THE FULL COMPETENCE HYPOTHESIS OF CLAUSE STRUCTURE IN EARLY GERMAN

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We argue that young German children have the major functional sentential heads, in particular the inflectional and complementizer systems. The major empirical basis is natural production data from a 25-month-old child. We perform quantitative analyses which show that the full complement of functional categories is available to the child, and that what crucially distinguishes the child's grammar from the adult's is the use of infinitives in matrix clauses. The evidence we consider includes the child's knowledge of finiteness and verb placement, agreement, head movement, and permissible word-order variations. We examine several accounts which presuppose a degenerate grammar or which deviate from the standard analysis of German and conclude that they provide a less adequate explanation of the acquisition facts.*

INTRODUCTION

1. The principles and parameters framework attempts to solve the fundamental problem of generative grammar, the problem of learnability: how is it that any normal child can learn any natural language?[1] The idea is that there exists a set of universal principles, called Universal Grammar (UG), and a set of parameters whose values are specified by experience.[2]

In recent years the scope of the principles and parameters approach has expanded to include the important problem of how development of the mature grammar can take place given the stages the child passes through. Intensive empirical research, both experimental and observational, has made it clear that the principles and parameters approach is a powerful tool in the attempt to understand child grammar.[3] In many domains of grammar it has been concluded that young children at particular ages know the principles. In other domains, questions still remain.

One central area of research involves functional categories. Intuitively, functional categories are grammatical categories which play a formal role in the sentence, for example, inflectional categories like agreement. Functional cat-

[1] For the statement of the learnability problem see Chomsky 1965, Wexler & Hamburger 1973, Wexler & Culicover 1980, and many other references.

[2] The innate parameters may either be completely present at the beginning or develop in their complete form only maturationally, as advocated, for example, in Borer & Wexler 1987, 1992. Properties of the lexicon must also be set via language input, and it has been suggested that the only parametric properties are morphological or lexical. See Borer 1983, Manzini & Wexler 1987, Wexler & Chien 1985, Fukui 1988, and Chomsky 1989 for different versions of this suggestion. We will not consider the issue further in this paper.

[3] For textbook introductions, see Atkinson 1992 and Goodluck 1991.

egories and the principles which govern them have become a focus of acquisition research. Because the use of functional categories is so deeply intertwined with grammar, if it can be shown that young children's grammars have functional categories and the principles which govern them, this would be further strong evidence that the initial state of the language faculty includes quite particular formal principles. The goal of this paper is to provide such evidence.

Much of the recent literature on early syntactic development claims that the grammar of children younger than 2;6 (years;months) lacks functional categories. More explicitly, children's grammar is argued to be an instantiation solely of maximal projections of the lexical categories noun, verb, pre/postposition, and adjective, either in total or partial absence of categories subserving grammatical functions, such as agreement and tense. Theories of this flavor have the logical consequence that the syntactic properties which must be attributed to the existence of functional categories are necessarily absent in the early speech of children. Some researchers deny the existence (availability) of any functional categories before the age of 2;6 (Guilfoyle & Noonan 1988, Lebeaux 1988, Platzack 1990; Radford 1990 for a somewhat younger age). They take recourse in the syntactic notion of Small Clause (Stowell 1981) to explain the output of an early grammar. Others argue for the availability of one or two functional projections (e.g. a single category resembling what will become IP, or both AgrP and TP but not CP) but maintain that the full complement of functional categories as it is manifest in the adult grammar is not present in early grammar (Clahsen 1990, Gawlitzek-Maiwald et al. 1992, Meisel & Müller 1992). These types of hypotheses reflect a view of the acquisition of syntactic knowledge under which the developing grammar gradually approaches the adult state by adding functional categories stepwise to the syntactic repertoire.

Our quantitative analysis of some German acquisition data focuses on the existence of the functional category IP, although we also offer some evidence for the CP system in declarative clauses. The evidence comes from word-order phenomena which must be attributed to the existence of these categories. In particular, we argue for the conclusions in 1.

(1) a. matrix sentences with clause-final infinitives are a legitimate structure for declarative sentences in early German grammar (for a proposed explanation see Wexler 1993);

b. the child makes the distinction between finite and nonfinite clauses in a systematic and consistent way;

c. the morphosyntactic processes associated with finiteness and attributable to the availability of functional categories (notably head movement) are in place;

d. word-order data implicate the existence of IP and CP;

e. the best model of the data is the standard analysis of adult German. Alternative theories, especially those with degenerate functional projections, cannot adequately account for the phenomena described here.

In this paper we will argue for the theory on which the child has the adult grammar, in particular the properties listed in 1b–e. We will call this theory the FULL COMPETENCE HYPOTHESIS (FCH). An exception to full adult competence lies in the use of infinitives in matrix clauses in corpora of early German (see 1a). We argue that the verbs in these clauses are actually represented by the child as nonfinite main verbs. We will refer to this hypothesis as the GRAMMATICAL INFINITIVE HYPOTHESIS. Issues pertaining specifically to these two models will be addressed in §5.

In §2 we provide some technical background and summarize the model of adult German within which we work. Section 3 summarizes the background of the acquisition data that we analyze. Section 4 presents the results of this analysis, with respect to finiteness, agreement, head movement, and nonsubjects in first position. The child is shown to have mostly adult properties with respect to these syntactic phenomena. The section also argues for the Grammatical Infinitive Hypothesis. In §5 we maintain that both the I and C systems exist at the early stage, presenting the case for the Full Competence Hypothesis.

THE STRUCTURE OF ADULT GERMAN[4]

2. In the principles and parameters approach, phrase structure (e.g. NPs, VPs, PPs) is captured by a unifying projection schema, the X-bar schema. X-bar theory[5] assumes that all phrasal categories project from their heads, where heads are the lexical categories noun, verb, pre/postposition, and adjective and functional categories like inflection and complementizer.[6] A category X (e.g. V) projects to X' (e.g. V') by the addition of a complement like an object, where linear order differs among languages; X' projects to XP (e.g. VP) by the addition of a specifier (Spec). The CP system (C, C', CP) provides positions for complementizers (such as that in C) and for WH-words in the specifier of C (called Spec,C); it also plays an important role in topicalization of NPs and adverbials in German. Inflectional properties of the clause are represented in the IP system. In the context of this paper it is important to bear in mind the difference between the lexical and nonlexical (functional) categories. At stake is the availability of categories which satisfy formal clausal requirements, such as IP and CP, not the developmental status of the lexical categories.

German is a typical example of a V2 language, a class that includes Dutch, Danish, Swedish, Yiddish, Frisian, and Icelandic, among others. The characteristic syntactic phenomenon of V2 languages, in particular German, is that the finite verb (main verb OR auxiliary OR modal) is always in second constituent position in matrix clauses, and that some subject, object, or adverbial maximal

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[4] Following den Besten 1989, Grewendorf 1988, Haegeman 1991, contributions in Haider & Prinzhorn 1986, Schwartz & Vikner 1989, and Vikner & Schwartz 1992.

[5] See Chomsky 1986. For an extended introduction, see Haegeman 1991. For illustration, see exx. 2, 20, and 24 below.

[6] Formally, lexical categories are those generated by the features [±N] and [±V] (nominal, verbal). All other categories are functional categories—tense, agreement, determiner, etc. In the first part of this paper we lump together tense (TP) and agreement (AgrP) as inflection (IP).

projection appears in first position. In contrast to matrix clauses, the finite verb in subordinate clauses is in final position. Assuming that subordinate clauses reflect the underlying word order, German is analyzed as having the underlying word order Subject-Object-Verb, although in matrix clauses the (unmarked) order is SV[+ FIN]O.[7] The finite verbal element which appears in second position in matrix clauses is assumed to be in C, the head of CP. Evidence for this analysis comes from the complementary distribution of finite verbal elements and overt complementizers. In short, the existence of an overt complementizer introducing a subordinate clause blocks the movement of the finite verb to the canonical complementizer position. Additional evidence is provided by the existence of inflected complementizers, for example in Bavarian and West Flemish (Bayer 1984, Haegeman 1992). Given the underlying SOV order and the visibly different S-structure order in matrix clauses, we assume two rules (instantiations of move α, where order is irrelevant for our purposes) in deriving the S-structure representations of root clauses: (i) fronting of the finite verbal element to C, and (ii) fronting of subject, object, or adverb XP to Spec of CP. The structure of the adult German grammar assumed here is schematized in 2.[8]

(2)
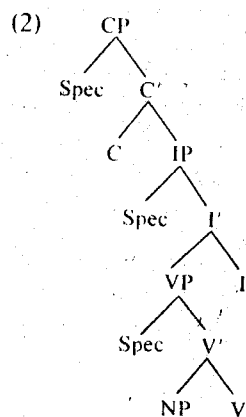
[7] There are several reasons to believe that in Dutch and German subordinate clauses reflect the underlying word order. (Importantly, this assumption allows for a more unified syntactic treatment.) Note, for example, that in a root clause that has a finite auxiliary or modal and a nonfinite verbal element, the infinitival verbal part remains in clause-final position, following its complement (as in subordinate clauses), whereas the finite auxiliary or modal is in second position. Also, when the sentence contains a separable particle verb such as *fertig-machen* 'finish' in (i), only the finite verbal element *mach-* 'make' is fronted and the particle (*fertig*) remains in its putative D-structure position.

