g. requesting the hearer to produce the boarding pass in response). Thus (11) shows that (at least) two illocutionary functions can be associated with the same syntactic form in a given context.

I consider now the relevance of the notion *intended speech act*, and how it differs from the notion of illocutionary function. Richardson (1982), diagnosing "a chronic bedevilment [of] how to properly separate out the

notions of illocutionary force and intended perlocutionary effect", shows a useful solution to clarify the two, which I will follow here. Richardson argues that a sentence can have ambiguous illocutionary functions, but it cannot have ambiguous intended speech acts. The key observation is that it is a defining characteristic of a speech act that it refers to the *intended response* (verbal or non-verbal) which the addressee is expected to deliver as a result of hearing the utterance. Importantly, no single utterance can be used with the intention of soliciting two different responses from an addressee.

To see this, consider again example (11) from above. This sentence cannot be intended to solicit both a verbal response (*yes* or *no*), and a non-verbal one (to get the addressee to produce her boarding pass). The conventions of English permit both interpretations, and (11) can be understood either way by the hearer. But, while the illocutionary function of (11) is ambiguous, as described above, the intended speech act is not. As a result, the intended speech act can be *misunderstood* by the hearer as a result of ambiguity of illocutionary force. (11) is an actual example, whose ambiguity with respect to illocution did in fact cause a misunderstanding between the person who uttered it (a ground staff member at a German airport), and the hearer (K. O'Bryan, who reported the example to me). The hearer replied to (11) with "yes", assuming that the speaker's intention was only to check that she was in possession of a boarding pass. However, the speaker's actual intention had been to have the hearer produce the boarding pass. (The misunderstanding came to the surface painfully during an ensuing verbal altercation.)

Intended speech acts can be performed quite indirectly by means of an utterance. For instance, if I want to sit in a certain space but it is occupied with someone else's belongings, I might choose to utter one of the two sentences in (12).

(12) a. Make some room here, please!
b. I want to sit over here.

(12a) is an imperative form which directly contains the intended speech act ("make room"). In contrast, the form of the sentence (12b) is declarative (no inversion, falling intonation), and its function in discourse can be simply to inform the hearer that the speaker wants to sit in a particular spot - when the spot is unoccupied, for instance. However, (12b) shares with (12a) that it can be used in imperative function, for instance implying that the addressee should free some space for the speaker to sit in. Unlike in examples (10) and

(12a), the requested action cannot be read off the predicate of the utterance in the case of (12b). The imperative is implied indirectly in that it does not specify what the addressee should do in order to make it possible for the speaker to sit down.[11]

Finite sentences out of context can be assigned at least one illocutionary function, namely that one which can be directly associated with the structural form of the sentence. For instance, without context, a sentence like (13a) with a finite verb and one constituent preceding it is interpreted as a declarative, unless, as in (13b), the constituent preceding the finite verb is a wh-phrase, in which case the sentence is interpreted as a wh-interrogative. If no constituent precedes the finite verb, as in (13c), the sentence is interpreted as a yes-no question when there is no context which suggests otherwise.

(13) a. Der Student ging mit seiner Freundin ins Kino.
the student go-*fin* with his girlfriend to-the theater

b. Wer ging mit seiner Freundin ins Kino.
who go-*fin* with his girlfriend to-the theater

c. Ging der Student mit seiner Freundin ins Kino.
go-*fin* the student with his girlfriend to-the theater

However, these associations of sentence form and illocutionary function are by no means fixed. In context, (13a) (with falling intonation) can be used as a rhetorical question (with similar presuppositions as the examples in (7) above, or (with rising intonation) as a yes-no question. (13c) is possible as a declarative. In German declaratives which begin with the finite verb, often a constituent ("the topic") is unexpressed and assumed to occupy the first position in the sentence, preceding the verb. As Önnerfors (1993a) shows, topic-omission is not necessary for a finite verb-initial sentence in German.

[11] Indirect speech acts must be kept separate from idiomatic expressions (e.g. *He gave her the cold shoulder.* for "He rebuffed her."). The interpretation of intended speech acts always relies on context (i.e. the context must be such that a hearer can recognize the intended speech act). Idiomatic expressions on the other hand are perceived as idiomatic in and out of context. Although idiomatic expressions rely on context for disambiguation from the literal meaning, they require a lexical entry which defines the expression as idiomatic. This is not so for indirect speech acts.

For instance, the first sentence in telling a joke or a story is often verb-initial, but no topic is omitted from first position. These sentences are verb-initial declaratives.

The point just made is that the relations between sentence form and illocutionary functions are by no means absolute in finite sentences. Next, I show how the notions of syntactic form, illocutionary function, and intended speech act are related in RIs.

2.4 PRAGMATIC FUNCTIONS OF ROOT INFINITIVES

I have just illustrated that a given utterance can potentially have more than one illocutionary function, not all of which are suggested by the structure of the utterance. In particular, the intended speech act may or may not be suggested by the syntactic form. RIs constitute an extreme case of this general situation, because in RIs no explicit syntactic or morphological process refers to the (potential) illocutionary function, and therefore no intended speech act is suggested by the structure. Unlike the finite sentence forms in (13) above, RIs are not associated with a particular illocutionary function. For interpreting a RI with respect to pragmatic function, the hearer must rely on intonational and prosodic cues (if present), as well as on contextual information. If present, lexical elements like adverbs or particles can be of help also. As we will see in the following subsections, RIs in German and other languages can be used in declarative, interrogative, and imperative function. As the word order and verbal morphology is the same in each case, it makes little sense to use the terms "declarative", or "interrogative", or "imperative" referring to syntactic form of a RI.

The recovery of illocutionary function is then one way in which RIs depend on context to a higher degree than finite clauses. Contextual information is often necessary for recovery of the intended speech act. Because the illocutionary function is a very important aspect of a sentence's interpretation, understanding a RI out of context is not possible. This may be the reason why RIs have been deemed ungrammatical in much of the literature.

2.4.1 Declaratives

Although it is not their most common use, RIs can be used as declaratives. For instance, as pointed out in Weuster (1983), one can use an infinitival root clause in German to state a desire. For a sentence which expresses a desire I will use the term *desiderative*. In Chapter 7 we will see that quite a high

proportion of children's RIs are have a desiderative meaning. Some examples of desiderative RIs by adults are given in (15):

(15) Adult German desiderative Root Infinitives

a. Einmal richtig ausschlafen. (Weuster 1983)
once really out-sleep-*inf*
"I just want to get enough sleep once."

b. Ach, nur ein bisschen in der Ecke sitzen. (Miller Corpus)
oh only a little in the corner sit-*inf*
"I just want to sit in the corner a little bit."

c. Aber erst Nachrichten gucken. (Miller Corpus)
but first news watch-*inf*
"But first I want to watch the news."

Clearly, using the definitions in (9) above, these sentences are not interrogatives or imperatives, but declarative statements. They can be paraphrased with finite sentences containing a modal expressing the desiderative content: [12]

(15') a. Ich möchte einmal richtig ausschlafen.
I want-*fin* once really out-sleep-*inf*
"I just want to get enough sleep once."

b. Ich will nur ein bisschen in der Ecke sitzen.
I want-*fin* only a little in the corner sit-*inf*
"I just want to sit in the corner a little bit."

[12] This is by no means to say that *finite* sentences expressing a desire require a modal verb expressing the desire. For instance, the finite sentence in (i) could be used to express a speaker's desire to go to the zoo.
(i) Gehen wir lieber in den Zoo!
go-*fin* we rather in the zoo
"Let's rather go to the zoo."
Also, by saying that the finite paraphrases in (15') are consistent with the interpretation of the RIs in (15), it is not necessarily implied that the respective counterparts mean the same in all respects.

c. Ich will aber erst Nachrichten gucken.
I want-*fin* however first news watch-*inf*
"But first I want to watch the news."

A speaker using sentences like the ones in (15) (or (15')) may or may not assume that the desire is fulfillable. Desideratives are about *potential future* Events.[13] (Henceforth, I will use the term *Event* to mean "situation or event".) Sometimes fulfillment of the desire is so likely that a future tense interpretation is equally possible. For instance, (15c) has, in appropriate context, the alternative interpretation of "I am going to watch the news first." In example (15c) this is because the speaker himself possesses the power to fulfill his own desire. (16) shows another two desiderative examples:

(16) a. Lieber untergehen als paktieren. (Fries 1983)
rather perish-*inf* than cooperate-*inf*
"We would rather perish than cooperate."

b. Den Pullover umdrehen. (diary; looking at a sweater which
the sweater turn-*inf* was put on the radiator for drying)
"I must turn the sweater."

These examples are self-addressed reminders, expressing the need, or a very strong desire, for the speaker to perform a certain action. As the desired activity is to be performed by the speaker, or, as in (16a), by a group including the speaker, the urgency of the desire and the likelihood of it being fulfilled depends in part on the speaker's determination to perform the desired activity, and in part on the potential obstacles that someone else might put in the speaker's way.

These shades of meaning aside, the examples in (15) and (16) refer, in some sense, to an imminent (potential) activity to be carried out by the speaker, and are therefore not imperatives by the definition in (9). With

[13] Therefore, even if a speaker assumes that the desire is unfulfillable, the interpretation of the sentence is still slightly different from that of the exclamatives in (6) and (7) above, where the speaker's presupposition is that the proposition is false or debatable from his point of view.

respect to illocutionary function, they are parallel to the finite sentence in (12b) (*"I want to sit over here."*). They may, but need not, contain an unspecific request for action on the part of the addressee.

The examples in (15) and (16) also illustrate the notorious ambivalence of future reference between a tense and a modality interpretation (see Comrie 1985, Fleischman 1982, Dahl 1985, Abraham 1989, Vater 1997). Chapter 7 will show that many of children's RIs which express desires.

In adult German, one finds also RIs whose purpose it is to comment on an on-going activity, such as the examples in (17):

(17) a. Die Nudeln noch ein bisschen zudecken. (Miller Corpus)
the pasta still a little cover-*inf*
"I am (in the process of) covering the pasta for a short while."

b. Gucke mal, Füsse waschen. (Miller Corpus)
look particle, feet wash-*inf*
"Look, now we wash your feet."

c. Füsse abtrocknen. (Miller Corpus)
feet dry-*inf*
"We dry your feet now."

d. Suppe essen, Suppe essen. (Miller Corpus)
soup eat-inf, soup eat-*inf*
"We eat soup now."

These utterances describe situations which are going on at the time of the utterance in the discourse context of the utterance. Note once more that in each case the relevant interpretation can only be extracted using prosodic and discourse information (and, if present, lexical information, such as adverbs and particles). This is because the syntactic form of the RI is compatible with all interpretations which are permitted for RIs in principle. (I will determine in the sections to follow some interpretations which are not permitted for German RIs.) The actual examples in (17) above were used in the non-perlocutionary, contact-sustaining function (see section 2.3 above).

Finally, (18) and (19) illustrate that RIs in declarative function are not limited to German, but that Russian and Dutch RIs permit them also.

(18) Adult Russian RI declaratives

a. reporting an Event
Carevna xoxotat'. (Avrutin 1997)
princess laugh-*inf*
"The princess started to laugh."

b. negative declarative statement
Emu nas ne obmanut'. (Kondrashova 1993)
he-*dat* we-*acc neg* deceive-*inf*
"He wouldn't deceive us."

(19) Adult Dutch RI declaratives

a. reporting an Event
(i) De conducteur floot al voor het vertrek, dus ik rennen!
the conductor whistle-*fin-past* already for the departure, so I run-*inf*
"The conductor had already blown his whistle, so I ran/began running." (Wijnen 1997:8)

(ii) Hij toen snikkend naar zijn moeder lopen. (Reuland 1983:165)
he then sobbing to his mother run-*inf*
"Then he ran to his mother, sobbing."

b. announcing an imminent Event
(i) Even washandje pakken. (Jordens 1990:Appendix)
just washcloth take-*inf*
"I am only taking the washcloth."

(ii) Om vijf kijken en luisteren naar muziek. (diary; TV announcer)
at five watch-*inf* and listen-*inf* to music
"At five you can watch and listen to music."

With the exception of (19bi), the corresponding German infinitival sentences would *not* be grammatical in the interpretation that the sentences in (18) and (19) have (even when the general constraints of German word order are obeyed):

(18') German equivalents of the Russian examples in (18)

a. * (Die) Prinzessin lachen.
princess laugh-*inf*
"The princess started to laugh."

b. * Ihn/er uns nicht betrügen.
he-*dat*/he-*nom* we-*acc* *neg* deceive-*inf*
"He wouldn't deceive us."

(19') German equivalents of the Russian examples in (19)

a. (i) *Also ich rennen.
so I run-*inf*
"So I ran/began running."

(ii) *Dann er schluchzend zu seiner Mutter laufen.
then he sobbing to his mother run-*inf*
"Then he ran to his mother, sobbing."

b. (i) √Nur den Waschlappen nehmen.
just the washcloth take-*inf*
"I am only taking the washcloth."

(ii) *Um fünf Musik hören und sehen.
at five music listen-*inf* and see-*inf*
"At five you can watch and listen to music."

The reason that only (18b) is well-formed in German, and the other German equivalents of the sentences in (18) and (19) are not, is not that German does not license RIs syntactically, or that RIs cannot be declarative in German. Rather, there are *additional* language-specific restrictions on the use of the sentence type "Root Infinitive". Some of these will be discussed in section 2.5.

2.4.2 Interrogatives

RIs can also be used to solicit information from one's addressee. Consider the examples in (20):

(20) Adult German interrogatives (non-wh)

a. Du auch noch ein Bier trinken? (diary; at a party)
you also still a beer drink-*inf*
"Would you also like another beer?"
or "Are you also going to have another beer?"

b. Konkav schneiden? (diary; at the hairdresser)
concave cut-*inf*
"Should I cut (your hair) concave?"

c. Mal probieren? (diary; in the office)
particle try-*inf*
"Do you want to try this?"

The examples in (20) are genuine interrogatives, in the sense that they seek a verbal response from the addressee. From the diary collection of examples it seems that a typical interpretation of a (non-wh) interrogative RI is a request for information as to whether the addressee wants the speaker to carry out an action for the hearer (make his bed, bring some coffee, give him something to try, etc.). The proposition in the examples in (20) refers to some potential future Event, never to a past Event. (I return to this point in section 2.5.2)

Genuine wh-interrogatives (i.e. ones which are not rhetorical exclamatives) seem to exist only to a very limited extent as RIs. For instance, the examples in (21a,b) are interpreted either as echo questions (in case the wh-phrase is stressed), or with a flavor of incredulity comparable to the rhetorical exclamatives in (7) above. Example (21c), unlike (21a,b) can seek information like a normal interrogative.

(21) a. Was dem Patienten verschreiben?
what the-*dat* patient-*dat* prescribe-*inf*

b. Wohin morgen fahren?
where-to tomorrow drive-*inf*

c. Warum die Blumen giessen?
why the flowers water-*inf*
"Why water the flowers"?

I propose an explanation for these facts in section 2.5.2. I believe it has to do with an aspectual restriction on RIs, which will be discussed there.

2.4.3 Imperatives

We have already seen in the examples in (8) above that RIs can have imperative function. Because imperative RIs play a prominent role in the corpus analysis to be presented later, I state some further observations about them here. This will also illustrate some language-specific differences concerning the RI construction.

Recall that the defining characteristic of an imperative is that it solicits a specific action from the addressee. This action is expressed in the predicate of the sentence. Typically the addressee of an imperative is a 2nd person singular or plural referential (and usually human) entity. It is sometimes said in the child language literature that adult languages allow "jussive" interpretations of RIs. (For instance, Rizzi 1994 refers to (8a) above as a jussive; see also Wexler 1994.) Jussives are a kind of imperative. As I understand it, they are imperatives which are directed to a 3rd person (singular or plural).[14]

Imperatives can also be addressed to a non-referential 3rd person entity, roughly to "whoever hears/reads this", as is the case in German cooking recipes and public notices, which often appear in infinitival form:

(22) a. Den Teig glatt rühren und Eiweiss unterheben. (cookbook)
the dough smooth mix-*inf* and eggwhite under-lift-*inf*
"Mix dough until smooth and fold in eggs."

b. Hunde an die Leine nehmen. (notice in park)
dogs on the leash take-*inf*.
"Dogs must be leashed."

c. Kaugummi nach Kaugenuss in Folie einwickeln.
chewing-gum after chew-enjoyment in foil wrap-*inf*
"Dispose gum in wrapper after use." (on gum wrapper)

[14] A finite example for a jussive would be:
(i) Everyone in this room lifts their hands above their shoulders now.

Sometimes the addressee of an imperative includes the speaker. To refer to such constructions the linguistic literature sometimes uses the term "adhortative" (Bußman 1983).[15] A Dutch RI example of an adhortative is (23a) below. (23b,c) are two examples that were treated as desideratives above. They can alternatively be treated as "adhortatives", i.e. as self-addressed imperatives. Both meanings are felicitous interpretations for these sentences.

(23) a. Rennen! (Dutch; diary)
run-*inf*
Let's run!

b. Lieber untergehen als paktieren. (=(16a); Fries 1983)
rather perish-*inf* than cooperate-*inf*
"We would rather perish than cooperate."

c. Den Pullover umdrehen. (=(16b); diary)
the sweater turn-*inf*
"I must turn the sweater."

We already saw, however, that not all imperatives in German have this adhortative interpretation. Furthermore, there seem to be subtle language-specific differences as to whether or not an adhortative RI is felicitous in a given context. For instance, the most appropriate German equivalent of the Dutch adhortative in (23a) would involve a RI construction. The three constructions in (24a-c) are more suitable equivalents than the RI in (24d):

(24) a. ?Laßt uns laufen!
let-*2pl-pres* us go-*inf*

b. Laufen wir!
go-*1pl-pres* we-*nom*

[15] In some languages, like French, the subjunctive would be used to convey an adhortative meaning, e.g.
(i) soyons amis
be-*subj-1pl* friends
"Let us be friends."

c. Los!
away

d. ??Laufen!
go-*inf*

"Let's run!" / "Go!"

Example (24a) involves the modal verb *lassen*. Although the *lassen*-construction has a common use as an adhortative, it sounds somehow stilted with the verb "run". The *lassen*-construction has more a suggesting tone, and lacks the urgency of the Dutch example (But notice that the English "Let's run!" is perfect to convey the meaning of the Dutch example in (23a). *Let* is an English cognate of German *lassen*.) Example (24b) is a verb-initial finite construction, and in example (24c) an isolated particle expresses the adhortative meaning. (24c) sounds the most natural of the possibilities, because it expresses best the urgency of the adhortative, which was present in the context of (23a). It is my intuition that the RI in (24d) would not be used in German to include the speaker in the referent for its subject.

There are then subtle language-specific conditions on RIs involving very subtle differences. For instance, it seems to be the case that in Dutch, but not in German, imperative RIs are compatible with a first person plural addressee. At the same time it should be noted that imperative RIs in Dutch need not be adhortatives or jussives, but they can be addressed to a 2nd person singular interlocutor. In both German and Dutch, one can request a specific action from a 2nd person interlocutor using a RI.

The German examples in (25) are intended to show that the criterion for the felicity of RI imperative is *not* whether speaker and addressee are familiar with each other.

(25) a. Mal draufstellen! (German, Miller Corpus)
particle on-put-*inf*
"Put it up on top."

b. Mund weit öffnen! (German; diary; dentist to patient)
mouth wide open-*inf*
"Open your mouth wide!"

(25a) was uttered by an adult addressed to a child, but it could have been addressed to an adult. The imperative does not have great urgency (which could be determined from the gentle intonation with which it was uttered). This is because the speaker could expect co-operation of the hearer in conforming to his request. (25b) was uttered in a formal situation. Both RI examples in (25) are felicitous because the speaker can expect the addressee's co-operation in carrying out the requested action. One basis for this co-operation is that the hearer can extract, on the basis of the discourse context, the intended perlocutionary act. By contrast, the speaker who said (26) tried to counter her addressee's (potential) resistance to her imperative.

(26) Jetzt keine Blätter mehr sammeln! (German, diary; mother
now no leaves more collect-*inf*! to daughter)
"Don't collect any more leaves now!"

(26) had a very impatient intonation, and it has a very authoritative flavor. The mother was expressing her presumed parental authority to get the child to comply. It is the reliance on presumed authority which would make (26) infelicitous, or at least very impolite, in normal conversation between adults. Co-operation and politeness are notions of conversational pragmatics and thus the felicity of a RI depends on conversational-pragmatic notions.

2.4.4 On the Ambiguity between Imperatives and Declaratives

We have seen in this section that RIs are ambiguous with respect to their illocutionary function, and that their perlocutionary function can only be understood by taking the discourse context into account. We saw in (13) that ambiguity of illocutionary functions occurs in finite sentences as well. (27) highlights this, by showing that also finite sentences which contain modals can have more than one illocutionary function.

(27) Du sollst das jetzt hinstellen!
you should-*fin* this now down-put-*inf*
"You should put this down now." or "Put this down now!"

(27) contains a deontic modal and is ambiguous between an imperative speech act and a declarative asserting an obligation or a desired Event. By convention, the intended speech act of (27) will often be imperative. It is (in German) simply not a common communicative behavior to assert (fulfillable)

desires or obligations, without an implicit request addressed to the hearer asking for an action in response. Even without a deontic modal, finite sentences with normal declarative form are effortlessly interpreted with imperative function, as the examples in (28) show.

(28) a. Du stellst das jetzt hin .
you put-*fin* this now down
You are putting this down now." or "Put this down now!"

b. Du wirst das jetzt hinstellen
you will-*fin* this now down-put-*inf*
"You will put this down." or "Put this down now!"

I return to the ambiguity of illocutionary function of finite clauses in section 3.2.7. Here, it is only important to recognize that in principle this is not a characteristic limited to RIs. In this context, consider again desideratives:

(29) a. Ach, nur ein bisschen in der Ecke sitzen. (=(15b); Miller Corpus)
oh only a little in the corner sit-*inf*
"I just want to sit in the corner a little bit."

b. Nur einmal reinschlagen. (Miller Corpus)
only once in-pound-*inf*
"I want/need pound on it only once."

c. Aber erst Nachrichten gucken. (=(15c); Miller Corpus)
but first news watch-*inf*
"But first I want to watch the news."

In each case in (29), the predicate refers to an action which the speaker is about to or wants to carry out. Thus, by the definitions in (9) above the sentences are declaratives. However, the examples in (29) can also have an *indirect* imperative meaning associated with them, requesting some unspecified action on the part of the addressee which is necessary to fulfill the desire. In the particular case of (29a) this implied imperative was something like "So be quiet and get out of my way." (29a) even has the flavor of "you know exactly that you are getting on my nerves", although this is only from the speaker's perspective (an adult) and may not have been

understood by the two-year-old addressee. In (26b) the implicit imperative was along the lines of "Don't be afraid and keep still now." The example was used to calm the child down who was scared of the mother hitting a cardboard cat with a hammer in order to attach it to the wall. The example would equally well be addressed to an adult in the same function. (29c) was perhaps used to "test" the child's co-operation. The father had previously announced that he was going to watch the news. Then the child demanded that they play some more together, so the father repeated his intention to watch TV.

Having established that RIs exist in declarative, interrogative and imperative function, I will now turn to the issue of what temporal interpretation RIs can have.

2.5 THE TEMPORAL INTERPRETATION OF ROOT INFINITIVES

I will show in this section that adult RIs can have any interpretation for TENSE, but not any interpretation for ASPECT. Small caps will henceforth be used to refer to semantic concepts such as TENSE, ASPECT, PAST, PRESENT, etc. This is to disambiguate these semantic notions in the grammar from their their morpho-syntactic counterparts which represent them in sentences, e.g. the affixes and word forms. When used in a "real-world" (non-grammatical) sense, temporal concepts (such as past time, present time or and future time) will also be in normal type.

2.5.1 Tense

Verbs which bear finite affixes contribute directly to the TENSE interpretation of the utterance in which they occur. Infinitives, on the other hand, do not express TENSE, and thus do not contribute to the TENSE interpretation of the utterance. When infinitives have affixes, such as *-en* in German, these do not express TENSE, and do not contribute to the temporal interpretation. [16] The

[16] The simple infinitive form contrasts with the "perfective infinitive" form (also called "Infinitiv II" in grammar books of German). The latter consists of the infinitive of "have", *haben*, and the past participle of the verb, similar to the English perfective infinitive. Compare (i) and (ii):

(i) Er *gibt* vor, ihn zu kennen.
he pretend-*fin* him to know-*inf*
"He is pretending that he knows him."

(ii) Er gibt vor, ihn gekannt zu haben.
he pretend-*fin* him know-*pp* to have-*inf*
he is pretending to have known him

TENSE interpretation in adult RIs is thus fully based on other lexical items besides the verb (such as adverbs or discourse particles) and on the discourse context.[17]

A theoretical treatment of the notion TENSE is delayed until Chapter 3 for expository reasons. I will assume for now that there are three TENSES, namely *PAST*, *PRESENT* AND *FUTURE*. FUTURE and PRESENT interpretation is common for RIs: Imperatives and desideratives by definition refer to future Events. We have also seen declarative examples describing on-going Events.

Examples (18a) and (19a) above describe Events which happened before the utterance occurred. I repeat these examples here in (30):

(30) Root Infinitives with PAST interpretation

a. Carevna xoxotat'. (=18a)
princess laugh-*inf*
"The princess started to laugh."

b. De conducteur floot al voor het vertrek, (=19a(i))
the conductor whistle-*fin-past* already for the departure,
dus ik rennen!
so I run-*inf*
"The conductor had already blown his whistle, so I ran/began running."

c. Hij toen snikkend naar zijn moeder lopen. (=19a(ii))
he then sobbing to his mother run-*inf*
"So he ran to his mother, sobbing"

The difference in these two infinitival forms is more likely aspectual than temporal. I set perfective infinitives aside here.

[17] In Chapter 3, we will see that in finite utterances TENSE information is sometimes also supplied by context. This is because verbal tense forms do not provide "fixed" temporal specifications for situations or Events. Rather, they specify the temporal relation of a situation relative to other situations, or Events, in the text or context (see Comrie 1976, Ehrich 1994, Klein 1992, Binnick 1992, for discussion). Also, in languages which do not mark TENSE on their verbs in the form of morphemes, contextual information must be used as a source for temporal interpretation.

Thus, we find RIs with FUTURE, PRESENT and PAST interpretation, though different examples lend themselves most naturally to different temporal interpretation, given the particular context in which they are uttered. As we saw, there are language-specific differences with respect to what temporal interpretations are permitted for RIs in a given language. This will become clearer in the next section.

2.5.2 Aspect

A second component of the temporal interpretation of an utterance concerns its ASPECT. To avoid digressing, a theoretical treatment of ASPECT must await the next chapter. I only illustrate here an interesting peculiarity about RIs which refer to Events in the past, such as (18a) and (19a), and repeated in (30) above.

The Events reported by these sentences all convey an inchoative perspective (rendered in the translation of (30a) as "started to"). The Event is reported as just beginning, and sometimes as one directly resulting from another Event. In some of the utterances this is expressed by an adverb (equivalents of *already*, or *then*, for instance) or particle (e.g. German *nur* or *mal*, which do not have simple English equivalents), although these elements need not be present to make the utterances grammatical in this interpretation. Such adverbs or discourse particles do however add temporal perspective in an overt manner.

Strikingly, adverbs which are anchored at speech time and would imply a PERFECT or PERFECTIVE ASPECT (such as *last Monday, 3 hours ago*) cannot be used in RI utterances which refer to past Events. Thus, in discussing (30a), Avrutin emphasizes that "the action described by the verb indicates the beginning of an action that follows immediately some event assumed to be known" (p.2). The same is true for the Dutch examples. So, clearly the past Events cannot be presented as *completed* using a RI (which is what PERFECT and PERFECTIVE ASPECT have in common). I give in (31) a German example which makes the same point.

(31) Und dann noch die U-Bahn nehmen. (diary)
and then still the subway take-*inf*
"And then we still had to take the subway."
* "And then we took the subway."

(31) occurred in a travel report by the speaker to his friend. The example contains the adverbs *dann* ("then") and *noch* ("still"), indicating that from an inside perspective of the narration the Event expressed by the predicate was still to happen. From the perspective of speech time, the Event had already happened, and the speaker had already arrived home safely. Importantly, even without the adverbs the sentence cannot relate the Event from the perspective of speech time, which is shown by (31'):

(31') (Und) die U-Bahn nehmen.
(and) the subway take-*inf*
* "And then we took the subway."

(31) is only compatible with an interpretation in which the Event is presented as imminent or incipient, not as over, or completed.

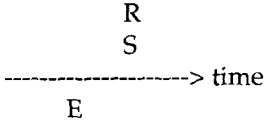
It is a well-established fact that Events can be presented from different temporal perspectives. For instance, an Event that happened in the past, in addition to being presented from a perspective before that Event, can be presented from a point of time which lies before speech time, but after the Event itself. The most normal case is that Events are reported from the vantage point of *speech time* (*S*). In that case, a speaker would use the simple past tense form in English (e.g. *took*). If the Event is reported from a past perspective which follows the Event reported, an English speaker would use the pluperfect tense form (e.g. *had taken* in English). In both cases the Event is reported as prior to speech time, and prior to the respective time point from which the Event is presented. This latter time point will be referred to here as the "*Reference Time*", and abbreviated with *R*.[18]

The temporal relationships between S, R, and the *time of the Event* (*E*) which is described by the utterance can be illustrated by the diagram in (32), in which the arrow signifies time as it passes:

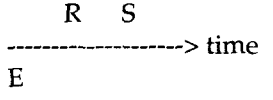
[18] The term "reference time" (R), as used here, overlaps with Reichenbach's (1947) notion by the same name, but the two not formally equivalent. Reichenbach is credited with having discovered the importance of a third temporal notion for the interpretation of TENSE. The exact nature of this third temporal notion has been a matter of vervent discussion (see Binnick 1991, Comrie 1985, Klein 1994, Ehrich 1994, and references there, for discussion). Hamann (1987) and Klein (1992) point to some shortcomings of Reichenbach's particular conception of the notion "reference time".

(32) S, R and E in two English tense forms describing past Events

a. English past tense form



b. English pluperfect tense form



In English, with the simple past tense form, S and R are the same point in time, whereas when the pluperfect is used R lies prior to S.

For the RI examples in (30) and (31) above it can be shown that, while E lies before S, the only interpretation available is one where R lies at or before E. (In example (30b) this can be seen in the English translation; it uses the pluperfect form for reporting the Event that precedes the one that is referred to with an infinitival form.) In other words, the speaker presents the Event as just beginning or imminent with respect to R, which is in the past.

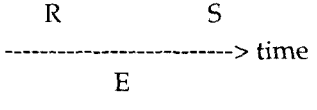
In narratives it is not uncommon that R and S of a sentence are at distinct points in time. Compare this to the narrative use of the present tense form in English for reporting an Event that happened in the past:

(33) So he is jumping up and down, while I try and fix the tire.

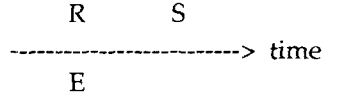
The Events in (33) are presented as happening at or before the time of R, and it is implicit that the they happened before S. Schematically, the relationships between S, R, and E in examples (31) and (33) can be given as in (34a) and (34b), respectively.

(34) S, R and E in in "narratives"

a. for (31):



b. for (33)



It is these two constellations between S, R, and E which are allowed for the RI examples with past reference, but not the constellations depicted in (32)

above. I take these observations to be evidence for a constraint on the interpretation of RIs, which I shall call the Non-Completedness Constraint (NCC):

(35) **Non-Completedness Constraint (NCC):**
The predicate of a Root Infinitive cannot refer to a completed Event.

The constraint implies that the PERFECT and PERFECTIVE ASPECTS are not possible interpretations for RIs. The RI examples discussed above were all compatible with this constraint. Imperatives and desideratives by definition refer to non-completed Events (i.e. ones presented as FUTURE, non-PERFECT, and non-PERFECTIVE). On-going Events are also non-completed by definition.

I mentioned also that the yes-no interrogative RIs in (20) all refer to Events which potentially lie in the future, and never to one that is presupposed as having happened in the past. In fact, at least in German, interrogative RIs do not allow that the predicate makes reference to any presupposed Event. For Events prior to S, this can be tested by adding appropriate adverbs to the examples of (19) above. (19'a), with an adverb referring to the present or the future, is a well-formed RI, but (19'b) is not, because the adverb *gestern* is only compatible with an interpretation which implies that the Event to which the predicate refers is presupposed as completed.

(19') a. √Du jetzt auch Bier trinken?
you now beer drink-*inf*
"Do you want to have some beer now?"

b. *Du gestern Bier trinken?
you yesterday beer drink-*inf*
"Did you have/want beer yesterday? "

The NNC in (35) may also explain the restricted use of infinitival Wh-interrogatives mentioned above. Recall that not all of the examples could be given a genuine interrogative ("information-seeking") interpretation. I repeat the examples from (21) above in (36). Only (36a) can have a genuine interrogative interpretation.

(36) a. Was dem Patienten verschreiben? (=21a)
what the-*dat* patient-*dat* prescribe-*inf*

b. Wohin morgen fahren? (=21b)
where-to tomorrow drive-*inf*

c. Warum die Blumen giessen? (=21c)
why the flowers water-*inf*
"Why water the flowers"?

Arguably, for (36a) and (36b) to receive a genuine interrogative interpretation, a completed Event would have to be presupposed for the question even to arise. If someone asks *what* to prescribe, then there is an Event of prescribing which is presupposed for some point in time. Likewise, if someone asks *where* to go tomorrow, an Event of going somewhere is presupposed as happening on the day following the day which contains S. However, asking *why* a certain Event should take place, does not presuppose that the Event did take place or will take place. Similarly, asking *how* an Event should take place, does not presuppose that. As *why* and *how* ask about the nature of the Event and not just some aspect of it, a particular Event is not presupposed in these cases. In contrast, with other wh-words (*who, what, where*) an Event is presupposed, and only one of its arguments is queried. Just like infinitival *why*-questions and unlike other wh-initial RIs, infinitival *how*-questions can (though need not) be truly information-seeking, as (37) shows:

(37) a. Wie ihm das erklären? (=6c)
how him this explain-*inf*
"How should I explain this to him?"
or "How should this be explained to him?"

b. Wie diese schließen?
how these close-*inf*
"How should I close these?"
or "How should these be closed?"

The point here is that while all *finite* interrogative sentence forms are compatible with a normal information-seeking interpretation, RI

interrogatives can receive that interpretation only if the predicate does not make reference to a presupposed Event.[19]

These facts may well follow directly from the NCC in (35). Following the discussion of finiteness in Chapter 3, I will derive the Non-Completedness Constraint from a more general property of infinitival constructions. It is an open question whether the generalization in (35) is a language-specific restriction or whether it constitutes a deeper principle which unites RIs of all languages as a class. I must leave this issue for further research.

2.5.3 Eventive and Non-Eventive Verbs in Root Infinitives

The facts just described fit well with Avrutin's (1997) very interesting proposal that RIs universally "introduce" a semantic Event. Following Kratzer (1989), he assumes that semantic Events have variables which must be bound by an index. In finite sentences this variable is bound by the tense operator. As there is no tense operator in RIs, an index must be introduced (for details see Avrutin 1997). Avrutin points out that his analysis makes the prediction that RIs occur only with stage-level predicates, and not with individual-level predicates, because only stage-level predicates refer to Events which have a variable which needs to be bound. Although it is also my impression that RIs tend to occur predominantly with stage-level (i.e. eventive) predicates, one does find well-formed examples with individual-level (non-eventive) predicates:

(38) a. Zeker weten? (Dutch; diary)
sure know-*inf*
"Do you know for sure?"

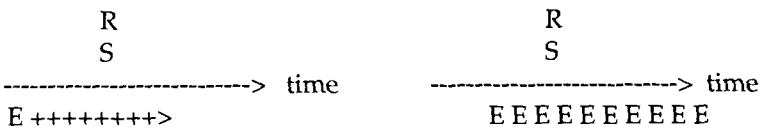
b. Immer erster sein. (Miller Corpus)
always first be-*inf*
"You always want to be first."

Note that the examples in (38) are compatible with the NCC in (35): In (38a), the verb ("know") is factive, and it is generally assumed that factive states are

[19] Without context, RIs with rising intonation and wh-initial RIs lend themselves more easily to an interpretation where the Event to which the predicate refers is not presupposed.

never completed. In (38b), the predicate does not refer to a completed Event either. Rather, the example states that there are repetitive Events, some before speech time, some after. The constellations of S, D and E would be as in (38'):

(38') a. b.



The plus-symbols in (38'a) denote that the Event is continuous into the future. So far, the NCC has been able to account for all semantically ill-formed examples, while not ruling out the wellformed ones. It can therefore be hoped that the NCC will be part of a larger theory on RIs in adult language. It is also very noteworthy that children seem to use RIs mostly with eventive verbs, a fact which will be discussed in greater detail in Chapter 5.

Having discussed a number of interpretive properties of RIs, I turn now to some structural properties. I return to the interpretation of RIs at the beginning of Chapter 4.

2.6 THE SYNTACTIC STRUCTURE OF ROOT INFINITIVES

In Chapter 7 I will conclude that child RIs do not violate any syntactic constraints of German. But because the structure of child and adult RIs is not at the center of the present investigation, I will keep the discussion of the structural properties short. I will not give too much detail, beyond establishing the following points: First, adult RIs can have overt subjects, and even closely related languages differ in when subjects of RIs are permitted to be overt in RIs. Second, subjects, as well as other elements (such as objects or determiners) are often covert and must be understood from discourse. Third, modals and the copula can occur as infinitives in adult German RIs, even though the "typical" (in the sense of "permitted by the grammar and frequently ocurring") interpretations for RIs make these examples a rare sight. And fourth, word order in German RIs is not as variable as in finite clauses. I end by tentatively proposing a structural analysis of RIs.