(i) *Sie macht den Artikel fertig.*
    she makes the article finished

For an introductory (but very sophisticated) discussion of these topics, the reader might consult Haegeman 1991.

[8] For an excellent introduction to the syntactic phenomena of German discussed here, the reader is again referred to Haegeman 1991.

In root clauses the verb moves from its base position V to I (where it remains in subordinate CPs) and then to C. The subject or object NP, or an adverbial maximal projection, moves to Spec of CP from its D-structure position. While the object is assumed to be the sister of V, the issue of the position of the subject, in particular with respect to the acquisition data, will be taken up later.

THE ACQUISITION DATA

3. The data we analyze are from the transcript of Andreas (age 2;1; monolingual) from the CHILDES database (MacWhinney & Snow 1985; data contributed by Wagner 1985). Included in the analysis are all multiword utterances that are unique (i.e. types), spontaneous (i.e. not imitated or prompted), and interpretable by a native German speaker (Poeppel). Importantly, imperatives and questions are not included in the sample; only indicative declarative sentences were counted. Of the 996 types which Wagner reports (recording of spontaneous speech), 282 match the criteria and make up the total sample included in our analysis. The remaining 714 types are one-word utterances, two-word utterances which cannot reasonably be interpreted to also include a null-subject or do not match our criteria because they are imitations or expansions of a prompt, and finally any utterances that are uninterpretable because of transcript quality. Importantly, WH-questions, yes/no-questions, and imperatives are consistent with our analysis, although these are not included in the sample.

RESULTS

4.1. FINITENESS. Wexler 1993 argues that the alternation between finite and nonfinite forms of matrix verbs is characteristic of early child grammar. However, the choice of these forms is not free; rather, the form of the verb correlates with its position in the clause. As a first step in determining whether this generalization holds for early German and whether early German shows evidence of functional categories, it is crucial to demonstrate a contingency between the position of the verb and its inflectional status, i.e. whether it is used as an infinitive or in a finite form. If we can show a reliable contingency with respect to these factors, this in itself provides strong evidence against a theory which assumes that early grammars are pure instantiations of lexical categories in the absence of any functional elements and syntactic operations like movement (notably a model which is based on a Small Clause analysis). What needs to be established is the observation that [+ finite] verbs systematically appear in second clausal position, whereas [− finite] verbs systematically remain in final position.[9] Some examples from the transcript are given in 3 and 4, where 3a-b illustrate finite verbs in second position and 4a-b infinitivals in final position.

(3) a. *Ich hab ein dossen Ball.*
       I   have a   big   ball
    b. *ich mach das nich*
       I   do   that not

[9] The curious observation that the structure SOV[− finite] is apparently permitted as a matrix sentence in early German grammar will be taken up later.

(4) a. *Thorsten Caesar   haben.*
   Thorsten C.(= doll) have
   b. *du   das   haben*
   you   that   have

The criteria for classifying an utterance as finite or not were straightforward. If there was an *-en* ending in the verb stem (canonical infinitival morphology), the utterance counted as [−finite]. (This is always correct unless the *-en* is the agreement morpheme for first or third person plural subjects; 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]. The classification was fairly unproblematic given that Andreas used predominantly singular subjects with correct agreement morphology on the verb.

The total of 282 admitted utterances breaks down as follows: 231 [+finite], 51 [−finite]. The contingency between finiteness and position is shown in Table 1. Notice in Table 1 that there are only 22 counterexamples (7.8%) to the distribution of finite verbs in second position and infinitives in final position.

	+FINITE	−FINITE
VERB SECOND	216	7
VERB FINAL	15	44

Total = 282
$\chi^2 = 155.93$
$p < 0.0001$

TABLE 1. Finiteness versus verb position.

Although this result is statistically and descriptively overwhelming, we need to control for the result in a crucial way. The 282 utterances considered in this analysis include two-word sentences in which the second position is also the final position. If we eliminate all the two-word utterances in which V2 = Vfinal, we are left with 251 sentences with three or more constituents.[10] In this set we can perform the identical analysis, now considering the finiteness contingency in a more meaningful way—namely, we can check for finite verbs in second BUT NOT final position versus infinitives in final BUT NOT second position. This result is summarized in Table 2.

Clearly, the contingency obtains in the same way under these more stringent criteria. We infer from this analysis that the finiteness distinction is made cor-

[10] Null subjects are counted as a constituent in this analysis. Thus, a sentence interpreted as pro O V is counted as a three-constituent utterance. Examples from the transcript include:

(i) **pro** *bin da*
   pro am here
(ii) **pro** *Hubsauber putzen*
   pro helicopter clean
(iii) **pro** *Wasser heinmachen*
   pro water put.in

	+FINITE	−FINITE
V2/NOT FINAL	197	6
VFINAL/NOT V2	11	37

Total = 251
$\chi^2 = 145.08$
$p < 0.0001$

TABLE 2. Finiteness versus verb position: three or more constituents.

rectly at the very earliest stages of grammatical development.[11] The 17 'errors' include sentences like 5–9.

(5) *Papa aufbasn   dies.*   SVO   (verb[−fin] second)
   Papa aufblasen dies
         blow.up this
   'Papa is blowing this up.'

(6) *Fafen   mein Bu.*   VS   (verb[−fin] first)
   schlafen mein Bruder
         'My brother is sleeping.'

(7) *Nimm ich das Auto.*   VSO   (verb[+fin] first)
   take I   the car
   'I am taking the car.'

(8) *Alle beide Bonties*   OSV   (verb[+fin] third)
   both   B.'s (M&Ms)
      ich hab.
      I have

(9) *Hier ich such.*   AdvSV   (verb[+fin] third)
   here I   look
   'I search here.'

Importantly, the 'errors' (i.e. [−finite] verbs in second position and [+finite] verbs in final position) are randomly distributed over verb positions (and in that sense the numbers in the corresponding cells should be even smaller), and therefore do not provide any systematic counterevidence to these claims. For example, 7 was counted as 'not V2' and thus appeared in the 'Vfinal/not V2' cell of Table 2. However, the verb in 7 is probably a finite verb (in some dialects this is the phonologically plausible form and, in any case, Andreas may have chosen the incorrect form). Therefore, the verb in 7 is clearly not a finite verb in final position. More likely, V is in C position, perhaps with the Spec,C constituent omitted. The forms not clearly in the cells that are 'correct' on our hypothesis were counted in the other two cells, though it is not at all clear that they should have been. In other words, we counted errors in Table 2 AGAINST our hypothesis. Thus the data in Table 2, strong as they are, should be interpreted even more strongly. These results are consistent with the data reported in the literature, although clear quantitative descriptions along these lines have

[11] Eighteen per cent of the utterances counted in Table 1 are nonfinite. In general, younger children give larger percentages of nonfinite utterances, often more than 50%. See Clahsen 1990 and Weissenborn 1990.

only occasionally been provided (see, for example, Mills 1985, Meisel & Müller 1992, Weissenborn 1990, Verrips & Weissenborn 1992, and Boser et al. 1991 for German, Platzack 1990 for Swedish, and Weverink 1989 for Dutch). We are restricting our theory and analysis to what we consider to be the systematic output of Andreas' grammar. The relatively small number of exceptions are really EXCEPTIONS, and we feel that as such they do not require us to structure our theory explicitly to account for them. In particular, these few exceptions to the otherwise very stable distribution might be performance errors or might depend on a wide variety of other considerations. One advantage of presenting a quantitative analysis is that it enables us to see which effects are systematic in the data.[12] The 'example-based' approach in language-acquisition research leaves open the possibility that one is ignoring important effects or, alternatively, building theories based on the exceptions and outliers in the data rather than on the underlying grammar.[13]

4.2. AGREEMENT. It has been argued (cf. Clahsen & Smolka 1986) that, although knowledge of the finite/nonfinite distinction can be established, children do not know subject-verb agreement. Specifically, the claim has been made that the agreement morphology on the verb is randomly distributed among subjects. In other words, we expect sentences with, say, a first person singular subject and third person singular agreement morphology on the verb. Our analysis does not confirm this conclusion. In the data from Andreas 2;1 the following generalizations are more accurate:

(i) First and third person singular subjects always co-occur with the correct agreement form on the verb. More specifically, the third person is always

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[12] A curious descriptive asymmetry about the SOV| – finite| sentences emerges from our quantitative analysis. Although about 90% of the simple verb tokens occur in finite form, only 19% of separable verb (see n. 7) tokens occur in finite form. This generalization seems to hold qualitatively for the data in Verrips & Weissenborn 1991 as well.

Consider the following contrasts involving a particle verb:

(i) *Katrin liest das Buch durch.*	
Katrin reads the book through	adult
'Katrin reads through the book'	
(ii) ?*Katrin liest das Buch durch.*	child (very infrequent)
(iii) *Katrin durchliest das Buch*	adult
(iv) *Katrin durchliest das Buch*	child
(v) *Katrin das Buch durchlesen*	adult
(vi) *Katrin das Buch durchlesen.*	child (very frequent).

Note from (iii) and (iv) that, like the adult, the learner knows not to raise the entire, unanalyzed particle verb. Yet something prevents the child from raising the verbal head alone. Although we have no explanation of this phenomenon, we speculate that it might include the fact that the learner must discover that he or she is learning a language in which prepositions and other particles are morphemes that can appear independently, and that there is a syntactic and phonological contrast between particle verbs and prefix verbs (which don't separate and bear a different stress pattern). Moreover, the learner must specify the categorial status of the particle verb and its contents. Depending on the structure that the learner assigns to the category, movement of the verbal head may be prohibited due to the empty category principle, for instance.

[13] For a discussion of problems with the example-based approach in acquisition research, see Cook 1990.

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correctly marked with -t; first person singular is either the correct form or a bare stem, but since the bare stem actually matches colloquial adult pronunciation of 1sg. forms (cf. *Ich mach(e) das* 'I make that'), it is not in fact incorrect.

(ii) Second person singular subjects are rare (total: 9).[14] The agreement morphology is phonologically deficient but not unambiguously wrong (e.g., *Du hast ein Pinsel* 'you have a brush' occurs in the transcript as *Du hass ein Tinsel*).

(iii) All the errors (total: 7) occur with plural subjects (total: 11); there are two correct cases and two bare stems. The errors are all of a characteristic type: plural subjects occur with singular verb agreement, with correct person agreement. So, for instance, a 3plu. subject NP will co-occur with 3sg. verb morphology -t. A typical example from the transcript is shown in 10.[15]

(10) *Alle Tiere   liegt da.*
     all   animals lies there

To summarize the data from Andreas 2;1, in 231 finite verbs with possible agreement morphology there are seven errors, all with plural subjects. This result indicates that, although the agreement paradigm is not fully available, it is not sensible to argue that agreement is totally deficient or that, when present, it is randomly distributed.

In short, our results on Andreas' 2;1 agreement system show that he basically knows the agreement system, especially first and third person singular. How can these results be made to square with the results of Clahsen (1986), who claims that children at a much later age still don't know the agreement system, in particular 3sg. -t? In Clahsen's data, children do use -t; however, Clahsen claims that -t is an (in)transitivity marker for them, not a 3sg. marker as it is for the adult. It is important to note that Andreas is not simply further advanced than other children who have been studied; crucially, he uses many matrix infinitives (see n. 11).

It seems to us that Clahsen's data are quite compatible with ours, but that his analytic methods have led to a different view. Clahsen concentrates on a particular conditional probability, namely the probability of the child's providing a -t inflection given that the subject is third person singular. This probability, in his data, is about .25 for Matthias at stage II (see Clahsen 1986, Table 2). Thus, he argues, children don't know that -t is a 3sg. marker.

The opposite conditional probability, however, is more appropriate for the test of whether -t is a 3sg. marker. Specifically, what is the probability of the subject's being third person singular given that -t is the inflectional marker on the verb? In Clahsen's data, this probability is almost ONE. In other words, the child almost never uses -t in an incorrect syntactic context. For example, Mat-

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[14] This is not as unusual as it seems prima facie. Most utterances involving a second person 'subject' are yes/no questions, wh-questions, and imperatives—of which there are many. Descriptive statements about second person subjects are rare and sound somewhat strange coming from a two-year-old.

[15] Many of the plural examples involve *alle* 'all', as in 10. It may be that Andreas interprets *alle X* as a singular quantifier. We have too little data on this point to pursue this analysis.

thias at stage II (where -*t* is used 25% of the time for 3sg. subjects) uses -*t* 2% of the time for 1sg. subjects and NEVER for 3plu. subjects (there are no instances of other kinds of subjects). Daniel uses -*t* at stage II 17% of the time for 3sg. subjects and never otherwise. (There is no relevant data for Julia.) After stage II, there is no incorrect use of -*t*. In summary, the probability of a 3sg. subject given that the verb has a -*t* inflection is essentially one. The appropriate conclusion, for Clahsen's data as well as for Andreas, is that the child knows that -*t* is a 3sg. marker. Otherwise we would expect the child to use -*t* with subjects other than 3sg.

Many of the non-*t* inflections for 3sg. subjects in Clahsen's data are -*en* inflections.[16] They are therefore infinitives, as we interpret them. The important point, however, is that -*t* is not used in incorrect syntactic contexts. Thus Clahsen's data, like our data, indicate that the child knows the syntactic meaning of -*t* (and of 1sg. -*e*). The singular agreement system is thus in place quite early, with the major exception that the child uses nonfinite forms where they would not be allowed by the adult.[17]

4.3. HEAD MOVEMENT. We have established that the data from Andreas 2;1 reveal a principled distinction between finite and nonfinite verbs in that they systematically appear in different positions. Finite verbs reliably appear as the second constituent, while nonfinite verbs are in final position. If we proceed from the assumption that a child's grammar is UG-constrained (cf. Borer & Wexler 1987, 1992), it would strengthen the argument to demonstrate the existence of the morphosyntactic process associated with finiteness, namely head movement. Head movement of the verb from V to I to C MUST be attributed to a functional projection.

De Haan 1987, Frijn & deHaan 1991, and Jordens 1990 have studied the acquisition of Dutch (and some German) with similar questions in mind. Comparable to the results reported here, they argue that children younger than 2;6 know the [±finite] distinction and—partially—the agreement paradigm. They hypothesize, however, that head movement, which correlates with finiteness, is a syntactic process not yet available to the child. Rather, the finite verbs

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[16] Many other non-*t* inflections for 3sg. subjects, especially at the youngest stage, are stem forms. Most of these are 'incorrect' stem forms—i.e., the verbs should take -*t* in 3sg.

Clahsen does not tell us whether the verbs appear in V2 or Vfinal position. If in V2, the children may simply think that -∅ is an alternative 3sg. inflection, a natural assumption given that irregular verbs which use -∅ as the 3sg. inflection are frequent verbs (namely modals). At any rate, the crucial point is that -*t* is not used in incorrect syntactic contexts.

[17] We really cannot say much about the plural agreement system at this early stage, because there are so few instances of plural subjects, at least in Andreas' data. The lack of plural subjects, of course, doesn't mean that the child necessarily doesn't know plural agreement. It might just be that the child, for whatever reasons, isn't using plural subjects. On the other hand, there is not a lot of evidence that the child does know plural agreement. It may be that the fact that the child doesn't use plural subjects often might slow down the learning of the form of plural agreement. The essential point is, that the child does know what an agreement system is, and uses it appropriately for the kinds of subjects that he actually uses, again, with the exception of using nonfinite forms.