2.6.1 Overt Subjects

Whether a phrase is considered a subject of a clause depends on one's definition of the term "subject". One can apply at least four different defining criteria:

(39) Criteria for subject-hood
a. Semantic relation with the predicate (e.g. agency;. Fillmore 1968)
b. Pragmatic status in the sentence (Chafe 1976)
c. Syntactic relation with the predicate (Chomsky 1981)
d. Morphological case-marking

Of the RI examples in this chapter, many had no overt subject, but some did, at least by criterion (a). For instance, the rhetorical exclamatives in (7) (including the German ones), as well as the Russian and Dutch declarative examples in (18) and (18') have overt subjects.

Although it is traditionally assumed that infinitives do not have overt subjects (in the absence of special licensing, as by *for* in English), it is by no means impossible to find overt subjects with infinitives. Cross-linguistically, a number of different infinitival constructions do allow overt subjects. For instance, Latin had overt nominative subjects in certain constructions, as shown in (40a), and modern Portuguese allows embedded infinitives to have overt subjects, as shown in (40b).

(40) a. Latin embedded infinitives
Fabri pontem restituere iubentur. (Hornung 1960)
pioneers-*nom* bridge-*acc* restore-*inf* order-*imp-pass*
"The pioneers were ordered to restore the bridge."

b. Portuguese embedded infinitives
Será difícil **eles** aprovarem a proposta. (Raposo 1987)
be-*fin* difficult they approve-*inf* the proposal
"For them to approve the proposal will be difficult."

The examples in (41) below (taken from Bresnan 1986) show that in English infinitival clauses can have overt accusative subjects at least if they are introduced by the complementizer *for*, and the so-called absolutive

construction is a case where gerunds (which are usually considered a non-finite verb form) can have an overt nominative subject:

(41) a. For **them** to try to sing a song was just too horrible.
b. Elaine's winking at Roddy was fruitless, **he** being a confirmed bachelor.

Although the bold-face phrases in the sentences in (40) and (41) may not be considered subjects by every scholar by all of the criteria in (33), at least semantically these phrases do seem to be in a subject-relation with their predicates.

There seem to be language-specific differences as to when (semantic) subjects of RIs can be overt. For instance, the German example (31) above, which did not have an overt subject, sounds degraded when it has an overt subject:

(31'') ?? Und **wir/du/er/der Student** dann noch die U-Bahn nehmen.
and we/you/he/the student then still the subway take-*inf*
"And then we/you/he/the student still had to take the subway."

On the other hand, the Dutch examples which had similar semantics for TENSE and ASPECT, did allow an overt subject, as was evidenced by (30b,c). It is also noteworthy that imperative RIs in German do not allow overt second person subjects. I repeat in (42) the adult examples of (25), but with second person subjects added. The resulting sentences sound unacceptable as imperatives to a native German.

(42) a. * Du mal draufstellen!
you *particle* on-put-*inf*
"Put it up on top."

b. * Sie Mund weit öffnen!
mouth wide open-*inf*
"Open your mouth wide!"

In sum, while overt subjects are disallowed in some specific cases, Universal Grammar does not exclude the possibility that infinitival constructions have overt subjects which refer to the semantic subjects of the

predicate. Languages differ in their constraints on when overt subjects can be present in RIs (see Lasser in prep.). Overt subjects of infinitives may well be marked cases. If that is so, then the subjects in RIs must be regarded another item on this list of marked exceptions.

2.6.2 "Dropped" Elements

We saw that in many cases the subject remains implicit in RIs. The same can be true for the objects, as (43) illustrates:

(43) a. Mir das Buch geben!
me the book give-*inf*

b. Mir geben! (direct object omitted)
me give-*inf*

"Give me the book!"

The direct object can be omitted, when it can be recovered from the discourse. As Fries (1983) notes about written RIs, omitted implicit arguments are typically in a close physical relationship with the medium on which the RI is written. Consider the examples in (44):

(44) a. On the wrapper of a piece of chewing gum:
Nach Kaugenuss in Alufolie einwickeln. (Fries 1983)
after chew-pleasure in aluminum-foil wrap-*inf*
"Wrap in foil after use!"

b. Sticker on the flap of a private mail box:
Keine Reklame einwerfen. (Fries 1983)
no advertisements in-throw-*inf*
"No advertisements please!"

In (44a) it is clear to the reader that the covert object must be the chewing gum, and in (44b) the missing location is the mailbox to which the sticker is attached. Determiners and articles can also be omitted in RIs:

(45) a. On a package of medication:
Packungsbeilage beachten. (diary;)
insert notice-*inf*
"Read insert!"

b. Linken Fuss auf linkes Pedal ziehen. (Fries 1983)
left foot on left pedal pull-*inf*
"Pull left foot on left pedal."

In (45a), the only notice that could be relevant is the one which comes with the medication, and in (45b), the noun-phrases refer to the foot of the addressee and the left pedal of the bicycle in front of him.

Although I do not show it here, in German *finite* sentences objects can only be dropped from certain syntactic positions, and determiners are normally present. I note also that objects and determiners in RIs can be missing only when the hearer can recover them from context (linguistic or non-linguistic). While it would be interesting to see whether there are any additional syntactic constraints on the possibility to omit objects and determiners in RIs, this issue must be left for further research. I have brought it to attention here, in order to point out that it is worthwhile comparing these adult examples with child examples lacking objects and determiners.

2.6.3 Modals and the Copula

Unlike in English, the paradigm of German modals and auxiliaries contains infinitives. Modals can appear in RIs as part of a complex verb, or even constitute the only verbal element in RIs:

(46) a. Warum jeden Tag frisches Brot essen wollen?
why every day fresh bread eat-*inf* want-*inf*?
Why would one/we want to eat fresh bread every day?

b. Alle einen Weihnachtsbaum wollen?
all a christmas tree want-*inf*.
"Everyone want a christmas tree?"

c. Erst nicht teilnehmen, und dann sich beklagen wollen!
first not participate-*inf* and then *refl* complain-*inf mod-inf*
"First you don't participate and then you want to complain!"

Such examples are relatively rare. Although I will not present any evidence here, this may have to do with the NCC and its consequence that the predicate of a RI cannot refer to presupposed Event. It could be that, when talking about, for instance, intentions, we typically presuppose them. Observe also in this context that a modal turns the verbal complex into a non-eventive, or individual-level, predicate. According to Avrutin, this should not occur in a RI, but it does.

I have already shown with example (38b) above that the copula can occur as the verb in a German RI. I repeat the example here in (47).

(47) Immer erster sein! (Miller Corpus)
always first be-*inf*
"You always want to be first."

Of all examples which I have collected, this was the only one with the copula. Although (47) is a well-formed and natural-sounding example, RIs with the copula are also rare in German.

2.6.4 Word Order in Root Infinitives

An interesting fact about German RIs is that all elements, not just the verb, in the sentence seem to have to appear in their base-position. (Only extraposition to the right is possible. I leave extraposition aside.) For instance, we find the object directly to the left of the verb. I use the example in (19'a) above to show this:

(19') a'. √ Du jetzt auch Bier trinken?
now beer drink-*inf*
"Do you want to have some beer now?"

a''. * Jetzt auch Bier du trinken?
now beer you drink-*inf*
"Do you want to have some beer now?"

a'''. ??Du Bier jetzt auch trinken?
you beer now also drink-*inf*
"Do you want to have some beer now?"

These examples shall be sufficient to show that apparently word order is less variable in German RIs than in German finite clauses, where, for instance, objects can be moved away from the verb. Notice that one interpretive function of this movement operation is to mark the moved constituent as "topic", or "background".[20] These are discourse-pragmatic notions. As RIs have a more rigid word order, they are less versatile in marking these notions overtly. We can conclude that these pragmatic notions are expressed to a smaller degree by word order in RIs. (They might still be expressed by other structural or lexical means.)

2.6.5 The Structural Representation of Root Infinitives

The structure of child RIs has been hotly debated in the acquisition literature. For comparing child RIs with adult RIs, it is of interest to determine the structure of adult RIs. Two main hypotheses offer themselves. One might either posit that, since RIs receive a finite interpretation, they are underlyingly finite constructions with all functional phrases and properties which finite sentences have. In particular, since finite German sentences involve CP, one might hypothesize that the root node in German RIs is a CP also, and that RIs differ from finite CPs in that some features are not spelled out. Specifically, C° would be phonologically empty. Alternatively, one might prefer to follow the "what-you-see-is-what-you-get" approach and postulate that RIs are "truncated" clauses, as Rizzi (1994) has suggested for child RIs. The question is not a simple one to decide, and for the main purpose of the present work it is not a crucial one. Nevertheless I will briefly address it.

Two facts suggest that RIs are truncated structures, and not full-blown CPs. First, if RIs were sentences in which the speaker simply chose not to pronounce some material, in particular the finite element, we would expect that in each case one could insert that finite element (and a subject), and the sentence should be grammatical. However, there are cases where no such element exists. This is the true for the rhetorical exclamatives. I repeat here the German examples (7d,e).

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[20] See Webelhuth (1997) for a set of constraints on what elements can move to the "topic" position preceding the finite verb in German finite root clauses.

(48) a. Ich ins Studio gehen?!
I to-the gym go-*inf*
"What! Me go to the gym?"

b. Henry heiraten? Wirklich nicht.
Henry marry-*inf* really not
"Henry getting married? I don't think so."

One meaning of these examples is that the speaker denies that the Event to which the predicate refers is *ever* true. As (48"a,b) show, there are modals which can be inserted into (48a,b), but none can express that particular meaning. (The glosses in (48') give the closest English equivalent to the German modals.)

(48') a. Ich will/soll/werde ins Studio gehen?!
I want/should/will to-the gym go-*inf*
"Me going to the gym?"

b. Henry will/soll/wird heiraten? Wirklich nicht.
Henry want/should/will marry-*inf* really not
"Henry getting married? I don't think so.

These examples can express disbelief, but not with respect to the entire time-line (future, present, and past), as the sentences in (48) do. The modals in (48') express disbelieve, but restricted to the future. Insertion of a form of the auxiliaries *haben* ("have") or *sein* ("be") into the examples in (48) would make the examples ungrammatical. (There is no complex verb form in German which consists of one of these auxiliaries plus the infinitive.)

Also, as just mentioned, RIs in German do not seem to occur with OSV word order, a word order which is normal for finite clauses. If RIs were syntactically just like finite clauses, one would not expect this word order restriction, unless one could motivate the restriction independently.

Cursory evidence suggests then that adult German RIs are not full-blown CPs, but perhaps truncated at a level below CP.[21] However, for the remainder

[21] Fries (1983), in examining the question whether RIs involve a "deletion transformation", comes to the same conclusion.

of this thesis the question does not play an important role. It is also a possibility that not all RIs have the same structural representation.

2.7 SUMMARY

The discussion above has yielded a number of important results.

1. Root Infinitives are licensed by UG semantically, syntactically, and pragmatically.
2. Root Infinitives have a wide range of interpretations. In particular they are *not* restricted to non-declarative interpretations. Although many examples have a modal interpretation, not all do. For instance, RIs can refer to on-going or past Events.
3. There is presumably a restriction on the aspectual interpretation on RIs, the Non-Completedness Constraint, as stated in (35).
4. The interpretation of RIs is context-dependent in at least 4 ways:

(49) Context-dependent characteristics of RIs
   a. illocutionary function
   b. temporal interpretation (TENSE, ASPECT)
   c. modal interpretation (MODALITY)
   d. reference of the subject, and sometimes other arguments

I believe that it is because RIs are so context-dependent, and as a consequence only felicitous under very precise discourse conditions, that they are relatively more infrequent as a sentence type than finite sentences. For the same reason, they sound infelicitous out of context.

2.8 A NOTE ON ROOT PARTICIPLES

Some non-finite root constructions contain as their only verbal element a participle. The examples below are from a magazine. The first is a headline, the second a caption.

(50) a. Millionen Chinesen durch Jodmangel verblödet
   millions Chinese through iodine deficiency demented-*pp*
   "Millions of Chinese gone insane as a result of iodine deficiency."

   b. Den Lebensnerv getroffen
   the life nerve hit-*pp*
   "The nerve of life was hit."

The following examples are some RP participle constructions that the adults used in the corpus I have analyzed.

(51) a. Umgestupst. (Miller Corpus)
over-knocked-*pp*
"It is knocked over." or: "You knocked it over."

b. Angefasst. (Miller Corpus)
touched-*pp*
"I touched it."

A difference that RP constructions exhibit when compared with RI constructions is that the former *can* refer to a completed event. In fact it seems that this is the only kind of Event an RP can refer to. The syntactic, semantic and pragmatic restrictions on RPs merit a separate investigation and were not a part of this study.

THE NOTION OF FINITENESS

CHAPTER 3

In discussing child RIs, the acquisition literature has not provided any theoretical discussion of the notion "finiteness". This may have to do with the fact that researchers have predominantly focused on the question whether children know the distinctions between finite and non-finite verb forms which derive from morphology and syntax. In this chapter it will be brought to attention that for a learner to have acquired verbal paradigms and order restrictions on verb forms is not enough for being able to use inflectional morphemes correctly. Unless the learner knows in addition when to use which morphological form, he will not be able to mark finiteness as required in the target language. The overall purpose of this chapter is to illuminate what the notion "finiteness" involves and what this implies for the learner.

It is vital to draw a distinction between a semantic notion of finiteness on the one hand, and the morpho-syntactic expression it takes on the other, for at least three reasons. First, different languages use different means to express finiteness. For instance, verbs express finiteness features of the proposition contained in a sentence in many languages, but not all. For example, in Chinese and Burmese verb forms are invariant, and finiteness is expressed by particles and adverbs. Second, even in languages which typically do involve the verb in expressing finiteness, finiteness is not always expressed on the verb. And finally, even closely related languages, such as Dutch and German, do not express semantic features related to finiteness in corresponding ways in each case. These cross-linguistic differences will be one topic of the present chapter.

A terminological distinction is therefore necessary between the overt form that finiteness takes and the invisible function that the finite form serves. I will use the terms M-finiteness (for morphological finiteness) and S-finiteness (for semantic finiteness) for these two different notions. M-finiteness concerns any overt ("audible") marking of (some aspects of) S-finiteness.

The sections to follow will corroborate the significance of the distinction between M-finiteness and S-finiteness. I show first that different languages use different morpho-syntactic means for expressing S-finiteness. Then I explicate the different interpretive features which make up the notion of S-finiteness, namely ASSERTION, TENSE, ASPECT, and MODALITY. I will continue

the notational convention introduced in Chapter 2, using small caps for disambiguating semantic notions such as TENSE, ASPECT, and MODALITY, from the forms which express them. Examples from German, English and Dutch will show that finite forms relate to finite functions, and vice versa, in language-specific ways. In other words, even languages which are historically and typologically closely related differ in the actual use of finite elements. In section 3.2.5 I illustrate how this variation could be captured in UG. At the end of this chapter I summarize the implications for the learner.

3.1 M-FINITENESS IN UNIVERSAL GRAMMAR

One conclusion of Chapter 2 was that RIs, despite their lacking finiteness markers, receive an interpretation for S-finiteness based on discourse context. This is in fact quite a normal process in the languages of the world.[1]

Until the next section where I explicate the notion of S-finiteness in detail, let me assume that the purpose of S-finiteness is to supply sentences with a temporal interpretation. We have seen in Chapter 1 that German uses two concurrent grammatical processes to mark S-finiteness, namely affixation and movement of the verb. The same is true of Dutch, for instance, but other Germanic languages work differently. For instance, Afrikaans uses verb movement, but, unlike in German or Dutch, some tensed forms (in particular the present tense forms) are indistinguishable from the infinitive. In English verbal inflections are used only with main verbs, and verb movement is restricted to modals and auxiliaries and to certain construction types. Thus, on the form side, the finite/non-finite distinction is less consistently expressed in the verbal systems of English and Afrikaans, than it is in Dutch or German.

An extreme case are languages such as Chinese or Burmese, which use neither verbal morphology nor verbal syntax to mark S-finiteness. In such languages, S-finiteness cannot arise from the verb form used, but it must be interpreted from other lexical elements in the utterance, such as particles or adverbs (see Klein and Hendriks 1995 on Chinese particles expressing finiteness). In addition, contextual information is used to obtain an interpretation for S-finiteness.

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[1] Discussion will be restricted to utterances which contain (at least one) verbal element. I will use the term "sentence" for such utterances. Quite similar considerations apply to certain utterances without verbs. As the interpretation of verbless utterances more typically (though not always) depends on a preceding utterance containing a finite verbal element, I exclude them here.

Even those languages which do typically mark S-finiteness overtly on a verbal element rely additionally on linguistic elements other than the verb in order to further specify the S-finiteness features of the proposition expressed by the utterance. For instance, adverbials can supply temporal information, and deictic as well as anaphoric elements can specify temporal properties of the proposition.[2] In addition, as Chapter 2 made clear, the context itself, both linguistic and non-linguistic, can supply crucial information for interpreting S-finiteness.

The variation across languages with respect to how S-finiteness is structurally visible can be summarized by a cross-classification as in (1).

(1) Linguistic devices to make S-finiteness explicit:

	ON THE VERB		NOT ON THE VERB		
	syntax	morph.	particles	adverbs	other (e.g.context)
Afrikaans	+	-	-	+	+
English	-	+	-	+	+
Ger./Du.	+	+	-	+	+
Chin./Burm.	-	-	+	+	+

Very broadly, languages either do (e.g. Afrikaans, English, German, Dutch), or do not (e.g. Chinese, Burmese) involve the verb in the expression of S-finiteness. Of those languages that do involve the verb in the expression of finiteness, some use morphological processes (English), some use a syntactic operation (Afrikaans), and some use both (German, Dutch). Omitting finiteness information from verbs is not an unusual linguistic phenomenon. Some languages cannot mark S-finiteness on verbs; and those languages that can, do not always make use of that possibility. The adult German RI constructions are evidence for the latter observation. Consider also that some languages, such as Hebrew or Russian, do not always use the copula in predicative constructions. The copula is that element which, if it were present, would bear finiteness information.

The specifications in (1) are for present tense declarative sentences in each example language. To avoid clutter, the classification is only rudimentary, in

[2] For discussion of such temporal and deictic expressions, see, for instance, Wunderlich (1970), Hornstein (1990), Ehrich (1992), and Klein (1994).

fact too crude to represent the full picture of finiteness marking, even across this small set of example languages. For instance, in English interrogatives the finite verb (though never the thematic verb) is affected by a syntactic rule, and not just a morphological rule. And Afrikaans (but not Chinese) does have morphological means to differentiate past from present on the verb.

Despite its limitations, the classification in (1) draws attention to the fact that no matter whether a language involves the verb in the marking of finiteness or not, it has other lexical expressions for expressing S-finiteness, and it can rely on discourse context for interpreting S-finiteness.

There is evidently a variety of devices which languages use for marking information concerning S-finiteness. Different languages use the different devices to varying degrees. In (2) I give an overview of the different devices available across and within languages for interpreting S-finiteness.

(2) Devices for interpreting S-finiteness:

a. MORPHOLOGICAL DEVICES
   closed-class morphemes:
      - affixation
      - particles
   open-class morphemes:
      - adverbial phrases
      - deictic elements
      - anaphoric elements
b. SYNTACTIC DEVICES
   verb fronting
c. CONTEXT
   linguistic context:
      - from preceding or higher clause[3]
   non-linguistic context:
      - deixis (e.g. gestures, like pointing)
      - discourse situation

[3] Embedded non-finite verbs in all languages normally receive their interpretation with respect to S-Finiteness at least in part through the linguistic context outside their own clause. This interpretive process often involves the S-Finiteness interpretation of the higher clause (the "sequence of tense" phenomenon).

Under (2a) different kinds of morphological expressions are listed which contribute to the finiteness interpretation of the utterance they occur in. (2b) states a syntactic process which, in some languages, contributes to S-finiteness. In (2c) two kinds of sources for interpreting finiteness that lie outside the utterance are noted.

The observations made so far about how S-finiteness is overtly expressed in natural languages can be summarized as follows:

(3) The morpho-syntactic expression of S-finiteness across languages:
1. Languages differ in the structural devices which they use.
2. While only some languages use devices involving the verb, no language seems to lack devices which do not involve the verb.
3. In a language which typically uses a device involving the verb, it is not the case that in every utterance the S-finiteness is marked on the verb.

These considerations have direct implications for language acquisition. One thing a learner has to determine is which devices his target language uses to mark S-finiteness. For example, a child learning German must discover that the grammar of root clauses has two processes involving the verb, namely affixation and movement, which must always occur concurrently. As mentioned in section 1.2.3 and as discussed further in Chapter 5, there is good reason to believe that children have acquired this knowledge at least at some point during the RI-stage.

However, learning must not stop there. Setting aside languages like Chinese, knowledge also has be acquired with respect to the following two questions: 1. When is finiteness expressed on the verb? 2. If finiteness is expressed on the verb, how is it expressed? The first issue was the topic of Chapter 2, where I discussed conditions under which verbs can remain non-finite. The second of these issues will now be the focus of section 3.2.

3.2 S-FINITENESS IN UNIVERSAL GRAMMAR

S-finiteness is a composite notion, but the individual features that contribute to it are best discussed separately. The notions most commonly associated with S-finiteness are temporal features of a proposition, such as TENSE and ASPECT. Sometimes MODALITY is also included in discussions of S-finiteness, and authors speak of the TMA-system (TENSE/MODALITY/ASPECT). It makes sense to include MODALITY in a discussion of S-finiteness. For one thing,

temporal and modal properties of sentences are often expressed by the same morpheme. Also, it was said in section 2.5.1, and will become apparent again below, that it can be difficult to differentiate modal from temporal interpretations.

Klein (1994, 1997b) shows that another essential feature of S-finiteness is what he calls "ASSERTION". This feature goes mostly unmentioned in other discussions of S-finiteness. I will introduce it here first, because it will help define the notion TENSE later on. Moreover, the ASSERTION feature is possibly present in all linguistic expressions which receive an interpretation for finiteness, not just those which are overtly marked for TENSE, ASPECT OR MODALITY.

3.2.1 Assertion

To begin with an example, the feature ASSERTION[4] refers to that semantic notion which is highlighted by contrastive intonation of the element *WAS* in example (5a).

(5) a. The light WAS on.
b. The light was on.

The examples in (5a) and (5b) express the same proposition. The only semantic difference between examples (5a) and (5b) is that in (5a) ASSERTION is contrastively marked by stress, ut in (5b) it is not. What is highlighted by stress in (5a) is the "mere claim" that the light was, at an unspecified time before now, on.[5] (The implied contrast expressed in (5a) can be of various

[4] For lack of a less ambiguous term, I will follow Klein (1994, and elsewhere in his work) in using the word "ASSERTION" for the notion to be explained in this section. It is unfortunate that the term is used to refer to other semantic concepts as well. These are distinct from that notion for which the term is used in this thesis. All examples in this subsection are from Klein (1994), and even where I do not quote directly, I will follow his formulations relatively closely in explicating the notion ASSERTION.

[5] For lack of a less ambiguous term, I will follow Klein (1994, and elsewhere in his work) in using the word "Assertion" for the notion to be explained in this section. It is unfortunate that the term is used to refer to other semantic concepts as well. These are distinct from that for which the term "Assertion" is used in this thesis. All examples in this subsection are from Klein (1994), and even where I do not quote directly, I will follow his formulations relatively closely in explicating the notion.

kinds, e.g. "but now the light isn't any longer on", or "was indeed on".) The content of ASSERTION is present in (5b) as well; but it is not highlighted there. Note that ASSERTION is a different notion from TENSE, because it need not be temporal properties of the proposition which are highlighted in (5a). It is only a coincidence in English elements which express ASSERTION also express TENSE. I will henceforth use the notation [ASN] to refer to the content of ASSERTION.

[ASN] functions like an operator, and it should not be confused with other notions which may be related to it but are different, such as "declarative", or "modality". First, although "declaratives" are said to "assert", or "make a claim", [ASN] is also present in other illocutionary types. Consider an interrogative like (6), which could have been the utterance preceding (5b) above in an imaginary discourse.

(6) What did you notice when you looked in the room?

The utterance does not make an ASSERTION, but it calls for one (at the same time as presupposing one, i.e. that the addressee noticed something), and it contains the timespan for which this ASSERTION has to be made (E before S; more specifically E at time when addressee looked in the room). This timespan is linked to [ASN], as will be explained in the next section where TENSE is discussed. Klein assumes that [ASN] is contained in a question like (6), and also that it is contained in imperatives, where it is linked to the timespan for which the expressed obligation holds.

In sentences which contain a modal interpretation, such as (7), [ASN] operates over MODALITY (see Klein, 1994, section 9.7.3 for details). [ASN] is surely contained in (7), as there is a claim made by the speaker.

(7) The light could have been on.

(6) and (7) make clear that ASSERTION is independent of whether the claimed content is a "fact". It is then a broader notion than is covered by the terms "declarative" or "modal".

Also, ASSERTION is not restricted to constructions with finite elements. Construction types without a verb, such as adjectival modification in English, can contain [ASN] as well. For instance, by beginning a sentence with the modified noun *this pink house* and continuing it with *is not pink* one causes a contradiction. Thus, by using the modified noun *pink house* one makes the

claim that the house in question has the property "pink". This shows that the presence of [ASN] is not tied to an element which marks finiteness. However, for all that is known. finite expressions imply [ASN].

According to Klein (1997), some construction types cannot contain [ASN]. For instance, [ASN] is not present in noun compounds. If it were present, the examples in (8) would have to contain a contradiction, but they do not:

(8) a. This **canopener** never opens cans.
b. This **cleaning solution** makes things dirty.

While the semantics of the sentences in (8) is surprising, it is not inherently contradictory. Two generalizations concerning the relationship between [ASN] and M-finiteness may therefore be formulated:

(9) ASSERTION and M-finiteness:
a. M-finiteness implies [ASN]
b. The absence of M-finiteness does not imply the absence of [ASN].

It may be that these two properties of the feature [ASN] are invariant across languages, and constitute one of the universal characteristics of S-finiteness. This knowledge could be made available to the learner via UG.

An important question is whether [ASN] is present in RI constructions. A review of the RI examples discussed in the previous chapter would show that most of them are related to a timespan to which a claim is linked. An exception are those examples which I have called "exclamatives with counterfactual presuppositions". I repeat the examples here:

(10) Adult RIs with exclamative function (wh-initial) (= (6) in Chapter 2)

a. Comment lui expliquer cela?! (French, Haegeman 1995)
how to-him explain-*inf* this
"How to explain this to him?!"

b. Che cosa dire in questi casi?! (Italian, Rizzi 1994)
what say-*inf* in these cases
"What to say in these cases?!"

c. Wie ihm das erklären?! (German)
how him this explain-*inf*
"How to explain this to him?!"

d. But how to get there?! (English)

(11) Adult RIs with exclamative function (non-wh-initial) (=(7) in Chapter 2)

a. Moi partir?! Jamais. (French, Haegeman 1995)
I leave-*inf*?! Never.
"Me leave? Never."

b. What, me worry?! (English, Akmaijan 1984)

c. What! John get a job?! Fat chance. (English, Akmajian 1984)

d. Ich (und) ins Studio gehen?! (German)
I (and) to-the gym go-*inf*
"What! Me go to the gym?"

e. Henry (und) heiraten?! Wirklich nicht. (German)
Henry (and) marry-*inf* really not
"Henry getting married? I don't think so."

It is characteristic of these examples that there is no timespan to which a claim can be attached. This coincides exactly with the attitude which they express: The Event which is contained in the proposition is presented as counterfactual. I therefore propose that the sentences with the underlined verbs in (10) and (11) either do not contain a feature [ASN] or perhaps, in view of their negative implication with respect to the Event contained in the proposition, they contain a negative feature [ASN]. This would be consistent with the generalizations in (9); if M-finiteness is absent, [ASN] can be absent, but need not be.

The exact details of how [ASN] works will not be important in the exposition below (see Klein 1994). However, I will assume that (a) there is such a feature which is distinct from all other features associated with finiteness (such as TENSE, MODALITY, ASPECT), (b) [ASN] is abstract (in that it is independent from visible grammatical markers), and (c) [ASN] can be present

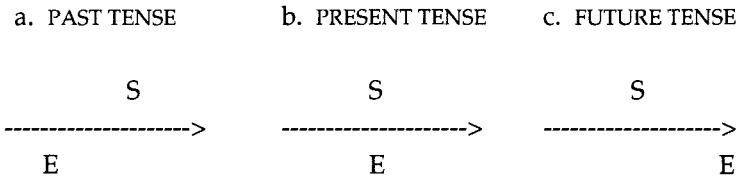
in all illocutionary types. Where the presence of [ASN] is non-obvious, but relevant to the discussion, I will note it.

3.2.2 Tense

The formal nature of TENSE has been a matter of debate among semanticists. Traditionally, it has been viewed as a logical operator. By contrast, some linguists, for instance Partee (1973) and Enç (1987), have described pronominal properties of TENSE, and Hornstein (1990) classifies it as an adverbial modifier. Fortunately, for a basic understanding of the notion TENSE, we do not need to decide to which of these categories TENSE belongs. What is important to understand is that TENSE denotes a relation between different times. This observation is usually attributed to Reichenbach (1947).

Most of the literature distinguishes PAST, PRESENT, and FUTURE, as the "basic" (Hornstein 1990), or "absolute" (Comrie 1985), TENSES. The absolute TENSES can be defined as relations between the time at which the sentence is spoken (speech time), and the time of the Event[6] that the sentence talks about (Event time). Resuming the notation of Chapter 2, the absolute TENSES can be illustrated as in (12):

(12) Time relations in the absolute TENSES (first version)



Thus, a PAST Event lies before S, a PRESENT Event is at S, and a FUTURE Event is after S. This is an oversimplified picture, however, and at least two additional observations are important for an adequate understanding of TENSE.

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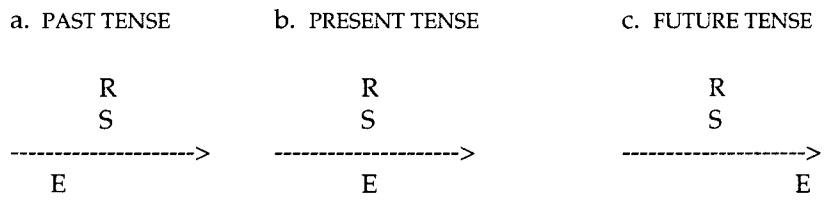
[6] For lack of a less ambiguous term, I will follow Klein (1994, and elsewhere in his work) in using the word "Assertion" for the notion to be explained in this section. It is unfortunate that the term is used to refer to other semantic concepts as well. These are distinct from that for which the term "Assertion" is used in this thesis. All examples in this subsection are from Klein (1994), and even where I do not quote directly, I will follow his formulations relatively closely in explicating the notion.

First, as was already shown in section 2.5.2 of the previous chapter, there is a second point, besides S, to which to relate E. In the "relative" TENSES (for instance in the PLUPERFECT; see diagram in (32b) of section 2.5.1), as well as in "narrative" uses of tense forms (see diagram in (34) of section 2.5.1), there is a reference point R, distinct from S, which is the time point to which E must be related. In the absolute TENSES R concurs with S. [7] A more complete illustration of the absolute tenses is therefore as in (12'):

(12') Time relations in the absolute TENSES (second version)



A second important fact to realize is, that the time (period) E must not be understood as "the time of the entire duration of the Event". Klein (1994, 1995a) shows that in these temporal relations E denotes "the time span to which the speaker's claim on this occasion is confined" (1994a:4). To see that this is so, consider the example in (13):

(13) David was in a good mood yesterday.

Sentence (13) is about an Event that happened within a relatively clearly defined time interval that lies fully before S, i.e. in the PAST (specifically, in a time period somewhere in, or coinciding with, the timespan which corresponds to the day preceding the day on which the utterance is made). However, this time interval only overlaps with or contains, but is not necessarily coincidental, with the entire situation of David being in a good

[7] From now on I set aside the "relative" TENSES, such as PLUPERFECT and FUTURE PERFECT. This decision will not harm the present project, because these more complex TENSES play a negligible role in the data that I will discuss in later chapters. Moreover, while a learner will have to acquire how these relative TENSES are expressed in his target language, it is reasonable to assume that the TENSES which are anchored in the present, namely PAST, PRESENT, and FUTURE are learned first.

mood. In fact nothing at all is said about how long the situation of David being in a good mood actually lasted. (13) is entirely compatible with David having been in a good mood for 7 consecutive days (yesterday being one of them), i.e. the situation can extend beyond the time-span of the Event which the utterance actually talks about. The sentence in (13) is also compatible with David having been in a good mood only part of yesterday, for instance between 1 p.m. and 2 p.m. The adverb yesterday only limits the time span which the utterance talks about. It does not preclude the possibility of restricting that time further (e.g. by adding "between 1 and 2 o'clock").

Thus, temporal information in an utterance selects a time-slice, as it were, which overlaps with or contains the time period during which the Event which the utterance talks about happened. Klein introduces the term "TOPIC time" (TT) for the time-slice which finiteness information selects. The term refers to that timespan which the speaker has chosen as relevant with respect to the entire Event expressed in the proposition. The relationship between [ASN] and TT is then that [ASN] operates over TT, i.e. the "claim" in a sentence is made with respect to the duration of TT. It is now possible to give an more precise definition of the PRESENT, the PAST and the FUTURE TENSES.

(13) Definitions of the three absolute TENSES (final version)

FUTURE: S before TT
PRESENT: S includes TT
PAST : S after TT

Semanticists working on tense disagree quite strongly about how many tense forms, i.e. distinct morpho-syntactic tenses, can be distinguished in language. For instance, it has been claimed that German has three, six, and nine tenses (see Thieroff 1992; on Dutch see Janssen 1994a). Such controversies have in part to do with the fact that one can base one's account either on tense forms or on TENSE interpretations. Of course not all languages have grammatical devices to mark all possible TENSE and ASPECT distinctions. In addition, as we already saw, TENSE and MODALITY can be semantically difficult to differentiate.[8] Similarly, TENSE can be difficult to distinguish

[8] Abraham (1989), Comrie (1989), and Janssen (1989) discuss this matter with particular reference to the Germanic languages. For discussion of this problem in the Romance languages see Fleischman (1982). It also noteworthy in this context that expressions of

semantically from ASPECT. For instance, there is discussion of whether the German "perfekt" tense form (a complex verb form composed of a finite form of the auxiliary haben ("have") and the past participle of the main verb) corresponds to a semantic TENSE or an ASPECT.

I will assume here only the three absolute TENSES as defined in (12) above. These are purely semantic characterizations, entirely independent from the morpho-syntactic realization which they might find in a given language. Where languages differ is in how they express the Past, Present, and Future. These differences exist irrespective of one's assumptions about the number of TENSES that exist, and the number and kind expressed by a given language.[9]

For illustration of the cross-linguistic differences in how a given TENSE is expressed, consider a German and an English sentence, each of which have a verb form which expresses Present Tense:

(15) a. Russell arbeitet heute in einer Fabrik.
Russell work-*pres* today in a factory

b. Russell is working in a factory today.
Russell aux-*pres* work-*ing* in a factory today

"Russell is working in a factory today."

Both (15a) and (15b) have the prototypical PESENT TENSE interpretation and express the same proposition, i.e. that Russell is working in a factory at a time which includes that of the utterance. But the morpho-syntactic realization of this interpretation differs in the two languages: English uses a complex verb form (a present tense auxiliary plus a non-finite *ing*-form), whereas German uses a simplex verb form. (To highlight this difference the English examples are also glossed.) Of course, a simplex verb form denoting PRESENT TENSE also exists in English, but it has a different meaning, as (16a) illustrates.

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future time reference, such as English *will* frequently derive diachronically from modal expressions (Comrie 1985, Warner 1993).

[9] It is assumed here that learners, unlike linguists, receive help from Universal Grammar and an innate learning mechanism in order to answer these questions for their own language.

(16) a. Russell works in a factory.
Russell work-*pres* in a factory

b. Russell arbeitet in einer Fabrik.
Russell work-*pres* in a factory

"Russell works in a factory."

The German equivalent of (16a) is (16b), which also has a simplex verb form. Generally speaking, the German simplex verb form bearing a present tense affix has a broader range of meanings than the English simplex verb form bearing a present tense affix. In German, the simplex verb form covers all PRESENT interpretations (and some FUTURE interpretations, as we will see).[10]

English thus makes a distinction in expressing temporality on verbs that German does not make. It also looks as if languages can behave idiosyncratically in the way in which they choose to mark a given TENSE. There is no obvious a priori conceptual reason for why a certain temporal content should be expressed by a complex form, rather than a simplex form, or vice versa. And it is also hard to imagine an independent reason for why in English a complex verb form expresses what is expressed by a simplex verb form in German. After all, both languages have simplex and complex verb forms in their repertoires.

The examples below involving the PAST TENSE show the same point. English and German both make use of a simplex form to express PAST (i.e. *verb-past*) on the one hand, and of a complex form (*have-fin+participle*) on the other. Both forms can be used to refer to a PAST Event in both languages, as

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[10] Present tense verbs are used to refer to the future in English, but to a lesser extent than in German. It seems to be the case that, if the speaker is to a certain extent in control of the future, then present tense is used more felicitously. Compare:

(i) a. I will go/be going to Chicago tomorrow.
b. I am going to Chicago tomorrow.
c. I go to Chicago tomorrow.

The lexical content of the verb also plays a role. E.g. verbs like "come", "arrive", or "leave" are more likely to be used with future interpretation than other verbs.

(ii) a. He will come/be coming tomorrow.
b. He is coming tomorrow.
c. He comes tomorrow.

This has to do with the semantic verb type (see discussion in Klein 1994a).

(17) and (18) show. (In parentheses I give the names that are commonly used in the linguistics literature for these tense forms.)

(17) English verb forms referring to PAST

a. Susan has left Holland. (present perfect form)
Susan have-*pres* leave-*pp* Holland

b. Susan left Holland. (simple past form)
Susan leave-*past* Holland

"Susan left Holland"

(18) German verb forms referring to PAST

a. Susan hat Holland verlassen. (perfekt form)
Susan have-*pres* Holland leave-*pp*

b. Susan verliess Holland. (imperfekt form)
Susan leave-*past* Holland

"Susan left Holland"

With respect to verb forms, the (a)-examples are equivalents of each other, as are the (b)-examples (see the glosses). However, on the content-side no such equivalence exists. The forms are not interpreted in the same ways. [11] This holds in particular of the *have-fin+participle* construction, as a comparison of the German (19a) with the English (19b) shows.