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appearing in V2 position and the nonfinite verbs in final position belong to nonoverlapping sets. Specifically, they argue that the finite verbs in V2 have auxiliary function and are base-generated in V2 position; in contrast, the uninflected verbs in final position are the action verbs which the child knows. Under their assumptions there is no semantic overlap and no syntactic similarity between these two sets. We will call this the NO-OVERLAP HYPOTHESIS. Contrary to these claims, we argue that the data analyzed here show that head movement as a morphosyntactic process is in place in the early grammar.[18] Consider, from Table 2, the 251 utterances with three or more constituents. Of these, 197 cases are sentences with the inflected verb in second/not final position. Another 37 sentences have the nonfinite verb in final/not second position. (The 17 exceptions are not included in this analysis.) We are thus looking only at those cases about which these authors are making claims. The set of 197 [+finite] verbs has 33 different verbs and the set of 37 infinitives has 26 different verbs, for a total of 59. Since 8 verbs occur in both sets, there are therefore 51 types. Of the 51 types, 23 are used only once; these provide no evidence, because they can only appear in one or the other position. The 28 remaining types occur at least twice and therefore could be in second or final position and be finite or nonfinite. Of these 28, the eight listed in Table 3 are

fahren	'to drive'
gucken	'to look'
haben	'to have'
holen	'to fetch, to get'
liegen	'to lie'
machen	'to do, to make'
sehen	'to see'
suchen	'to look for, to search'

TABLE 3. Head movement verbs.

actually [+finite] in the V2 position and [−finite] in final position, and therefore provide direct counterevidence to the no-overlap hypothesis. An example from the transcript provides the descriptive contrast:

(11) *Thorsten Caesar haben.*
    Thorsten Caesar to.have
      'Thorsten has [the doll] Caesar.'

(12) *Ich hab tein Bürse.*
    I have [a] small brush

Performing a contingency analysis for tokens of these eight verbs in the set of 251 three-constituent utterances yields the result in Table 4. Notice in Table 4 that the contingency established for all verbs in Tables 1 and 2 holds for this

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[18] What is important in establishing these data as from the 'early grammar' is not only Andreas' age (2;1); it is also crucial that Andreas at this age is still using many matrix infinitives. So we conclude from the analysis of Andreas that the infinitival forms in the early grammar do not represent a stage at which there is no head movement.

	+ FINITE	− FINITE
V2/NOT FINAL	70	1
VFINAL/NOT V2	6	15

Total = 92
$\chi^2 = 50.54$
$p < 0.0001$

TABLE 4. Finiteness versus verb position: head movement verbs.

much more restricted set. Thus, the argument that there is no syntactic similarity between verbs used in second position and verbs used in final position is hard to defend in this context. Moreover, the claim that there is no semantic overlap between sets is difficult to maintain, given the meanings of the verbs listed in Table 3. We find it implausible to assume that these verbs are used exclusively as auxiliaries when they are [+finite] and in second position, and exclusively as action verbs when they are final-position infinitivals.

An important control still needs to be considered. We looked at the 28 verbs used at least twice and showed that 8 of them provide counterevidence to the No Overlap Hypothesis in that they appear in both finite and nonfinite forms and in the correct respective positions. The remaining 20 verbs must now be classified in terms of where they appear—that is, we must list the verbs that are exclusively second and [+finite] and the verbs that are exclusively final and [−finite]—and examined in terms of their semantics. Could it be plausible, in principle, to consider the [+finite] verbs as auxiliaries and the [−finite] verbs as action verbs? In other words, do these 20 comprise counterexamples to our hypothesis that head movement is available? Even a cursory analysis of the semantics of the verbs in question shows that such an account is not tenable (Table 5). In fact, even the verbs that appear only once do not provide

USED [+FINITE] ONLY		USED [−FINITE] ONLY	
brauchen	'need'	putzen	'clean'
finden	'find'	sauber machen	'clean'
fliegen	'fly'	spielen	'play'
gehen	'go'	stehenbleiben	'stand still'
können	'can'	werfen	'throw'
kommen	'come'	zeigen	'show'
kriegen	'get'		
lassen	'let'		
möchten	'want'		
nehmen	'take'		
sein	'be'		
umkippen	'fall over'		
wissen	'know'		
wollen	'want'		

TABLE 5. Verbs occurring with one finiteness value—two or more tokens.

counterevidence (Table 6). Although the list of verbs used only [+finite] does include items which are reasonably categorized as auxiliaries (e.g. möchten, können, sein, and wollen in Table 5), it is certainly not the case that all items

USED [+FINITE] ONCE		USED [−FINITE] ONCE	
abfahren	'drive away'	abtrocknen	'dry'
fressen	'devour'	anziehen	'dress'
hängen	'hang'	aufblasen	'inflate'
hauen	'hit'	dareintun	'put in'
heissen	'to be called'	drauffahren	'drive on'
klauen	'steal'	fertigmachen	'finish'
müssen	'must'	fragen	'ask'
sagen	'say'	hineintun	'put in'
schreiben	'write'	hineinmachen	'put in'
tragen	'carry'	hingehen	'go there'
werden	'become'	Tor machen	'score a goal'
		wiederfahren	'drive again'

TABLE 6. Verbs occurring with one finiteness value—one token.

appearing in second position as inflected verbs can be classified as auxiliaries. These items are thus counterevidence to the no-overlap hypothesis.[19]

Our conclusion is that Andreas knows the morphosyntactic processes associated with head movement. There is much additional evidence in the literature suggesting that children know head movement and the associated properties. Wexler 1993 argues this point for a variety of languages. Verrips & Weissenborn 1992 convincingly make the case against analyses such as Jordens' (1990), de Haan's (1987), and Clahsen's (1990); these authors argue that a rule of verb movement is acquired as a consequence of the acquisition of certain morphological prerequisites. In particular, they assume that the acquisition sequence is such that the child must first master the agreement paradigm (or other morphological and semantic knowledge) before being able to apply the syntactic operation of verb movement. In accord with Verrips & Weissenborn's 1992 analysis, we believe that these observations are phenomenologically incorrect and that they lead to serious learnability problems. Specifically, our analysis of the Andreas corpus does not support the theory that the child must know the full agreement paradigm before showing evidence of verb movement in the grammar.

Other evidence for head movement in early grammar has been adduced in Pierce 1989, Deprez & Pierce 1992, and Weissenborn 1988. For ages younger than 2;0 Pierce shows that there is a reliable contingency between placement of the negative *pas* and the finiteness status of the verb in early French: *pas* precedes the nonfinite verb and follows the finite verb. Pierce 1989 argues that, in those cases in which *pas* follows the finite verb, the verb has raised to a

[19] It does appear to be the case that modals appear only in V2 position. There are many possible explanations for this. One possibility is that it is some kind of performance effect. Generally, modals are used with other verbs; perhaps Andreas has a constraint against two verbs appearing in final position. Another, more grammatical, possibility is that modals are generated in I. To explain why they are always in second position, we would have to assume (with Travis 1984 and Zwart 1992) that I is to the left of VP in German, and that the child knows this. Alternatively, one might assume that modals are generated in C. We will not pursue these questions here. The crucial point is that,

functional category.[20] Like the German data presented here, this French pattern provides evidence for the availability of at least one functional category even at the earliest stages of syntactic development.

4.4. NONSUBJECTS IN FIRST POSITION: ESTABLISHMENT OF THE V2 PHENOMENON. Taken in conjunction, the evidence for knowledge of the finiteness distinction and the evidence for the availability of head movement as a syntactic process strongly implicate the existence of AT LEAST ONE functional projection above VP, say IP. With regard to the grammar of early German we are now in a position to examine whether the V2 phenomenon is genuinely in place. Recall that the V2 phenomenon is analyzed as a combination of two rules: fronting of the finite verb to the second constituent position and fronting of a maximal projection (subject, object, or adverb) to first position. Characteristic of this phenomenon is the appearance of nonsubjects in first constituent position, followed by a finite verb. If we are able to show that this is also typical in the child's utterances, we may conclude that the acquisition data are entirely consistent with the model of the adult German grammar presented earlier. Specifically, a theory which allows only for canonical word orders such as SVO or SOV cannot adequately account for this phenomenon.

The relevant utterances to examine are the 197 sentences in which the finite verb is correctly placed in second position (see Table 2). For this set of sentences we then ask: what is in first position, i.e. in Spec of C on our theory? Nineteen of the 197 sentences have an object in first position. Examples from the transcript are given in 13.

(13) a. *Kahehabahn fahr ich.*
         (toy race car) drive I
     b. *Eine Fase hab ich.*
         a   vase have I

The analysis for adverbs is analogous to the one for object-first cases. Examples of the 31 sentences with adverbs in first position are given in 14.

(14) a. *Da   bin ich.*
         there am I
     b. *So macht der.*
         so makes he

In the set of 197 sentences, 180 have overt subjects.[21] Of these, 50 (= 28%)

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[20] For example, consider this contrast from Pierce 1989:

(i) *Pas rouler en velo.*
    not roll   on bike
(ii) *Elle roule pas.*
    it rolls not

The verb in (i) is nonfinite; the verb in (ii) is finite.

[21] Notice from Table 7 that subjects are never dropped when they are not in clause-initial position. In all 17 cases of pro-drop in the set of 197 utterances with the V2 property, the subject is dropped from the first constituent position. The generalization, at least for this corpus, is this: if there is a nonsubject in first position, then there is an overt postverbal subject. (Note that Weverink 1989 found the same for Dutch.)

have a nonsubject in first position. This high percentage of noncanonical word order in itself implies that the V2 phenomenon, which is attributed to the existence of a CP system, is in place. In addition, there is some specific evidence which suggests that both the IP and CP systems are available in Andreas' early grammar; we will discuss this in §5.

Table 7 is a breakdown of the V2 utterances by word order, and Table 8 shows the infinitives by word order.

S	V	O	(x)	130
O	V	S	(x)	19
Adv	V	S	(x)	31
pro	V	O	(x)	17
O	V	pro	(x)	0
Adv	V	pro	(x)	0
			TOTAL:	197

TABLE 7. Finite verbs in V2 position. (x) = optional additional constituent, specifically adverbial phrase, negation, or prepositional phrase.

S		O	V	14
S	x		V	4
S	x	O	V	5
S		O x	V	1
pro		O	V	10
pro	x		V	3
O	(x)	S	V	0
Adv	(x)	S	V	0
			TOTAL:	37

TABLE 8. Infinitival verbs in Vfinal position. (x) = an optional constituent; x = a constituent definitely appears (adverbial, negation, or prepositional phrase).

4.5. DO MATRIX INFINITIVES INVOLVE MODAL DROP? We argue that matrix infinitives are allowed by the grammatical system of the child; for whatever reasons, infinitives are allowed in final position (see Wexler 1993 for one possible theory). Call this the GRAMMATICAL INFINITIVE HYPOTHESIS. Another possible interpretation is that the child has a complete adult system, in which matrix infinitives are not allowed, but that somehow the child 'drops' a modal, giving the surface appearance of a matrix infinitive (in clause-final position) without a modal. We call this the MODAL-DROP HYPOTHESIS.

It is not clear to us why the modal-drop hypothesis should hold: why should the child drop modals? Presumably it would be for some kind of processing reason, but it is difficult to see what the processing explanation would be. Other attempts to explain omitted constituents in child language via an 'output omission model' have run up against severe conceptual, theoretical, and empirical problems (see Hyams & Wexler 1993).

Nevertheless, we can see what empirical effects are relevant to the modal-

in the underlying structure. The claim of the modal-drop hypothesis is that infinitives without a modal are not actually grammatical for the child; they simply represent some kind of output omission. First, note that the modal-drop hypothesis predicts that the meaning of infinitival verbs will be that of infinitives associated with a modal. Thus the verbs will be used in contexts that we may call irrealis, the kinds of contexts where infinitives paired with modals are used by an adult; they will not be used in the kinds of 'finite,' 'realized' contexts in which finite verbs are used by adults.

We did a contextual analysis of all 37 nonfinite verbs used in multiword utterances by Andreas. We classified the verbs according to the judgments of a native speaker (Poeppel) as to whether they were used in irrealis (modal) or realized (finite) contexts. These judgments were based on the contextual information in the transcripts. For example, consider Andreas' utterance in 15.

(15) *Thorsten Ball haben.*
     Thorsten ball have

From the information given in the transcript, plus the preceding and subsequent utterances, it is evident that Thorsten already has the ball when 15 is uttered. Since he already has it, it is clear that Thorsten doesn't WANT to have (get) the ball; nor does there seem to be any other appropriate modal to insert into 15. Andreas is giving a descriptive, realized utterance.

Sometimes the contextual information was not sufficient to make a clear determination. Our figures indicate that 20 of the 37 nonfinite verbs are realized, nonmodal uses. The other 17 are unclear; they may very well be descriptive, but this cannot be determined from the context. In summary, the contextual analysis does not support the modal-drop hypothesis. The infinitives are often clearly used in the same way that an adult would use a finite verb, and they are never clearly used in the way an adult would use a modal/infinitive pair. Their meanings are not irrealis meanings—the meanings that would be associated with an infinitive that was part of a modal/infinitive pair.

In addition to these contextual and semantic arguments, there is a direct syntactic distributional argument against the hypothesis that the infinitival forms in Andreas' speech merely represent a dropped modal.[22] Suppose that Andreas sometimes drops modals, i.e. that there is a process of 'modal drop'. Modal drop should occur wherever the modal may appear in the underlying representation. In particular, it may be dropped in syntactic contexts in which a nonsubject has been raised to Spec,C, for example a syntactic object or an adverb. We have already shown (§4.4) that Andreas often raises an object or adverb to Spec,C, with a finite verb following in V2 position (i.e. in C). Therefore modal drop predicts that, even when an object or adverb has been raised to Spec,C, the modal in second position may be dropped. Thus modal drop predicts that there will be sequences in Andreas' speech like 16.

(16) a. Object Subject Verb[−fin]
     b. Adverb Subject (Object) Verb[−fin]

In other words, the 'drop modal' hypothesis predicts that modals in second position will be dropped no matter what has been placed in first position.

Compare this prediction to that of the grammatical infinitive hypothesis, which says that what looks like an infinitive without a modal in child speech is in fact an infinitive without a modal. The grammar of German (or of any other V2 language) licenses a constituent move to Spec,C only if a verb moves into C. Since in Andreas' speech the infinitives appear in final position, this means that when there is an infinitive, no verb has moved into C. Therefore a constituent cannot be licensed in Spec,C. We assume that the child knows the relevant grammatical processes, so the appearance of an infinitive in his speech (in final position) means that no constituent can move into Spec,C. Therefore the grammatical infinitive hypothesis predicts that 16a−b will not appear in Andreas' speech, even though Andreas has many object-first and adverb-first sentences: such sentences must always involve a finite verb in second position.

The data unequivocally support the grammatical infinitive hypothesis. Andreas has 50 object- or adverb-first sentences (see §4.4), and all of them have a (finite) verb in second position. That is, there are NO sentences which, like 16a−b, have an object or adverb first and a (nonfinite) verb in final position. The modal-drop hypothesis makes a clear misprediction, while the grammatical infinitive hypothesis makes a clear correct prediction.

We should ask whether this result is somehow artifactual. In particular, there aren't many infinitival sentences, and topicalization only occurs some of the time. So it is possible that the lack of topicalized infinitival (TI) sentences results from the fact that two infrequent processes must occur in order for a TI sentence to appear. This artifactual hypothesis assumes that the selection of tense (+ or −finite) and the selection of topicalization are independent processes. Thus the probability of a TI sentence is the product of the probability of an infinitive and the probability of a topicalized sentence. Looking at Table 2, we estimate that p(infinitive) = 43/251 = 0.17. We have already calculated that there are 50 sentences with topicalized objects or adverbs, so that we estimate p(topicalization) = 50/251 = 0.20. Thus, p(TI) = 0.17 × 0.20 = 0.034. Because there were 251 sentences, we expect that there will be 0.034 × 251 = 8.53 TI sentences. However, there were none. This clearly shows that the lack of topicalized infinitives is not due to the infrequency of topicalized sentences and of infinitives.