(19) a. Susan hat Holland gestern um 10 Uhr verlassen.
Susan have-*pres* Holland yesterday at 10 o'clock leave-*pp*

[11] For German second-language learners of English the difference between the simple past tense form and what is called the "present perfect" form is a notorious source of difficulty. Even rather advanced L2-learners make mistakes in using these forms.

b.* Susan has left Holland yesterday at 10 o'clock.
Susan have-pres leave-*pp* Holland yesterday at 10 o'clock.

"Susan left Holland yesterday at 10'clock."

The English (19b) is clearly unacceptable, whereas the German (19a) is ar entirely good sentence. Klein (1992) shows that in English there is both a semantic and a pragmatic constraint on the present perfect tense form. I wil not be concerned with their exact nature or the the details of the cross linguistic differences between those English forms and the correspondin forms in other languages (for discussion of the English present perfect se also McCoard 1978, and Fenn 1987; on the German perfekt see Ehrich 1992 or Klein 1997a). Rouhly speaking, the difference has to do with how TENSI and information and information concerning other notions, such as ASPECT are jointly expressed by finiteness markers, and with what this implies fo the compatibility of tense forms with other elements expressing temporality.

Dutch is a language which is typologically closer to German than English and one might expect that the two languages work more similarly. Dutcl also has both a simple and a complex form for referring to PAST Events However, again there are differences in the range of meanings that thes forms can take in Dutch compared with German. Imagine someone askin "Where was Oliver when you came to see him this morning?" As (20) shows in German (at least in its Southern dialects), a reply with either the simpl past tense or a complex form is equally possible. In contrast, in Dutch, onl the simple past tense form is acceptable, as (21) shows.[12]

(20) a. Er lag im Bett.
he lie-*3sg-past* in-the bed

[12] This abstracts away from the problem of auxiliary choice in the complex verb forms. I Dutch and German both (the equivalents of) *be* and *have* are used. In some cases wher German uses *be*, Dutch uses *have*. A similar variation is manifested for certain verbs (e.g the equivalents of "begin", "sit", or "swim") in different regional dialects of German. Thi illustrates yet another language-specific idiosyncrasy in the mappings from S-Finiteness t morphologically finite forms.

b. Er hat im Bett gelegen.
he have-*3sg-pres* in-the bed lie-*pp*

"He was lying in bed."

(21) a. Hij lag in bed.
he lie-*3sg-past* in bed

b.*Hij heeft in bed gelegen.
he have-*3sg-pres* in bed lie-*pp*

"He was lying in bed."

It is shown by (20) and (21) that where German allows a complex verb form, Dutch does not. More examples of such differences between German and Dutch can be found in Janssen (1989, 1994b).

Finally, consider how the FUTURE TENSE is expressed across different Germanic languages.

(22) English verb forms referring to FUTURE

a. It will rain tomorrow.
it *mod* rain-*inf* tomorrow

b. It is going to rain tomorrow.
it be-*pres* go-*ing* rain-*inf* tomorrow

c. If it rains tomorrow, I'll stay home.
if it rain-*pres* tomorrow I *mod* stay-*inf* home

(23) German verb forms referring to FUTURE

a. Es wird morgen regnen.
it *modal-pres* tomorrow rain-*inf*

b. Es regnet morgen.
it rain-*pres* tomorrow

(24) Dutch verb forms referring to FUTURE

a. Het regent morgen.
it rain-*pres* tomorrow

b. Het gaat regenen.
it go-*pres* rain-*inf*

c. Het zal regenen.
it *modal-3sg-pres* rain-*inf*

These examples illustrate that a number of different means are used to encode the FUTURE TENSE relation.[13] English uses at least three different forms of varying complexity to refer to FUTURE Events. These forms are not always interchangeable. A German speaker, in contrast, can only chose from two forms, a simple one, and a complex one involving the auxiliary werden. Dutch has a repertoire of three forms, two of which involve modal auxiliaries (*gaan, zullen*). Interestingly, the counterparts of these modal verbs cannot be used in German to express FUTURE. The German morphological counterpart of *gaan* is *gehen*, but it is not used as a modal auxiliary in Standard German.[14] The German morphological counterpart of *zullen* is sollen. Although it is used as a modal auxiliary in Standard German, it implies an additional modal sense that is clearly absent from the Dutch form. Thus the German sentences in (25a,b), although they refer to FUTURE Events are not equivalents of the Dutch sentences in (25a,b).

(25) a. Es soll regnen.
it *modal-3sg-pres* rain-*inf*
"It is supposed to rain." or: "It should rain."

[13] This variety of different forms across languages is perhaps a reflection of the arguably ambiguous status of Future as Tense and a Modality.

[14] But these verbs are used as auxiliaries to refer to future in dialects of German, for instance Swiss Bernese (Penner p.c.), or certain Allemanic dialects, such as Monteferese (see Abraham 1992).

b. Sie soll nach Holland ziehen.
she *modal-3sg-pres* to Holland move-*inf*
"She is supposedly moving to Holland."
or: "She should move to Holland."

(26) a. Het zal regenen.
it *modal-3sg-pres* rain-*inf*
"It will rain."

b. Ze gaat naar Holland verhuizen.
she *go-3sg-pres* to Holland move-*inf*
"She will move to Holland."

The modal auxiliary that is used in German to express FUTURE, *werden*, has a morphological counterpart Dutch, *worden*, which is used in passives, like German *werden*, but it cannot be used to express FUTURE. A sentence like (27) has no interpretation in Dutch:[15]

(27) *Ze wordt naar Holland verhuizen.
she *modal* to Holland move-*inf*

Languages thus behave rather idiosyncratically when it comes to expressing specific TENSE relations. Even languages which are typologicially and historically closely related vary in how TENSE must be encoded in a given instance. The same TENSE relation can require a simple or a complex verb form, and when a complex verb form is used, the choice of auxiliary can vary across languages.

3.2.3 Aspect

ASPECT is another temporal notion that tends to be grammaticized in language, but to different degrees and by different means. It has been said that ASPECT refers to the "internal temporal structure of an event" (Comrie 1976). Klein (1994) has cast this intuitive idea into more concrete terms. He shows that, like TENSE, ASPECT specifies a temporal relation, namely the

[15] For a specific comparison of the modal auxiliaries *werden* (German) and *zullen* (Dutch), see Janssen (1989).

relation between TT (i.e. "the time span to which the speaker's claim on this occasion is confined"), and the time of the entire situation which figures in the proposition. I will abbreviate "time of the entire situation" as T-SIT. As with TENSE, the number of different aspectual relations in existence is disputed, but fortunately it is not crucial to our purpose. In (28), I list only four common aspectual relations, and state the different temporal relations they refer to.

(28) Different ASPECTS (from Klein, 1994)

IMPERFECTIVE:	T-TT in T-SIT
PERFECTIVE:	T-TT overlaps[16] T-SIT and TIME AFTER T-SIT
PERFECT:	T-TT after T-SIT
PROSPECTIVE:	T-SIT after T-TT

Schematically these relations can be illustrated as in (29):

(29) IMPERFECTIVE: ---++++++++++----> +++ = Situation Time
******* **** = Topic Time

PERFECTIVE: ---++++++++++----->
****

PERFECT: ----++++---------->
****

PROSPECTIVE: --------+++++++++-->
****

Again, these definitions are purely semantic and have nothing to do with the surface verb forms. The differences among them concern the relationship of the timespan one is concerned with in the utterance with the timespan during which the Event one is talking about lasted. So for instance, using the PERFECT implies that what one is talking about is after the time of the situation.

[16] Read "overlaps" as "has a common subinterval with".

Consider how the four different ASPECTS defined above are expressed in English. The examples illustrate ASPECT in combination with PAST.

(32) ASPECT in English

a. IMPERFECTIVE: She was building a house.
she *be-past* build-*ing* a house

b. PERFECTIVE: She has built a house.
she *have-pres* build-*pp* a house

c. PERFECT: She built a house.
she build-*past* a house

d. PROSPECTIVE: She was going to build a house.
she *be-past go-ing* build-*inf* a house

Even more than with TENSE, languages differ with respect to the degree to which they express aspectual distinctions on the verb. For instance, Russian is known for its rather elaborate system of verbal aspectual inflections, whereas German has almost none. English can be considered as somewhere in the middle of the continuum. In German, the IMPERFECTIVE, the PERFECTIVE and the PERFECT can all be expressed by a simplex verb form, as shown by (33).

(33) Er baute ein Haus.
he build-*past* a house

Again we see that there is no generalization concerning whether a given relation is expressed by a complex or a simplex form. The forms have no absolute intrinsic meaning.

3.2.4 Modality

As Chung and Timberlake state, "[...] there is basically one way for an event to be actual, there are numerous ways that an event can be less than completely actual" (1985:241). Thus, speakers can express many different relations between the Event and the "actual" world. (The "actual" world is the one to which utterances are in normal cases assumed to be relevant.) The

speaker can present the Event as hypothetical, possible, impossible, likely, necessary, and so on. Certain combinations of these notions of "non-actuality" are also possible, for instance "hypothetical but impossible" or "possible and counterfactual" (see Chung and Timberlake 1992).

MODALITY is connected to both S-finiteness and M-finiteness. The connection to S-finiteness is via the [ASN] feature. If a sentence has a modal meaning, [ASN] not only operates over TENSE, but also over MODALITY. The association with M-finiteness is that TENSE and MODALITY can be perceived as two sides of the same coin in the case in which TT is after S:[17]

> "Future is thus a semantic category where tense and mood merge. In practice many languages do not distinguish morphologically between future tense and potential (irrealis) mood. Where a difference is made, the future tense is used for events that are presumed to be certain to occur, and the irrealis mood for events that are potentially possible but not presumed to be certain." (Chung and Timberlake: 1985: 243).

Lastly, as mentioned, MODALITY and TENSE are often expressed by the same morphological devices.

As with ASPECT and TENSE, languages differ in which particular device they choose and in how fine-grained the distinctions made by the forms are. In the Germanic languages, MODALITY can be expressed either by modal verbs or by inflectional elements. How exactly a given modal meaning is expressed depends on the language. Modal semantics is a notoriously complex topic, and I will refrain from a theoretical treatment here. For our purpose it is sufficient to realize that MODALITY, like the other interpretive features contributing to S-finiteness, can be expressed by inflectional affixes, by special modal verbs, and by other lexical means (such as adverbials).

An interesting case is that of certain Oceanic languages, Mannam for instance. These languages, although they do not have elaborate tense systems, still express the basic distinction between factual (or "realis") and non-factual (or "irrealis") by way of verbal inflections. Frawley (1990) quotes an example from Lichtenberk's grammar of Mannam:

---

[17] For arguments concerning the status of the future morphology as modal or temporal in the Germanic languages see Comrie (1989), Janssen (1989), Abraham (1989), and references there.

(34) a. ?u- pura. (from Frawley 1992)
2sg/Real come
e.g. "You came."

b. go- pura.
2sg/Irr come
e.g. "You should come."

According to Frawley, (34a) is compatible with a number of interpretations, such as the one given ("you came") but also with, for example, "you are coming". (34b) in turn could convey any non-factual interpretation, such as "you should come", "you ought to come", etc. What the verbal inflection signifies is only the factual or modal status of the Event (for similar examples see Comrie 1985). What is also interesting about this pair of Mannam examples is that future reference is expressed by the morpheme that expresses modal meanings, and not by the one which expresses factuality.

Modal elements figure in cross-linguistic form-function mappings in the same way as elements expressing tense and aspect makers. That is, the ranges of interpretation of modal forms do not correspond to each other across languages. (35) shows that an interpretation which expressed by a finite modal in English and Dutch, in German requires a subjunctive form of "be", and cannot be expressed with a modal.

(35) a. That would be nice. (English)
that *modal-fin* be-*inf* nice

b. Dat zou leuk zijn. (Dutch)
that *modal-fin* nice be-*inf*

c. Das wäre schön. (German)
that be-*fin* nice

d. *Das würde/wird schön sein. (German)
that *modal-fin* nice be-*inf*

"That would be nice."

(36) below shows that an interpretation which is expressed by a finite modal in English and German, requires two modals (a finite and a non-finite one) in Dutch.

(36) a. What should she do? (English)
what *modal-fin-past* she do-*inf*

b. Wat zou ze moeten doen? (Dutch)
what *modal-fin* she *modal-inf* do-*inf*

c. Was soll sie tun? (German)
what *modal-fin-pres* she do-*inf*

"What should she do?"

Moreover, a comparison of (36a) with (36c) makes clear that English uses a past (or, under a different analysis, subjunctive) modal form where German uses a present (or indicative) modal form. The closer equivalent of English should in German is *sollte*, but the sentence *Was sollte sie tun?* has a different meaning from *What should she do?*[18] Thus, although English has *shall* and *should*, and German has *soll* and *sollte*, the uses of these forms do not coincide.

(37) - (40) below illustrate further that the range of interpretation for a modal in one language can overlap with the range of interpretation for a modal in another language, but there need not be a total correspondence. (37a) shows that the meaning of *darfst* in German can conveyed by *may* in English. (38) shows that the meaning of *mußt* in German can be conveyed by *must* in English.

(37) a. Du darfst das tun. (German)
you *modal-fin* that do-*inf*

b. You may do that. (English)
you *modal-fin* do-*inf* that

"You may do that."

[18] Second-language learners have notorious trouble with choice of modals in such examples.

(38) a. Du mußt das tun. (German)
you *modal-fin* that do-*inf*

b. You must do that. (English)
you *modal-fin* do-*inf* that

"You must do that"

However, if negated, the modals do not always correspond in their respective interpretive ranges, as (39) and (40) exemplify:

(39) a. Du darfst das nicht tun.
you *modal-fin* that not do-*inf*

b. You must not do that.
you *modal-fin* not do-*inf* that

"You must not do that."

(40) a. Du mußt das nicht tun.
you *modal-fin* that not do-*inf*
"You need not do that."

b. You must not do that.
you *modal-fin* not do-*inf* that
"You must not do that."

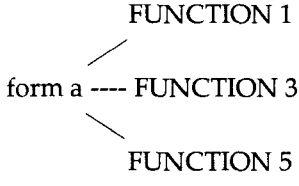
In sum, the preceding sections showed that languages differ in the degree to which they involve the morpho-syntax of the verb in the expression of TENSE and ASPECT. Some languages choose to make finer distinctions in some areas than others. In the extreme case, a language does not express a certain feature morpho-syntactically. For instance, one way to look at Chinese verb forms is to say that this language simply collapses all TENSES and all ASPECTS in one morphological form, one way to look at German is to say that it collapses all ASPECTS into one form.

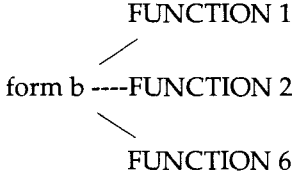
3.2.5 Mapping Finiteness onto Verb Forms

Even languages which are historically and typologically close can differ quite starkly in how they map the TENSE and ASPECT onto verbal forms. (41) schematizes the kinds of mappings that can exist from finite morphology to semantic functions.

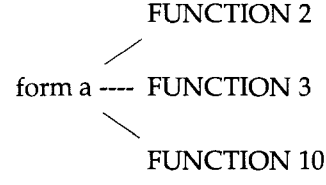
(41) One-to-many mappings from morphological forms to semantic functions

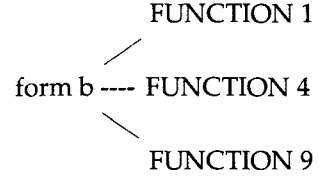
(a) Language A





(b) Language B

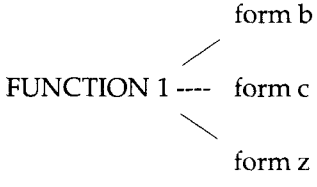




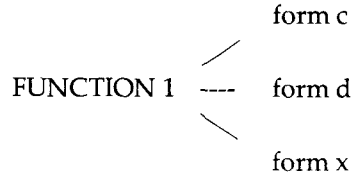
In creating the inverse mappings, those from semantic functions to morphological forms, a similar picture holds. Again, as we have seen, the relations are one-to-many, and differ across languages.

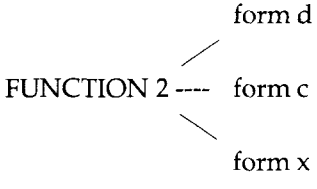
(42) One-to-many mappings from semantic functions to morphological forms

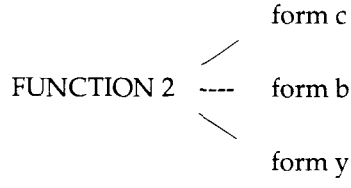
(a) Language A



(b) Language B







In the case of FINITENESS, semantic functions can be conceived of as feature matrices with slots for TENSE, ASPECT, and MODALITY. A possible representation for a sentence like (13) above (*David was in a good mood yesterday.*) or (32a) above (*She was building a house.*) would be like in (43):

(43) Example of a Finiteness Feature Matrix :
[[ASN] [TENSE: PAST] [ASPECT: IMPERFECTIVE] [MODALITY: FACTUAL]]

As discussed above, the feature [ASN] is part of the semantic representation of every finite form (and of some non-finite forms). Another helpful way to illustrate finiteness is using the notation involving the time-line. It is easy to mark the relevant time relations in the way depicted in (44), which illustrates the feature matrix in (43):

(44) Example diagram illustrating temporal properties of finite expressions

```
          R                    R     = Reference Time
          S                    S     = Speech Time
----++++++++++++----------->   +++   = Situation Time
   *******                     ****  = Topic Time
```

Although the representation in (44) is quite illustrative, it is difficult to express MODALITY in it.

One of the claims made in the previous sections is that finite forms are not intrinsically linked to the finiteness features involving TENSE, ASPECT AND MODALITY; rather these semantic features are mapped onto forms in language-particular ways. The fact that languages behave idiosyncratically in how they map S-Finiteness onto M-Finiteness has evidently implications for the learner. One consequence is that learners have to acquire from the input which finite forms map onto which individual finiteness matrices. Thus, learners must analyze finite forms by somehow reading off a finiteness feature matrix. As we saw, a single form can correspond to more than one finiteness matrix, and one finiteness matrix can be expressed by more than one form.[19] Chapter 4 will exemplify some mappings that German children must acquire.

3.2.6 The Interaction of Finiteness with Discourse-Pragmatics

Mature speakers normally structure their utterances taking into account three discourse-linked pragmatic aspects of communication (see Molnár 1993, Vallduví 1993, Lambrecht 1994, Rosengren 1997):

(45) Three levels of discourse pragmatics[20]

a. Topic-Comment Structure	(the text-oriented level)
b. Theme-Rheme Structure	(the hearer-oriented level)
c Focus-Background Structure	(the speaker-oriented level)

First, as is more or less standardly assumed, all utterances are structured with respect to "what the sentence is about", or the Topic of the sentence. The remaining non-topical part of the sentence contains the Comment. Topic-

[19] Note that the expression of certain finiteness features can be optional. For instance, whether or not aspect is expressed in English is in some cases up to the speaker (see Smith 1991).

[20] The referenced literature deals with all three levels of information structure. See references there for work treating the individual aspects of information structure. As Molnár mentions, the three different aspects of communication structure are already contained in Bühler's (1934) "Organonmodel" of communication.

Comment structure is a text-oriented category and must be distinguished from the other two discourse-pragmatically relevant levels, one of which is speaker-oriented and one of which is hearer-oriented.

The hearer-oriented level is the level at which speakers take into account their addressee's background knowledge. The pragmatic literature refers to this aspect of sentences with the term Theme-Rheme structure, or "given/new" distinctions. "Given" information often correlates with the Topic of the sentence, but by no means is this always the case, as the authors referred to above make clear.

Thirdly, speakers structure their utterances in accordance with what they wish to focus on, i.e. they impose focus-background structure. Focus-background structure is a thus speaker-oriented notion. Focus information is often expressed by the same expression as "new" information and it tends to occur in the part of the utterance that contains the comment. However these three notions are by no means interchangeable.

It turns out that, at least in German, finite sentences demand of the language user to express three levels of discourse pragmatics, whereas non-finite sentences do not do so to the same degree. We do not need to go into any detail with respect to these notions. Two realizations are important: First, every German finite sentence expresses all three of these structures. This is done mainly using intonational patterns and, importantly, word-order. Thus, the decision to use a finite sentence forces the expression of pragmatic information. Second, as any cursory look at the literature cited above makes clear, the expression of all three of these levels involves language-specific differences. It is a characteristic of German (but not of English or French), for instance, that the interaction of the three levels of discourse pragmatics plays a role for the decision which constituent immediately precedes the finite verb in a sentence. Unless one has acquired this language-particular knowledge about the expression of pragmatic information, it will not be possible to use correct word order in finite sentences.

In contrast, in German non-finite sentences word order is relatively fixed. For instance, we saw in section 2.6.5 that in a German RI the subject cannot be preceded by another constituent (e.g. AdvSVnon-fin or OSVnon-fin are not possible).

3.2.7 The Interaction of Finiteness with Conversational Pragmatics

Recall from Chapter 2 the three illocutionary functions assumed here. They are repeated in (46).

(46) Definitions of three illocutionary functions

a. Declarative: Asserts the propositional content of the utterance.
b. Interrogative: Solicits verbal information from the addressee with respect to some aspect of the proposition.
c. Imperative: Solicits action on the part of the addressee.

Recall also that different sentence forms can be associated with a given illocutionary function. This is particularly evident in the case of imperatives. However there are many different ways in which one can ask a person to do something in English:

(47) a. Be quiet now.
b. You will be quiet now!
c. Will you be quiet now!
d. You must be quiet now!

Interestingly, the choice of verb form has an effect on the sentence form one may use: Although a verb-initial form can be used (as in (47c)), and although the modal *must* can be used (as in (47d)), the two cannot be combined in one sentence, i.e (48) cannot have an imperative meaning:

(48) * Must you be quiet now!

(48) shows that verb form, illocutionary function and sentence form interact, and that this interaction is subject to restrictions.

With respect to the different sentence forms that can be used to express an imperative, there are additional cross-linguistic differences. For instance, Önnerfors (1993b) observes that in Swedish a normal declarative form is an entirely appropriate way to express an imperative in a casual interaction, for instance asking for the salt shaker at the breakfast table. The comparable examples in German and English do not function like the Swedish sentence, as (49) shows. In German, if a declarative with a present tense verb form (without a modal) is used as an imperative, it has a very rude or urgent undertone not at all suitable to be used in casual conversation. The English (49c) cannot be used as an imperative at all.

(49) a. Du räcker mig saltet! (Swedish; Önnerfors 1993b)
you pass-*pres* me salt
"Would you pass me the salt please."

b. Du reichst mir das Salz! (German)
you pass-*pres* me the salt

c. You pass /are passing me the salt! (English)
you pass-*pres*/be-*pres* pass-*ing* me the salt

I return to German imperatives in the next chapter. The point to be made here is that sociolinguistic considerations determine which form (of the possible ones) is best used in order to formulate a certain illocution, such as an imperative. The examples have shown that there are language specific differences in how forms function in socio-linguistic context. Learners must associate sentence forms with socio-linguistic functions.

3.3 SUMMARY OF THE LEARNER'S TASK

At the end of section 3.1 I concluded that learners are confronted with two general questions: 1. When is S-finiteness is expressed on the verb? and 2. If S-finiteness is expressed on the verb, how is it expressed? Section 3.2 has shown that competence in the domain of finiteness-marking requires further language-specific knowledge concerning a number of phenomena:

1. Mappings from finite verbal morphology to semantic functions (e.g. Finiteness Feature Matrices).
2. Mappings from semantic functions to finite verbal morphology.
3. The expression of three levels of discourse-pragmatic structure.
4. Associations between sentence forms and socio-linguistic functions.

Note that all of these issues involve properties of entire propositions, not just of verbs. (Recall that even S-finiteness is a property not of verbs, but of sentences.) And, importantly, issues 3 and 4 concern properties of sentences which have nothing to do with finiteness-marking itself, but ones which simply have to be expressed in finite clause-structures of German.

FINITENESS IN ADULT GERMAN

CHAPTER 4

The previous chapter emphasized that, across languages, a given finite function is expressed by different verbal forms, and a given form can express various different functions. This chapter will highlight that the same is true within a single language. It will be illustrated for German, the language of the empirical study presented in later chapters. I will identify some of the language-specific knowledge which is necessary for target behavior with respect to marking S-Finiteness in utterances.

I begin with a brief review of the semantics of RI constructions. With the background on S-Finiteness it is now possible to specify more precisely the kinds of finite interpretations that RIs can receive. In section 4.2 I introduce the morpho-syntactic devices of German which are used to mark S-Finiteness on verbs. Readers who are familiar with German verb forms could omit this section and skip to section 4.3. There, I will focus on some language-specific mappings between finite forms and finite functions. Learners must acquire these in addition to specific morphological paradigms and the distribution of verb forms.

4.1 THE SEMANTICS OF ROOT INFINITIVES REVISITED

I begin by illustrating the finiteness characteristics of German RIs in terms of the notions introduced in Chapter 3. We saw there that not all TENSE/ASPECT combinations were possible for RIs. I hypothesized in Chapter 2 that there is a constraint on the interpretation of RIs. In (35) of Chapter 2 I named this hypothesized constraint the Non-Completeness constraint, and I repeat it here in (1):

(1) Non-Completedness Constraint (NCC; informal):
The predicate in a Root Infinitive cannot refer to a completed Event.

Specifically PERFECTIVE and PERFECT ASPECT are excluded by the NCC. Using the diagrams of the previous chapter, the two ruled-out interpretations are shown in (2):

(2) Excluded interpretations for RIs

a. PERFECTIVE: ---++++++++++++-----> +++ = Situation Time
********** **** = Topic Time

b. PERFECT: ----++++----------> *********

Given the definitions of the three basic TENSES in Chapter 3, and repeated in (3) below, a FUTURE PERFECTIVE or PERFECT interpretation arises when Speech time (S) is before Topic time (TT); a PRESENT PERFECTIVE or PERFECT interpretation arises when S includes TT; a PAST PERFECTIVE or PERFECT interpretation arises when S is after TT.

(3) Definitions of the three absolute TENSES (=(3) in Chapter 3)

FUTURE:	S before TT	S = Speech Time
PRESENT:	S includes TT	TT = Topic Time
PAST :	S after TT	

The six possible combinations of FUTURE, PRESENT and PAST with PERFECT and PERFECTIVE can be depicted as in (4), (5) and (6).

(4) FUTURE

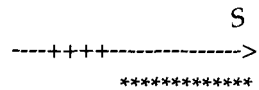
a. PERFECTIVE: S
---++++++++++++-----> +++ = Situation Time
********** *** = Topic Time

b. PERFECT: S
----++++----------> *********

(5) PRESENT

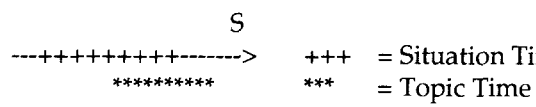
a. PERFECTIVE: S
-++++++++++++----> +++ = Situation Time
********** *** = Topic Time

b. PERFECT:

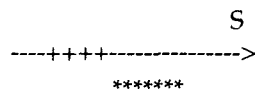


(6) PAST

a. PERFECTIVE:



b. PERFECT:



According to the NNC, the interpretations shown in (4) - (6) are not permitted for RIs. Recall now that Reference time (R) indicates the perspective from which an event gets interpreted. Normally, R is at S. With R at S, and S after TT, all PAST interpretations are excluded. The only way to obtain a PAST interpretation is therefore by shifting R. If R is shifted before S, then an interpretation becomes possible for a RI. This is exactly the interpretation which was obtained for the RI examples with PAST interpretation in section 2.5.1. Note that for PRESENT and FUTURE, other aspectual interpretations do not refer to a completed event. For instance, desideratives, or descriptions of on-going events do not. They are then appropriately ruled in.

In terms of the notions of Chapter 3, the Non-Completedness Constraint on RIs can be translated into the following two more formal semantic constraints:

(7) The Non-Completedness Constraint (NCC; formal):
   a. R not after TT and
   b. S only after TT if R before S

While this must be taken as a preliminary result from the study of a limited number of examples, it shows how constraints on temporal interpretations can be formalized, and gives an impression what kinds of tools UG might contain in guiding a learner in acquiring and using temporal interpretations (see Hornstein 1990 for some further proposals along the same line).

In (8) I summarize what, on the basis of the analysis presented in Chapter 2, I would call common interpretations for German Root Infinitives.

(8) Common interpretations for Root Infinitives in adult German

a. RIs with FUTURE reference:
   desideratives, intentions for imminent acts, inquiries about imminent acts, imperatives
b. RIs with PRESENT reference:
   descriptions of on-going events
c. RIs with PAST reference:
   narratives (R before S)

A further observation to summarize about the interpretation of RIs is that they sometimes, though not necessarily, contained implicit reference to a performative act. Thus some desideratives contained an indirect imperative speech act, thereby soliciting an action on the part of the addressee. Yes-no interrogative forms were apparently indirect queries as to whether the speaker should perform an action (not mentioned in the utterance) for the addressee. I mention this here for the sole reason that it is an interesting observation to keep in mind when analyzing child RIs.

References with RIs to on-going events can be see as serving the function of sustaining communication. Note that they cannot be used for informing the interlocutor about the on-going event, because if the addressee would require the information expressed by the proposition in the RI, this would preclude that the hearer can effortlessly extract finiteness and other non-expressed interpretive concepts from the discourse context.

It is also worth noting again that that RIs were compatible with the feature [ASN], which was described as a characteristic feature of all finite interpretations. It was argued that RIs which serve as rhetorical exclamatives do not contain [ASN].

4.2 M-FINITENESS

I discuss now first the non-finite and finite morphology of German thematic verbs, modals, auxiliaries and the copula. Then I review briefly the Verb Second Constraint.

4.2.1 Non-finite morphology

All German infinitival verb forms, without exception, underlyingly end in *-n* or *–en*, pronounced /n/ and /ən/, respectively . If the verb stem ends in a vowel, liquid or nasal, then even verbs whose infinitival affix is spelled *-en*, is optionally pronounced /n/ or (for instance */gehn/* for the orthographic *gehen*). With nasals as the stem-final sound, the *-n* can get assimilated (as in */komm/* instead of */komən/* or */komn/*).

Participles exist with circumfixation and with affixation. Participial circumfixes are *ge-...-t*, and *ge...-n*. In very colloquial German, *ge-* is occasionally omitted. Some verb forms take only the affix.

4.2.2 Finite morphology on thematic verbs

The morphological marking of finiteness on a thematic verb typically involves an affix expressing both TENSE and AGREEMENT.[1] As an example, consider the present tense and the past tense paradigms of the regular verb *kochen*. (In all examples that follow, "pol" represents the polite form.)

(9) Finite verbal affixes: weak verbs (*kochen*, "cook")

person/ number	**pronoun**	**present**	**past**
1*sg*	ich	koch-(e)	koch-te
2*sg*	du	koch-st	koch-test
2*pol/sg*	Sie	koch-en	koch-ten
3*sg*	er/sie/es	koch-t	koch-te
1*pl*	wir	koch-en	koch-ten
2*pl*	ihr	koch-t	koch-tet
2*pol/pl*	Sie	koch-en	koch-ten
3*pl*	sie	koch-en	koch-ten

There are also irregular verbs where the marking of finiteness involves a stem-vowel change in addition to the affix. This is exemplified by the present tense and the past tense paradigms of the verb *gehen*.

[1] Agreement is not discussed in this thesis. It is taken to be a feature which is independent from Finiteness. It does not affect temporal or modal interpretation.

(10) Finite verbal affixes: strong verbs (*gehen*, "go")

person/ number	**pronoun**	**present**	**past**
1*sg*	ich	geh-(e)	ging
2*sg*	du	geh-st	ging-st
2*pol/sg*	Sie	geh-en	ging-en
3*sg*	er/sie/es	geht	ging
1*pl*	wir	geh-en	ging-en
2*pl*	ihr	geh-t	ging-t
2*pol/pl*	Sie	geh-en	ging-en
3*pl*	sie	geh-en	ging-en

With some verbs it can be difficult to isolate the morpheme which marks finiteness, from the morpheme(s) which express the lexical content of the verb. For instance, the paradigm of the verb *essen* contain some forms which are formed regularly (present tense: 1*sg*, 2*pol/sg*, 1*pl*, 2*pl*, 3*pl*), and some which are formed irregularly (present tense: 2*sg*, 3*sg*, all past tense forms).

(11) Finite verbal affixes: strong verbs (*essen*, "eat")

person/ number	**pronoun**	**present**	**past**
1*sg*	ich	ess-(e)	aß
2*sg*	du	ißt	aßt
2*pol/sg*	Sie	ess-en	aß-en
3*sg*	er/sie/es	iß-t	aß
1*pl*	wir	ess-en	aß-en
2*pl*	ihr	iß-t	aß-t
2*pol/pl*	Sie	ess-en	aß-en
3*pl*	sie	ess-en	aß-en

German has verbal affixes marking the subjunctive. Simplex subjunctive verbs play a minor role in spoken German (see Thieroff 1992 for discussion) For subjunctive forms there are also complex verbs (*modal+infinitive*) available.

German has a paradigm for expressing imperatives addressed at a second person interlocutor. Sentences whose verbs are morphologically marked for imperative are sometimes not considered finite sentences, perhaps because they frequently lack overt subjects, even in languages which otherwise

require overt subjects. German imperative verb forms, however, clearly occur in finite (raised) position, and I would take this as evidence that they count as finite. As briefly discussed in Chapter 3, section 3.2.1, they can also be considered to have finite semantics.

(11) The morphological imperative paradigm (for second person)

	sg	**pl**
familiar	-0/-e	-t
polite	-(e)n	-(e)n

4.2.3 Verbal affixes in spoken German

In spoken German, a variety of pronominals and particles, when they occur right-adjacent to a finite verb form, are involved in (optional) phonetic encliticization processes. As a result, verb forms sometimes have suffixes that express finiteness plus a pronoun and/or particle.[2]

It will not list here the forms that arise, except for one, because it frequently occurred it the speech sample studied below. The affix in question is *-ste* on a second person singular finite verb. This affix is the result of a postverbal 2nd singular pronoun *du* having phonetically merged with the finite affix *-st*. (The vowel in the pronoun *du* gets weakened and the two dentals at the boundary of the two words merge, hence st + du = ste.) Thus the -ste affix expresses both finiteness and the subject pronoun. The additional inclusion of a subject pronoun in the utterance is therefore ungrammatical.

(12) Das wirfste (*du) mal am besten alles in 'n Mülleimer, Mone.
that throw-*2sg* you *part prep* best all in the garbage-can, Mone
"You had better throw this in the garbage, Mone." (Miller Corpus)

[2] The degree to which such encliticized forms appear in a speaker's language is one aspect which determines how "dialectal", i.e. divergent from Standard German, this person's speech sounds: The more encliticized forms the speech contains, the greater the departure from the standard. However, some cliticized forms are also part of registers which can arguably be called "Standard German".

4.2.4 Auxiliaries, modals, and the copula

When a modal or auxiliary is present in a sentence, a finiteness marking appears on this modal or auxiliary. (If two modals occur, only one of them is a finite form, the other appears in the infinitive.) If a thematic verb appears additionally, then this thematic verb must be a non-finite form (infinitive, or past participle).

The set of German modals and auxiliaries is small. There are three auxiliaries -- *haben, sein,* and *werden* -- which are involved in the formation of the tenses. *Haben* and *sein* function as auxiliaries in the so-called "perfekt" tense form (and should as a form be distinguished from PERFECT interpretation), *werden* is used for FUTURE interpretation and for the passive. The verb *sein* is the German copula. I give the present tense and past tense paradigms of these three verbs in (13).

(13) Paradigms of the three German auxiliaries

a. present

person/ number	**pronoun**	**haben**	**sein**	**werden**
1sg	ich	hab-e	bin	werd-e
2sg	du	ha-st	bist	wir-st
2pol/sg	Sie	hab-en	sind	werd-en
3sg	er/sie/es	ha-t	ist	wird
1pl	wir	hab-en	sind	werd-en
2pl	ihr	hab-t	seid	werd-et
2pol/pl	Sie	hab-en	sind	werd-en
3pl	sie	hab-en	sind	werd-en

b. past

person/ number	**pronoun**	**haben**	**sein**	**werden**
1sg	ich	hatt-e	war	wurd-e
2sg	du	hatt-est	warst	wurde-st
2pol/sg	Sie	hatt-en	war-en	wurd-en
3sg	er/sie/es	hatt-e	war	wurd-e
1pl	wir	hatt-en	war-en	wurd-en
2pl	ihr	hatt-et	war-t	wurd-et
2pol/pl	Sie	hatt-en	war-en	wurd-en
3pl	sie	hatt-en	war-en	wurd-en

The differences in the verbal stems between the present and past paradigms, and a comparison of these paradigms with the respective paradigms of regular thematic verbs shows that the inflection of auxiliaries is relatively irregular.