In fact, we can provide an exact estimate of the probability of observing no TI sentences. The probability that a sentence is not a TI sentence is (1 − 0.034) = 0.966. Since each sentence is independent of any other sentence, the probability of observing no instances of TI sentences out of the total of 251 is 0.966 to the 251st power. This probability is less than 0.001. That is, on the assumption that topicalized infinitives are produced as often as we expect them given the probabilities of topics and infinitives, the probability of observing the data we actually observe by chance is less than 0.001. Clearly some other factor is impeding topicalized infinitives. The grammatical infinitive hypothesis is just

mary, the evidence. both contextual and syntactic, is that the grammatical infinitive hypothesis is correct. It is not that modals are somehow dropped in the output. Rather, matrix infinitives represent a grammatical possibility for the child.

THE I AND C SYSTEMS BOTH EXIST

5. We are following a theory which says that children have the standard adult model of German grammar, except that they allow infinitives in matrix clauses. This is the Full Competence Hypothesis, according to which children have full adult competence (except that they allow optional infinitives in matrix clauses).[23] In particular, the theory says that children have I and C projections, that the finite verb is in C (in matrix clauses), and that a major projection is in Spec,C in matrix clauses (except for yes/no questions, imperatives and related forms). The Full Competence Hypothesis predicts 17.

(17) a. Finite verbs are in second position only (except for special V1 cases).
 b. Nonfinite verbs are in final position only.
 c. Subjects, objects, and adverbs may all appear in clause-initial position followed by a finite verb and with the remaining constituents in D-structure order.[24]

The data from Andreas that we have reviewed are completely consistent with the Full Competence Hypothesis; in fact, the data follow from the Full Competence Hypothesis. In particular, the finite verb is in V2 position, and subjects, objects, and adverbs can all appear in first position, with the order of the remaining constituents in their D-structure order.

In our view, the fact that the data are consistent with the Full Competence model is enough to favor this model, since any theory which assumes that the child has less competence would involve more learnability problems. That is, the Full Competence Hypothesis has no developmental question associated with it (except for the optional infinitive problem), whereas theories that assume less than full competence must explain how the missing or wrong properties are learned or, alternatively, develop through maturation. Nevertheless, it is useful to consider the empirical consequences of models which assume that the child has less than full adult competence, to see if the data favor the full

[23] We will discuss the conceptual status of our hypothesis at the end of §5.
[24] Other orders of VP constituents are possible in (adult) German. By hypothesis, these variations in word order are due to a rule of 'scrambling', a syntactic operation which is perhaps conditioned by semantic requirements. Thus, an object may be scrambled over a preceding adverb, as shown in the contrast between (i) and (ii).

(i) weil   sie   wahrscheinlich die Bücher kauft
    because she probably   the books buys
(ii) weil   sie die Bücher wahrscheinlich kauft
    because she the books probably   buys

For discussion of scrambling in Dutch and German see Haegeman 1991 and Grewendorf & Sternefeld 1989. We will ignore such word-order variation here, except to note that there appears to be no evidence of scrambling at this early age. It is difficult to tell, of course, since there aren't very many sentences with a sufficient number of constituents.

theory or the other theory. We will argue in this section that the Full Competence Hypothesis comes off best in this empirical comparison.

5.1. NO FUNCTIONAL CATEGORIES. According to one very popular theory, young children (say, younger than 2;6) lack functional categories entirely (Lebeaux 1988, Radford 1990, Platzack 1990, Guilfoyle & Noonan 1988). For the clause, the claim is that children have only the major projections of NP and XP (usually VP). The child's phrase structure is hypothesized to be, for example, as shown in 18.

(18)   S
          / \
         /   \
        NP   VP
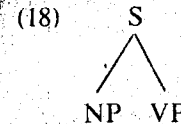
No functional projection XP is available in the grammar; specifically, the grammar lacks IP and CP. This theory has the consequence that (i) there is no verb movement, and (ii) there can be no agreement on the verb. The data presented above show quite clearly that this cannot be correct. The child Andreas (2;1) is substantially younger than 2;6, at a stage when five months is an enormous amount of time. (Importantly, the data from his transcript are consistent with reports in the literature for children of comparable age with regard to the linguistic properties discussed here. In other words, the data are not exceptional in any way, but rather appear to be standard.) Andreas has V2 for finite verbs. Moreover, objects and adverbs (as well as subjects) can appear in first position, with the subject following the verb. This is clearly the V2 phenomenon. There is no way to derive such constructions without functional categories, if the child has a system consistent at all with UG. And if Andreas doesn't have a UG system, how does he wind up with these rather special UG-allowed orders and the relationship between finiteness and word order? Clearly, Andreas has verb movement, predicted in (i) to be impossible if there are no functional categories.

In addition, Andreas has agreement, as we argued in §4.2. Thus the second prediction of the 'no functional categories' hypothesis is clearly wrong for Andreas—and also, as we argued in §4.2, for the German children studied by Clahsen. Our conclusion is that Andreas (and other young children) have functional categories in German.

5.2. EVIDENCE AGAINST C. As we have argued, the Full Competence Hypothesis predicts 17, which is confirmed in the data. The 'no functional categories' hypothesis cannot begin to deal with the data. It has been suggested, however, that the category C and its projections might not exist in the early grammar, but that the data predicted in 17 can nevertheless be accounted for (see, e.g., Clahsen 1990, Meisel & Müller 1992, and Gawlitzek-Maiwald et al. 1992). Let us call this the NO-C HYPOTHESIS.

First, why has it been suggested that C doesn't exist? The major evidence

Notice, crucially, that we do not expect a large number of overt complementizers in early speech anyway, because overt complementizers primarily introduce subordinate clauses and young children rarely use subordinate clauses. (The situation would be more problematic if there were substantive evidence that young children use embedded clauses regularly and systematically leave out the complementizer.) From the viewpoint of scientific method, absence of evidence for some category does not constitute evidence for its absence. The lack of overt complementizers, therefore, does not conclusively prove the absence (or unavailability) of the linguistic category in question. Two additional arguments brought forth against the existence of CP are the absence of WH-preposing and the absence of auxiliary inversion. These, of course, are syntactic operations definitely associated with the availability of a CP system. But in fact there is evidence that these syntactic operations ARE in place in early grammar (Hyams 1992, Stromswold 1990). Thus, we find the arguments postulating categorial absence to be insufficient and inconclusive.

An important reason for examining the acquisition of Germanic languages with the V2 property arises from the fact that syntactic phenomena other than complementizers are associated with the CP system. In particular, we showed in §4.4 that objects and adverbs often occur in first position in Andreas' speech, followed by the finite verb. This is syntactic behavior which is usually taken to be dependent on the existence of a CP system. As we have pointed out, the standard analysis of adult German (see §2) assumes that a constituent moves into Spec,C and the finite verb moves into C. Thus the existence of such phenomena in Andreas' speech is prima facie evidence that Andreas has a C system. We have argued from word-order data and quantitative analyses that these other properties can in fact be shown to exist in the grammar of a child significantly younger than 2;6.

Returning to arguments against the existence of C, we note that Meisel & Müller (1992) argue that very young children have subordinate clauses—at least in the sense of logical subordination—but that they don't have complementizers. In particular, they claim that there are sentences without complementizers that show logical subordination. Their examples, however, are not unambiguously interpretable as cases of subordination. They provide the following four examples from two of the three (bilingual) children in their study (1992:120):

(19) a. *Pa' auf teddy tombe pas.*
      watch out teddy falls   not
      'Watch out that the teddy doesn't fall.' [age 2;4]
   b. *Est pas gentil il vas il vas dans le sac.*
      is not nice he goes he goes into the bag
      'If they aren't nice they will go into the bag.' [age 2;9]
   c. *Guck mal—ich hab. hab ich.*
      look   I   have have I
      'Look what I have.' [age 2;6]
   d. *Weisst du—geht ein haus?*
      know you build a house
   'Do you know how to build a house?' [

First, notice that there are only four examples. There may be more in the corpus, but if these are representative of the apparent phenomenon, they hardly constitute evidence for logical subordination. Second, it is not clear how the utterances are to be interpreted, or what the reasons are for the lack of a complementizer. Ex. 19a involves code-switching; there could be many reasons for the non-use of a complementizer here. Ex. 19b would presumably involve the conditional complementizer (the equivalent of English *if*), and conditionals might have enough cognitive complexity to develop late. Ex. 19c, if the interpretation is correct, doesn't show complementizer deletion at all; rather, at best a specifier (*was* 'what') is omitted. Similarly, in 19d a specifier (*wie* 'how') is deleted. Thus, Meisel & Müller adduce at most two examples of complementizer omission, and both of these are subject to other interpretations.

There could be evidence for the claim that complementizers are omitted. The German complementizer *dass* 'that' has no semantic content, aside from its subordinating function. If children have logical subordination without complementizers, then we would expect to see clear examples of subordinate clauses with *dass* omitted. Since Meisel & Müller provide no such examples, it seems safe to infer that their subjects did not produce any subordinate clauses with *dass* omitted. In other words, there is no solid evidence that children are using subordinate clauses and omitting obligatory complementizers. In our view, therefore, Meisel & Müller's evidence does not weaken the case for the existence of C.

From the UG-constrained maturation standpoint (i.e. from any viewpoint which assumes that UG constrains children's grammars), it is not at all clear that one can maintain a hypothesis that C is missing but subordinate clauses exist. Something in grammar necessitates C. Presumably, the no-C hypothesis would require the assumption that a verb which in the adult selects for CP selects for IP in the child. In general (except for special verbs) selections for IP are not allowed by UG. Even when a visible lexical C is not present, the C system is in the underlying structure. It is not at all clear, therefore, that the no-C hypothesis can be made compatible with UG. Of course, it is possible that child grammars violate UG; however, since a large body of empirical results is consistent with the UG-constrained hypothesis, we believe that the hypothesis should be maintained unless conclusive evidence is presented against it. The evidence from the nonexistence of lexical complementizers in early speech is far too weak, in our opinion, to overturn the hypothesis.

5.3. TWO FUNCTIONAL CATEGORIES. It is now widely accepted that at least one functional projection is necessary to account for even the simplest facts of very early grammar. We have argued that C exists (consistent with the Full Competence Hypothesis); the basis for this argument is the set of predictions in 17. Can these predictions also be made by models which assume the existence of one functional projection while maintaining that the CP system is absent? The models in this class include Clahsen's 1990 suggestion of a head-initial CP-precursor category which is responsible for finiteness (FinitenessP), Gawlitzek-Maiwald et al.'s 1992 theory, which postulates a head-initial IP, and Meisel &

Müller's 1992 Split Infl Theory. The claims of these theories are that there are head-initial functional categories (e.g. IP) available and that the grammar develops by gradually adding functional categories—CP, D[eterminer] P[hrase], etc. The proposed grammars can be schematized (in category-neutral terms) as in 20, where X is an arbitrary functional head.

(20)
```
        XP
       /  \
    Spec   X'
          /  \
         X    VP
             /  \
          Spec   V'
                /  \
              NP    V
```
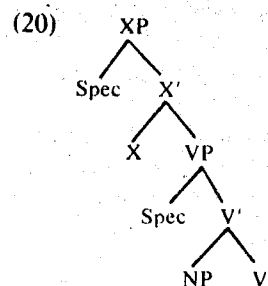
It is clear that 20 allows the finite verb to wind up in V2 position (i.e. in X). Thus 17a can be captured. Similarly, the fact that [−finite] verbs can be in final position (17b) is also consistent with 20, for whatever reasons make the grammatical infinitive hypothesis possible. Prediction 17c requires that it be possible for adverbs and grammatical objects to appear in first position (in Spec,C according to the Full Competence Hypothesis). In order for the 'one projection model' in 20 to allow nonsubjects in first position, these nonsubjects must appear in Spec,X. Therefore, in sentences with adverbs or objects first (of which there are many, as we have shown), the subject must appear in Spec,VP. There are possible conceptual problems with such an analysis, especially on learnability grounds. If the subject remains in Spec,VP, is this possible on UG? Even if it is, if the subject doesn't remain in Spec,VP in adult German, how does the child learn the correct analysis from positive data? Alternatively, how does maturation take place?

Note in particular that for 17a and 17c (i.e. the V2 effects) to be consistent with 20, the functional head X (possibly Inflection) must be on the left of VP. If Infl is on the right of VP, as is standardly assumed (see e.g. Vikner 1991), how does the child learn (or mature into) I on the right of VP?[25] Presumably C grows (possibly maturationally, as e.g. Radford [1990] would maintain).[26] At that point the finite verb moves into C. There would be no evidence from matrix clauses to tell the child that I was on the right of VP. Now assume that subordinate clauses came in, with I still on the left of VP. The complementizer would be in C, followed by Spec,IP, followed by I. Since the child moves the finite verb into I (as we know), we expect V2 effects in subordinate clauses. However, it has been argued (Clahsen 1982, Rothweiler 1989) that, from the moment of appearance of subordinate clauses, there are no exclusive V2 effects

[25] See Zwart 1992 for an analysis of adult Dutch which places I to the left of VP.

in embedded clauses. To the extent that this empirical claim is correct, the One Functional Category Hypothesis is not supported.[27]

There are also direct empirical arguments against the One Functional Category Hypothesis at the level of Andreas' current grammar. There are three kinds of sentences that the One Functional Category Hypothesis will not allow. First consider sentences which contain an object in first position and which also contain negation or an adverb. The accepted assumption is that negation and certain adverbs are outside (and to the left of) the VP at D-structure. We have already shown that the One Functional Category Hypothesis requires that the subject be in Spec,VP in sentences in which the first position is occupied by an adverb or an object (there is simply no other place for it in 20). Therefore the adverb or negation must appear to the left of the subject, according to the One Functional Category Hypothesis in 20. The Full Competence Hypothesis, however, predicts that the (correct) subject-adverb/negation order will be maintained in such sentences. The predictions are summarized in 21.[28]

(21) a. FULL COMPETENCE HYPOTHESIS: Obj V Subj Neg/Adv
     b. ONE FUNCTIONAL CATEGORY HYPOTHESIS: Obj V Neg/Adv Subj

Of the 19 sentences that begin with an object, four contain an adverb and/or negation. All four of these utterances occur in order 21a. An example (which happens to contain both negation and an adverb) is given in 22.

(22) *Den   tiegt a   nich wieda.*
     that.ACC gets he not again
     'He can't get that one again'

A second class of relevant sentences contains an adverb in first position and also negation or a second adverb. Exactly the same reasoning as above yields the predictions in 23.

[27] If children DO make some V2 errors in subordinate clauses, then the V2 or Vfinal position of tensed verbs is optional for them, since it is overwhelmingly clear that most verbs in subordinate clauses are in Vfinal position. How then from positive evidence only (see Wexler & Hamburger 1973 and many subsequent publications for the 'no negative evidence assumption') would the child decide that V2 structures were not possible in embedded clauses? In other words, if the child does make some V2 errors, there is no way to recover from this analysis; I will have to remain possible on the left of VP, and the child will continue to produce incorrect utterances. The only empirical possibility that would be consistent with the assumption that I is on the left of VP in early grammars would be the consistent use of V2 in subordinate clauses when they appear. To the best of our knowledge, such a result has never been suggested.

[28] We are assuming that Neg is adjoined to VP, so that there is no Spec,Neg to which the subject may raise. If one assumes that Neg heads its own projection, then the subject may move to Spec,Neg and the order in 21a would be expected. This assumption does entail that other functional categories with full projections, besides X, exist. Moreover, it is generally not proposed that adverbs head their own projections; they are usually taken to adjoin. Thus, even if Neg heads its own projection, the One Functional Category Hypothesis will still mispredict the order of sentences beginning with objects and containing adverbs. That is, it will predict the order in (i) rather than the order that the FCH predicts (ii).

   (i) Obj V Adv Subj
   (ii) Obj V Subj Adv

(23) a. FULL COMPETENCE HYPOTHESIS: Adv V Subj Neg/Adv
   b. ONE FUNCTIONAL CATEGORY HYPOTHESIS: Adv V Neg/Adv Subj

Of the 31 sentences that begin with an adverb, four contain either negation or another adverb. All four of these conform to the order 23a, predicted by the FCH.[29]

In summary, eight sentences distinguish between the FCH and the One Functional Category Hypothesis, and all eight of these come out as predicted by the FCH. This is quite strong evidence in favor of the FCH and against the One Functional Category Hypothesis. Note that all sentences beginning with an object or an adverb (a total of 50) are consistent with the FCH; there are no counterexamples.