In the formation of certain finite verb forms (e.g. in conditional contexts) the subjunctive forms of the auxiliaries play a role. For this reason, I list them in here in (14):

(14) Finite verbal affixes: subjunctive of *sein, haben und werden*

a. *sein*

person/ number	**pronoun**	**present**	**past**
1*sg*	ich	sei	wär(-e)
2*sg*	du	sei-st	wär-(e)st
2*pol/sg*	Sie	sei-en	wär-en
3*sg*	er/sie/es	sei	wär-e
1*pl*	wir	sei-en	wär-en
2*pl*	ihr	sei-t	wär-t
2*pol/pl*	Sie	sei-en	wär-en
3*pl*	sie	sei-en	wär-en

b. *haben*

person/ number	**pronoun**	**present**	**past**
1*sg*	ich	hab-e	hätt(-e)
2*sg*	du	hab-st	hätt-(e)st
2*pol/sg*	Sie	hab-en	hätt-en
3*sg*	er/sie/es	hab-e	hätt-e
1*pl*	wir	hab-en	hätt-en
2*pl*	ihr	hab-t	hätt-t
2*pol/pl*	Sie	hab-en	hätt-en
3*pl*	sie	hab-en	hätt-en

c. *werden*

person/ number	**pronoun**	**present**
1sg	ich	würd-e
2sg	du	würd-est
2pol/sg	Sie	würd-en
3sg	er/sie/es	würd-e
1pl	wir	würd-en
2pl	ihr	würd-et
2pol/pl	Sie	würd-en
3pl	sie	würd-en

There are 6 frequently used German modals, whose present tense paradigms are given (15):

(15) Present tense paradigms of 6 German modals

person/ number	**pronoun**	*müssen*	*dürfen*	*können*
1sg	ich	muß	darf	kann
2sg	du	muß-t	darf-st	kann-st
2pol/sg	Sie	müss-en	dürf-en	könn-en
3sg	er/sie/es	muß	darf	kann
1pl	wir	müss-en	dürf-en	könn-en
2pl	ihr	müß-t	dürf-t	könn-t
2pol/pl	Sie	müss-en	dürf-en	könn-en
3pl	sie	müss-en	dürf-en	könn-en

person/ number	**pronoun**	*wollen*	*mögen*	*sollen*
1sg	ich	will	mag	soll
2sg	du	will-st	mag-st	soll-st
2pol/sg	Sie	woll-en	mög-en	soll-en
3sg	er/sie/es	will	mag	soll
1pl	wir	woll-en	mög-en	soll-en
2pl	ihr	woll-t	mög-t	soll-t
2pol/pl	Sie	woll-en	mög-en	soll-en
3pl	sie	woll-en	mög-en	soll-en

The modals are inflected irregularly to some degree. Most conspicuous are the stem-vowel changes, and the *3sg* form, which does not show an overt suffix. The first person uses the stem. Unlike with main verbs, *-e* is not an optional affix for *1st* person with modals.

4.2.5 Verb movement and M-finiteness

As mentioned in Chapter 1, the Verb Second Constraint requires for German and other so-called "Verb-Second Languages" that finite verbs are moved to the root head of the clause, whereas non-finite verbs are not. There is then a contingency of the sort in (16) which holds in root clauses of Verb-Second Languages:

(16) In a root clause, if a verb is [finite] then it moves.

In languages other than the Verb-Second languages, finite verbs may move also, but the contingency in (16) does not hold for them. For instance in English, movement is restricted to non-thematic verbs (auxiliaries, modals, perhaps the copula, depending on the framework). Thus, though verb movement exists cross-linguistically, it is not directly correlated to M-Finiteness in non-Verb-Second languages.

4.3 S-FINITENESS IN FINITE CONSTRUCTIONS

The structural devices above, exhaust the verb-related means with which German expresses finiteness features. The purpose of this section is to show how German verb forms which are morphologically marked for tense and aspect map onto the different semantic relations of tense and aspect.

4.3.1 Tense

The basic TENSE relations introduced in the previous chapter are realized in German as follows:

(17) Some realizations of TENSE relations in German

a. PAST (S after T-TT)

(i) Ich arbeitete.
I work-*1sg-past*

(ii) Ich habe gearbeitet.
I have-*1sg-pres* work-*pp*.

b. PRESENT (S includes T-TT)

Ich arbeite.
I work-*1sg-pres*

c. FUTURE (S before T-TT)

(i) Ich werde arbeiten.
I *aux* work-*inf*
(ii) Ich arbeite.
I work-*1sg-pres*

From these five forms it can be seen that some TENSE relations are expressed by more than one form. This is not at all to say that when a relation maps on two forms, these are entirely equivalent and interchangeable. They may differ with respect to other properties, aspect for instance. But with respect to tense they express the same. Conversely, one form, e.g. *arbeite*, is used for more than one TENSE relation. It was already illustrated in the preceding chapter that what would correspond to the German forms differs across languages. Where German uses a simple verb form, another languages use a complex one, and vice versa.

4.3.2 Aspect

It is often said that ASPECT is not a relevant grammatical category of German. The only aspectual form that is discussed in the context of German at all is the one expressing PERFECT ASPECT (in the PRESENT TENSE), which some authors claim can be expressed by the verb form consisting of the present tense of *haben* ("have") plus the past participle of the main verb, as in (18):

(18) Sie hat ein Haus gebaut.
she have-*pres* a house build-*pp*
"She built a house"

We have seen in the discussion of TENSE in German that the complex verb form *haben+participle* is also used to express PAST. Klein states that this verb

form "oscillates between a tense interpretation and an aspect interpretation" (1994a:111). For examples and discussion see Wunderlich (1970) and Ehrich and Vater (1989).

To say that German does not have any (or only one) special form to express ASPECT, of course does not imply that a German speaker never expresses the semantic features associated with ASPECT. What it does mean is that other aspectual interpretations (e.g. IMPERFECTIVE, PERFECTIVE, PROSPECTIVE) are indistinguishable from forms that express TENSE. In other words, German has no grammatical way to mark IMPERFECTIVE, PERFECTIVE, or PROSPECTIVE ASPECT on the verb. These aspectual relations can nevertheless be *interpreted* in German. This is only an example of the fact that not every possible temporal relation has a *separate* morpho-syntactic expression in every language. When a morpho-syntactic expression for a given property is not available, a hearer may interpret this property using other sources, such as linguistic context (e.g. adverbs, lexical content of the verb) and non-linguistic context, where available.

Importantly, the task for the learner of German in the domain of mapping forms to functions is not made easier by the fact that there are only a few grammatical distinctions to mark aspectual relations in German. This is because he has to learn just the same which forms to use in expressing these aspectual relations. For instance, he has to learn that simple forms like *arbeite,* or *schlief,* or *baute,* are used to express both IMPERFECTIVE and PERFECTIVE aspect. Stated more generally, he must learn whether a given semantic property, such as a particular aspectual relation, has a special form, and, whether it does or not, exactly which form is used.[3]

These observations are mentioned to support the view advocated here that to have learned the verb-second property, (i.e. the distribution of non-finite and finite verbs in a sentence of German), and verb forms which express finiteness is only a prerequisite for target behavior in the domain of verb placement and verbal morphology. Clearly, there are mappings between forms and functions which must additionally be acquired.

What all of this shows is that a speaker who has conceptual knowledge of the different linguistic TENSE relations who knows different morphological

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[3] A smaller amount of morphological forms may be helpful to the learner in other ways, perhaps for storing or remembering the forms, but with respect to the mappings between forms and functions, a German learner has to go through as rigid a routine as a learner of a language which makes more distinctions, like English or Russian.

expressions of TENSE (i.e. who has learned every target morphological form) may still be quite ignorant of how to express a given TENSE, unless he has additional knowledge about the mappings between the forms and their functions.

It seems that building such a system of mapping relations cannot be the matter of flipping a parameter switch. A learner has to detect different TENSE/ASPECT realizations in the input, and map the forms he hears to the semantic functions they express. In language production, a learner has a function in mind, and has to find a path to a form. At different stages of learning, there will be no path, exactly one path, or, when the system gains complexity, more than one.

4.3.3 Illocution, conversational pragmatics and finiteness in imperatives

We saw in the previous chapters that the imperative illocutionary function tends to be expressed by different sentence forms. This section illustrates this for German. Again the example of imperatives is used because it shows very well how there are many sentence forms available for one function.

One way to express an imperative function is by using a verb form with special imperative morphology. As mentioned, these imperative verb forms occur in C°, and the sentence format in which they are used is typically verb-initial. The examples in (19) are well-formed imperatives.

(19) a. Geh nach Hause!
go-*2sg-imp* to home
"Go home!"

b. Geht nach Hause!
go-*2pl-imp* to home
"Go home!"

c. Gehen Sie nach Hause!
go-*2sg/pl-pol-imp* you to home
"Go home!"

The polite form in (19c) must have an overt subject. The other two forms typically occur without overt subject, but an overt 2nd person pronoun as a

subject is always grammatical when under contrastive stress.. Example (20) illustrates a morphological imperative used in a verb-second-structure.

(20) Jetzt wasch Dir mal die Hände. (Miller Corpus)
now wash-*imp* yourself *part* the hands
"Now wash your hands."

To try to cause a person to perform an action one can also use a sentence with a simple present tense verb form.

(21) a. Das wirfste mal am besten alles in 'n Mülleimer, Mone.
that throw-*2sg-you part prep* best all in the garbage-can, Mone
"You had better throw this in the garbage, Mone."(Miller Corpus)

b. Gesicht wäschste dir aber auch en bisschen
face wash-*2sg*-you yourself *particle* also a little
"Wash your face a little too!" or
"Don't forget to wash your face a little." . (Miller Corpus)

c. Sagste gleich mal zum Maxe, dass er mir 'n Löffel
say-2nd-sg-you now *particle* to Maxe that he me a spoon

bringen soll.
bring-*inf mod*

"Now tell Max that he should bring me a spoon."(Miller Corpus)

These sentences are commands directed at the child to perform the action expressed in the proposition of the utterance. The sentences in (21) are verb-initial- and verb-second-structures, which would be grammatical in declarative function also. In the context in which they were uttered these sentences were clearly intended as imperatives to Simone (the child whose productions are contained in the Miller Corpus), and they would be interpreted with imperative function also when addressed to a mature speaker.

If a sentence with a finite verb form is used in imperative function, it is possible to use a modal, as the examples in (22), all from the analyzed corpus, show:

(22) a. Musste hier dich anlehen, Simone. (Miller Corpus)
must-*2sg*-you here yourself lean-*inf*, Simone.
"Lean against this here, Simone."

b. Du sollst mich nicht stossen! (Miller Corpus)
you should-*2sg* me not push-*inf*
"Don't push me!"

c. Da kannste einen Turm damit bauen. (Miller Corpus)
there can-*2sg*-you a tower with build-*inf*
"You can build a tower with this."

d. Das darfste nicht machen! (Miller Corpus)
that may-*2sg*-you not do-*inf*
"You may not do this!"

The examples in (21) share the property that the verb is a complex form consisting of a finite (present tense) modal and a thematic verb in infinitival form. The subject is in each case the 2nd sg pronoun *du*, and it (incidentally) occurs encliticized to the finite modal. Each example is intended to cause the child to do or not do something, and thus constitutes an imperative. In short, modal statements can have the effect of a command.

Yet another sentence format is used for giving a command or to request someone to do or not do something. This format is also associated with interrogatives, i.e. a clause with a clause-initial finite verb form and rising intonation. Here are some adult examples from the analyzed corpus:

(23) a. Machst die Flasche wieder zu? (Miller Corpus)
make-*2sg-pres* the bottle again closed
"Will you close the bottle again?"

b. Willste wohl sprechen? (Miller Corpus)
want-*2sg-pres*-you part talk-*inf*
"Won't you talk now!"

These examples are used in imperative function. In declarative function they would not be grammatical. The intonation which would be used for a declarative is not compatible with an imperative interpretation of these

sentence forms. More importantly these are not licit declarative verb-initial-structures. The sentences would be perfectly good yes-no questions however.

Summary of German imperatives:

(24) a. Bau(e) einen Turm damit. (morph. imp., raised thematic verb)
build-*imp* a tower with-it

b. Du musst einen Turm damit bauen. (complex verb)
you must-*2sg-pres* a tower with-it build-*inf*

c. Du sollst einen Turm damit bauen. (complex verb)
you shall-*2sg-pres* a tower with-it build-*inf*

d. Damit kannst du einen Turm bauen. (complex verb)
with-it can-*2sg-pres* a tower build-*inf*

e. Kannst (du) einen Turm bauen? (complex verb)
can-*2sg-pres* (you) a tower build-*inf*

f. Baust du einen Turm? (simplex, raised, thematic verb)
build-*2nd-pres* you a tower

g Einen Turm damit bauen. (Root Infinitive)
a tower build-*inf*

"(Why don't you) build a tower with these."

The collection of examples shows that sentence form and illocutionary function interact. A number of factors are relevant for the marking of S-Finiteness on the verb:

1. A speaker may or may not use a modal.
2. If a modal is used, the thematic verb must occur in the infinitive. If no modal is used, the thematic verb can occur either as a morphological imperative or as a present tense form.
3. The various available forms differ in how "urgent" or polite the imperative is stated to be. Different modals and/or intonation, as well as their combination, lead to different degrees of urgency and politeness.

CHILDREN'S ROOT INFINITIVES: PREVIOUS RESEARCH

CHAPTER 5

The debate in the field of language acquisition about children's RIs has grown increasingly vigorous over the past years. This is due, in part at least, to the fact already mentioned in Chapter 1 that this construction type can, prima facie, be perceived as a complication for otherwise sound learning-theoretic assumptions. As discussed, child RIs were perceived as challenging for the Continuity Hypothesis and the Subset Principle. Previous work on child RIs has tried to find explanations that would allow to these learnability assumptions to be retained. I will argue in this chapter that the proposals made so far cannot be taken as a basis for a learning mechanism which explains children's frequent production of RIs, because each proposed account suffers from at least one of two flaws. A short-coming which applies to most existing accounts is that they lead to an inappropriate target grammar, disallowing RIs altogether. Some accounts have the additional problem that they cannot predict certain aspects of the child data.

A second reason for the recent intensity in the debate on child RIs has to do, I believe, with the fact that assumptions (both implicit and explicit), goals, and empirical methods of individual authors have varied to a considerable extent. This circumstance has gone mostly unacknowledged. I will therefore begin this chapter by giving some attention to relevant methodological differences.

In order to give a balanced evaluation of the existing literature in the face of differing research methods and goals, the discussion below is organized around different research questions. I will concentrate on three issues:

A. Quantitative analyses: What is the magnitude of the RI phenomenon?
B. Qualitative analyses: How are children's early sentences represented (i) syntactically and (ii) semantically?
C. Learning Mechanisms

In the foreground of most existing studies is the question of how RIs are to be represented syntactically by children's grammars (issue B.(i)). This is a natural consequence of the fact that child RIs were studied quantitatively first by scholars who were mainly interested in syntactic parameter-setting. The

endeavor has been to determine the syntactic structure of child RIs, and to postulate a developmental mechanism that eliminates the property of the grammar which makes RIs possible -- as it was assumed that RIs are ungrammatical in adult language. The challenge has been to implement such an account without violating the Continuity Hypothesis.

In contrast, under the assumption, argued for in Chapter 2, that UG permits RIs, and that RIs are a part of languages like German and Dutch, the new aim to be pursued is to specify a mechanism which allows children to *restrict* their use of RIs in such a manner that they will ultimately behave like adults with respect to RIs. In order to be able to specify such a mechanism one must study first how adults and children use RIs, an issue which the study presented below seeks to illuminate.

Clearly the present thesis benefits greatly from prior studies, even though in the sections to follow I will point to theoretical and empirical flaws of these prior studies. They have provided an immense database as well as useful theoretical considerations about children's behavior in the domain of verb placement and verbal morphology. The most relevant results will be summarized in the next two sections.

5.1 QUANTITATIVE ANALYSES

All researchers concerned with the topic of verb-placement in young children learning Germanic languages have observed that learners often place a thematic verb in utterance-final position, in cases where an adult would place it in fronted position. Notably though, children rarely violate the Verb-Second Constraint. That is, when they use a verb in final position, they use a non-finite form; when they use a verb in fronted position, they use it in finite form.

Scholars have expressed some disagreement over *how often* children produce utterances containing only non-finite verb form. Some researchers (e.g. Miller 1976, Mills 1985, Clahsen and Penke 1992, Wijnen 1994b, Rohrbacher and Vainikka 1995) have claimed that there is a time when children use RIs (with thematic verbs) *predominantly* or *exclusively*, whereas others have said that it is the case only *sometimes* (e.g. Boser 1989, Weissenborn 1990, Poeppel and Wexler 1993). Mostly these claims were made concerning different children, but the data of one child, Simone, have figured in both of these positions. (Some of Simone's productions were also analyzed in the empirical study reported below.)

I believe that these differing quantitative findings are probably reconcilable, for several reasons. One consideration is that the *study* of RIs is tied to children's general linguistic proficiency in a way in which the *existence* of RIs is not: Suppose a child's RI phase falls mainly into the time before his utterance length (in terms of constituents) exceeds (roughly) 2.5, or into a time when the proportion of utterances with verbs is still relatively low. Then it will be difficult to find reliable examples of RIs for that particular child (see section 5.1.2 below for the causes for this unreliability). One can of course *declare* examples reliable by resorting to ancillary assumptions, but depending on whether one does this or not, the findings will differ accordingly (see Atkinson 1995 for similar concerns). Since RIs can be diagnosed only when a child's MLU is at least 2, and since children's utterance lengths and ages are not strongly correlated (Miller and Chapman 1981), one cannot use age either as a point of comparison. Thus, individual differences are bound to be found due to factors that are difficult to control. (As mentioned in Chapter 1, around the age of 2 years, a range between 15% and 100% has been reported for different children.)

In interpreting the different results one must also be aware that with differing assumptions and goals, methodological decisions inevitably have diverged as well. One purpose of the discussion in this section is to bring to light how varied methodological decisions have been, and to show that - no matter how well such decisions are motivated - they have profound effects.[1] At the end of the section, I give a quantitative profile of the child RI phenomenon as I believe it has emerged from the studies which have been carried out.

5.1.1 Comparison of Research Methods

Methodological decisions are often not taken into account properly when results are cited, with the consequence that the second-hand picture which emerges is not fully accurate. Moreover, as descriptions of methods in the literature are often minimal or even non-existent, it is sometimes difficult to gain a full understanding of the results. Even when methodological decisions

[1] Even what an author considered to be a "verb" was not uniform across studies. Miller (1976), unlike all other studies, counted instances of separable verbal prefixes, such as *ab* ("off") or *auf* ("on") as verbs. Some authors have treated modals and auxiliaries separately (e.g. Clahsen and Penke 1992), and others have not (e.g. Poeppel and Wexler 1993). Such decisions have affected the proportion of utterance-final verbs that an author found, and one should therefore not be surprised to find variable results.

are explicitly noted, their significance is frequently left unexplained. For instance, if a certain type of utterance is excluded, information is lacking as to what proportion of the analyzed body of utterances this excluded category constituted. Such documentation would be informative, however, as we will see.

5.1.1.1 A Remark on Clahsen's Work

A sizable body of influential empirical work on children's verbal morpho-syntax is provided by Clahsen (1982, 1986) and his colleagues. Work by Clahsen and Penke (1992 presents an analysis of the data provided by the Miller Corpus. This corpus contains data from one German child, Simone, between the ages of 1;7 and 3;5. I have re-analyzed a fragment of these data (1280 utterances with verbs, between the age of 2 and 3) in order to compare them to Simone's parents' utterances with verbs, which I have also analyzed. (The results are presented in Chapter 7.) Because I have been concerned with a subpart of the Miller Corpus, and because Clahsen's work is frequently cited in the context of the "acquisition of finiteness", I wish to comment briefly on the relevance of this work to my concerns.

First it must be pointed out that Clahsen and his colleagues undertook their studies with the goal of determining how and when subject-verb agreement morphology is acquired, not how finiteness is acquired. Since in the present tense of the verbal paradigm of German, subject-verb agreement and tense are encoded in the same morpheme, the results of this work, and specifically those reported by Clahsen and Penke (1992), has frequently been interpreted as showing how "finiteness" is acquired.

Clahsen and Penke (1992:206) state the important observation that children make a morphological and positional distinction between finite and non-finite verbs even before they use agreement correctly (in their notion of "correct", which is not important here). This finding has been confirmed by many other studies of two-year-old children since (see references above). Notably, however, such observations about the distribution of verb forms do not have any concrete implications for when and how children learn to use finite and non-finite forms correctly. As I have argued, acquisition of forms is only a prerequisite, but not a sufficient condition for mastery in terms of use.

Clahsen and Penke's study shows us impressive regularities about which verbal inflections are used by German children at what age, but it cannot tell us what children know about the function of finite verbs.

5.1.1.2 Exclusion of Utterances

One difference among the different quantitative studies concerns the methodological decisions concerning which utterance types are excluded from the respective analyses. Typically, the magnitude of a particular class of excluded utterances is not substantial (judging from the two children's transcripts which I have studied in detail). However, all methodological decisions, cumulatively, can inflate or deflate the proportions of diagnosed child RIs considered in one study relative to other studies. I illustrate this in the following. Readers not curious about the details of this methodological matter are encouraged to skip to section 5.1.1.3.

Clahsen and Penke's (1992) work is a prime example for seeing how excluded utterances must be taken into consideration when interpreting results. Utterances in which the verb ended in *-e* were excluded, based on the argument that *-e* is optional in German as a marker for 1st singular, as well as ambiguous. The ambiguity that Clahsen and Penke see is that "in the Southern dialect spoken by Simone, *-e* is also in free variation with *-n*" (1992:193, caption of Table IVb).[2]

To see the significance of the decision of excluding utterances whose verbs end in *-e*, consider that at age 2;1, 30% of Simone's utterances with verbs are affixed with *-e* . (see Chapter 6). This is a proportion which is large enough to potentially contradict two of Clahsen and Penke's main claims, namely that children's earliest use of inflections is restricted to 3rd person singular *-t*, an observation which forms a basis for Clahsen and Penke's other main claim that the child does not use agreement productively until the age of 29 months (see Weissenborn 1992 and Boser 1989 for similar criticism).[3]

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2 Incidentally, this is a false assumption. In listening to the original audiotapes I was unable to find any traces of this kind of Southernism in either Simone or her parents. While it is true that Simone's father (but not her mother) has a slight Swabian coloring in his language, this does not extend to a weakening of *-(e)n* suffixes in the way described by Clahsen and Penke. That *-e* is optionally used for 1st person singular is true in principle, but it is hard to see why this optionality would have confounded the analysis.

3 It is well-known that young children tend to refer to themselves as well as to their conversational partners with names instead of first and second person deictic pronouns. (Simone uses this strategy extensively.) To my knowledge, the reasons for the use of names have not been shown to have anything to do with the acquisition of verbal morphology.

We just saw an example of the effect which the exclusion of an utterance type can have on the interpretation of a study's results. The literature on child RIs contains further examples of how the restrictions on the pool of analyzed utterances can affect the outcome in ways which should not be ignored. For instance, some authors studied only utterance *types* (e.g. Poeppel and Wexler 1993), while others studied *tokens* (e.g. Roeper and Rohrbacher 1996). While either decision can be methodologically justified, it is obvious that the results can differ as a consequence, even if all other variables are kept constant.

One frequent motivation for excluding a particular class of utterances from analysis is to preempt a potential confound through ambiguous utterances. While this is sound methodological reasoning, I believe that, unless taken into account properly, this strategy limits our view of a young speaker's linguistic behavior. Some studies have excluded certain utterances which have less than two constituents besides the verb. For instance, Poeppel and Wexler (1993) excluded utterances of the type *subject+verb*, on the grounds that the position of the verb is ambiguous between second and final.[4] Although the same is true for utterances of the type *object+verb*, these were included by the authors, hypothesizing an utterance-initial empty pronominal *pro* as a third constituent. (The same was done for *verb+object* utterances.) The latter seems to me to be a rather problematic assumption, as adult German is not a "pro-drop" language, and to hypothesize *pro* as a subject in an non-finite clause seems even less warranted.[5]

To avoid these problems it would however be a step in the wrong direction to exclude all utterances of type *constituent+verb*. Table 1 shows that this utterance type represents 19% of all utterances with verbs for Andreas (the child Poeppel and Wexler analyzed) and 20% for Simone (the child who provided the data in the Miller Corpus; see Chapter 6 for explication of these two corpora). Of course utterances consisting only of the verb are equally ambiguous with respect to verb position, and were excluded by Poeppel and

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[4] For Andreas, the subject studied by Poeppel and Wexler, I found that the percentage of utterances of type *subject+verb* is 7%, for Simone (on average) it is 4%. The percentage of utterances of type *object+verb* was 7% for Andreas, and 9 % (on average). These figures are proportions of all analyzable utterances with verbs.

[5] Poeppel and Wexler also do not report *verb+subject* utterances. In going over the transcript I found 12 examples. They may have been excluded by Poeppel and Wexler for other reasons.

Wexler, as in most studies. Table 5.1 also shows the percentages for this utterance type. We see that 16% of utterances were excluded in this way for Andreas.

***Table 5.1**: Percent of utterances consisting of the verb preceded by one constituent, and of the verb alone for Simone and Andreas.*

Child age	2;1	2;7	2;9
	%[a]	%[a]	%[a]
Constituent+verb			
Simone	20	15	5
Andreas	19	-	-
Verb-only			
Simone	17	5	6
Andreas	16	-	-

[a] Denominator = all verb-containing utterances

As can be seen from Table 5.1, for Andreas and Simone at age 2;1 a total of around 35% utterances were ambiguous in terms of verb position (add respective cells in *constituent+verb* and *verb-only* categories). It should be clear that these utterances are "ambiguous" only in the eye of the analyst, but most likely had a determinate structure for the child. Since in addition "non-declaratives" were excluded (see discussion below), and only utterance types (not tokens) were studied, it becomes clear that the analysis considers only a subpart of Andreas' productions.

The point made by the above remarks is not that the analyses as such are flawed, but rather that in the absence of information about the proportion and precise nature of excluded utterances, it is hard to assess whether the reported figures give a full view on the respective child's behavior with respect to verb-placement and verbal morphology. Moreover figures are difficult to compare with the result of other studies which were carried out with the same research question in mind. In the present study, no utterances were excluded from the analysis except those that did not conform to a set of criteria of analyzability (e.g. the utterance had to be intelligible, see Chapter 6). A relatively fine-grained coding system was then used to keep track of utterances which would potentially confound the results. (see Boser, 1989, 1997, for a similar strategy).

To appreciate the importance of including two-constituent utterances in an analysis of child language with respect to finiteness, consider that Boser (1989), in her impressive cross-sectional study of 30 German children between the ages of 1;09 and 2;10, finds that the proportion of RIs in utterances with more than two constituents containing a simple verb does not exceed 20% for any child she studied (see her Table IV.9). The overall average is 2.9% (Group I average: 4.5%; Group II: 5.9%; Group III: 1.6%; Group IV: 1.9%). But in two-constituent utterances the proportion of RIs ranged up to 100%, with an overall average of 34% (Group I average: 38%; Group II: 32; Group III: 37; Group IV: 32%). A similar effect of utterance-length was found in the study to be presented in the following chapters. The effect was found in the children *and* the adults studied. Thus if utterances with two constituents are excluded from the analysis this results in a lower percentage for RIs.

If, as a researcher, one follows a strategy of caution and excludes utterances whose morpho-syntax is compatible with finite and non-finite, it is impossible to gain a full perspective on children's productions with verbs. Alternatively, one can employ the method (also employed in the study to be reported below) of not excluding utterances on the basis of ambiguity, and use all available resources (including discourse context) to make a decision on utterances which are morpho-syntactically ambiguous. Although context is a slightly less certain criterion than form, only a minimal amount of analyzable speech will have to be excluded. Both kinds of strategies are legitimate, but it should be clear that in comparing figures from different studies one must take into account how much of a child's production remained unanalyzed for methodological reasons. In the present study, the strategy of excluding a minimal amount of utterances from the analysis was employed as a general one.

Another dimension along which methodological discrepancies exist is that of illocutionary type. Some authors excluded all "non-declaratives" (e.g. Poeppel and Wexler 1993), others included "declaratives" and "interrogatives", but excluded "imperatives" (e.g. Wijnen 1994b, Ingram and Thompson 1995).

The reasoning behind these decisions is nowhere clearly stated, but the argument for excluding imperatives is presumably that it is not obvious whether they should be treated as finite or non-finite constructions. Also, the morphology of imperative verb forms in German and Dutch, in the regular case corresponds to the verb stem, and it is impossible to test whether or not

the child intended the verb to be affixed. As interrogatives are considered to involve the level of CP perhaps universally, and as there is the additional assumption that at least declarative RIs are ungrammatical in adult languages, declarative utterances are taken to be the crucial test case for whether or not the child has acquired knowledge of the target word order.

Even if one respects these assumptions, the problem is that it is not explained exactly what determined interrogativehood or imperativehood of an utterance as a basis for exclusion from analysis. Authors do not state whether their classification was based on the form or the function of the utterance in question. As I have explained in Chapter 2, sentence forms and sentence functions do not map onto each other one-to-one.

In the case of imperatives there is reason to believe that the decision was typically based on form. The morpho-syntactic form which explicitly marks imperative in German (for the singular familiar, see Chapter 4) is a verb stem, which would occur without an overt subject (unless the subject receives contrastive stress). One would expect that a researcher who had employed instead a functionally-determined criterion, would have mentioned doing so. (Functional analysis is more labor-intensive than analysis according to form.) Very importantly, if function had been used as the criterion, some RIs would have had to be excluded as imperatives also. Again, we would expect explicit mention of this.

Assuming that exclusion from analysis was based on form alone, the following considerations are relevant. The excluded utterances are "imperative" forms from the perspective of the adult grammar. It could be for quite different reasons that the verb in a child's utterance does not bear an inflection, and the subject is non-overt concomitantly.[6] But much more importantly, the converse contingency is not valid either in child language: We have no evidence that children's imperatives do not have overt subjects.

[6] Studies on English child language also report that "imperatives" were eliminated from the analysis. Again the criterion for imperative seems to be lack of an overt subject and use of a verb stem. However, English allows verb stems in all persons except third person singular, and children do not only use null-subjects when they want to express a command. This makes such a criterion for imperativehood more than questionable for English.

As a consequence utterances may have been excluded that were intended as non-imperatives by the child.[7]

As with imperatives, those authors who have excluded questions from their analysis do not mention their criteria for interrogativehood. Again, interrogativehood may have been determined by form or function. In transcripts, an utterance-final "?" is usually taken to indicate "interrogative". However, it is not clear whether the transcriber used "?" to mark form or function of an utterance. Note that not all utterances with rising intonation (which is an important aspect of "form" in the context of illocutionary function) have a interrogative function, and not even all utterances with interrogative function have rising intonation (it is optional with Wh-questions in German). If nothing but utterance-final intonation (or the "?") is used to determine questionhood, this would make both of the utterances from the Miller Corpus in (1) questions:

(1) a. Soll ma das mal anmachen ja? S 2;08
should we that *part* on-make-*inf tag*
"Shall we attach this?"

b. Schön aufessen, ja? S 2;06
nicely up-eat-*inf* yes
"Eat your food up nicely, will you?"

Both utterances end in a tag (*ja*) with rising intonation. From the discourse context it can however be determined with some confidence that (1a) is intended as an information-seeking interrogative, whereas (1b) has an imperative function, requesting action on the part of the addressee. Utterance-final rising intonation (on a tag, or another constituent) is not a reliable indicator for illocutionary status. (In Chapter 2 we saw further evidence that the dividing line between imperatives and questions can be based on different criteria.) To make matters worse, in my experience of listening to audiotapes containing speech of children under 3 years of age, intonation contours are an even less reliable indicator for pragmatic function for children than they are for adults.

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[7] Of the 1280 of Simone's verb-containing utterances which I studied, 50 tokens, or 4%, contained verb stems without affixes *and* no subjects. These were relatively evenly distributed across the files.

My general point is not to evaluate individual decisions, but to point to the fact that in the absence of information about how transcribers and analysts made their decisions in classifying utterances, the reported percentages of RIs do not lend themselves to comparison.[8] If decisions were taken on the basis of linguistic notions (such as "imperative") at least a rough definition of them would be necessary, in light of the fact that the field uses linguistic terms to refer to varying notions. However, if ,as I have conjectured in the preceding paragraphs may have been the case in some studies, imperatives are excluded on the basis of form, but questions are excluded on the basis of function, this results in an unmotivated inconsistency.

5.1.1.3 On the Definition of "Finite Verb"

An area where authors did *not* differ from each other is the definition of *finite verb* in child language. As discussed in the first chapter, finite forms in languages like German and Dutch are defined by a morphological criterion (affixation) and by a syntactic criterion (position). Authors seem to have essentially agreed about what they considered a "finite verb" in their analyses, even though for child language the criteria are by no means as clear-cut as for adult language. Poeppel and Wexler state their criterion for +/- finite as follows:

> The criteria for classifying an utterance as finite or not were straightforward. If there was an *-en* ending on the verb stem (canonical infinitival morphology), the utterances counted as [-finite]. (This is always correct unless the *-en* is the agreement morpheme for first or third person plural subject; these, however, occurred only a total of 11 times in this corpus, and then with incorrect agreement, namely the corresponding singular agreement.) Otherwise the form counted as [+finite]. (Poeppel and Wexler 1993:6)

This formulation makes it look at first blush as if Poeppel and Wexler's criterion was purely based on verbal morphology. However, indirectly, it

[8] It is disappointing that, for instance, Haegeman (1995) provides no information at all on which utterances were included in the analysis and which ones were not, except that she excluded participial root clauses. This makes it very difficult to put Haegeman's results into perspective, even though the entire body of data is of impressive size.

was position which was the decisive factor. The reason is that a verb which occurred in a raised position with either an unaffixed stem or an incorrect affix was classed as finite on the basis of its position, rather than non-finite. To be counted as non-finite, a verb had to have the non-agreeing *-(e)n* affix. One can assume, by inference, that most studies used both position of the verb and its inflectional morphology as joint criteria in a similar way. The study which is the topic of the chapters to follow this one is no exception in this respect.

To recapitulate the points of the preceding subsections: There are methodological inconsistencies across studies which make their quantitative results difficult to compare. Two facts conspire to prevent the acquisition researcher from gaining a maximally full picture: One is the target language itself, with its morphological syncretisms and form-function mismatches. The other problem is that children's utterances reflect partial knowledge, which makes it hard to classify them in ways that would be necessary for providing answers to particular questions. These problems can only be circumvented with a clearly-defined methodology and caution in interpreting any figures, especially if one compares results from different studies. Specifically, interpreting figures without methodological context should be avoided.

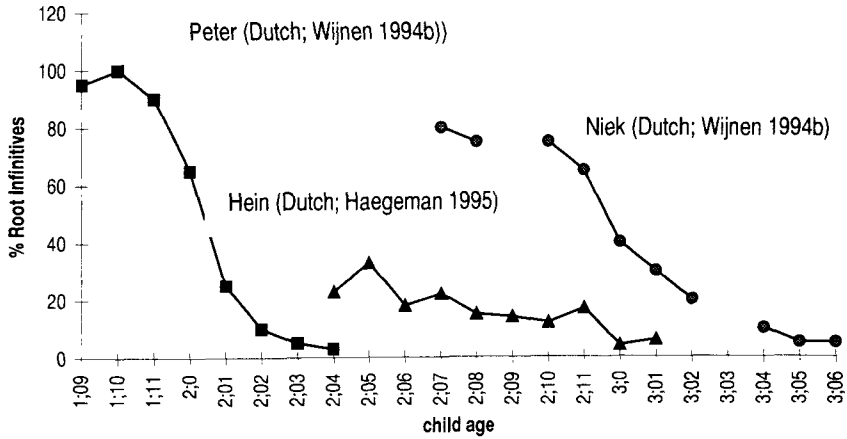
5.1.2 Magnitude of the Child Root Infinitive Phenomenon

When a phenomenon is first investigated, methodological discrepancies and uncertainties of the sort described are bound to exist. I have outlined in the previous paragraph why it is difficult to compare the proportions of RIs that were found in different studies. With these cautionary remarks in mind, I will now give an overview on the quantitative idea of children's grasp of verb-placement and verbal morphology, as it has emerged from previous studies.

Concerning children's developmental path, one detailed longitudinal study has been provided by Wijnen (1994b). At the time when his two subjects P and N begin producing multi-constituent utterances with verbs, RIs constitute the utterance type that forms the majority (80% and 100%, at ages 2;7 and 1;9, respectively). Over a period of three to four months, the proportion of RIs declines gradually. The two children follow similar developmental patterns, with a 10-month delay of subject Niek compared with subject Peter. Subject N is reported to be a normal child, albeit delayed in his development. Haegeman (1995) gives longitudinal data on a Dutch child aged 2;04 to 3;01. This child, Hein, shows a more gradual decrease of

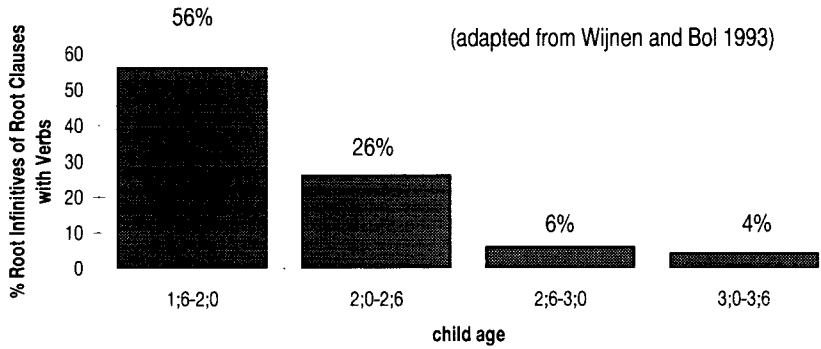
RIs than the two subjects in Wijnen's study. Hein's proportions are never as high as Peter's and Niek's, but it cannot be excluded that any child would have exhibited higher percentages, had they been studied at an earlier point in time, or had a different method been used. In Chapter 8, I will also argue that it is quite expected that children show individual differences which are independent from developmental phase (in terms of MLU and age) and from research method. Figure 1 shows a comparison of the percentages reported for those three Dutch children for which longitudinal data are available.

Figure 1: Development of Root Infinitives in Three Dutch Children



Cross-sectional studies are provided, as mentioned, by Boser (1989, for 30 German children), and also by Bol and Kuiken (1988; for 26 Dutch children). I believe that the findings of both studies essentially mirror the longitudinal results. Figure 2 below presents the results from Bol and Kuiken (1988), as reported in Wijnen and Bol (1993).

Figure 2:
% Root Infinitives in 26 Dutch Children



Crosslinguistic quantitative data have been culled from various sources for comparison by Sano and Hyams (1994) and by Phillips (1995). One might not yet draw any strong conclusions from cross-linguistic comparisons between results from different studies, given that, in addition to differences in ages and MLUs, additional methodological differences may have been introduced by the different structures of the languages. The only study that I am aware of which has been carried out with the aim of cross-linguistic comparisons in mind was carried out by Bar-Shalom and Snyder (in press). They found that Russian children produced far more RIs than Polish children. Russian is a richly-inflected language which does not permit thematic null-subject. Their findings thus support an observation by Sano and Hyams that children learning null-subject (or "pro-drop") languages, such as Spanish, Italian, or Portuguese, in general show lower proportions of RIs (typically below 5%) than children learning other languages (see also Rhee and Wexler 1995). Although, as Bar-Shalom and Snyder (in press) also emphasize, much more research is necessary before any strong conclusions can be drawn about variation across languages with respect to the RI phenomenon, the reported observations are extremely valuable and should be taken into consideration for future studies.

5.2 QUALITATIVE ANALYSES

In this section I present the main qualitative results which have been reported. First I present the arguments which were made in favor of different structural analyses of child RIs. Second I discuss what has been found concerning the interpretation of child RIs.

5.2.1 Structural representations

Previous work has revealed a number of very interesting distributional characteristics which occur in child RIs. I summarize these observations in (2):

(2) Distributional regularities occurring in child RIs

a. Fronting of object or adverbials does not exist in child RIs of Verb-Second languages. (Poeppel and Wexler 1993, Wijnen 1994b)

b. Wh-initial RIs do not exist.
(Poeppel and Wexler 1993, Haegeman 1995)

c. Subject clitics, object clitics and weak pronouns do not exist in RIs.
(Haegeman 1995, for Dutch)

d. Sentential negation is less frequent with RIs than in finite constructions.
(Friedemann 1994, Rizzi 1994, Roeper and Rohrbacher 1996)

e. Overt subjects occur less frequently with RIs than in finite clauses.
(Weverink 1989, Krämer 1993, Sano and Hyams 1994)

f. No RIs exist in which an auxiliary or modal is the infinitive.
(Haegeman 1995, Wijnen 1997).

Structural analyses of children's RIs, as well as proposed learning mechanisms, must account for these regularities. Some additional insights concerning these regularities offer themselves as a result of the preceding chapters.

Items a. and b. are on the list are phenomena which are normally related to the CP in Verb-Second languages, and have been taken as evidence that

RIs lack that functional level. Recall now from Chapter 2 that these characteristics largely hold for adult RIs also. For instance, RIs of type *object+subject+infinitive* presumably do not exist (in German), and Wh-initial RIs have a very limited interpretation (unless they are *how-* or *why*-questions, they must be interpreted as rhetorical questions). We do not expect these utterance types to occur in children's speech, given that their existence is heavily constrained in adult language. Thus what looks like a distributional peculiarity of child RIs, is in fact a target property of RIs.

It is relevant to item c. on the list, i.e. the lack of weak pronouns in children's RIs that, as was observed in Chapter 2, pronominal subjects must have contrastive stress in RIs. Thus at least weak pronominal subjects are also absent from adult RIs.

Negated RIs do exist for adults (item d). However, if there is any *additional* interpretive restriction on child RIs, the relevant proportion concerning negation should have the restriction in the numerator as well as in the denominator. For instance, if all RIs are "modal" (as has been argued; see below), then the proportion which would be informative for comparison with proportions for RIs is "negated finite sentences with modal meaning as a proportion of all finite sentences with modal meaning". No prior study has provided this measure. Rather, the assessment of negation in children's RIs has been drawn by comparing the proportion of negated RIs with the proportion of negation in all finite sentences. However, this understates the expected proportion, unless RIs have otherwise the same interpretive qualities as finite sentences. This is not so, as will become clear shortly.

Concerning item e. on the list above, overt subjects, Chapter 2 showed that while most adult RIs have no overt subject, some do. The constraints on the use of explicit and implicit subjects were shown to be complex. Until we understand these constraints, it will be hard to evaluate what children know about the use of overt subjects in RIs.

Lastly, with respect to item f., if child RIs already have a restriction on their interpretation, for instance that they are more compatible with events than with states, or have an inherent modal interpretation, then we do not expect the presence of a modal in the same way as if interpretation of RIs were free. This is the same point as was just made with respect to negation. If the interpretation of children's RIs is restricted, then in extrapolating expected proportions of modals in RIs from the proportion of modals in finite root clauses, the same interpretive restrictions as are present in RIs must hold of the pool of finite clauses used for the comparison.

With respect to the auxiliary *sein*, although it does ioccur rarely as the infinitival verb in child RIs, there is one example in Andreas' transcript, which I give in (3):

(3) Nicht Reporter sein. (A 2;1)
neg reporter be-*inf*

This is one of 194 RIs of Andreas' RIs (= .5%). The sample of adult language from the Miller Corpus, an analysis of which is presented below, also contains one example of a RI:

(4) Immer erster sein! (Miller Corpus)
always first be-*inf*
"You always want to be first!"

This example is one of 146 adult examples. Thus there does not seem to be any difference in the proportion of adult and child RIs which contain an auxiliary as the infinitival verb.

In sum, I suggest that some of the distributional patterns in (2) above are derivable from independent semantic properties of child RIs. In addition, it was highlighted that all of the regularities are compatible with regularities which hold of adult RIs. Thus the structural properties of child RIs on the above list could be taken as evidence that children already have a good handle on the structure of RIs as it exists in the adult language.

The contrary-to-fact assumption in the literature that RIs are essentially banned by adult grammars, has led to the perception that the solution to the puzzle about RIs lies in postulating an intermediate grammar which can assign RIs a structure, but that the target grammar will generate only finite sentences.

Two approaches, which are often contrasted, have been taken. They are referred to as the "full competence" or "structural continuity" approach on one hand, and "reduced competence" or "structure-building" approach on the other (for discussion of both see Wijnen 1994a, Meisel 1995).

Advocates of "full competence" take the evidence of finite grammatical structures (in addition to some CP-related phenomena such as finite wh-questions) as sufficient evidence that the relevant functional projection, namely CP, and the associated syntactic process of verb movement to the head of CP, is part of the child's grammar. This position is taken for instance

by Verrips and Weissenborn (1992), Wexler (1994), Poeppel and Wexler (1993), Boser (1989), and Whitman et al. (1992). In this way, the finite structures are predicted, and the challenge is to give a reason for non-finite root utterances. While authors have provided different proposals, the suggested solution is always one involving optionality of either a grammatical property or a lexical item. The next problem is to state what will eliminate this optionality later on. I turn to the different proposals in the next section.

In contrast, scholars supporting the "reduced competence" or "structure-building" approach hypothesize that a functional property, or entire projection, can be lacking completely from the child's current grammar, leading to some ungrammaticality in the child's productions. This path is followed by Clahsen and Penke (1992), and Radford (1995), for instance. The problem these authors have to confront is to say how correct finite sentences can be generated by that grammar, and what accounts ultimately for the acquisition of the functional property .

An intermediate position is taken by Rizzi (1994), Weissenborn (1994), and Phillips (1995). They propose that children have the full range of functional properties and morphemes, but, for different reasons (to which I turn below), they do not always use them.

Given that adult RIs exist, and also that children's RIs share many of their properties, the best hypothesis is that they have the same representation. In section 2.6.5 I took the position that this analysis does not involve the CP-level. This is however not crucial for the claims of this thesis since I do not claim that children have a defective grammar with respect to the structural properties of RIs. The empirical study was mainly concerned with interpretive aspects of child RIs. I turn to some previous research in this respect next.

5.2.2 Semantic Analyses

Analyses of the interpretation of child RIs are fewer in number than syntactic analyses. The first concrete proposal in this area is from Jordens (1990). He reports that a Dutch child at age 2 and age 2;6 uses non-finite sentences (i.e. RIs or Root Participles) when (but not: whenever) the verb denotes an activity, but never when the verb denotes a state or result.

This claim has recently been investigated more systematically by Wijnen (1997), who observes a comparable distributional difference between "eventive" and "non-eventive" verbs in 4 Dutch children. His figures show

that the infinitive in RIs was nearly always a verb denoting an event, while in (a subset of) finite utterances of the same children the chance of the verb denoting an event was only 48% (range: 43 - 64% across children; only finite sentences with a simple verb were included). A temporal analysis revealed that RIs referred predominantly to future events, whereas finite sentences predominantly referred to present events. (Past references were few. For eventive verbs, they were predominantly in the form of RIs. All non-eventive past references were in finite constructions.) These observations can be summarized as in (5):

(5) Generalizations about the interpretation of child RIs

a. While eventive verbs appear either in finite constructions or in RIs, a RI always receives an eventive interpretation.
b. If the eventive verb has future reference, the verb most likely appears in a RI, but if it has a present interpretation, it appears most likely in a finite construction.
c. If the verb is non-eventive, the verb appears in a finite construction.

As Wijnen notes, the fact that RIs occur overwhelmingly with future reference fits very well with the frequently reported impression that child RIs often refer to desired or future events (Boser et. al 1992, Hoekstra and Jordens 1992, Wijnen 1994a, Ingram and Thompson 1996). From this it has been suggested that child RIs have a "modal" interpretation in some sense. Ingram and Thompson define a "modal interpretation" as denoting "an activity which will, can or should occur" (p. 102). Other researchers (Poeppel and Wexler 1993, Boser 1997) have pointed out that child RIs can also have non-modal or non-future interpretation. While it seems to be the case that not all RIs can be given a modal interpretation, the question is why many at least appear to have a modal interpretation.[9]

Again, there is a possibility that the interpretation of child RIs resembles the interpretation of adult RIs. I have argued that the predicate in an *adult* RI cannot make reference to a presupposed event. Although this does not imply

[9] Note that when no other interpretation is available, a modal interpretation in Ingram and Thompson's sense is almost always a *possible* interpretation for a child utterance. Because most verbs in RIs are eventive verbs, one can always interpret the child as expressing a desire for that event. Often a modal and a non-modal interpretation are possible.

that adult RIs are "future" or "modal" (in Ingram and Thompson's sense), the restriction excludes a number of non-modal and past interpretations for RIs, so that relatively more modal and future interpretations are possible in RIs than in finite clauses. One might hypothesize that children's modal/future interpretive pattern with respect to RIs stems from fact that they already know the adult restriction on RIs which excludes certain interpretations, but not others.

What we have found is further support for the idea that child RIs at least overlap in their grammatical properties with adult RIs. This time we found concurrence with respect to semantic properties. Although the evidence in the semantic area is still preliminary, there seems to be no reason to put one's effort into contriving an acquisition mechanism which brings about a grammar which will disallow RIs with these target properties. What we should be in search of is any differences between adult and child RIs that might give us clues toward an explanation for the high frequency of child RIs, now that we are freed from having to explain their existence.

Summarizing, what we can discern about the interpretation of child RIs suggests that children do not use RIs randomly, but favor certain kinds of interpretations for them (e.g.future, modal, and eventive). These interpretations overlap with those that are found for adult RIs.

5.3 LEARNING MECHANISMS

On the basis of the proposals for the structure of RIs, explanations have been offered for why children favor RIs at first and why they later stop using RIs. This entails discovering the learning mechanism responsible for children's retreat from an intermediate grammar which generates (ill-formed) RIs, to a grammar which does not. A successful learning mechanism, in addition to accounting for the structural and interpretive facts discussed in the preceding sections, must be able to give answers to the three learning-theoretic questions in (6). Recall from Chapter 1 that the Grammar contains not only structural but also interpretive constraints:

(6) Desiderata for a learning mechanism

A. Intermediate Grammar Criterion:
What causes children to produce RIs?
B. Retreat Criterion:
What causes children to abandon RIs?

C. Target Criterion:
Does the learning mechanism lead the learner to the correct target grammar?

I discuss next what has been proposed with respect to these three questions.

5.3.1 Intermediate Grammar Criterion

Accounts which specify the relevant property of children's intermediate grammar which is responsible for their use of RIs have mainly focused on accommodating the *structural* properties of children's RIs. (These properties were listed in (2) of section 5.2.1 above.) This is natural, as the structure of RIs was of most concern to the first investigators of child RIs. However, the more recent results concerning semantic patterns in children's RIs must now also be accounted for. In addition it should be predicted that (at least some) children's proportions of RIs decrease gradually over the period of months. And, if cross-linguistic and individual variation is not (only) a result of methodological differences, these patterns have to be accommodated as well. I will include in the discussion to follow an evaluation of theories with respect to these newer discoveries. With respect to variation across languages and across learners, I will discuss how the proposals would deal with them in principle.

In searching for what causes children to produce RIs, two main avenues are open in principle for investigation. Either it can be shown that RIs are linked to a particular difference in the linguistic *competence* of the learner, as compared to the adult target grammar. Alternatively, it could be shown that in fact the child's grammar is like the adult's with respect to all the properties relevant to finiteness of verbs, and that children's use of RIs is due to *performance* effects.

At the present stage of research, the intermediate grammar postulated should also ideally address the question how cross-linguistic and individual differences with respect to RIs could be accounted for. Although I have cautioned in section 5.1. that one can currently not be entirely certain about the size of these differences, in the discussion to follow I will take into account whether the proposals are compatible with such differences.

5.3.1.1 Performance Accounts

Weissenborn (1994) and Phillips (1995) have each advocated a performance-based explanation. Performance accounts have the advantage

that they predict the steady decrease in child RIs, because it can be assumed that performance improves gradually over time. Performance accounts can also assume full Continuity in the child's syntax with respect to finiteness-marking. However, the structural and semantic patterns also need to be predicted. The two processing accounts deal with these issues differently.

Weissenborn (1994) attributes the fact that children's utterances are not always projected to the CP-level to a general limitation on processing or a restriction on cognitive load (not discussing them separately). He addresses the structural regularities in children's RIs by postulating what he calls the "Local Wellformedness Constraint". The effect of this is that children's sentences are syntactically well-formed up to the level to which they project. Children's utterances differ from adults' in that they sporadically lack the CP and/or IP-level, and the phenomena which are associated with them. Because the proposed limitations are rather general, it is unclear how cross-linguistic differences would be explained in this model. Presumably they would have to follow from independent ways in which children's grammars differ across languages, or perhaps from the differential processing loads incurred by sentences of these languages. Individual differences could be due to varying processing/cognitive abilities.

Phillips (1995) gives an account based on a limitation in children's ability to access morphological information. He assumes that "a two-year-old's root infinitive clause contains all of the components of an adult's finite clause", but that

> "in sentence production the advantage of spelling-out inflectional features attached to the verb must be weighed against the cost involved in accessing the morphological spell-out of inflectional features. For adults, accessing inflectional paradigms is a heavily overlearned process, and hence bears minimal or zero cost. [...] Since automatizing of the access process presumably takes place gradually, and therefore the cost of accessing morphological information gradually decreases, we expect to find gradual decreases in the use of root infinitives by any given child." (Phillips 1995: 360)

Phillips accounts for the structural properties of child RIs by taking them to be fully in accord with the adult grammar. To explain cross-linguistic differences in children, Phillips proposes that in languages with "richer

inflectional paradigms" (like Spanish or Italian) automatization of inflectional paradigms is speeded up. This proposal would not predict any RIs to occur in Russian child language, contra what was found by Bar-Shalom and Snyder (in press). However, once it is specified more precisely what the automatization process is based on, so perhaps this would not be a problem. A more severe issue that would have to be explained is why, as would have to be assumed, why learners of richly inflected languages access their morphological lexicon less often than learners of richly inflected languages. One would assume that each time children use a verb, they have to access the lexicon (even when they use a non-finite one). It would have to be the case that Spanish/Italian children begin using their morphological lexicon earlier, or store their morphemes differently. Individual differences could presumably be attributed to a variability in the timing with which the accessing process becomes routine.

The two performance accounts just discussed would have to derive the semantic regularities that have been found more recently from independent factors. To summarize, each performance account predicts some of the empirical findings about child RIs, but not all of them. In particular semantic patterns in child RIs would have to find an independent explanation.

5.3.1.2 Optional Tense

Competence explanations are linked in some way to the child's grammatical knowledge. In principle, such an approach can take two forms: Either RIs are due to a lack of some universal knowledge in the learner (which entails later maturation of that knowledge), or they arise because of the absence of some language-specific knowledge. The first claim has been advanced by many scholars.

Poeppel and Wexler (1993) and Wexler (1994) were first in proposing an analysis in which the child's grammar treats RIs as grammatical. To explain how this can be so, Wexler (1994) proposed that for young learners "tense is not interpreted at LF", because "syntactic tenses" are not yet distinguished. As a result, tense plays no role at LF, and no grammatical constraint is violated.[10] Wexler (1997a) specifies, in a slightly different proposal, that

[10] The analysis provided by Wexler (1994) requires that in the target language of English the verb and its morphology combine by verb-raising to Infl at surface structure, not by infl-lowering. This analysis is not motivated otherwise and, without additional non-standard assumptions, makes wrong predictions about English sentences, such as predicting that verbs occur to the left of adverbs and negation.

learners produce RIs because do not yet have access to the knowledge that tense is obligatory. This latter proposal has the advantage that, unlike the former, it does not predict of the former that children during the RI-stage do not use different tense forms which are distinguished by different tense features in their structures. (It is believed that children during the RI-stage do use, for instance, forms referring tot he Present and to the Past, see Behrens 1993).

The Optional Tense adequately predicts that children's productions contain finite and non-finite root clauses, side by side. If the absence of tense in a sentence structure can be linked to the other structural properties characteristic for child RIs (see section 5.2.1), then the Optional Tense account will correctly predict all finite and non-finite child sentences. The semantic regularities in child RIs would have to be explained independently. With respect to cross-linguistic differences, Wexler (1997b) links the RI-phenomenon to the null-subject property in the grammar. This proposal (see Wexler for details) makes the very strong prediction that children learning null-subject languages should not manifest the RI phenomenon. Future research will show whether this prediction is borne out. A question that remains open is how this theory would account for individual differences.

5.3.1.3 Truncation

Similarly to Weissenborn (1994), Rizzi (1994) hypothesizes that children can "truncate" their syntactic tree at any (XP-)level. However, in Rizzi's view this is because children do not yet have access to a universal principle which specifies that root clauses are always CPs. Haegeman (1995), and others, have adopted this idea. Although children have acquired the language-particular aspects of CP (they use CP correctly in finite clauses), they do not consistently use the CP-level.

The Truncation Hypothesis predicts very precisely the structural patterns in child RIs which were summarized in 5.2.1 above. It relies strongly on the theoretical assumption that "root=CP" is indeed a property of natural language. This may be the case abstractly, but it is clear that CP is not overtly realized in many constructions, for instance in English and French declaratives the CP-level are not phonologically realized. Children would have to acquire independently when to realize CP overtly. Semantic patterns and cross-linguistic and individual variation would have to follow from independent facts, which remain to be articulated.

5.3.1.4 Underspecification of Tense

Yet another proposal which relies on children not having access to a universal principle is Hyams' Underspecification Hypothesis, in which children's RIs are explained as a result of an underspecified feature in the head of the tense projection. Hyams' proposal (see also Hyams and Hoekstra 1996) is quite explicit. It is suggested for child language that when (and only when) tense is underspecified, a deictic "here-and-now" interpretation of the utterance becomes possible; tense in child RIs is bound by discourse, rather than in the syntax.

Hyams' idea is interesting in that she proposes that the child RI phenomenon "has its roots in the child's developing semantics and pragmatics". As it is stated, the account in terms of underspecified tense strictly predicts that RIs do not have overt subjects, thus it would cover the (presumed) fact that children learning pro-drop languages produce less or no RIs. However, an explanation for why children's RIs sometimes (if not very often) do have an overt subject.[11] For these cases Hyams assumes that a phonologically silent modal which is bound by a modal operator is present in the structure (see her fn. 18). For this it would need to be shown that a modal interpretation is correlated with overtness of subject, but this is not known at present, so this particular bipartite account is not yet fully motivated (although a multi-factor analysis of some kind may indeed be correct, as I suggest in Chapter 8).

It is not entirely clear how Hyams' proposal would explain the observations resulting from recent semantic analyses of child RIs, namely that children often (or even predominantly) refer to future events when they use a RI. Although it may somehow be possible to derive a future interpretation from a deictically bound tense, at first glance this seems to clash with Hyams' assumption that RIs must receive a "here and now" interpretation. It might be assumed that it is the intentionality with respect to the event which is located in the present discourse, and not the event itself to which the child refers. As for the variation in learners, the same

[11] Further, in extending her analysis to English, and in order to explain that finite verbs occur with and without subject, Hyams assumes that in early English past tense *-ed* marks perfective aspect, and 3rd singular *-s* marks "participial number agreement". Hyams follows Kayne's (1989) analysis of adult English with respect to the analysis of 3rd singular. Unless these assumptions in fact hold in adult language, they are cumbersome for an acquisition account.

considerations hold here as for the Truncation Hypothesis and the Optional Tense account.

I will propose later that the origin of child RIs indeed stems from a problem involving (potentially) the semantic and (definitively) the pragmatic components of the child's linguistic system. However, in contrast to Hyams, it will be the relationships between these modules and the morpho-syntactic module which are the source for the frequent use of RIs by young children.

5.3.1.5 Null-Auxiliary Hypothesis

Boser et al. (1992) and Whitman et al. (1993) support what they term the "Null-Auxiliary" Hypothesis, sometimes also referred to as the "Null-Modal Hypothesis"[12]. According to this hypothesis, a phonologically silent, and syntactically licensed null-auxiliary is licensed in child grammar by a subject in the specifier to the phrase in whose head the modal is located (but not by an object or adverb in that position, since children do not produce strings of the form *constituent+subject+infinitive*). The null-auxiliary contains "phi-features, including tense and agreement features, and is an empty pronominal category" (Boser et al. 1992). This null-auxiliary is also said to be responsible for the "modal" interpretation of RIs, but only when it is present in the utterance.

In refining the earlier theory, Boser (1997) concludes "that the particular predictions of the Null-Auxiliary Hypothesis as formulated in Boser et al. (1992) are not borne out" (p. 149). In this recent work, Boser observes that "in the child we find non-finite utterances mostly in the same contexts as for non-finite clauses in adult grammar". In particular, some adult examples with declarative meaning are noted (though not discussed in detail). A new version of the Null-Auxiliary Hypothesis is proposed which differs from the original version in that the empty element in C° is due to "language particular discourse and pragmatic licensing" (p. 149). Thus, in the new version of the

[12] The literature contains three similar terms, which must not be confused with each other. First, "The Null-Auxiliary Hypothesis" has been used to cover the proposal that an empty element with finiteness features resides in the head of CP. However, the "Modal-Drop-Hypothesis", briefly discussed by Poeppel and Wexler (1993), but discarded, refers to the idea that such an empty element is restricted to one that results in a modal interpretation. Thirdly, the "Modal Hypothesis" (proposed by Ingram and Thompson - to be discussed shortly in the text) is different from the first two in that it specifies that RIs are modal in meaning, but without specific syntactic consequence.

Null-Auxiliary Hypothesis the empty pronominal auxiliary is licensed by language-specific means.

While in the original version of the Null-Auxiliary Hypothesis did not contain a mechanism that would allow for language-specific differences, the new licensing mechanism is dependent on the input language, which allows it to account for cross-linguistic and individual differences. The immediate question arising now is why learners use RIs so much more frequently than adults.

To explain the difference in magnitudes, Boser suggests that the child has not yet fully acquired the "relation between syntax and pragmatics". This is very close in spirit to the main claim of the present work, and, I believe, fundamentally correct. It is unclear, however, that the Null-Auxiliary Hypothesis is a necessary component of this general idea, Once the source of child overgeneration of RIs has been identified as a lack of language-specific pragmatic constraints, a null-auxiliary would need more specific evidence to be justified. The present work includes a more substantial comparison of adult and child language, and makes some more specific proposals for how the relations between the structural component on the one hand, and the semantic and pragmatic components on the other, are strengthened in the course of development. In formulating this account it has not proved necessary to draw on the Null-Auxiliary Hypothesis.

5.3.1.6 Lack of Language-Specific Lexical/Semantic Knowledge

The idea that children's RIs may be related to a lack of language-specific lexical knowledge has also been suggested. Jordens (1990) holds that RIs disappear when children acquire relevant lexical items, such as modals. Thus, unlike Boser et al. 1992, Jordens does formulate a syntactic mechanism that would cause modals to be missing, but he attributes the lack of modals directly to a lexical deficit.

However, children during the RI-stage do know a variety of different modal elements and use complex-verb constructions containing them (see Boser 1997), although less frequently than adults (see Chapter 7). The use of complex-verb constructions increases as the use of RIs decreases, but the proportions are not exactly inverse (see Chapter 7), i.e. proportions of RIs drop more dramatically (if gradually) than complex-verb constructions. Thus, even if the increase of complex-verb constructions were due to an increased use of modals, not all RIs could be due to the more frequent use of modals. There is the possibility that, while having acquired the different

modal forms, children often do not know which modal is correct in which context, and that there is a tendency in such circumstances for a learner to avoid a troublesome construction rather than, for example, to make a random guess as to which is correct. therefore use a RI construction as an avoidance strategy. This latter idea will be developed more fully in Chapter 8.

Ingram and Thompson (1995) advocate the view "that a correlation exists between modality and finiteness". According to their "Modal Hypothesis" (p. 102), German children use infinitives as main verbs in sentences that contain a modal interpretation. Ingram and Thompson contend that this is due to children's having not assigned distinct semantic functions to grammatical forms. This is very much in the same spirit of what I propose below, but I do not believe that the hypothesis is correct as stated. The structural and interpretive patterns in child (and adult) RIs are much more complex than those that Ingram and Thompson describe. A strength of their proposal is that the semantic learning it demands could be highly sensitive to differences in the input data, and therefore could readily accommodate variation among learners.

5.3.1.7 Lack of Certain Syntactic Types

Wijnen (1994b) expresses the belief that "children's initial repertoire of syntactic types contains systematic "gaps", and in particular that. complex-verb constructions do not occur productively. Once they do, RIs will disappear. The evidence which is used to support these arguments is that children's complex-verb constructions increase in proportion as the use of RI constructions decreases.

In evaluating this idea, a similar consideration as in the case of Jordans' proposal is relevant: Complex-verb constructions in mature speakers do not reach the high proportions that are attested for RIs in children (I show below that even adults use a complex-verb construction only 25% of the time). Thus the decrease in RIs is more dramatic than the increase of complex-verb constructions. Moreover, children do use a variety of modals in complex-verb constructions while they are still producing a considerable proportion of RIs. However, the core of Wijnen's proposal may very well be part of the solution to the RI-puzzle. Learners may not know when to use which complex-verb constructions, or even lack knowledge in some contexts, about which finite construction type to use at all, and therefore use a RI as a default construction. I return to this proposal in Chapter 8.

5.3.1.8 Summary

The proposals which have been advanced to explain the existence of RIs in child language have been found to focus on quite different characteristics of the RI-phenomenon in child language. It was shown that they have quite different implications for intermediate grammars. These very brief evaluations of course do not do justice to the full range of empirical and explanatory motivation for each theory. They are offered here primarily as an aid to readers in distinguishing the many proposals that have been made in this area.

In conclusion, no proposal explicitly covers all of the findings about child RI, and this cannot be expected, because a number of relevant observations, for instance about the interpretation of child RIs, are only very recently reported. I note that my proposal to be developed in Chapter 8 concerning the development of mappings between the structural and the interpretive components of grammar could be regarded as ancillary to the accounts presented above, to cover facts they have not considered or to solve empirical or explanatory problems they face. However, I believe that once the necessity of substantial language-specific learning of mappings between forms on the one hand and the functions they have on the other is recognized, these other proposals simply drop out as unnecessary.

5.3.2 Retreat Criterion

The most difficult aspect of specifying a learning mechanism is to explain in concrete terms what causes a learner to move from a system which generates utterances which do not occur in the target, to one which generates only those utterances which do occur in the target. This problem is the problem of retreat (see Bowerman 1988, Pinker 1989, Randall 1992, and references therein). I consider here only retreat with respect to the early overgeneration of RIs. I discuss first what the role of retreat is in performance accounts, and turn in section 5.3.2.2 to retreat mechanisms which are proposed in conjunction with theories attributing RIs to a competence deficit.

5.3.2.1 Performance Accounts

Performance accounts locate retreat from RIs in the child's cognitive system or in his language-processing device. That children's cognitive powers in this area are more limited than adults' is undisputed. Thus Weissenborn's idea of how children restrict their use of RIs is plausible: with age the processing limitation will disappear, and so will RIs. It is a much less clear-cut matter at

present how exactly children's processing abilities differ from those of adults, but it is certainly feasible that retrieving morphology requires training, as Phillips (1995) proposes. In Phillips' proposal the system accessing non-finite morphology is easier than accessing finite morphology. As the cost of accessing finite morphology becomes less with age, finite morphology will be accessed more reliably.

A processing account, which has *not* been suggested, but which is a conceptual possibility, is one which associates utterance-length with RIs. This would be along the lines of Bloom (1990), who in discussing the null-subject phenomenon claims that children use fewer overt subjects the longer the VP is in terms of constituents. A parallel hypothesis would be that finiteness is omitted more often in longer VPs than in shorter ones. However, the study reported in the next two chapters did not find any confirmation of this hypothesis. Rather, the opposite held for adults and children: The shorter an utterance was, the more likely it was that it occurred as a RI.

5.3.2.2 Competence Accounts

Competence accounts which rely on the absence of a universal property in their explanation of child RIs usually advocate a maturational account for explaining the decrease in RIs. This applies to Rizzi's Truncation Hypothesis, Wexler's Optional Tense account, Hyams' Underspecification Hypothesis, and, presumably, to the original version (but not the revised version; see discussion in section 5.3.1.5 above) of the Null-Auxiliary Hypothesis. Maturation of linguistic competence is a process which is biologically based (see Borer and Wexler 1987, Bertolo 1995). It is a process whereby a piece of innately established knowledge becomes available at some time after birth. Maturation of UG principles is an important means by which in principle a learner could gain negative constraints which prevent the grammar from generating certain phenomena that were present in the child's language at earlier stages.

Rizzi (1993) suggests that the principle "root = CP" has to mature before children will cease producing truncated structures. In Wexler's (1994) proposal what matures is that "syntactic tense distinctions are relevant at LF". Wexler's (1997) account entails that UG makes available a principle which makes tense obligatory in all utterances: until that principle matures, learners can apply verb movement optionally.

Hyams (1996) argues for the maturation of a rule, referred to as "Rule T" (Rule T: "Infl A cannot co-refer with Infl B if replacing A with C, C a variable

bound by B yields an indistinguishable interpretation"). This rule regulates the counter-indexation of the tense operator with tenses on verbs. Once it has become accessible in the learner's UG, underspecification of tense in adult language will be ruled out, because Rule T prevents a situation where a discourse-bound tense operator not co-indexed with Infl.

Though some theorists disfavor maturational explanations as unparsimonious, maturation of linguistic abilities is plausible in general. If a particular maturational hypothesis can describe the phenomenon for which it was devised and in addition does not make any wrong predictions in other domains of the child's linguisitic behavior, then it should be adopted. However, as discussed above, it is doubtful that any of the current proposals has these characteristics.

If children's linguistic competence differs in a language-specific grammatical or lexical aspect from that of adults', then the attainment of the target is triggered by the learner incorporating a new characteristic of the target language into either his grammar or the lexicon. This could occur gradually in principle. The validity of such a proposal can be established by showing that there are relevant subtypes (of lexical items, or construction types) that exhibit to a step-by-step learning process. Differences between languages in the course of convergence on the target could be due to their having or lacking different subtypes. Between-children differences could be due to their hearing or attending to these subtypes to differing degrees. The non-maturational competence approaches therefore could potentially account for the gradual decrease of RIs very well, although it has not yet been shown in detail that they actually do so.

5.3.3 The Target

I have emphasized in various places above that adult RIs have been given little consideration in the previous literature on children's RIs. Their relevance to a learning account has been largely neglected, because it has not been known that RIs occur in variety of interpretations. However, it appear to be the case that adult grammars do license RIs and that adults do use RIs under certain conditions. There is also some indication that both universal and language-specific constraints apply to RIs, as I have argued in Chapter 2. One might thus ask whether the existence of adult RIs could in principle be integrated into the different proposals.

Accounts which attribute child RIs to a performance limitation, might contend that a residual cognitive or processing limitation remains in the

adult. However, as the interpretation of adult RIs is constrained, they cannot be treated solely on the level of slips of the tongue or the brain. It might however be the case that in cases where the grammar licenses a RI semantically and the RI is pragmatically felicitous, performance concerns become relevant. That is, once a RI is grammatical and felicitous, a RI might be chosen only when performance capacity is low.

It is implicit in maturational accounts for the RI-phenomenon that the cause for child RIs becomes eliminated through UG. Since the property which matures prevents generation of RIs, adult RIs must have a different source. For instance, Hyams (1996) permits adult RIs, for instance with rhetorical exclamative interpretation. This interpretation, according to Hyams, does not violate Rule T. If a mechanism can be found that covers all target RIs correctly and independently, their existence does not pose a problem to maturational accounts.

Accounts which are based on the acquisition of language-specific knowledge can in principle incorporate RIs as a target structure, in particular if a proposal incorporates the idea that children will not only learn finite constructions but also non-finite ones. Whether any particular account can do so is also an empirical question to be explored. My own proposal below falls into this category. However, since the empirical analyses carried out for the purpose of the present work were aimed mainly at a comparison of adult and child RIs, it will not be possible to present any empirical support for the ideas to be presented. However, the account does place emphasis on the fact that children have to acquire the grammatical conditions for non-finite sentences along-side those for finite sentences.

5.4 SUMMARY

We have seen that researchers have dedicated their attention to different aspects of the problem of RIs. Their contributions to a solution have differed. Some researchers have over the years adapted their proposals as new insights on the phenomenon have become available. Nevertheless, it is fair to say that no account that has been given so far has succeeded in both describing the data appropriately and offering a satisfactory learning mechanism.

The following points were stressed in the sections above; they express what has reasonably been established about the structural and interpretive properties of child RIs.

I. With respect to the structural properties of RIs

1. There are methodological differences between studies which make it difficult to compare quantitative results.
2. Some purportedly structural characteristics of child RIs (such as the lack of negation or modals in them) may be derivable from interpretive constraints.
3. Many (perhaps all) structural properties of RIs are compatible with those of adult RIs.

II. With respect to the semantic properties of children's RIs

1. Semantic analyses of child RIs, to the extent that they exist, show that their interpretations differ from those of finite sentences. In particular children's RIs have mostly to future reference, and rarely contain non-eventive verbs.
2. Although it is hard to demonstrate, some child RIs do not seem to receive a "modal" interpretation.

III. With respect to proposed learning mechanisms

1. Accounts differ in whether they consider RIs a genuine grammatical option in the intermediate child grammar.
2. The accounts differ in how closely they predict characteristics of the RI-phenomenon which are shared cross-linguistically by children who use RIs (structural properties, gradual decline, interpretive aspects insofar as they have been established)
3. The accounts differ in their built-in capacity to account for the latitude that appears to exist concerning the onset and the offset of the RI phenomenon in an individual child, and in the magnitude of the phenomenon across learners of different languages.
4. Most accounts have underestimated the systematic (if not necessarily frequent) role that RIs play in the target grammar.

The approach developed in this dissertation differs from all previous ones in that it is driven by the observation that UG permits RIs, including declarative RIs, and that there are universal and language-specific conditions under which they are permitted in a given language. My treatment of RIs is

embedded in an overall theory which assumes that the syntax of a language provides structural possibilities which are then constrained by semantic and pragmatic conditions (for discussion see, for instance, Lambrecht 1994, Klein 1997a). In such an approach any quantitative and qualitative differences between child and adult RIs could be attributed to the lack of some language-specific knowledge of the relationships between the structural and interpretive modules of the grammar. Moreover, I will develop the idea that the frequent use of RIs in children is a default strategy. This results in an account which gives a concrete description of the child's grammar at the intermediate state, as well as of the grammar of the adult speaker.

A FRESH LOOK AT ROOT INFINITIVES

CHAPTER 6

In the chapters above I have motivated two main claims: In Chapter 2 I argued that RI constructions are well-formed structures of adult languages, in particular of German. And, in the previous chapter, I have proposed that children's RIs are similar to adult RIs in structural ways, and differ mainly in interpretive respects from adults.

The study which is reported in the next two chapters was designed to corroborate both of these ideas by a direct comparison between spontaneous speech of adults and two children. In addition, the study was aimed at generating some plausible hypotheses as to what might be responsible for the high frequency of RIs in child language.

The present chapter introduces the rationale and the design of the study. Chapter 7 will report the results, and Chapter 8 will cover the conclusions which can be drawn from the analysis with respect to the learning process.

6.1 GOALS AND RATIONALE

As RIs are assumed here to be licensed by UG, the burden of the Continuity issue has been lifted off the shoulders of acquisition theory, at least in the area of RIs. We do not need to account for why children's grammars allow RIs, and simply assume it is by the same linguistic mechanism that allows RIs in mature grammars (see Chapter 2).

However, what remains to be explained is far from trivial: We need to know exactly how and why children use RIs differently from adults.

The design of the empirical study aimed at allowing a general analysis of all verb-containing utterances, as well as a particular analysis of RIs. Two reasons motivate the analysis of all verb-containing utterances with regard to some general measures, such as verb type and length of utterances. First, such broad measures concerning adult and child speech, in particular from the same conversational discourse, are informative in themselves, and have, to my knowledge, not yet been presented for German. Second, by extending our knowledge of how child language differs from adult language in general, we gain a better vantage point from which to evaluate specific comparisons of child and adult language, and, ultimately, to choose valid explanations for child phenomena. Thus, a general assessment of verbal utterances will provide a useful context in which to embed the analysis and discussion of RIs

to follow. This will, for instance, allow us to observe any differences between the body of RIs and the body of all verb-containing utterances. This casts light on the question of whether children use RIs optionally in place of any finite construction, or whether the interpretation of children's RIs is restricted in some way. (I have argued in Chapter 2 that the adult uses of RIs are restricted in several ways)

Taking into account results from previous work, as well as intuitions about adult language, it was expected (and found; see Chapter 7) that children use higher proportions of RIs than adults do. The analysis will show just how much more often the children use a RI than the adults. Naturally, any statements about frequency of use in individuals are generalizable only to the extent that the analyzed discourse represents a typical example, and it is impossible to be certain of what this is in the current state of acquisition research. However, what is of primary interest are not the data for individual speakers, but the child-adult comparisons, and these are relatively secure since they are based on the same discourses in which both child and adults participated.

Once the RI phenomenon is established in terms of quantity, the next issue concerns a proper interpretation of the quantitative difference. Certainly, a relative quantitative difference between children and adults with respect to a given structure must not immediately be interpreted as a deficiency on the child's part.[1] This is because, in principle, children could use RIs more frequently than adults for extra-grammatical reasons: For example, children might have more opportunities to produce RIs, because the things children talk about are more compatible with the range of meanings that RIs express in the target. Alternatively, children might talk about the same things as their parents, but still use RIs more often, because in situations when there is a choice between a RI and a finite construction, they opt for a RI more often than adults. This would constitute a performance-related explanation.

The present study investigated whether there might be qualitative properties of RIs which diverge in adult and child RIs. In principle,

[1] Conversely, when a child frequently produces a structure that is in principle grammatical in the target, the use of it could still be inappropriate. Even an exact quantitative correspondence between child and adult speech with respect to a certain structure does not imply corresponding degrees of grammaticality, unless it is also established that the child uses the structure in appropriate ways.

qualitative linguistic differences could be structural, semantic and pragmatic in nature. The structural properties of RIs have been studied extensively by previous authors (see Chapter 5). As emphasized in Chapter 5, adult and child RIs are quite similar in morpho-syntactic respects. The structure of RIs is therefore not at the center of the present investigation (although I briefly address the question of syntactic subjects in section 7.2.4).

With respect to the interpretation of child RIs, very limited information was available when the study was begun. As a consequence it was impossible at the outset to formulate any concrete predictions (beyond a few intuitive expectations) concerning whether and how the interpretation of child RIs would differ from the that of adult RIs.

A temporal analysis of RIs was however motivated by the Non-Completedness restriction, as determined for adult RIs (see Chapter 2). It is of interest to know whether or not children violate that restriction. The analysis of adult RIs suggested that most RIs in adult language would refer to future Events. This is because the possible future interpretations are the most varied (e.g. imperatives, desires, intents), and instances which refer to present and past have very specific interpretations (involving the non-perlocutionary communicative function, and reference time shifted away from speech time). The analysis was intended to test this expectation for adults, and investigate how children behave in this respect. And, lastly, a temporal analysis had been underway for Dutch data by Wijnen, so that the German data were intended for crosslinguistic comparison. (The data are published in Wijnen, 1997, and were discussed in section 5.2.2.)

An analysis of the illocutionary functions of RIs was motivated by two beliefs which prevail in the acquisition literature. It is commonly held that children use RIs as declaratives (whereas adults do not) and that children use RIs to express primarily "modal" (also referred to in the literature as "irrealis", "future", "desired") meanings. The analysis was intended to test these beliefs empirically.

6.2 CORPORA

Parts of two corpora were analyzed. First, six transcripts of the Miller Corpus (Miller 1976) were used. The corpus was made available to me, both on original audiotape and in the form of computer transcripts, by Jürgen Weissenborn at the Max-Planck-Institute for Psycholinguistics in Nijmegen in

1993.[2] In addition, one transcript from the Wagner corpus (Wagner 1985) was analyzed. The Wagner Corpus is publicly available on the CHILDES database (see Mac Whinney and Snow 1995, or on the internet at

http://atila-www.uia.ac.be/childes/index.html

or http://childes.psy.cmu.edu/childes/index.html).

The Miller Corpus has several advantages for the present purpose. One is that the recordings were taken during everyday situations like playing games, looking at books, eating, changing diapers, etc., and typically both parents are interacting with the child - either at the same time or separately - making it possible to compare the speech of two adults to that of a child.[3] This provides a maximally natural sample of both parental and child speech - an important prerequisite for a useful comparison between parental and child speech. Furthermore, as the adult speech stems from the same discourses as the speech of one of the children, the impact of non-linguistic variables is minimized. Analysis was performed separately for Simone's mother and father. The results were sufficiently similar for the two adults to warrant the presentation of the results as if the data came from one speaker.

The entire Miller Corpus includes recordings in which Simone's age ranges from 1;9 to 4;0. Six recordings were chosen which spread over a time when the child was between two and three years old. This age range was suitable because, on the one hand, it was expected that at least some RIs would be found in a sample of a learner of that age. Moreover, children around their second birthday typically begin to show the degree of linguistic sophistication in their productions which is necessary for our purpose. In particular, productive finite morphology, enough thematic verbs, and multi-constituent utterances appear at that time.

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[2] The recordings were made in 1972 and 1973 in a home outside Frankfurt, Germany. The transcriptions of the audiotapes generally followed the CHAT format (MacWhinney 1991). But inconsistencies between transcripts existed. To correct such inconsistencies, and to insure accuracy of the transcription, I checked each transcribed utterance against the audiotape twice. Note that the Miller Corpus is not (yet) publicly available.

[3] In two sessions, other adults, and another child, were present. In total, the speech by speakers other than Simone, and her parents, comprised 278 adult and 54 child utterances with and without verbs. This is less than 3% of the total number of analyzable utterances. I excluded these utterances from analysis, in order to increase the homogeneity of the sample.

The total duration of the six recordings is 15 hours (or 900 minutes). Table 6.1 gives for each transcript the recording time in minutes, the child's age (y;mm;dd) and the mean length of utterance for each participant. Mean lengths of utterance were calculated in accordance with Brown's (1973) rules, except that one word was counted as one morpheme, irrespective of how many morphemes it contained. (For the same methodology, see Clahsen and Penke 1992 and references there, also Valian and Eisenberg 1996.)

***Table 6.1**. Duration of transcripts, ages of the child, and mean length of utterance for each speaker in each transcript.*

Transcript	duration	age Simone	MLU-W* Simone	MLU-W* father	MLU-W* mother
1	134 min.	2;00;05	1.81	4.29	5.35
2	210 min.	2;02;21	1.68	4.10	5.21
3	200 min.	2;06;23	2.44	4.74	5.34
4	78 min.	2;07;23	2.05	6.66	5.55
5	106 min.	2;08;08	3.17	4.35	-
6	172 min.	2;11;11	3.86	5.24	6.29

* MLU-W = Mean length of utterance in terms of words.

Each two chronological transcripts were combined into one file in order to obtain files which were roughly matched in duration. The respective two combined transcripts are up to three months apart. This was considered unproblematic, because no claims are made here as to when exactly a particular development takes place. Nor are any other claims tied to information that was lost due to the combining of the 6 transcripts into three files for analysis. Table 6.2 states the recording duration, the mean age of Simone the and mean MLU-W for each speaker, for the resulting three files.

***Table 6.2**: Duration of recording for combined files, Simone's mean age, and mean MLU-W for all speakers at each measuring point.*

File	duration	mean age Simone	MLU-W* Simone	MLU-W* father	MLU-W* mother
1	344 min.	2;01	1.75	4.2	5.3
2	278 min.	2;07	2.25	5.7	5.5
3	278 min.	2;09	3.52	4.8	6.3

* MLU-W = Mean length of utterance in terms of words.

The purpose of analyzing one transcript of a second child, Andreas, was to provide a point of comparison for Simone's data at the earliest measuring point, when her utterances are most ambiguous and hardest to classify (see section 6.3.1 above, and section 6.4.3 below).[4] The analysis of Andreas' transcript was also intended to ensure that Simone's data were not affected by the relatively small sample size. Due to the inclusion of a fairly large amount of adult data, only a relatively small amount of Simone's data could be analyzed for each measuring point. Since in Andreas' transcript only child speech was analyzed, this allowed for the inclusion of a larger amount of child data. As the analysis below reveals, the results for Simone and Andreas at age 25 months were quite compatible, and do not warrant any concerns regarding the sample size of Simone's data.

Andreas' transcript is 213 minutes long. No auditory version was available. Andreas' MLU-W was calculated to be 2.5, and thus higher by 1.25 higher than Simone's at the same age. As far as could be determined, this difference did not prove relevant for any aspect of the analysis. (See Chapter 7, fn. 1 for why this may be so.)

6.3 METHOD

Having bemoaned, in the previous chapter, a general lack of explicitness in the published reports concerning details of methodology, I will attempt in the remainder of this chapter to be more informative in this respect. (Needless to say, a dissertation provides the ideal forum for such detail, and it will be possible to include here more information than is otherwise possible.) The next section specifies which utterances were analyzed. In combination with the information about length of the transcripts, it is possible to obtain an idea about general attributes of the analyzed discourse, such as its density, and, in the case of the Miller Corpus, about the amount of speech which was contributed by the child relative to the adults' contribution.

[4] Andreas' data have previously been analyzed with respect to finiteness by Poeppel and Wexler (1993), and by Ingram and Thompson (1996). Methods and particular research interests of these authors have differed from mine. Adult speech from this transcript has not been analyzed to date, and was not analyzed for the present purpose.

6.3.1 Analysable Utterances

The rationale was to include in the analysis every utterance that might constitute input to the child in the sense that it might potentially affect grammatical knowledge. Thus parental imitations, repetitions, as well as interrupted utterances, were included. (As interruptions were marked in the transcript, the information was not lost for the analysis.) Since the intention was to directly compare child and adult data, it made sense to include also the child's imitations, repetitions and interrupted utterances.[5]

An utterance was excluded if it met any one of the following criteria:

(1) Criteria for excluding an utterance from analysis

- The utterance is fully or partially unintelligible.
- The utterance consists only of non-speech sounds.
- The utterance is a recitation of a song or nursery rhyme.[6]
- The utterance is a one-word assent (*ja, ok*) or dissent (*nein, nee*).
- The utterance consists of a filler roughly in the sense of Brown (1973).

Concerning the last criterion in (1), Brown does not provide a definition for what constitutes a "filler", but only mentions a few English examples (*uh, oh*). A commonality among them is that they have no obvious syntactic structure and cannot easily be assigned to one of the common syntactic categories of words, such as noun, verb, adjective, etc. In the German transcripts, there were a great many different fillers of this kind (around 35 for adults). Note that the *meaning* of fillers can be rather proposition-like. Consider the English *shhhh!*, which is a way to say "Be quiet now!" I determined fillers by their form, not their content.[7]

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[5] It can be quite difficult to decide for a child utterance whether it looks incomplete because the child did not know how to produce a complete sentence, or because it constitutes a (self-) interrupted sentence.

[6] While parental recitations might be relevant for language acquisition, they had to be excluded, because, on the part of the child, recitations might constitute rote-learned strings and are not informative as to the child's grammatical competence.

[7] Fillers should be distinguished from *tags*. In the analyzed discourse, some elements like *he, ne, hm, ja, weisste ("know-you")*, as well as the second person singular personal pronoun *du* were sometimes used as tags, as is common in German. The general import of tags is to

If an utterance consisted of more than one clause, only one of them, the main clause, was considered. Note that even when two clauses are syntactically related, suggesting that they are part of the same utterance, prosody and intonation may suggest that the two clauses are separate utterances. Subordinate clauses with utterance status which were related to a previous utterance were included in the analysis (they were relatively rare). Any difficult decisions as to utterance division were made taking into account prosodic contour and contextual information.

Adult speech was included in the analysis whether it was child-directed or not. The preponderance of adult speech was clearly child-directed. Typically, adult-to-adult utterances were part of the main stream of discourse. For instance, while playing cards the parents address each other occasionally. These utterances were analyzed in the same manner as child-directed speech. In a few cases, adults were engaged in discourse amongst themselves which evidently excluded the child, and that part of the discourse was excluded from analysis. Only a few minutes per transcript were excluded for this reason. For instance, in one case the parents discuss the organization of the following day in a manner that is noticeably set apart from the preceding and the following discourse by a comparatively high speech rate, and low pitch. In cases of doubt, parental discourse was included rather than excluded.

The make-up of all tables to be presented here and in the remainder of the thesis conforms to the following system: Across the top of each table, the three measuring points are indicated in terms of the children's ages. I will refer to these respective measuring points as Time 1, Time 2, and Time 3. The left-most column in each table contains the subjects' names and a label for what was measured. Averages appear in the right-most column and were calculated only for adults. Naturally, adult averages are informative only to the extent that it can be assumed that adults did not change their behavior in the different recordings for any reason, for instance to adapt for greater

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add emphasis and to invite the conversational partner to take a turn in speaking. Sometimes tags mark the illocutionary function of an utterance. Languages differ in the particular devices they use for this purpose. Sometimes the English equivalent of a German tag is a tag-question (e.g. *isn't it?*), sometimes it would be elements like *right?* or *no?*. German does not have tag-questions in the English sense. In German, tags can occur inside or outside the intonational contour of an utterance, sometimes even separated from the utterance they are associated with by another speaker's utterance. Tags were coded as a separate utterance if they occurred outside the intonational contour of any utterance.

linguistic abilities on the part of the child at an older age. In most cases the adult measures to be reported below are surprisingly stable. Averages would not be informative for the children, as Simone's data are longitudinal, and there is only a single measuring point for Andreas. Andreas' age corresponded to Simone's at the first measuring point (Time 1), so his data appear directly under Simone's in the column labeled 2;1. The denominator for each measure is noted below each table.

For the Miller Corpus, the body of data consists of 11,389 utterances, 33% of which were contributed by Simone. For the adults, 90% of their utterances were analyzable. Simone's percentage of analyzable utterances is lower, ranging from 51% at Time 2, to 66 % at Time 1. Table 6.3 below shows the frequencies of all utterances, and frequencies and percentages of analyzable utterances (as calculated over all utterances).

Table 6.4 shows the frequencies of analyzable utterances and frequencies and percentages of verb-containing utterances (as calculated over analyzable utterances. The amount of analyzable speech contributed by each adult was not exactly equal in each file, but overall they were similar enough to be reported as one speaker's (*adult*) figure. Of the adults' speech, the father contributed 55%, the mother 45%.

6.3.2 Analyzed Utterances

To investigate the question of finiteness-marking on verbs, it was necessary to isolate all utterances containing at least one verbal element from all other analyzable utterances. In order to retain the maximum possible information in the data, while minimizing the risks for contaminating the analysis with ambiguous data (see discussion in Chapter 5), as many utterances as possible were included in the analysis. However, they were sorted into distinct categories, so that various analyses could be carried out, while taking into account potential ambiguities (see Boser, 1989, 1997, for the same strategy).

In total, 5,082 adult verb-containing utterances were analyzed, as well as 1249 verb-containing utterances of Simone's and 804 of Andreas. (Of the adult verb-containing utterances, 56% were contributed by the father, the rest by the mother.) Simone's proportion of verb-containing utterances increases over time, as is expected. In the last file she produces almost as many verbs as a proportion of analyzable utterances as the adults. It is interesting that the range of verbless utterances (the difference between analyzable and analyzed utterances) for the adults is as high as from 20 to 35% of analyzable utterances.

Table 6.3: Total number of utterances, and number and percentage of analyzable utterances.

child age	**2;1** Time 1			**2;7** Time 2			**2;9** Time 3					
										total		
	total n	a'able n	a'able %	total n	a'able n	a'able %	total n	a'able n	a'able %	total n	a'able n	a'able %
adult	2775	2568	93	2533	2242	89	2270	1995	88	7578	6805	90
Simone	1209	801	66	1221	708	51	1381	886	64	3811	2395	63
Andreas	-	1702	-	-	-	-	-	-	-	-	1702	-

Table 6.4: Number of analyzable utterances, and number and percentage of utterances containing verbs.

child age	**2;1** Time 1			**2;7** Time 2			**2;9** Time 3					
										total		
	a'able n	wV n	wV %	a'able n	wV n	wV %	a'able n	wV n	wV %	a'able n	wV n	wV %
adult	2568	1879	73	2242	1742	78	1995	1461	73	6805	5082	75
Simone	801	358	45	708	354	50	886	537	61	2395	1249	52
Andreas	1702	804	47	-	-	-	-	-	-	1702	804	47

Table 6.5 below illustrates how much speech in the discourse was due to Simone's contribution. The figures are given, from left to right, with respect to all speech, all analyzable speech and all analyzed speech. In each category values are given for each measuring point.

***Table 6.5**: Simone's contribution to the discourse in terms of percent of all speech, all analyzable speech and all analyzed speech.*

	all speech				analyzable speech				analyzed speech			
age	2;1	2;7	2;9		2;1	2;7	2;9		2;1	2;7	2;9	
Time	T1	T2	T3		T1	T2	T3		T1	T2	T3	
				av				av				av
Simone	30	32	38	33	28	24	31	26	16	17	27	20

Simone's contribution to the discourse does not seem to increase between Time 1 and Time 2, but at Time 3, her contribution is slightly higher than at Time 1.

6.4 CODING

The coding of the analyzable utterances was performed using the CLAN computerized tools of the CHILDES Workbench (MacWhinney and Snow 1990). Additional analyses were performed by hand. Each utterance was coded with a variety of codes referring to verb type, as well as to formal and interpretive aspects of the sentence. These codes, individually and in combination, provided a variety of information about a given utterance.

6.4.1 Verb Type

A relatively fine grain was chosen for scoring verb types. Each code expresses a number of coded properties, so that verb codes could be culled with respect to different relevant properties. In this way it was possible to keep track of a maximal number of coded properties, without making too big a commitment about the coding scheme at the outset. (Recall that the predictions had to be quite non-specific.) Because most of the 14 individual verb codes used do not figure per se in any of the analyses reported, I specify these only in Appendix 2, and restrict myself here to stating the four criteria, all of which are expressed by every verb code.

1. Is the verb a simplex or a complex verb?

A simplex verb is one consisting of a single element, i.e. one theta-assigning verb, one copula (a form of *sein*), or one modal. A complex verb consists of more than one element, typically of an auxiliary or modal (in auxiliary function) plus a thematic verb. This distinction was introduced in order to compare proportions of utterances with complex verbs in adults and children.

2. Is the verb thematic or not?

Simplex verbs were classed into "thematic" and "non-thematic" verbs. Thematic verbs are normal theta-role-assigning main verbs. Non-thematic verbs are the copula or modals. Recall that in German the modals have the general morpho-syntactic properties of main verbs. (The term "non-thematic" was used as a convenient umbrella term covering the copula and modals, on the assumption these verbs do not assign theta-roles in the way in which other main verbs do. This assumption is not crucial for the analysis however.) From the facts discussed in section 5.2.2 it was expected that neither adults nor children would use non-thematic verbs as the infinitive in RIs. The distinction in the verb codes allowed to test this expectation. The distinction also made it possible to calculate RIs as a proportion of those finite utterances excluding those with non-thematic simplex verbs.

It is interesting to compare these proportions in children and adults, because if neither adults nor children use modals in RIs, but both adults and RIs use modals in finite sentences,. If children and adults are more similar in these proportions than when RIs are calculated as proportions of all verb-containing utterances, it is suggested (though not shown) that children's interpretations of RIs and adult RIs overlap.

3. Does the verb occur in an utterance with one, two or more constituents?

This distinction allowed for extraction of adult and child utterances with differing utterance lengths (in terms of constituents). It was tested whether RIs were correlated to utterance length and whether the same length-effects (if any) existed in adults and children.

4. Is the verb utterance-initial, -second, or utterance-final?

This information was essential for separating non-finite utterances from finite ones. (see next section).

6.4.2 Definition of Root Infinitive

Root Infinitive utterances were determined, using the following definition:

(2) Working definition of Root Infinitive
A Root Infinitive is an utterance whose verb has an *-(e)n* affix which cannot be interpreted as 1st or 3rd person plural.

The definition proved straightforward for the analysis of adult speech, as it was always possible to discriminate between infinitival *-(e)n* and other uses of this suffix. Either context or verb position can be used reliably for adults. Ungrammatical uses of *-(e)n* did not occur in adults.

However, when put to use for child language, the definition in (1) failed to provide a precise enough criterion, because in the case of children, verb position and context are less reliable as sources of information. In addition, the children's propensity to use verbs with verb stems and verbs affixed with *-ə* (*"schwa"*) in utterance-final position, instead of the correct *-(e)n*, causes difficulty in determining the set of child RIs. In the next section, I explicate the ambiguities which occurred, and how they were dealt with in the analysis.

6.4.3 Ambiguities in Child Language

Unfortunately, there are numerous sources for misjudgment about child utterances. First, we cannot assume that all the elements necessary to express the intended meaning are present in the utterance. Second, even when all elements are present, or at least recoverable, by the hearer, the interpretation of an utterance may still be unclear in cases where intonation and stress patterns are not target-like. Another obstacle is that children sometimes utter isolated thoughts which are not connected to the preceding discourse. And, lastly, consider that adult speakers structure their utterances in accordance with what they assume to be the addressee's presuppositions and inferences in the given context. However, we cannot assume that children reliably structure their utterances in accordance with these Gricean principles. (See Chapter 8 for discussion). Thus as we may be frequently misled or unable to discover what a I child really meant to say (even when we have found one potential interpretation).

In the case of RIs these problems are acutely relevant, because one is studying properties (finite verb forms) which can be absent even in the target string. Thus, we will have to decide for each child utterance whether

finiteness was legitimately or illegitimately omitted. But, in light of the above insecurities, this is often not possible. Unfortunately, there is no principled solution to this methodological problem. We can only increase our effort to get to the meaning of child utterances by optimizing our methodology in suitable ways. For the case of children's RIs, this means that we have to look at every single example in its linguistic and non-linguistic context, in order to make a maximally informed guess about (a) what the child utterance could possibly have expressed and (b) what the child presumably intended to express with the utterance. This will give us a degree of certainty about their interpretations that is higher than chance, but absolute certainty will unfortunately not be possible.

In separating infinitival verb forms from finite verb forms in child language, the following strategy was pursued: If there was an overt 1st or 3rd person subject pronoun, the possibility that the utterance was a RI could be reliably excluded. (Overt plural subjects did not appear in the children's speech, and are rare in general in the speech of two-year-olds). The problem with the remaining cases is that we do not know whether children allow null-subjects in positions other than the utterance-initial topic position in finite constructions. If they do did, some constructions with verbs affixed by *-en* could potentially be finite sentences with 1st or 3rd person covert subjects. Context can be used to exclude a 3rd plural interpretation with relative safety, but often a 1st plural interpretation is compatible. So verb position had to be used as a further decision criterion.

In utterances with three or more constituents, verb position is usually unambiguous, but difficulty can sometimes be introduced by the ambiguity of proper names between sentential subjects and vocatives, and by postverbal subjects, or extra-posed arguments. By taking the possibility of these syntactic processes into account, and by referring to morphology and context, it was possible to make a decision for each utterance, so that no indeterminate category was necessary. For adults, this decision could be made with great confidence, for the children at least a maximally informed guess could be made.

Verb-position is frequently ambiguous in utterances with two and less constituents, listed in (3).

(3) Child utterances which are ambiguous with respect to verb-position
- two-constituent utterances in which the verb is second
- two-constituent utterances in which the verb is first, and extraposition of an argument to the right of the verb cannot be excluded
- utterances which consist only of the verb

In these cases, morphology and context were used in combination to make a maximally informed decision between finite and non-finite verbs. (Again, for adults, the decision was clearer for adults than for children in each case.)

Ambiguities occurred in judging verbal affixes for the children. They involved three different verb forms, namely bare verb stems, the *-t* inflection, and the *-e* inflection.[8]

First, bare verb stems in children's speech are ambiguous between a correct 1st person singular form, and an incorrect form in which the inflection has been omitted for some reason. Second, in children's speech the *-t* inflection can be ambiguous between a 3rd person singular form and a participial form. This is because children are known to leave out the participial prefix on the verb (*ge-*).[9]

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[8] There is a fourth ambiguity. This ambiguity involves the *-(e)n* inflection. Although this suffix is three ways ambiguous in children, it was *not* indeterminate for the analysis of morphological finiteness. As mentioned in the text, in the target *-(e)n* can mark 1st and 3rd person plural, or the infinitive. In children, with certain verbs, it can also constitute a participle with a left-off prefix *ge-*. The finite plural interpretation could always be excluded from context. Thus there was never an ambiguity between finite and non-finite with respect to the *-(e)n* inflection. The verbs whose participle ends in *-(e)n* typically involve a stem-vowel change in their participial form (e.g. *finden/gefunden*). If the child's verb from indicated a changed stem-vowel, it was classified as a participle, otherwise as an infinitive. (This method presupposes that children know which participles involve a stem-vowel change. There is some indication that they do. But even if they do not, there were only few verbs to which this particular ambiguity applied.)

[9] Not all forms ending in *-t* exhibit this ambiguity, only those which do not involve a stem-vowel change in the participial form. The method employed assumes that children always change the stem vowel when necessary. If they did not, all forms ending in *-t* would be ambiguous. In the verb-final utterances in at Time 1 there were overall very few thematic verbs ending in *-t*. At Time 2, all such forms occurred in utterances introduced by the complementizer *weil* (because), and could thus be assumed to be determinately finite. At Time 3, the likelihood that Simone does not know stem changes is low. Andreas, uses a

Lastly, children -- in particular Simone, at Time 1 -- sometimes use *-e* on verbs which are in a non-finite position. (In adult speech, *-e* is an *un*ambiguous, and optional marker for first person singular, and never occurs in the non-finite position, except in certain dialects, which are not represented in the sample studied.) In addition, Simone, at Time 1, uses *-e* in total 90 times in utterances with simplex verbs in finite position. There is never an overt first person subject, and for most cases it can be determined from the context that the implied subject is not 1st person. (At this young an age children typically refer to themselves with their name, i.e. a phrase requiring 3rd person agreement). Moreover, Simone persistently uses *-e* on the (utterance-final) thematic verb of utterances with complex verb forms. It seems therefore that Simone uses the *-e* inflection as a non-finite marker, rather than for first person singular. At Time 1 *-e* was therefore considered an infinitival affix. At Times 2 and 3, however, Simone used *-e* on simplex verbs a total of only 20 times, and no longer used it on the thematic verb in utterances with complex verb forms. At Time 2 and Time 3, *-e* was classified as indeterminate, unless an overt first person subject occurred.

Table 6.6 shows frequencies for occurrence of inflections which were non-classifiable despite these careful considerations. Figures are shown separately for utterances with three or more constituents, two-constituent utterances, and utterances consisting of the verb only.

***Table 6.6**: Frequencies of three kinds of indeterminate verb inflections in utterances with three or more constituents, two-constituent utterances, and utterances consisting of the verb only.*

	3-plus				2-constituent				verb-only		
Simone	-e	-0	-t		-e	-0	-t		-e	-0	-t
Time 1	0	2	2		0	5	0		0	7	1
Time 2	0	0	0		7	4	2		1	2	0
Time 3	1	2	0		4	2	4		2	16	2
Andreas	1	6	0		0	10	6		0	39	2

number of finite verb-forms with appropriately changed stem-vowels and also a few non-finite ones.

6.4.4 Illocutionary Analysis

The illocutionary function of each RI utterance was determined using the three-way classification of illocutionary functions which was introduced in Chapter 2. I repeat the definitions for each one below, and provide, for each type, two adult examples. In each case, one example is an adult RI taken from the Miller Corpus, and the other a finite clause with the same illocutionary interpretation as the RI had in context. The finite clauses are constructed to form a minimal pair with each RI.

Declarative: Asserts the content of the proposition in the utterance.

(4) a. Nur einmal reinschlagen. (adult RI, Miller Corpus)
only once in-pound-*inf*

b. Ich schlage nur einmal rein. (finite root clause)
I pound-*fin* only once in

"I am going to pound on it only once."

Imperative: Solicits future action on the part of the addressee, as described by the proposition in the utterance.

(5) a. Nicht stossen! (adult RI; Miller Corpus)
not push-*inf*

b. Du darfst es nicht stossen! (finite root clause)
you must-*fin* it not push-inf

"Don't push it!"

Interrogative: Solicits information from the addressee with respect to some aspect of the proposition.

(6) a. Auch noch 'n bisschen Suppe essen? (adult RI, Miller Corpus)
also still a little soup eat-*inf*

b. Willst du auch noch 'n bisschen Suppe essen? (finite root clause)
want-*fin* you also still a little soup eat-*inf*

"Do you want some more soup?"

Ambiguities also occurred in this type of analysis. This is because, for instance, to decide between imperative and declarative, one has to know who the utterance is addressed to. In commands the addressee and the subject have the same referent. Information about the addressee must almost always be taken from the context (unless there is a vocative present in the utterance). An utterance is usually -- on the surface -- ambiguous between a declarative and an imperative, if it does not have an overt subject either, or if what looks like an overt subject could also be interpreted as a vocative referring to a discourse participant. This is the case for the examples in (7):

(7) a. Hubschrauber putzen. (A 2;1)
helicopter clean-*inf*

b. Nikolaus auch gucken. (A 2;1)
Santa Claus also look-*inf*

For (7a) it could be that Andreas is addressing someone asking the person to clean the helicopter (an imperative), or he could be saying that he wants to clean the helicopter, or is in the process of cleaning it. From the discourse it could be determined that Andreas was referring to his own activity of cleaning his toy helicopter. (7b) could be addressed to the Santa Claus puppet, which present in the discourse, or it could be a statement about Santa Claus. For this utterance it could not be decided which was the intended interpretation by Andreas.

In contest, and examples like in (8) are unambiguous, because the first person subject excludes a command. In (8b) the subject is a name, but it has reference to the speaker.

(8) a. Nee Mone nich heia machen. (S 2;1)
no Mone not sleep make-*inf*
"Mone does not want to go to sleep."

b. Ich erst ma das Buch angucken. (S 2;9)
I first part the book at-look-*inf*
"First I am going to/want to look at the book."

For the cases which were ambiguous on the surface, the decision could be made with great confidence, taking into account all available contextual information. If the context did not provide secure criteria (which differed on a case-to-case basis), the utterance was classed as "indeterminate".

6.4.5 Temporal Analysis

The analysis with respect to the predicate of each RI was carried out by determining whether it referred to a future, a present, or a past Event. The categories future, present and past are defined below and are exemplified below with an adult and a child RI from the corpora.

Future: Predicate refers to an Event with will (potentially) happen after speech time.

(9) a. Tauschen? (adult, Miller Corpus)
swap-*inf*
"Do you want to swap?"

b. Achtung schön festhalten. (S 2;6)
caution nicely on-hold-*inf*
"Careful, hold on tightly!"

Present: Predicate refers to an Event which is going on at speech time.

(10) a. So, abtropfen. (adult, Miller Corpus)
particle drain-*inf*
"And now the pasta is draining."

b. Wasser holen. (A 2;1)
water get-*inf*
"He is getting water."

Past: Predicate refers to an Event which happened prior to speech time (i.e. a completed Event).

(11) a. Thorsten auspusten. (A 2;1)
Thorsten out-blow-*inf*
"Thorsten blew it out."

There was no adult example of a RI with past interpretation in the corpus. I repeat here one from diary notes, which was discussed in Chapter 2:

(12) Und dann noch die U-Bahn nehmen! (diary)
and then still the subway take-*inf*
"And after all of this we still had to take the subway."

With respect to the temporal analysis too, not all utterances could be classified unambiguously. If an utterance was ambiguous between present and future, it was kept track of in a separate category. This was in order to get a more clear idea of how many utterances referred to past Events. Some utterances were entirely indeterminate, and were kept track of separately.

Declarative RIs were then further analyzed with respect to whether a future Event was desiderative or not:

Desiderative: The predicate refers to a desired Event, but the utterance is not an imperative. The (explicit or implicit) subject is 1st or 3rd person. The fulfillment of the desire may or may not require action on the part of the addressee.

(13) a. Ach, nur ein bisschen in der Ecke sitzen. (adult, Miller Corpus)
oh only a little in the corner sit-*inf*
"I just want to sit over here in the corner a little bit."

b. Thorsten Ball haben. (A 2;1)
Thorsten ball have-*inf*.
"Thorsten shall have the ball."
or "I want Thorsten to have the ball."

Non-desiderative: The predicate refers to a future Event, but the utterance is not a desiderative.

(14) a. Mal sehen, ob ich das finde. (adult, Miller Corpus)
particle see-inf whether I this find-fin.
"We/I will see whether I can find it."

b. Ich hineintun. (A 2;1)
I in-put-*inf*
" I am going to put it in."

In declarative RIs with future reference and a first person subject, the decision between desiderative and non-desiderative can be difficult, even when all available contextual is taken into consideration. The utterance could mean "I am going to x" or "I want to x". This is an example of the more general problem, mentioned in Chapters 2 and 3, of classifying future interpretations, as they share charactersistics of tense as well as of modality. In the examples where this was relevant, it was determined on the basis of context whether the speaker intended to express a desire or was more likely to express a neutral statement about the future. A few utterances were not classifiable and appear under "indeterminate" in the tables.

Note that in general Andreas' speech exhibits the most ambiguities (in proportion to utterances analyzed), because no audiotapes were available. Especially for distinguishing between declaratives and imperatives intonation and stress patterns can be helpful.

RESULTS: ROOT INFINITIVES IN ADULT AND CHILD SPEECH

CHAPTER 7

Before the analysis of RIs is presented, results with respect to some measures concerning all analyzed utterances are given. These data will serve later to show that certain trends which are apparent in the longitudinal analysis of Simone's RIs and of the adult RIs are not mirrored in the analysis of all verb-containing utterances by the respective speaker. By implication, RIs in those respects, do not behave like finite clauses.

7.1 GENERAL ANALYSIS

It will be interesting to see from the data presented in this section, how, despite some global differences, adults and children behave quite similarly along a number of dimensions, for instance how certain phenomena are a function of utterance length. Recall that only root utterances which contained a verb were analyzed.

7.1.1 Utterance-length in terms of constituents

As the first general measure, Table 7.1 shows the break-down of all verb-containing utterances according to length in terms of constituents. (As noted earlier, adverbs and particles counted as constituents.) Figures are shown separately for utterances which consisted of three or more constituents (the verb plus two or more constituents), two constituents (the verb plus another constituent) or the verb alone. These categories are labeled *3-plus*, *two-constituent*, and *verb-only*, respectively, and will be referred to as such in the text. Adult percentages are quite stable in all categories: The percentage of 3-plus utterances is consistently high at around 90%. The percentage of two-constituent utterances is at 10% or less, with the average at 8%. Verb-only utterances are rare in adults, on average only 1%.

As one would expect from the children's ages at each measuring point (and their respective MLU-W values -- see Chapter 6, section 6.2), their percentage of 3-plus utterances is lower than that of adults, and their percentage of two-constituent and verb-only utterances is higher than that of the adults. It is in line with these expectations that Simone shows development in the direction of the adult figures in each category. Her

***Table 7.1**: Percent of verb-containing utterances which consist of three or more, two, and one constituents*

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
	%[a]	%[a]	%[a]	%[a]
3-plus				
adults	88	92	92	91
Simone	50	65	82	-
Andreas	53	-	-	-
two-constituent				
adults	10	6	7	8
Simone	33	29	12	-
Andreas	31	-	-	-
verb-only				
adult	2	1	1	1
Simone	17	5	6	-
Andreas	16	-	-	-

[a] Denominator = all verb-containing utterances.

percentage of 3-plus utterances is at 50% at Time 1, reaching 82% at Time 3 (adult average: 91%). Her percentage of two-constituent utterances is 33% at first, and decreases to 12% (adult average: 8%). Her percentage of verb-only utterances is 17% at first, and decreases by over 10% by Time 2, not decreasing any further by Time 3 (adult average: 1%).

Thus in looking at how all utterances with verbs distribute over the three length-related categories, Simone at Time 3 shows similar figures as her parents. Andreas' percentages are highly similar to Simone's at Time 1 in all three categories, as expected.[1]

[1] Given the similarity of Andreas' values with Simone's, it is surprising that Andreas' W-MLU exceeds Simone's by almost 1.25 (see Chapter 6). Either one or both of the following conclusions can be drawn: Andreas' constituents consist of more words. (MLU-Ws are counted in words, the figures above are calculated in terms of constituents.) Alternatively, Andreas' utterances in category *3-plus* are longer on average than Simone's in that category.

7.1.2 PERCENTAGE OF UTTERANCES WITH A THEMATIC VERB

Table 7.2 allows a comparison of adult and child utterances in terms of the percentage of utterances which contain a thematic verb. The measure was calculated over all verb-containing utterances.

Table 7.2: Verb-containing utterances with a thematic verb

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
thematic verb	%[a]	%[a]	%[a]	%[a]
adults	75	77	76	76
Simone	63	69	71	-
Andreas	65	-	-	-

[a] Denominator = all verb-containing utterances.

The adult proportion is quite stable at three quarters of all verb-containing utterances. The values for the children at Time 1 are between 10% and 13% lower than the adult average of 76%. Simone's percentage increases somewhat in the direction of the adult's, so that by Time 3 the difference between her and her parents is only 5%.

If we look at the same figures, but analyzed separately according to utterance-length, we see that the development for Simone is mainly in the category of 3-plus utterances. Table 7.3 illustrates this.

In the category of 3-plus utterances, the adult percentage ranges between 66% and 72%, whereas the children at Time 1 lag behind at 41% (Simone) and 38% (Andreas). At Time 2, Simone's percentage has increased to 55%, and at Time 3, her 60% come even closer to the adult average of 68%.

In contrast, in the category of two-constituent and verb-only utterances children's values are similar to the adults' from the outset. Concerning two-constituent utterances, the adult average is at 87%, and the children's are actually slightly higher overall, ranging from 85% (Simone, Time 2) to 98% (Andreas). In the category of verb-only utterances, the verb is thematic 100% of the time for all speakers.

Children thus were as likely to use a thematic verb as the adults, when the utterances consisted only of the verb. Children were slightly more likely than adults to use a thematic verb when the utterance consisted of the verb and another constituent. Children were less likely than adults to use a

Table 7.3: Utterances containing a thematic verb calculated separately as percentages of utterances consisting of three or more, two, and one constituents.

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
3-plus	%[a3]	%[a3]	%[a3]	%[a3]
adults	66	72	67	68
Simone	41	55	60	-
Andreas	38	-	-	-
two-constituent	%[a2]	%[a2]	%[a2]	%[a2]
adults	84	91	86	87
Simone	87	85	95	-
Andreas	98	-	-	-
verb-only	%[a1]	%[a1]	%[a1]	%[a1]
adult	100	100	100	100
Simone	100	100	100	-
Andreas	100	-	-	-

[a3] Denominator = verb-containing utterances with three or more constituents.
[a2] Denominator = verb-containing utterances with two constituents.
[a1] Denominator = verb-containing utterances consisting of the verb only.

thematic verb than adults when the utterance contained three or more constituents.

7.1.3 Simple vs. complex verb constructions

As discussed in Chapter 5, some theories correlate the decrease in child RIs with an increase in complex-verb constructions. It is then worthwhile comparing children and adults with respect to what percentage of utterances contained complex verbs. Complex verbs occured only in utterances longer than two constituents. For additional detail, utterances with a simplex verb are broken down into ones with a simplex thematic verb and ones with a simplex non-thematic verb. Because in two-constituent and verb-only utterances children and adults behave similarly with respect to thematicity of the verb (see Table 7.3 above), we can restrict the analysis now to 3-plus utterances.

***Table 7.4**: Percent of 3-plus utterances containing a simplex thematic, a simplex non-thematic and a complex verb in utterances consisting of at least three constituents.*

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
simplex thematic	%[a3]	%[a3]	%[a3]	%[a3]
adults	49	54	51	51
Simone	51	54	58	-
Andreas	62	-	-	-
simplex non-them.				
adults	25	22	25	24
Simone	37	31	29	-
Andreas	35	-	-	-
complex				
adult	26	23	25	25
Simone	12	15	13	-
Andreas	3	-	-	-

[a3] Denominator = verb-containing utterances with three or more constituents.

The figures show that, in 3-plus utterances, children use somewhat more simplex verbs in the category of simplex thematic and the category of simplex non-thematic. The children's percentage of complex-verb constructions is smaller than the adult's, but, notably, Simone's percentage does not change in a discernible way over time.

Only when calculated as a proportion of all verb-containing utterances, do the figures for complex-verb constructions show the developmental increase in complex-verb utterances which Jordens (1990) and Wijnen (1994b) have noted in other children (see Chapter 5) These figures are given in Table 7.5.

Between Time 1 and Time 3 the percentage of Simone's complex-verb utterances doubles when calculated as a percentage of all verb-containing utterances, but even at Time 3 the percentage constitutes only half of the parental percentage. The increase of her proportion of complex verbs shown in Table 7.5 must be due to the fact that Simone's *overall* percentage of two-constituent and verb-only utterances decreases over time (as was attested to

***Table** 7.5: Percent utterances containing complex verb in all verb-containing utterances.*

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
complex verbs	%[a]	%[a]	%[a]	%[a]
adult	23	22	23	23
Simone	6	10	11	-
Andreas	2	-	-	-

[a] Denominator = all verb-containing utterances.

in Table 7.1) combined with the fact that just these categories (two-constituent and verb-only utterances) do not contain any complex verb constructions. As the denominator in the percentages of Table 7.5 becomes increasingly larger for Simone over time (while the numerator stays the same as in Table 7.3), percentages increase (while they remain stable in Table 7.4).

As complex-verb constructions do not increase as a proportion of 3-plus utterances (the only category in which they exist in the first place), this could indicate that some of Simone's early two-constituent and verb-only constructions are realized as complex-verb constructions at Time 2 and Time 3. In particular one might hypothesize that it is the RI constructions in this category which get turned into complex-verb constructions. I will address this hypothesis further in section 7.2.1.2 where I discuss the relationship between RIs and utterance-length.

7.2 ANALYSIS OF ROOT INFINITIVES

The analysis of RIs to follow should be seen against the background of the broader measures reported above. I will refer back to those results as necessary.

7.2.1 Magnitude of the phenomenon

I present the data concerning the magnitude of RIs according to two different measures. To provide a way to compare adults and children with a general measure, I present the percentage of RIs first as a proportion of all utterances. To add detail, I then show two length-related measures. First I compare how long children's and adult RIs were. Then I look at whether there is a correlation between RIs and utterance length. It turns out that Simone's

proportions develop toward her parents' proportions with respect to both measures. The results also shed some light on whether RIs could be the due to a length-related processing effect.

7.2.1.1 In terms of all utterances

Table 7.6 below calculates the percentage of RIs over all utterances containing verbs. In addition, percentages are given for root participial clauses (RPs), in order to show that they are a proportionately smaller phenomenon in the adults and the children. Percentages for indeterminate utterances for which it could not be decided whether they were infinitival, participial, or finite are also give. The raw frequencies are given in parentheses.

For adults, the percentage of RIs is 3% on average. The range is only 1% in each direction. While 3% may sound a low percentage, a target phenomenon of this size should not be neglected. The figure implies that every 33rd adult utterance containing a verb is infinitival. (In the particular corpus here, this corresponded to one adult RI every seven minutes on average.) Many other grammatical and lexical phenomena, which are arguably much rarer, must be systematically acquired, for instance the use of the pluperfect tense, of bound anaphora, or even the use of individual lexical items.

As expected, the children show higher percentages of RIs. For Simone at Time 1, 32% of verb-containing utterances are RIs. This is ten times the adult percentage, and implies that every third utterance of Simone's with a verb was a RI. (This corresponds to one RI every 3 minutes on average). For Andreas, RIs make up 25% of utterances with verbs (or one per minute). Simone's RIs reduce to 10% by Time 2 (one every 9 minutes), and by Time 3 she produces only 6% RIs (one every 9 minutes). While the number of tokens is too small to decide whether the step between Time 2 and Time 3 is a statistically significant developmental effect, the last percentage constitutes still twice as many as the adults produce on average.

With respect to participial utterances, children (especially at Time 1) produce more than adults, but both adults and children produce very few examples. The percentage of indeterminate utterances, for which it could not be decided whether they were infinitival, participial or finite root clauses (see Chapter 6, section 6.4.3), ranges from 5% to 8% in the children, and in adults it is below 1%. Potentially then, children's percentages of RIs and RPs may be somewhat higher than the numbers given here indicate.

Table 7.6: Percentages and frequencies of infinitival, participial and indeterminate root utterances, calculated over all utterances with verbs.

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
Root Infinitive	%[a] (n)	%[a] (n)	%[a] (n)	%[a]
adults	4 (68)	2 (39)	3 (39)	3
Simone	32 (116)	10 (35)	6 (34)	-
Andreas	25 (203)	-	-	-
Root Participle				
adults	<1 (4)	<1 (4)	<1 (5)	< 1
Simone	2 (7)	2 (6)	1 (4)	-
Andreas	3 (27)	-	-	-
indeterminate				
adult	<1 (3)	0 (0)	0 (0)	< 1
Simone	5 (17)	7 (26)	6 (33)	-
Andreas	8 (62)	-	-	-

[a] Denominator = all verb-containing utterances.

Note that all of the children's figures are quite compatible with what has been said by others about the magnitude of the RI phenomenon (compare with Figures 1 and 2 in section 5.1.2). In addition we now have, at least for one corpus, a comparative measure for the input language. It is evident that Simone's use of RI decreases in the direction of the adult level over time, but she does not quite reach adult behavior by Time 3.

7.2.1.2 As a function of utterance length

As a second measure for the magnitude of the RI phenomenon in adults and children, I illustrate now how RIs and utterance length are related in adults and children. As mentioned in Chapter 5, some previous developmental accounts have motivated the existence of RIs by processing limitations. Although it has not explicitly been proposed, one hypothesis in this vein would be that RIs are the result of a processing bottle-neck more likely to

occur in longer utterances than in shorter ones.[2] The distribution of RIs over our three categories of utterance length (3-plus, two-constituent, and verb-only) is given in Table 7.7.

***Table 7.7** : Distribution of RIs in terms of utterance length: Percentages with three or more, two and one constituents.*

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
3-plus	%[n]	%[n]	%[n]	%[n]
adult	39	32	50	40
Simone	16	22	40	-
Andreas	32	-	-	-
two-constituent				
adult	45	47	50	47
Simone	48	59	34	-
Andreas	50	-	-	-
verb-only				
adult	16	21	0	19
Simone	36	19	25	-
Andreas	18	-	-	-

[n] Denominator = all Root Infinitive utterances.

At all measuring points and for all speakers, the fewest RIs consist of the verb alone, except for Simone at Time 1. For the adults, most RIs fall into the two-constituent or 3-plus categories. Except at Time 2, where exactly half of the RIs have two, and half of them have more than two constituents, the highest proportion of RIs is found in the 2-constituent category. (For some reason no verb-only RIs were found for the adults at Time 3).

Although the range of adult percentages in each category is somewhat wide, Table 7.8 highlights a number of issues at hand, when compared to the child values. First, Andreas looks remarkably similar to the adults with respect to this measure. Second, at Time 1, Simone's amount of RIs in the 3-plus category is relatively low (16%), when compared to both the value for Simone at Time 3 (40%), and the adult figures (40% average). Figures for two-

[2] Such an argument would be along the lines of Bloom's (1990) proposal that children are more likely to omit subjects in the context of longer VPs than in the context of shorter VPs.

constituent and verb-only RIs are harder to interpret, but *taken together* they do decrease, and Simone's figure at Time 3 is clearly within the range of the adult figure, as Table 7.8 illustrates:

Table 7.8: percent Root Infinitives with less than 3 constituents.

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
two-const.& verb-only	%[n]	%[ri]	%[ri]	%[ri]
adult	61	68	50	60
Simone	84	78	59	-
Andreas	68	-	-	-

[ri] Denominator = all Root Infinitive utterances.

The point which can be made with these figures is that Simone's RIs tend to get longer with time. This is of course expected; as overall her utterances get longer. However, comparing the distribution of RIs in terms of length shown in Table 7.8 with the distribution of *all* utterances with verbs in terms of length reveals that RIs are more likely to have less than three constituents than utterances in general. This is true for all speakers, as Table 7.9 shows.

Table 7.9: Percent utterances with less than 3 constituents.

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
two-const.& verb-only	%[a]	%[a]	%[a]	%[a]
adult	12	7	8	9
Simone	50	34	18	-
Andreas	47	-	-	-

[a] Denominator = all verb-containing utterances.

These data imply that RIs tend to be shorter than finite clauses. Note that this holds of the children and the adults. The data also show that in terms of length Simone develops toward her parents, not only overall, but also with respect to her RIs. Overall her utterances become longer, with respect to RIs alone, however they become shorter. From the perspective of the approach taken in this thesis this is an aspect in which the child's grammar converges

on adult uses of RIs, and not on the elimination of RIs. At present it is unclear what property of the grammar would determine this length-related effect in RIs. However, since utterance-length in terms of constituents is a reflection of how many constituents are overtly expressed, it is at least plausible that the origin of this reflex is in the discourse-pragmatic domain.

In section 7.1.3 above I hypothesized that some of Simone's early two-constituent and verb-only utterances are realized as complex-verb utterances at a later time. However, the data just shown suggest that more RIs are short utterances (consisting of only the verb, or of the verb and another constituent) at a later time than at an earlier time. This means that it cannot be the one- and two-constituent RIs which become realized as complex-verb constructions at a later age. This conclusion does not support a theory which attributes young children's RIs to a lack of competence knowledge concerning complex verbs or complex verb constructions, because one would expect the proportion of short RIs to decrease relative to the proportion of long RIs. The opposite is the case.

The results of this section so far could be taken to be in line with the hypothesis that RIs are due to a length-related processing bottle-neck. However, a striking effect emerges, if we compare how frequently RIs occur *proportionately* in utterances of different length. That is, we ask the question how frequent are RIs *within* each length-related category. Table 7.10 shows that RIs did not occur equally frequently in utterances of different length, in either the adults or the children.

The main effect shown by Table 7.10 is that for Simone and her parents, the shorter the utterance is in terms of constituents, the more likely it is that the utterance is infinitival. This is the same effect which was also demonstrated by Table 7.9 above.

For adults at Time 1 and 2, the percentage of RIs is lowest in the 3-plus category. The range at Time 1 and 2 is very small for adults in every category. At Time 3 the previously noted absence of verb-only RI utterances make the adult figures for that measuring point hard to interpret.

Also, Simone at all three measuring points produces proportionately the least RIs in the category of 3-plus utterances (range: 17% - 5%, compared to 45% - 17% of two-constituent utterances, and 69% - 39% of verb-only utterances). If we assume the adult figures at Time 3 are exceptional (as they are so consistent at the other two times), Simone's proportions at Time 3 are within the adult range for two-constituent and verb-only RIs. In the category

Table 7.10: Percentages of Root Infinitives in utterances consisting of three or more, two, and one constituents.

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
3-plus	%[a3]	%[a3]	%[a3]	%[a3]
adults	2	1	2	2
Simone	17	5	5	-
Andreas	14	-	-	-
two constituents	%[a2]	%[a2]	%[a2]	%[a2]
adults	15	18	19	17
Simone	45	21	17	-
Andreas	54	-	-	-
verb only	%[a1]	%[a1]	%[a1]	%[a1]
adult	44	39	0	42
Simone	69	39	39	-
Andreas	26	-	-	-

[a3] Denominator = verb-containing utterances with three or more constituents.
[a2] Denominator = verb-containing utterances with two constituents.
[a1] Denominator = verb-containing utterances consisting of the verb only.

of 3-plus RIs, Simone produces more than double the adult proportion, but numbers are too small to determine whether this constitutes a statistically-significant difference.

What is strikingly apparent from the figures in Table 7.10 is that when one looks at the proportion of RIs within utterances of different length, the figures become more similar for Simone and her parents over time. That is, for both adults and Simone, a small proportion of utterances which contain at least 3 constituents are RIs, but a large proportion of utterances which consist only of the verb are RIs. Slightly under 20% of utterances with two constituents (one of which is a verb) contain RIs.

Andreas, like all the other speakers, has proportionately the fewest RIs in the 3-plus category. His percentage of RIs in utterances consisting of the verb only is at 26% much lower than Simone's (69%). Andreas' percentage is highest in two-constituent utterances (54%).

While the samples in some cells are too small to claim a statistically-significant effect, I believe that the overall picture conveyed by the figures in Table 7.11 speak against an account for RIs in terms of a length-related processing bottle-neck (which, as discussed, has not been proposed, but is a plausible hypothesis). This is because such a theory would predict that the *longer* the utterance is, the more likely it is that the utterance is infinitival. As we find just the opposite in adults and children, such an account is unlikely to be true in any obvious way.

7.2.1.3 Discussion

While the above data on the magnitude of the RI phenomenon can be no more than a few additional pieces in the mosaic researchers are putting together about the RI phenomenon of child speech, I believe that some conclusions can be drawn.

Simone can be said to converge on adult behavior in that we have discovered a trend for the general magnitude of the RI phenomenon, and for the distribution of RIs across utterance-length-related categories, to become more similar with time to the respective adult values. I have also shown some counterevidence for a theory which would attribute child RIs exclusively to a processing bottle-neck related to utterance length (in terms of constituents).

Recall that in Chapter 2 I have already excluded processing reasons as the sole cause for adult RIs. However, the possibility that processing factors play a role in contexts where the grammar already permits RIs cannot be excluded. In other words, it may be that, given the choice between a RI and a finite construction by the grammar, processing considerations become apparent. If processing pressure is greater on children, they might make the choice in favor of a RI infinitive more often. However, the data above speak against a processing explanation which is related to utterance length.

Moreover, the data above also disfavor an explanation in terms of a genuine optionality in the child's grammar. We would simply not expect any length-related effects and we would not expect the increasing similarity between child and adult RIs. To explain these effects, an account embracing optionality would need to bring in additional mechanisms. But then optionality as a property specific to child grammar becomes a redundant explanation.

7.2.2 Illocutionary analysis of Root Infinitives

In Chapter 2 it was argued that there is no restriction on the illocutionary function of RIs in the target language. Nevertheless, the literature has reported the impression that children use RIs as declaratives when they should not. The results of this section speak to this issue. Table 7.11 presents the results of the classification of RIs in terms of three illocutionary functions. Raw frequencies are given in parentheses.

At all measuring points, the majority of the *children's* RIs are declaratives. For both children at Time 1 the percentage of declarative RIs is four times that of their imperatives. At Time 2, Simone's figures look more similar to those of her parents, but still she produces more declarative RIs than the adults, and the adults produce more imperative RIs than she does. However, at Time 3 the values for Simone are almost exactly like the adult values. This may indicate a change in the use of RIs for Simone. Over time, she uses RIs less often as declaratives, and more often as imperatives.

With regard to imperatives, Simone's percentage at Time 1 is 19%, and doubles by Time 3. At 14%, Andreas' percentage of imperative RIs is comparable to Simone's at Time 1. At Time 1 the majority of adult RIs are imperatives (63%, compared to 27% declaratives). At the two later measuring points adults produce fewer imperatives (32% and 40%), and more declaratives (around 50%).

Interrogative RIs are below 10% in the children, and in adults they range from 3% (Time 3) to 11% (Time 1).

Again, due to small sample size in some cells, it is not clear whether some of the differences just mentioned are significant. If they are, they may be due, in the parents case, to their using more declarative utterances as indirect imperatives, or, alternatively, to a dissimilar discourse-situation which requires less commands. Simone's decreasing proportion of declaratives is however quite impressive, and what is most striking is that at Time 3 her RIs distribute over the three illocutionary categories in the same way as the RIs uttered by the adults do.

Table 7.11: Illocutionary functions of Root Infinitives: Percentages and frequencies of Root Infinitives that were used as declaratives, imperatives, and interrogatives.

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
declaratives	%[ri] (n)	%[ri] (n)	%[ri] (n)	%[ri]
adult	27 (15)	56 (19)	58 (22)	47
Simone	81 (91)	69 (22)	59 (19)	-
Andreas	61(118)	-	-	-
imperatives				
adult	63 (35)	32 (11)	40 (15)	45
Simone	19 (21)	25 (8)	38 (12)	-
Andreas	14 (28)	-	-	-
interrogatives				
adult	11 (6)	6 (2)	3 (1)	7
Simone	0 (0)	0 (0)	3 (1)	-
Andreas	9 (17)	-	-	-
indeterminate				
adult	0 (0)	6 (2)	0 (0)	3
Simone	1 (1)	6 (2)	0 (0)	-
Andreas	16 (31)	-	-	-

[ri] Denominator = all Root Infinitives.

7.2.3 Temporal analysis of Root Infinitives

The temporal analysis is reported first for all RIs, and then separately for declaratives, which constitute the illocutionary category in which children had the highest percentage of RIs at the early ages. Declaratives are also of the most interest, because for the children they contain the highest proportion of RIs which are potentially semantically or pragmatically ill-formed.

For the children and the adults at all measuring points, the majority of RI utterances refer to future events. Percentages are above 70 % at all times for the adults and Simone. Andreas' percentage of RIs which refer to future events is 66%.

Children and adults refer to on-going events with RIs, but less frequently. Percentages are below 10% for all speakers at all times.

The percentages for those utterances for which the decision between a future or a present interpretation could not be made range between 0% and 12% for the adults, and between 6% and 9% for the children.

Events that happened prior to speech time are referred to rarely with RIs by the children, and never by the adults. It was said in Chapter 2 that in German RIs can not refer to a past event, if reference time (R) coincides with speech time (S), and that in normal discourse R does coincide with S.

One of the few examples where a child seemed to refer to the past is (1):

(1) Thorsten Ball *haben*. (A 2;1)
Thorsten ball have-*inf*

(1) was uttered by Andreas when Thorsten had previously been in possession of a ball, but it was not clear from the transcript whether Thorsten was still in possession of the ball at the time Andreas made the utterance in (1). At least three scenarios are possible with respect to the specification of finiteness in (1). I discuss these in turn.

First, if (a) Thorsten was no longer in possession of the ball, and (b) example (1) was used by Andreas to refer to this past Event, and (c) R is anchored at speech time in the utterance, then (1) is semantically ungrammatical, as this particular analysis is not allowed in adult German, according to the Non-Completedness Constraint in Chapter 2. I give an illustration for the temporal interpretation of (1) in (1'). (For explication of the diagram see Chapter 2).

(1')

```
                R
                S
---++++++++++++---->        +++ = Situation Time
  *************             **** = Topic Time
```

Second, if Thorsten was still in possession of the ball at the time of the utterance, and Andreas was referring to this state, the utterance does not violate any of the semantic principles concerning RIs which were discussed in Chapter 2 (and summarized at the beginning of Chapter 3). Note, however, that the verb in (1) is non-eventive ("have"). As discussed in section 2.5.2, adult RIs, for reasons not entirely clear, typically contain eventive verbs. As far as I can see, if, as is normal, R coincides with S in (1), this example is illformed because of the type of verb used, not because of its

Table 7.12: Temporal interpretation of Root Infinitives: Percentages and frequencies of utterances in which the verb refers to a future, present, or past event.

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
future	%[n] (n)	%[n] (n)	%[n] (n)	%[n]
adult	84 (47)	79 (27)	100 (38)	88
Simone	72 (83)	78 (25)	78 (25)	-
Andreas	66(129)	-	-	-
present				
adult	7 (4)	6 (2)	0 (0)	4
Simone	9 (10)	0 (0)	9 (3)	-
Andreas	9 (18)	-	-	-
pres./future				
adult	4 (2)	12 (4)	0 (0)	5
Simone	7 (8)	9 (3)	6 (2)	-
Andreas	9 (7)	-	-	-
past				
adult	0 (0)	0 (0)	0 (0)	0
Simone	6 (7)	3 (1)	0 (0)	-
Andreas	5 (9)	-	-	-
indeterminate				
adult	5 (3)	3 (1)	0 (0)	1
Simone	4 (5)	9 (3)	6 (2)	-
Andreas	6 (11)	-	-	-

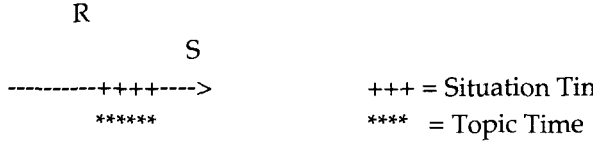
[n] Denominator = all Root Infinitives

semantic finiteness features. The FFM which illustrates these is in (1''):

(1'') R
S
---++++++++++----> +++ = Situation Time
******** **** = Topic Time

A third scenario is that R did not coincide with S. This is the case if Andreas referred to Thorsten's having the ball from the perspective of the past, as is illustrated by (1'''):

(1''')



In adult language, this configuration is stylistically marked and presumably would not be used unless one was narrating events. It is not known whether children keep R at S when they speak in dialogue.

It simply cannot be decided which semantic feature matrix Andreas intended to express, and that it is therefore impossible to tell why the example is ungrammatical.

With respect to the child RIs which at least potentially refer to the past, it is interesting that at Time 3, no such examples are found. Occurrences of them at the first two measuring points are too few in to know whether this constitutes a statistical effect.

Concerning this temporal analysis, the overall results for the children are very much in line with the results Wijnen (1997) presented for four Dutch children.

Since the children at Time 1 differed from the adults in the amount of declarative RIs they produced, and since the intuition is that children's declarative RIs are particularly flawed, a separate temporal analysis of RI declaratives was carried out. Recall that declaratives were coded for two types of future events, desiderative and non-desiderative events. In desideratives the

the predicate refers to a desired event, but the utterance is not an imperative. (Imperatives have to have a 2nd-person subject and refer to an Event that the addressee is asked to carry out.) The (explicit or implicit) subject in a desiderative is 1st or 3rd person. The fulfillment of the desire may or may not require action on the part of the addressee. The category of non-desideratives in Table 7.13 consists of utterances in which the predicate refers to a future event, but the utterance is not a desiderative by the criteria just mentioned. As Table 7.13 shows, the introduction of this distinction into the temporal analysis brings out a difference in the interpretation of children's and adults' declarative RIs.

***Table 7.13**: The interpretation of declarative Root infinitives: Percentages and frequencies of desiderative future, non-desiderative future, present, and past events.*

child age	2;1 Time 1	2;7 Time 2	2;9 Time 3	
				average
desid. fut.	%[id] (n)	%[id] (n)	%[id] (n)	%[id]
adult	0 (0)	11 (2)	23 (5)	12
Simone	66 (60)	45 (10)	37 (7)	-
Andreas	47 (56)	-	-	-
non-desid.fut.				
adult	60 (9)	53 (10)	76 (16)	63
Simone	5 (5)	32 (7)	32 (6)	-
Andreas	15 (18)	-	-	-
Present				
adult	27 (4)	11 (2)	0 (0)	13
Simone	11 (10)	0 (0)	16 (3)	-
Andreas	15 (18)	-	-	-
pres./future				
adult	13 (2)	21 (4)	0 (0)	11
Simone	10 (9)	9 (3)	11 (2)	-
Andreas	6 (7)	-	-	-
Past				
adult	0 (0)	0 (0)	0 (0)	0
Simone	8 (7)	5 (1)	0 (0)	-
Andreas	8 (9)	-	-	-
Indeterminate				
adult	0 (0)	5 (1)	1 (5)	3
Simone	0 (0)	5 (1)	5 (1)	-
Andreas	8 (10)	-	-	-

[id] Denominator = declarative root infinitival root utterances

At age 2;1, 66% of Simone's declaratives, are desideratives. At the two later measuring points this percentage decreases to 45% and 37%, respectively. Andreas at age 2;1 has 47% desideratives.

In contrast, of the adults' declaratives, far fewer have a desiderative meaning. Their percentage of desideratives ranges from 0 to 24%. Adults

mostly refer to future non-desiderative events in declaratives (for instance, explaining what they are about to do). For children and adults less than a quarter of infinitival declaratives refer to an on-going event.

7.2.4 Subjects

Although the structure of RIs was not the main interest of this study, I report briefly on some observations about subjects. It has been observed by many researchers that children's RIs tend to occur without overt subjects. If the subject of an utterance refers to its addressee, then it is difficult to decide whether the phrase is a subject or a vocative. This is true of adult and child examples. Consider these adult cases with vocatives:

(2) a. Hu, Krododil, nicht kommen. (adult, Miller Corpus)
hey crocodile not come-*inf*
"Hey, crocodile, don't come here!"

b. Eh, Mone, nich mit der Flöte hauen. (adult, Miller Corpus)
hey, Mone, not with the recorder hit-*inf*
"Hey, Mone, don't hit [discourse-implicit object] with the recorder!"

In adult utterances, the two cases can be distinguished using either phonological criteria , or on the basis that due to the ungrammaticality of a subject the phrase in question must be interpreted as a vocative. For instance, the examples in (2) above are both imperative (i.e. (2a) is addressed to a toy crocodile, and (2b) to Simone), and one cannot use a 2nd person overt subject with imperative RIs, as was discussed in Chapter 2.

Both the phonological criterion and the exclusion criterion are unreliable in the speech of two-year-old children, although phonological analysis can be helpful in some cases. However, it should not go unmentioned that the children in this study did sometimes, though not often, use unambiguous subjects. Examples are in (3):

(3) a. Mone auch 'n Löffel habe(n). (S 2;0)
Mone also a spoon have-*inf*

b. Ich erst ma das Buch angucken. (S 2;11)
I first *part* the book look-at-*inf*

7.2.5 SUMMARY AND DISCUSSION

In this chapter we have seen a number of similarities and differences between children's and adult's verb-containing sentences. The general analysis revealed that children's percentage of utterances with thematic verbs is almost as high as the adults' and that they use some complex-verb constructions.

The analysis of RIs gave insight into similarities and differences between children and adults specifically with respect to their RIs.

(4) Similarities with respect to RIs
a) For children and adults, the shorter the utterance was in terms of constituents, the more likely it was that for the utterance to contain only an infinitival verb and no finite verb.
b) Children and adults used RIs in the declarative, interrogative and imperative function.
c) Children and adults used RIs mostly with a future reference.

(5) Differences with respect to RIs
a) Adults used RIs with lower frequency than children.
b) Adults used RIs mostly as imperatives.
c) Children used RIs mostly as declaratives.
d) Children used declarative RIs mostly as desideratives
e) Adult used declarative RIs mostly as non-desideratives.
f) Adults do not refer to completed events with a RI, children do so rarely.

Although the data are not appropriate for inferential statistics, some developmental trends can be observed in Simone's transcripts with respect to her overall productions with verbs, as well as with her RIs:

(6) Developmental trends for Simone's overall productions with verbs:
   a) Increase of complex verbs as a percentage of all verb-containing utterances (but not as a percentage of utterances with thematic verbs).
   b) Considerable increase of utterances containing more than two constituents at the expense of the percentage of utterances containing two and one constituents.

(7) Developmental trends for Simone's RIs:
   a) Decrease of RIs.
   b) With age, the likelihood that a RI was shorter than three constituents increased, converging on the adult pattern with respect to the relation between RIs and constituent length.
   c) Decrease of declarative RIs.

What should be concluded from all of this about the well-formedness of child RIs? As was explicated in Chapter 1, it is assumed here that an utterance is well-formed when it is formed in compliance with the principles and rules of all grammatical components. In addition, the relationships between the different components must be well-formed. Recall from Chapter 2 that semantic and pragmatic features are expressed to a lower degree in RIs than in finite sentences. Adults use RIs in felicitous contexts, i.e. just when this information is recoverable. Adult listeners can use discourse information in order to find a suitable interpretation in line with all principles of grammar.

Because RIs are so impoverished in the expression of semantic and pragmatic features, it is difficult to tell how many child RIs in the study were fully well-formed sentences, and to determine the reasons why those that were not, were ill-formed. However, some conclusions are possible on the basis of the data presented. First, some examples were semantically and pragmatically well-formed, such as those in (8), which could have been uttered by an adult in the same context:

(8) a. Mal alles wieder reintun. (declarative about on-going activity)
part everything again in-put-*inf.*
"I am putting everything inside again." (S 2;6)

b. Nikolaus, du auch mitfahren? (interrogative about future event)
Nikolaus you also with-go-*inf*
"Santa Claus, are you coming along?" (A 2;1)

c. Aber nich anfassen! (imperative)
but not touch-*inf*
"But don't touch it!" (S 2;7)

In other examples, the mere addition of a discourse particle like *aber*, *mal*, or *nur*, or a temporal adverb like *erst* ("first")would have repaired a child RI, so that it could have been uttered by an adult. These discourse particles have no direct equivalents in English, and their function is presumably complex. One aspect of them which is most likely relevant here is that they help disambiguate the intended speech act of the utterance in the particular discourse context in which it occurs. *Aber* has a contrastive flavor, *(ein)mal* can have the meaning of "If you don't mind", and *nur* can take on roughly the function of what can be expressed in English by "Just let me"(e.g. in an urgent request). Of course, temporal adverbs supply some information which could otherwise have been provided by a finite verbal element. Omission of these elements in adult desiderative examples degrades them. I show this in (9) and (9′). In (9) I repeat three declaratives expressing desires from Chapter 2. In (9′) I show the same examples without the discourse particles or adverbs. A native speaker will notice that without context these examples are harder to identify as expressing desires.

(9) a. Einmal richtig ausschlafen.
once really out-sleep-*inf*
"I just want to get enough sleep once."

b. Ach, nur ein bisschen in der Ecke sitzen.
oh only a little in the corner sit-*inf*
"I just want to sit in the corner a little bit."

c. Aber erst Nachrichten gucken.
but first news watch-*inf*
"But first I want to watch the news."

(9') a. Richtig ausschlafen.
really out-sleep-*inf*
"I want to get enough sleep once."

b. Ach, ein bisschen in der Ecke sitzen.
oh a little in the corner sit-*inf*
"I want to sit in the corner a little bit."

c. Aber Nachrichten gucken.
but news watch-*inf*
"But first I want to watch the news."

I believe therefore that some child RIs would be well-formed, if children had used particles or adverbs to provide at least some information related to finiteness. Particles and adverbs are not necessary to make a RI well-formed in adult language, and the data above showed that adults often use RIs which consist only of the verb. However, adults presumably have the ability to use these short infinitival utterances just in those situations where the addressee can recover all unexpressed information which is necessary to interpret the utterance successfully. It is quite possible that children are not as good as adults in restricting utterances in which finiteness, and sometimes arguments, remain unexpressed, in just those situations where it is not detrimental to communication.

Another way in which the child examples could be improved is by complying with conversational conventions more. This is important especially when expressing a desire whose fulfillment requires the cooperation of the addressee (a frequent use of RIs in children, e.g. asking for something to eat) or when expressing imperatives. For instance, the child RI in (10) sounds rather nagging and impolite as it was uttered. In contrast, (10') sounds just like what an adult could have said under certain pragmatic conditions. These conditions include recoverability of the intended first person subject (e.g. from the fact that the speaker had already had two pieces of melon), and recoverability of the indirect speech act of "give me some more melon".

(10) Melone essen.
melon eat-*inf*

(10′) Noch Melone essen?
still melon eat-*inf*
"Could I still have more melon?"

(10′) differs from (10) in that it contains both a temporal adverb *and* shows rising intonation, which is a more polite way to express a request of that kind.

Thus, child RIs which are not fully well-formed could be flawed for a variety of reasons, and they can be repaired in a number of ways. It is difficult to establish for each example exactly why it is ill-formed. To determine this, more controlled studies designed to address more specific questions about the interpretation of children's utterances in general, and of RIs in particular, are needed. The results of this chapter concerning the temporal interpretation of child and adult RIs encourage at least the preliminary conclusion that with respect to their semantic finiteness features, child RIs seldom violate the constraints of the adult language.

CONSEQUENCES FOR ACQUISITION THEORY AND OPEN ISSUES

CHAPTER 8

In this final chapter I investigate the possible reasons why young children use Root Infinitives more frequently than adults, and address the issue of how children may gradually converge on the adult grammar in the domain of finiteness-marking. The empirical findings of the previous chapters make available a number of new explanations for the RI-phenomenon. While accommodating the new empirical findings, these solutions are free of some of the problems of existing proposals (see Chapter 5). The findings of the previous chapters can summarized as follows:

I. Concerning adult Root Infinitives:
   1. The syntax of German licenses RIs as a construction type.
   2. There are semantic and pragmatic constraints on the felicitous use of a RI. The same holds for finite construction types.
   3. There are no blanket restrictions on the illocutionary function of Root Infinitives (though different subtypes may have difterent functions).

II. Concerning knowledge of finiteness:
   1. Competence in the domain of finiteness-marking involves knowledge of language-particular mappings from semantic properties to verb forms, and vice versa.
   2. Competence in the domain of finiteness-marking involves knowledge of language particular mappings from pragmatic properties to verb forms and sentence forms, and vice versa.

III. Concerning children's Root Infinitives:
   1. Children's RIs differ from adult RIs mostly in pragmatic ways.
   2. Some child RIs are grammatical.

I begin by addressing the question of whether RIs are optional constructions in any sense. In section 8.2 I sketch out how the facts in I. and II. above fit with the assumption that language acquisition is a result of

parameter-setting and lexical learning. In section 8.3 I discuss in more detail which deficits on the part of the learner might be responsible for the overly frequent use of RIs, and how these deficiencies could be remedied on the basis of experience and in accordance with learning-theoretic assumptions. In section 8.4 I show how, in principle, cross-linguistic and individual differences are handled in such a learning mechanism. I conclude with remarks on some future research directions which could challenge and amplify the conclusions.

8.1 ARE ROOT INFINITIVES OPTIONAL?

In some of the literature the term "optional infinitives" is used for child RIs. The term is due to Wexler (1994), who first suggested that RIs are a grammatical "option" in the child's competence grammar. The term underscores (a) the fact that children during the RI-phase give strong evidence of knowledge of finite verbal inflections and verb-second syntax (as mentioned in Chapter 1), and (b) the fact that they produce RIs in two-digit proportions, whereas adults (in normal conversation) produce far fewer.

It was demonstrated in Chapter 2 that RIs form a part of the adult repertoire of sentence types. One may thus also ask in what sense RIs are an "option" in adult language. I discuss this issue next, and return then to the question of whether RIs should be regarded as "optional" in child language.

It should be clear from Chapter 2 that in adult language RIs can be called optional from a syntactic perspective, but not from a semantic and pragmatic one. While the syntax makes available both finite and non-finite constructions equally, RIs do not alternate *freely* with finite constructions. Rather, there is a set of semantic grammaticality conditions under which RIs are grammatical. In addition there are pragmatic felicity conditions.

With respect to semantics, there are restrictions on which finiteness interpretation can be expressed by RIs. In Chapter 2 I have argued that presumably some of these restrictions are universal, others certainly language-specific. The pragmatic felicity conditions derive from the fact that important aspects of the interpretation are not overtly expressed in RIs. This extends to temporal information and intended speech act, as well as arguments of the verb (in many, if not all, cases the subject *must* be omitted in a RI) and, to some extent, discourse-pragmatic concepts (such as theme and topic). These notions must therefore be interpreted via the use of contextual information. In general, the use of a RI is felicitous when the addressee is in a position to recover the information which is normally conveyed by morpho-

syntactic finiteness markers and the structural processes which accompany them (such as topicalization of a constituent in German). (A RI can only be felicitous if it is also grammatical.)

Only if (a) the semantic finiteness features of the utterance can be expressed by a RI and (b) the context is felicitous, are finite and infinitival root constructions synonymous and equally usable. To make the choice between the two construction types, a speaker will consider additional criteria from the domain of conversational pragmatics (i.e. he will use the structure which best fits his perlocutionary goals), and, possibly, socio-linguistic criteria (e.g. he will consider which structure is more suitable given his relationship with the addressee). Under present assumptions, these two latter criteria lie outside the grammar (see Chapter 1).

In child language, for which the term "optional infinitives" was coined, the situation is slightly more complicated. First, with respect to syntax, there is the question of whether finite constructions are available at all, at a time when RIs are used close to 100%. When finite constructions do appear, children can be said to have acquired which morpho-syntactic devices their languages uses to express finiteness overtly. For instance, German children have recognized that verb-raising and affixation are involved in the expression of finiteness. At that point, children's syntax is the same as that of adults' with respect to allowing both finite and non-finite constructions. Simone, for instance, during her second year of life, uses a variety of forms to express imperatives, among them structures with morphologically imperative verbs, and complex verb forms consisting of a modal and an infinitive, alongside RI constructions. Examples of these are shown in (1)-(3).[1]

(1) Imperatives with verbs morphlogially expressing imperative

a. Geh mal fort. (S 2;2)
go-*imp part* away
"Can you go away?"

[1] The translations here reflect the conversational flavor that Simone's utterances have, i.e. what an English adult could have said in Simone's situation to convey the meaning of the respective example. For instance, the "softening" effect of the discourse particle *mal* is rendered in English by an interrogative *form* (as in 2a), a *tag* ("please" in (2e)), and by a complex verb form involving a modal (as in 3). In an example like (2b), where the solicited action is for the benefit of the addressee, the particle was left untranslated.

b. Such mal aus. (S 2;6)
search-*imp part* out
"Choose one."

c. Mach endlich ab. (S 2;8)
make-*imp* already off
"Take it off already."

d. Guck mal was Mone hat. (S 2;8)
look-*imp part* what Mone has
"Look, what I have."

e. Komm mal mit mir. (S 2;11)
come-*imp part* with me
"Come with me please."

f. Nee - halt mich schön fest. (S 2;11)
no hold-*imp* me nice tight
"No, hold me nice and tight."

g. Blätter ma weiter. (S 2;11)
turn-the-page-*imp part* over
"Turn the page over now."

h. Laß mich in Ruhe (S. 2;11)
leave-*imp* in peace
"Leave me alone!"

(2) Imperatives with complex verbs

a. Darfst nicht draufsitzen. (S 2;2)
mod-2pres not on-sit-*inf*
"You can't sit over here."

b. Sollst heia machen ja. (S 2;6)
mod-2pres sleep make-*inf tag*
"You should sleep. "

c. Du soll eintun. (S 2;6)
you *mod-2pres* in-put-inf
"You should put this in."

d. Kannst du mal helfen. (S 2;11)
mod-2pres you part help-*inf*
"Could you help me , please."

(3) RI imperatives

a. Aufwachen. (while pointing to her sleeping baby brother) (S 2;1)
up-wake-*inf*
"Wake up!"

b. Nochmal anstupsen. (S 2;6)
once-more push-*inf*
"Push me again!"

c. Aua - nich bumm bumm machen. (S 2;6)
ouch - not boing boing make-*inf*
"Ouch - stop going boing boing."

The examples in (1) - (3) show that Simone has various finite and non-finite structures available to express an imperative. We cannot be sure, but it seems that she cannot yet recognize in each context, the subtle ways in which they differ in appropriateness. For instance, the use of the modal *soll* in (2c) suggests authority or an impatient and urgent request. With (2c) Simone is asking her mother to put some toy fish into a pot. (2c) is not ungrammatical, but as an initial request it is inappropriate, in particular given that it was the mother's own suggestion to put the fish into the pots.

The question whether, for young children, RIs are semantically and pragmatically unconstrained is a separate one. If, at any point, RIs are an entirely unconstrained option in the learner's grammar (in the structural *and* the interpretive component), this would violate the Continuity Hypothesis and introduce the problem of retreat in the absence of negative evidence, because learners must eventually constrain their use of RIs in the adult manner. From a learnability standpoint it would therefore be desirable to postulate that children know at least all universal interpretive constraints on RIs from the outset (barring maturation in this domain), and will acquire all the language-specific constraints on RIs from positive evidence.

There are some empirical reasons to assume that, in the absence of evidence to the contrary, young children's grammars already contain interpretive constraints on RIs. First, it looks very much as if semantically, RIs are *not* unconstrained. We have seen above a number of similarities with

respect to the interpretations of children's and adults' RIs. One of them is that children and adults use RIs mostly with eventive verbs, whereas finite constructions contain comparatively more non-eventive verbs. (see Wijnen 1997 for data on Dutch children, and Avrutin 1997 on adults). Furthermore, there is, at least at present, no clear evidence in favor of the fact that children violate semantic constraints on RIs such as the Non-Completedness Constraint (proposed in Chapter 2). In contrast, if children's grammars do not contain any interpretive constraints on RIs, it is predicted that all children during the RI-stage use RIs with chance frequency until the cause for the optionality is eliminated. Relatively soon after that point one would expect adult proportions of RIs. In contrast, it has been shown, at least for some children, that at a very young age they produce RIs with more than chance frequency (up to 100%). More importantly, proportions of RIs decrease consistently. No child has shown a flat learning curve or increasing proportions of RIs. This correlation between age and the decrease of RIs is, however, compatible with a scenario in which children cannot choose freely between a RI and a finite clause, and in which the constraints on RIs are, with time, increasingly more often obeyed.

Thus, learnability considerations favor, and empirical evidence is compatible with, the idea that children's grammars constrain the use of RIs in some way. On the other hand, it is clear that there is some knowledge which children lack in comparison to adults. The main question is what is the nature of this knowledge.

I have argued at the end of Chapter 7, that some child RIs are infelicitous for conversational-pragmatic reasons. While it is often assumed that acquiring conversational-pragmatic abilities is not subject to the same strict learnability constraints as acquiring facts of grammar, the issue is still interesting, especially if it is part of the explanation for the RI puzzle. It is thus important to consider this possibility. The length effects observed in children's and adults' RIs might be taken as an indication that children already take into consideration conversational-pragmatic concerns, albeit perhaps only to a limited extent. In Chapter 7 (Table 7.9) it was shown for the adults and the two children that the majority of their RIs were shorter than three constituents, whereas, by comparison (with Table 7.1), that was not the case with finite clauses. Although this does not constitute clear evidence, it might indicate that children are at least sensitive to the fact that RIs are a construction type which permits omission of constituents to a greater degree than finite sentences, and that their interpretation and use is more dependent

on context than that of finite clauses. While it is presently unclear what children know about the felicity conditions on RIs, it is clear that they do not know or cannot obey all of the relevant conditions. The preceding chapters can be taken as a basis for some novel hypotheses to deal with the issue of how children might constrain their use of RIs to adult behavior without access to negative evidence. In section 8.3. I explore several concrete accounts for child RIs which take into consideration the observations reported. In these proposals, RIs are optional in child language in the same sense in which they are optional in adult grammar. That is RIs are always a syntactic option, and only to the extent that a RI expresses the same semantic interpretation as a finite sentence, is it an alternative to a finite construction. I will argue that ungrammatical RIs are a result of a default specification, and that children will also use RIs under infelicitous pragmatic conditions.

8.2 PARAMETER-SETTING OR LEXICAL LEARNING?

In Chapter 1 I adopted the view that language acquisition is due to parameter-setting and lexical learning. Which of these two mechanisms could handle the language-specific mappings necessary to express finiteness correctly? To answer this question I now examine more closely the nature of the mappings.

At a general level, the described mappings define relationships between the semantic and pragmatic components of the grammar, on the one hand, and the structural component on the other. Though further research on different languages might show this to be an over-pessimistic assessment, it does not seem likely that the differences between languages in this respect fall naturally into a few binary distinctions of the kind that would allow for parameterization of the relevant facts.

However, links between structural forms and interpretive functions are a hallmark of the lexicon. I conjecture that the mappings with respect to finiteness resemble lexical form-meaning mappings in two important respects. They are idiosyncratic in the sense that they cannot be predicted by any independent characteristic of a language. But at the same time, they are not fully arbitrary, because they must fall within an envelope of possible mappings defined by UG. Within any particular language, a limited set of structures is used to express an inventory of finiteness interpretations. The properties of the mapping relationships therefore resemble those of the lexicon of closed-class grammatical markers (such as case markers, complementizers, etc.).

It is not a practical possibility, however, to characterize finiteness-mappings entirely within the closed-class lexicon. This is because the expression of finiteness comes about through the *combination* of different structural means. Thus individual elements from various types of grammatical markers listed in the closed-class lexicon (modals, auxiliaries, and verbal affixes) must combine appropriately to express finiteness. In addition, the choice of these markers is not only important for marking finiteness but also has effects on other important aspects of interpretation. For instance, whether a modal must be used, can be used, or must not be used depends on the interaction of the intended speech act and the sentence form chosen. The Verb-Second Constraint makes available a set of sentence forms (examples (13) in Chapter 2 illustrated this), and these combine with elements bearing grammatical markers for finiteness to yield a number of different interpretive aspects of the sentence, such as illocutionary functions. In other words, grammatical elements which bear a marker for finiteness, not only contribute to finiteness interpretation, but, in conjunction with other formal devices, affect other interpretive aspects of the sentence as well.

These intricate interactions between structural devices on the one hand, and interpretive properties on the other, may be captured by mapping relationships between elements within and across grammatical modules. If this is correct, then learning language-specific facts about finiteness is more than learning lexical facts, but there is nevertheless a possibility that children can learn finiteness mappings in much the same way as they learn lexical facts. In particular, it is suggested here that UG can be invoked to ensure the learning of the target system of finiteness marking.

First, the kinds of devices which are used in principle to express finiteness can be innately specified. In addition, finiteness features or even entire finiteness feature matrices may be innately specified. Furthermore, abstract definitions of semantic Tense and Aspect may be specified, so that the learners can apply these notions in extracting from the input the language-specific realization of these concepts. Hornstein (1990) has investigated the possibility that there are constraints on what is a possible Tense universally, and made some very interesting explicit proposals which could help the learner in acquiring language specific mappings which affect the interpretation of finiteness.

A very general mechanism that would be suitable to deal with this task has already been proposed by Boser et al. (1995). They propose that in language acquisition the child must establish how UG is instantiated in the

grammar of a specific language. With this proposal Boser et al. aim to accommodate subtle language-specific differences. For instance, although both Swedish and German allow topicalization, the two languages differ along pragmatic dimensions in the degree to which they make use of topicalization. In both cases the relevant parameter has to be set to allow topicalization. But in addition it is the task of Swedish and German learners to extract from the input, with the help of some pragmatic primitives provided by UG, just the right contexts in which topicalization is properly used in their language.[2]

I have just proposed that a similar process is necessary in the domain of finiteness. Children must take an inventory of forms which they have acquired through parameter-setting and lexical learning and map them onto finiteness feature matrices provided by UG.

In conclusion, although substantial details need to be filled in by further research, it seems hopeful that mastery of finiteness-marking can in principle be attained within the learning theory outlined in Chapter 1. The problems raised in Chapter 5 do not apply to this learning mechanism. The effect of gradual convergence on adult behavior is explained by children improving their competence in the area of finiteness mappings. By establishing the language-specific relationships between forms and meanings, the child will, with time, be more and more able to use finite forms instead of non-finite forms. As this acquisition process will include learning the mappings between RIs and their appropriate finiteness feature matrices, children will be able to restrict RIs to exactly those interpretations which are found in the adult language. It is proposed below that, until all details of this intricate system of finiteness-marking are in place, the RI construction is used as an innately established default construction in child language.[3] This ensures that children can be conservative learners and converge on the target grammar

[2] A terminological caution. Boser et al. call their proposal the "Grammatical Mapping Hypothesis", but notice that these mappings between UG and a specific grammar are distinct from the mappings discussed in this thesis, which hold between the different components (syntax, morphology, phonology, semantics, discourse-pragmatics) of the grammar of *one* language.

[3] Clahsen and Penke (1992) use the term "default marker" for the *-(e)n* affix in non-agreeing infinitival forms in child language. It is not clear whether they intended the term in a learning-theoretic sense, as I do here.

without negative evidence. The issue of variation between individual learners and learners of different languages is addressed in section 8.4.

8.3 ON THE ORIGIN AND DECREASE OF CHILD ROOT INFINITIVES

I turn now to some concrete proposals as to what causes young learners to use RIs frequently and how children later retreat from this overgeneration. I would emphasize at the outset that the learning mechanism must not eliminate all RIs as the child gains experience with the language. Rather, the course of learning must allow for a child to grow into a mature speaker who produces grammatical RIs under appropriate conditions.

Every proposal below can be empirically evaluated through carefully designed studies. Although none of them has been comprehensively tested yet, in each case there is some existing research that provides supporting evidence for it. The fact that they all receive at least some support from previous research, together with the fact that they are quite compatible with each other, makes it quite possible that the RI phenomenon is heterogeneous in origin. Though this may seem like an unparsimonious proposal, it obviously should not be rejected if the empirical evidence points toward it.

In principle, the origin of the RI-phenomenon could lie in a deficit concerning non-finite constructions, or, alternatively, in a deficit concerning finite constructions. Below I explore both possibilities.

8.3.1 Deficit in using non-finite constructions

A potential explanation for the extensive use of RIs by children is that they cannot yet obey the conditions of use which apply to non-finite sentences. At the end of Chapter 2 I noted that the interpretation of RIs is context-dependent in at least 4 ways. I repeat these four factors here for convenience.

(3) Context-dependent characteristics of RIs

illocutionary function
temporal interpretation (Tense, Aspect)
modal interpretation (Modality)
reference of the subject, and sometimes other arguments

Whether a RI is felicitous or not depends on whether this information is recoverable for the hearer. The recoverability of the items in (3) depends, at least in part, on the presuppositions which the hearer shares with the speaker. As Grice has emphasized, successful communication depends on

expressing presuppositions which do not violate certain conversational principles. From a survey on research about young children's use of presuppositional devices, DeHart and Maratsos (1984) conclude that

> "It seems likely, however, that adults observe Grice's principles more consistently than do children. Children's inconsistent conversational skill may be due to imperfect understanding of a word they are using or to imperfect understanding of what another person knows about a topic." (p. 242)

De Hart and Maratsos also point out that

> "In discussing children, it is especially important to differentiate between the presuppositions normally implied in the use of a word, linguistic form, or discourse device, and the speaker's presuppositions in using it." (p. 250)

In light of these considerations one might therefore hypothesize that the source of children overusing RIs is they presuppose too much information, and therefore do not express it, resulting in a RI. In Chapter 7 two observations in favor of this idea were reported. First, as just mentioned, the fact that children omit not only finiteness from RIs but also other elements (to a higher degree than in non-finite sentences) may indicate that they do in fact expect their hearers to rely on discourse information more than with finite clauses. And second, I showed at the end of Chapter 7 how some child RIs are infelicitous simply on the basis of what they presuppose and not on the basis of a grammatical violation.

However, several reasons suggest it is worth investigating a second possibility, namely that at least part of the problem stems from an inability with finite constructions. First of all, if children's use of RIs gets restricted exclusively via learning in the domain of conversational pragmatics, this means there is presumably no help available through linguistic innate knowledge. Therefore it will be very difficult, though perhaps not impossible, to devise an account for children's convergence on the adult behavior. The second reason is that the facts about finiteness-marking which have been the topic mainly of Chapter 3 above have to be learned independently. That is, a mechanism must be found which explains how children acquire the language-specific mappings between finiteness feature

matrices and the elements which express them, as well as the mappings between certain discourse-pragmatic notions and various finite sentence forms. Under the assumption that children during the RI stage do not yet master all of these mappings, it is an extremely interesting hypothesis that RIs are a side-effect of incomplete knowledge in the domain of finite verb forms and sentences. I investigate this hypothesis further in the following sections.

8.3.2 Deficits in using finite constructions

In the following I describe three ways in which two- and three-year-old children may differ from adults in their ability to use finite constructions, which I will label "deficit in the interface between semantics and structural form", the "deficit in the interface between discourse-pragmatics and structural form" and "deficit in conversational behavior". The three explanations are compatible with children's grammars being continuous with adult grammars (in the sense of Pinker 1984). The first two proposals allow for convergence on target behavior through acquisition of some language-specific knowledge via positive evidence. The third is based on a more general cognitive development, and therefore is not subject to the learnability conditions set out in section 1.2.2.

8.3.2.1 Deficit in the interface between semantics and structural form

As noted in II. at the beginning of this chapter, marking finiteness in adult languages involves language-particular knowledge beyond knowledge of verb position and verbal morphology. To date, no empirical studies have addressed in any detail how this knowledge is acquired, and it is unknown when acquisition in this domain is complete. Two- to three-year-old German children in dialog with care-takers use verbal tenses predominantly correctly when they do use them (Behrens 1993). This is important. However, it does not establish that children know how to express every Finiteness Feature Matrix (FFM) that plays a role in adult German. Berman and Slobin (1994) conclude from cross-linguistic study[4] of narrative abilities in children 3, 5 and 9 (as well as adults) that

> "half of the 3-year-olds across the languages manifest "mixed" tense usage, veering back and forth from present to past [...]. The 3-

[4] The languages studied were English, Hebrew, Turkish, Spanish, as well as German.

> year-olds quite generally fail to establish a single grammatical tense as a means of temporal anchoring for their account [...]. [...] their shifts from one tense, or from one grammatical aspect, to another is typically not thematically motivated." (Berman and Slobin 1994: 62)

Note that the inconsistent use of tenses described here does not need to amount to ungrammaticality, e.g. a present tense form used where only a past tense form would be grammatical. It may well be the case that each sentence is well-formed but the children are unable to keep a constant perspective on the narration (a problem of text cohesion). For instance, they may oscillate in where reference time is anchored. Children may anchor it at speech time in the actual world, or they may anchor it in the story world. If children are not consistent in this respect, this predicts shifts between forms expressing Present and Past.

In the domain of finiteness marking, the demands are most likely not the same in narrating a story (e.g. following a series of pictures, as in the studies reported by Berman in Slobin) and in engaging in dialogue (usually a more goal-oriented behavior). Yet it is certainly feasible that, if three-year-olds have difficulty expressing finiteness in narrative situations, two-year-olds may have trouble expressing finiteness in dialog. Berman and Slobin attribute the three-year-olds' deficits in this domain to underdeveloped cognitive abilities. In contrast, I develop now an account for the RI-phenomenon in which its origin is due to a lack of language-specific knowledge.

If the relationships between M-finiteness and S-finiteness are conceived of as mappings of the kind outlined in this thesis, it is apparent that a learner can have acquired morpho-syntactic forms which express finiteness features, and may know all possible Finiteness Feature Matrices, but may not have established all the relationships which exist between them in the adult language. One might therefore speculate that this is the origin of the non-adult-like RIs in early child language. I state this proposal in what I will call the Incomplete Mapping Hypothesis as in (4):

(4) Incomplete Mapping Hypothesis (for FFMs) - Version 1

> When a learner lacks a link from a particular Finiteness Feature Matrix which he wants to express , to a verb form which expresses it, he uses an non-finite verb.

(4) states that learners use a non-finite form when there is no link from the intended FFM to a finite form which expresses it. Note in this context that for adults a given FFM is sometimes connected to more than one form. For instance, Past and Future in German are expressible with a simplex or a complex verb form. Or, whether a modal is used depends on conversational-pragmatic considerations, for instance on how polite one wants to be. Children may lack independent criteria for deciding which of two or more semantically grammatical forms is appropriate. Under such circumstances, children may either choose one of the finite forms, as all of them are grammatical, or, alternatively it is possible that children will choose a non-finite one. This is because their conservative use of language use extends into the pragmatic domain. In the latter case the Incomplete Mapping Hypothesis may be reformulated as in (4')

(4') Incomplete Mapping Hypothesis (for FFMs) - Version 2

> When a learner lacks a unique link from a particular Finiteness Feature Matrix which he wants to express , to a verb form which expresses it, he uses an non-finite verb.

Note again that Finiteness Feature Matrices denote properties of entire sentences (or more precisely, of propositions expressed by sentences). Thus (4) concerns mappings from properties of propositions to verb forms. For illustration consider one of Andreas' RI examples:

(5) Thorsten nicht <u>auspusten</u>. (A 2;1)
Thorsten not out-blow-*inf*

Andreas utters this sentence after his brother Thorsten has blown out a candle. So the sentence refers to an Event that happened in the past. Given the negation in the sentence, it seems quite likely that what Andreas wanted to express is something like "Thorsten should not have blown out the candle". We may speculate that Andreas had not yet learned how to express the FFM of such a sentence. Instead, Andreas used an infinitival construction.

Another of Andreas' examples makes the same point:

(6) Saft einschütten. A 2;1
juice in-pour-*inf*

Andreas produces this sentence after the juice has been poured. Although we can't be sure what Andreas meant to say, it is reasonable to suppose that he wanted to refer to the following finiteness relations:

(6') Possible Finiteness Feature Matrices for example (6)

a. [[ASN] [TENSE: PAST]; [ASPECT: PERFECTIVE]; [MODALITY: FACTUAL]
b. [[ASN] [TENSE: PAST]; [ASPECT: PERFECT]; [MODALITY: FACTUAL]

(6'a.) would be the FFM intended by Andreas if he was referring the fact that the juice is now poured, i.e. a situation which is expressed by the English finite construction *You have poured the juice.* This interpretation corresponds to the one depicted in diagram in (6''a.)

(6'') a.

```
          R
          S
---++++++++++++----->        +++ = Situation Time
          **********         **** = Topic Time
```

Alternatively, Andreas may have wanted to express a PERFECT interpretation, as would be conveyed by the English finite sentence *You poured the juice.* In that case the FFM which Andreas intended to express is the one in (6'b), and the corresponding diagram is as in (6''b):

(6'') b.

```
          R
          S
---+++++++---------->        +++ = Situation Time
          **********         **** = Topic Time
```

In Chapter 3 we saw that in the area of tense/aspect-marking even typologically closely related languages like English, Dutch, and German exhibit subtle, yet important, differences. In English (6a') would require a complex past tense form (*You have poured the juice*). While the expression of (6b') would require a simplex form (*You poured the juice.*) In adult German one would express both (6a') and (7'b) using the same complex form (*Du hast*

den Saft eingeschüttet.)[5] It is feasible that Andreas, even if he has already learned the different verb forms for past tense, has not sorted out whether any of them denote aspect, and if so, which aspects they denote. As a result of the hypothesized default strategy in (4) or (4') he might use an infinitive, which results in a RI.

In general, even if a learner has acquired the *full* inventory of simple and complex forms of his target language, he may be uncertain which verb form to use in a particular case. If it is correct that two-year-old learners have not yet acquired how to express every possible FFM, this lack of knowledge with respect to language-specific relationships between semantic features (of sentences) and morpho-syntactic verb forms might be a sufficient motive to sidestep the expressive problem by using an infinitive rather than any particular finite form.

While it is an empirical question whether the deficit is cognitive or linguistic in origin, and this issue cannot be resolved here, I would take a linguistic explanation to be more attractive than the account in terms of cognitive underdevelopment which Berman and Slobin suggested as an explanation for children's marking of finiteness in narratives. This is because one would assume that the acquisition of language-specific finiteness mappings presupposes that the learner is able to process the individual Finiteness Feature Matrices cognitively.

8.3.2.2 Deficit in the interface between discourse-pragmatics and structural form

There is another way in which mappings concerning finite constructions may be incomplete in two-year-old learners. Recall from Chapter 1 that I assume a component of discourse pragmatics, which is defined as that level of grammar at which sentence form and discourse context are associated. In section 3.2.7 I introduced three levels of discourse-pragmatic structure, all of which play a role for how sentences are realized structurally, i.e. phonologically, morphologically, and syntactically. I repeat these three levels of discourse-pragmatics in (8):

[5] I set aside the possibility that (3) as intended by Andreas as a passive (i.e. *"The juice is poured."* or *"The juice has been poured."*) In principle, similar considerations would apply.

(8) Three levels of discourse pragmatics (=(45) in Chapter 3)

a. Topic-Comment Structure (the utterance-oriented level)
b. Theme-Rheme Structure (the hearer-oriented level)
c. Focus-Background Structure (the speaker-oriented level)

At the end of section 3.2.7 I noted in particular that in German the word order in RIs is less permissive than in finite constructions, and that therefore discourse-pragmatic properties cannot be *syntactically* expressed in non-finite clauses. (They can still be marked morphologically and phonologically).

We may consider whether there is reason to believe that two-year-old children lack the ability to associate properly any or all of these three discourse-pragmatic levels with sentence forms. This would be another instance of the Incomplete Mapping Hypothesis, this time in the domain of pragmatics:

(9) Incomplete Mapping Hypothesis (for discourse pragmatics)

When a learner lacks a (unique) link from a particular discourse-pragmatic feature, which he wants to express, to a sentence form which expresses it, he uses an infinitival construction.

Mappings from discourse-pragmatic notions to sentence forms are relevant to finiteness-marking in German, because in finite constructions, discourse-pragmatic notions, such as Theme and Rheme are unavoidably expressed by word order, whereas in RIs they are not. The correct expression of Theme-Rheme structure in terms of word order in a finite sentence requires in turn an appropriate evaluation of the discourse context in terms of presuppositions. Since in RIs fewer word-order decisions need to be made which relate to these concepts, RIs might be suitable default forms which avoid these choices.

Unfortunately, no existing research has addressed the question of how competent young children are in mapping particular discourse-pragmatic notions onto sentence forms in conversation. There are some indications, however, which suggest that children may have a deficit in this area. Keenan and Schiefflin (1976), in comparing the means that adults and children use for

making clear what their topic[6] of conversation is, conclude that both groups of speakers use verbal and non-verbal means, but that children rely more on non-verbal means than adults. This points to a deficit in children in the discourse domain. The origin of the deficit could in principle be cognitive or linguistic. There are no results at present which could distinguish the two. I presume that cognitive ability is a prerequisite for learning the relevant linguistic mappings, and although we don't know when the cognitive prerequisites develop, they should develop before, or simultaneously with, linguistic competence in this area. It is a possibility that children, perhaps for a quite some time, have trouble integrating the three levels of discourse structure cognitively, as this requires the mapping of three different perspectives (utterance-internal, hearer and speaker) onto a single sentence form. This integration process requires knowing all discourse-pragmatic criteria that are relevant to the meaning that the speaker wants to express, and also picking the right referents for the relevant categories. Confronted with difficulty in knowing which decisions have to be made, or lacking the ability to evaluate the discourse situation appropriately to make these decisions, children may use a default RI form instead.

8.3.3 The Incomplete Mapping Hypothesis

I have proposed two different instantiations of the Incomplete Mapping Hypothesis. If these ideas are on the right track, they may point to a more general learning mechanism which applies whenever form/interpretation mappings have to be established by learners:

(10) Incomplete Mapping Hypothesis (generalized version)

> When a learner lacks a (unique) link from a particular interpretive feature which he wants to express, to a structural form which expresses it, he uses a default form.

The Hypothesis in (10) is a close relation of the Specific Defaults Principle suggested by Fodor (1992), which reads as follows:

[6] The word "topic" is used here in a more general sense than in (4), where it is a technical term.

(11) Specific Defaults Principle (Fodor 1992)

> UG must assign a specific (i.e. non-disjunctive) default value to every feature in every context except where the value is universally fixed or is universally free.

By incorporating the notion of a default, the Incomplete Mapping Hypothesis has the effect of cannot establish random links between finite functions and finite forms. Although we might find that children do not behave exactly like adults in employing finite forms, if (10) applies then children cannot -- even temporarily -- establish random links between finite functions and finite forms. In this way a conservative learning process which avoids overgeneration is ensured, and orderly progress towards the target is possible. Any non-adultlike uses of verb-forms would be do to extra-grammatical deficits, or, as in the case of the RIs, to a specific default.

In order to further constrain the learning process, it is feasible that it is regulated by what Crain (1996) terms the "Semantic Subset Principle":

(12) Semantic Subset Principle (Crain 1996):

> Suppose the interpretive component of children's grammars makes two interpretations, A and B, available for a sentence S, and that S is true in a narrower range of circumstances on interpretation A than on interpretation B. If so, A is hypothesized before B in the course of language development.

As it is stated, this principle would, for instance, require that learners acquire mappings conservatively.

While all of this requires careful empirical investigation, it is at least plausible that mapping relationships in the grammars are built in this way during language acquisition. As the number of individual mapping relationships which have to be established is considerable, it is predicted that learners' use of finite forms becomes gradually more adult-like. With each mapping that gets acquired fewer RIs are used. At the same time, especially at a later point in development, the RIs might already show the properties of adult RIs, as they too are more and more restricted to appropriate interpretations.

8.3.4 Deficit in conversational behavior

In addition to explanations based on a lack of language-specific grammatical knowledge in the domain of finiteness-marking it is also possible that cognitive or socio-linguistic deficits contribute to the frequent use of RIs by young learners. It was said above, that finite sentences require the expression of discourse-pragmatic notions in structural terms to a higher degree than RIs. If, as is suggested in section 8.3.1 by the quotes from DeHart and Maratsos, children lack the conversational skills necessary to associate these discourse-pragmatic notions with appropriate referents, one might speculate that children use RIs as a way to sidestep expression of these notions.

Also, recall from Chapter 3 that the same illocutionary function can be expressed by various sentence forms. Learners may not be sure in each context which form is the most appropriate. First, for choosing among forms socio-linguistic criteria are relevant. We saw in section 3.2.8 that in German, but not in Swedish, it is considered rude to address a request in an informal context to a peer using a declarative sentence form without a modal. At the end of Chapter 4 I showed that the declarative sentence form is a suitable form to make a request in German, if the speaker has either authority with respect to the hearer in the relevant matter, or he can expect co-operation on the part of the hearer for achieving his perlocutionary goal. Also the use of a modal makes a declarative sentence more acceptable as a request.

Previous research by, for instance, Garvey (1975), Bates (1976), and Ervin-Tripp (1976) suggests that children may not be aware of these sociolinguistic nuances, or, if they are aware of their existence, they may not always be in a position to know which sentence form is required in a specific situation:

> "The general finding [...] is that children begin to adjust their language to reflect differences in the status or familiarity of their listeners at a relatively early age, but it takes them a while to master completely the social conventions involved." (DeHart and Maratsos 1984: 278).

Furthermore, in listening to children one often observes that, despite their impoverished language, they are apparently trying to sound like an adult, using sentence forms that one would not expect from them. While as mature speakers we may find this amusing or annoying (when children sound

impatient), this could be a result of children's incomplete socio-linguistic and conversational skills.

Although it would be more interesting to linguistic learnability theory, if the overuse of RIs by children receives a linguistic explanation, none of the proposals above can be discounted at the moment. Undoubtedly ample research will be required before the different solutions can be teased apart. In this sense, the exposition of this chapter has provided a collection of research questions. The issues themselves are not altogether new, but it would be novel to investigate how they are connected specifically to children's use of verb forms.

8.4 DIFFERENCES IN THE ACQUISITION PATH

I reported in Chapter 1 that cross-linguistic and individual differences exist with respect to the RI phenomenon. For instance, Spanish and Italian children are said to exhibit lower proportions of RIs than German or Dutch children. Furthermore, some children's proportions of RIs decrease soon after the age of two, other children's only when they approach their third birthday. I believe that the proposals of the previous section can very naturally accommodate these differences.

First, since individual languages map finiteness features onto linguistic forms differently, it is no surprise that the acquisition paths differ across languages. Thus I suggest that the fact that RIs are possible in natural language is a matter of UG, but that the specific developmental course of competence with respect to RIs is a result of characteristics of the input language. Across languages, some mappings might be less conspicuous than others or might demand more subtle cognitive or morphological distinctions. What an individual learner knows about finiteness-marking depends on the variety of forms which is offered to him in the input. Care-takers may differ in this respect even within the same language, for instance whether they address the child with explicit imperatives, indirect imperatives (declaratives, or questions) or with RI imperatives.

Furthermore, another possible cross-linguistic difference is that different languages may offer different default forms. For instance, Varlokosta et al. (1997) have argued for Greek that children use a default form which corresponds to the 3rd person singular as well as to the participle. This is of interest especially because Greek has no infinitival forms. Thus which particular default form is employed by the learners may be responsive in

some way to the facts of the input language; see Ferdinand (1994) for a more explicit proposal along these lines.

These various facts are consistent with the theory put forward here. However, in order to investigate this proposal in full, it will be necessary to study carefully the finiteness systems of a greater variety of languages, as well as to compare, under maximally controlled conditions, the behavior of children learning different languages.

8.5 CONCLUDING REMARKS

The goal of this work was to give an explanation for the frequent occurrence of Root Infinitive constructions in the speech of two-year--old children, an explanation which can maximally accommodate the known empirical facts of child language and of adult language, and at the same time adhere to fundamental principles of learning theory.

It was proposed that the solution to the Root Infinitive puzzle lies in the fact that young learners have not yet acquired enough facts about their target grammar to be able to use appropriately the inventory of structural devices which adult speakers use to mark finiteness in sentences. Although some or all the devices are already at the children's disposal during the Root Infinitive stage, children have yet to establish the exact relationship between those devices and the interpretations which they express. It could not be excluded that the origin for this deficit in children is related to a general cognitive immaturity, rather than to more specific lack of linguistic knowledge. However, the fact that this linguistic knowledge that children have to acquire is quite complex makes it reasonable that linguistic problems at least contribute to the delay. In the theory outlined above, acquisition of the language-specific rules which apply at the interfaces between syntax and semantics and between syntax and pragmatics is crucial for using finiteness markers correctly.

Several semantic categories besides finiteness itself are not formally expressed in Root Infinitives. Nevertheless I have argued that RIs are subject to semantic and pragmatic well-formedness conditions. It is a characteristic of mature native speakers that they have the competence to omit elements from sentences in a constrained fashion. For a concrete example of this consider an every-day dialogue from a store whose main merchandise is pieces of dough filled with different ingredients, such as mushroom, spinach or potato (called "knishes").

(13) Customer: Two to go. One mushroom, one spinach.
Shop Keeper: Hot?
Customer: No, but in a box.

One might suppose that elliptical constructions are formed according to a relevance criterion. However, this cannot be the entire basis on which contextual ellipses are formed, as (13') should make clear:

(13') Customer: Give two to go. Mushroom, spinach.
Shop Keeper: Want hot?
Customer: No, but box.

Although arguably all relevant information is expressed, (13') is not a well-formed dialogue of English (although its equivalent might be well-formed in another language). Competence is required to be able to use such elliptical utterances appropriately. For appropriate use, not only is it necessary to evaluate the discourse situation in certain ways, but there are also language specific differences in what kinds of ellipses are permitted. It is therefore worthwhile pointing out that acquiring the adult competence to use RIs can be seen as part of a larger problem of acquiring the ability to use certain types of elliptical constructions. This last point also emphasizes the need for directing research toward a broader investigation of child and adult utterances in context.

ABBREVIATIONS USED IN THE GLOSSES

APPENDIX 1

1. Abbreviations representing entire word forms (in alphabetical order)

aux	auxiliary verb
mod or *modal*	modal verb
neg	negation
part or *particle*	discourse particle
prep	preposition
refl	reflexive pronoun
tag	sentential tag signalling a pragmatic function

2. Abbreviations denoting grammatical form (in alphabetical order)

1, 2, 3	person feature
acc	accusative
dat	dative
fam	familiar (applies to German 2nd person pronouns and verbs)
fin	finite
inf	infinitival
ing	gerundive or progressive participle (applies to English)
imp	imperative
nom	nominative
past	past tense
pl	plural
pol	polite (applies to German 2nd person pronouns and verbs)
pp	past participle
pres	present tense
sg	singular
subj	subjunctive

VERB CODES

APPENDIX 2

14 different verb codes were used in the analysis for verb type. Each code is explained here, and illustrated with an adult example from the Miller Corpus. Note that where a RI example is given, a finite example could have been given as well.

A. 7 different verb codes were used for utterances with three or more constituents. Verb position, and thematicity of the verb are expressed in each code.:

- ThV1

The verb is a thematic verb in clause-initial position.

Schmeckt besser als Schockolade?
Taste-*3sg* better than chocolate?
"Does this taste better than chocolate?"

- ThV2

The verb is a thematic verb in the second position.

So geht das, ne.
so go-*3sg* this, tag.
"This is how works, isn't it."

- ThVf

The verb is to the right of all arguments, preceded by at least two constituents. If an extraposed argument clause or prepositional phrase followed the verb, this code was also used, as long as two other constituents preceded the verb. The verb could be simple (one verbal element) or complex (more than one verbal elements), but complex verbs never occurred clause-finally with all their elements.

Aber nicht kapputtmachen, Mone.
but not break-*inf* Mone
"But don't break it, Mone."

- NonThV1

The verb is a main-verb modal the copula in clause-initial position.

Sind die gleich?
be-*3sg* they same?
"Are these the same?"

- NonThV2

The verb is a main-verb modal or the copula, in second position. This verb is the only verbal element in this clause.

Das ist so gross.
This be-*3sg* so big.
"This is so big."

- ComplV1

The verb is a complex verb with a modal or auxiliary in clause-initial position and the theta-assigning verb occurring clause-finally (to the right of all arguments).

Hast Du heute nicht geweint?
have-*2sg* you today not cry-*pp*?
"Have you not yet cried today?"

- ComplV2

The verb is a complex verb with a modal or auxiliary in second position and the theta-assigning verb occurring clause-finally (to the right of all arguments, except for arguably extraposed ones).

Wer hat die Haare gewaschen?
who have-*3sg* the hairs wash-*pp*
"Who has washed your hair?"

B. 6 different verb codes were used for utterances with two constituents. Verb position and type of constituent that occurred with the verb are classified.

- SV

The verb is the second constituent. The first constituent is the subject of that verb.

Fünf fehlen.
five miss-*3pl*
"Five are missing."

- OV

The verb is the second constituent. The first constituent is the object to that verb.

Lätzchen ausziehen.
bib off-take-*inf*
"We are taking off your bib."

- XV

The verb is the second constituent. The first constituent is a non-argument (adjunct, particle, PP) to that verb.

Nur zugucken.
only on-look-*inf*
"I only want to watch."

- VS

The verb is the first constituent. The second constituent is the subject of that verb.

Lacht der?
laugh-*3sg* he
"Is he laughing?"

- VO

The verb is the first constituent. The second constituent is the object to that verb.

Reintun - den Fisch?
in-put-*inf* - the fish
"Should I put the fish in?"

- VX

The verb is the first constituent. The second constituent is a non-argument adjunct, particle, PP) to that verb.

Komm mal!
come-*imp particle*
Come here!"

C. One verb code was used for utterances consisting of a verb only:

- V

The verb is the sole constituent of the clause. (Tags did not count as inside the clause.)

Festhalten!
on-hold-*inf*
"Hold on!"

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