5.4. TENSE AND AGR BUT NOT C. Meisel & Müller (1992) propose a theory that does provide for two functional projections. Their model of early grammar includes a head-initial T[ense]P[hrase] above a head-final Agr[eement] P[hrase]. This is in line with the Split-Infl hypothesis of Pollock 1989 and Chomsky 1989.[30] However, Meisel & Müller maintain that the CP system is initially absent; their model is represented in 24. Let us call the theory represented in 24 the T, AGR, No C HYPOTHESIS (TANC). Since the theory makes two functional projections available, it is more difficult to separate its predictions from those of the Full Competence Hypothesis. Nevertheless, there are still considerations that argue in favor of the FCH over the TANC.

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[29] A third relevant class of sentences might not distinguish between the two hypotheses, depending on assumptions—namely, sentences which begin with a subject and which contain an object and either an adverb or negation. The Full Competence Hypothesis assumes that the subject moves to Spec,C and the verb to C. Therefore, we expect Neg/Adv before Object. It is not clear which of two possibilities is instantiated by the One Functional Category Hypothesis. Either the subject remains in Spec,VP or it raises to Spec,XP. Suppose that the subject remains in Spec,VP. Then we would expect the Neg/Adv to start the sentence. But if the subject raises to Spec,XP in 20, we would expect the Neg/Adv to appear before the object. The predictions are: (i) FCH: Subj V Neg/Adv Obj; (ii) One Functional Category Hypothesis (subject doesn't raise): Neg/Adv Subj Obj V; (iii) One Functional Category Hypothesis (subject raises): Subj V Neg/Adv Obj. There are no sentences that begin with a subject and contain an object and an adverb. However, eight sentences start with a subject and have both an object and a negation. Of these, five have the order Subj V Neg Obj, and three have the order Subj V Obj Neg. None have the order Neg Subj Obj V. Clearly, the prediction of the One Functional Category Hypothesis in (ii), in which the subject doesn't raise, are not upheld. The FCH and the One Functional Category Hypothesis with the subject raising make the same prediction, and it is correct five of the eight times. The other three utterances, with the order Subj V Obj Neg, are grammatical also for the adult, and are usually taken to be determined by the scrambling of the object over Neg. Therefore, although these sentences don't distinguish between the two hypotheses, they are fully consistent with the FCH, and they force the One Functional Category Hypothesis to require that subjects raise when they are in first position. Note that in French and English there is evidence for a very early stage during which subjects don't raise. To the best of our knowledge, no such evidence exists for German; it may be that V2 languages don't exhibit such a phenomenon. One possibility is that the requirement that a constituent must appear in Spec,C forces some constituent to raise. Perhaps the A-bar status (A-bar positions take nonarguments and syntactic operators) of Spec,C versus the A-status (A positions take arguments) of Spec,I is also relevant. We won't pursue this point any further here.

[30] Note, though, the order of T and Agr is opposite that of Chomsky. We will discuss this below.

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(24)
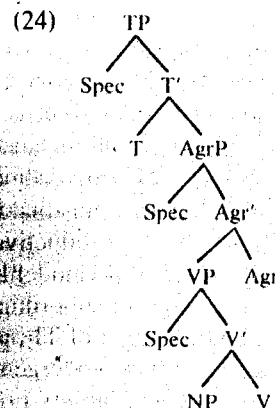
Note first that the only argument presented for TANC is the claim that lexical complementizers don't exist for the young child. In §5.2 we argued against the relevance of such claims. What other data are relevant?

5.4.1. ACQUISITION CONSIDERATIONS AND TANC. Consider the ordering of sentences with objects first and with an adverb and/or negation, e.g. 22. According to the Split-Infl hypothesis of Pollock 1989, Negation and Adverbs are located above AgrP and below TP. Therefore, if TANC holds, there is only one Spec above Neg or Adverb, and thus the subject must follow the Neg or Adverb. In other words, we have the predictions in 25.[31]

(25) a. FCH: Obj V Subj Neg/Adv
    b. TANC: Obj V Neg/Adv Subj

As before, the four relevant sentences come out in the order predicted by the FCH (21a, repeated here as 25a) and not in the order predicted by TANC (25b).

A second class of distinguishing data consists of sentences which have an adverb in first position and also negation or a second adverb (cf. 23). Since TANC has the Neg or (second) Adverb above AgrP and under TP, there is only one Spec above the Neg/Adv for which a constituent may be substituted. This is Spec,TP. So the (first) adverb goes in that Spec, and the subject has no place to move. Therefore TANC predicts the order in 26.

(26) TANC: Adv V Adv/Neg Subj

As noted above, four sentences have the relevant constituents, and all four have the order as predicted by the FCH (23a); none have the order predicted by TANC (26).

In summary, TANC makes the same predictions as the One Functional Category Hypothesis concerning the relevant sentences. Again, the FCH shows a clear superiority, correctly predicting the order in 8 sentences on which TANC makes a misprediction.

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[31] Questions about the status of Neg, as discussed in n. 28, are again relevant. Even if Neg is taken to be a head, the orders with adverbs first (see 26 below) will still be mispredicted by TANC.

In addition to its failure to predict Andreas' sentences at this stage, TANC (24) encounters the same sorts of learnability problems (essentially mispredictions of later data) that we found with the One Functional Category Hypothesis. As we discussed in §5.3, children evidently produce the correct verb-final word order as soon as they spontaneously produce subordinate clauses; in other words, they do not overregularize by showing V2 effects in subordinate CPs. The production of complementizer-introduced embeddings means that CP is now definitely an available set of syntactic positions that is productively used. Now, if CP (obligatorily head-initial) is acquired, the TANC model has two implicit consequences: first, V2 effects are to be expected in subordinate CPs, because T will attract the verb and an XP will move to Spec of TP; and second, the learner will need negative evidence to correct for the overgeneralizations. The phenomenological prediction is false, and the learnability problem violates one of the central assumptions of language acquisition research that is informed by current linguistic theory—namely, that negative evidence is either entirely absent or irrelevant to learning when present. The Full Competence Hypothesis, by contrast, has no such problems.

A final question is: why allow an early grammar with TP but not with CP? Very young children use only the present tense—as a default tense, as it were. TP, however, is associated with tense at large.[32] It is not at all obvious prima facie why a theory positing TP and AgrP but not CP is to be preferred over a theory that includes CP at a very young age.

Let us consider whether there is any way to improve the class of models of child clause structure in which C doesn't exist. Both the Clahsen 1990 model and the Meisel & Müller 1992 model capture the insight that, if there is no C, the remaining functional category or categories must be on the left of VP, to provide a Spec position for NPs to move into. In addition to their empirical problems in describing children's syntax, we have argued that these models encounter learnability problems if indeed it is the case that adult inflectional categories are on the right of VP. Travis 1984 argued that German inflectional categories are on the left, and Zwart 1992 argues that both empirical considerations and current theory lead to the conclusion that the inflectional categories are on the left of the VP in Dutch and German. Let us briefly consider Zwart's theory (calling it the I[nflection] L[eft] theory) and see if deleting C from it will provide an adequate account of Andreas' syntax.

Zwart assumes that the basic structure of the Dutch/German clause is the same as the English structure proposed in Chomsky 1992. That is, from left to right we find C, head-medial Agr, head-medial Tns, and VP.[33] V2 is the result of Agr having the property that it must be bound to a lexical head. This can be accomplished by Agr's moving to C or by V's moving to Agr. In root clauses there is no complementizer C, so V must move to Agr, producing the V2 effect for subjects in Spec,Agr. A constituent that is to be topicalized has a [+operator] feature that forces it to move to Spec,C, and the verb must then move

to C, again yielding the V2 effect. In embedded clauses there is a complementizer in C, so Agr moves to C and the verb remains (on the surface) in final position.

The IL theory captures the facts of adult German as well as the standard theory (which is presented in §2) does, so it is as adequate an account of Andreas' syntax as the standard theory is. Other facts will have to be brought to bear to distinguish the theories. But the point at issue here is whether dropping C from the IL system (henceforth ILNC—I left, no C) will permit an adequate account of Andreas' grammar. The answer is no.

First, according to ILNC, when objects or adverbs are preposed they must appear in Spec,Agr, the leftmost functional category. Since Spec,Agr is the locus of subject-verb agreement in IL, this means that wherever the subject is (perhaps in Spec,T), it will not show agreement. But we have already seen that Andreas has agreement. Second, if a topicalized constituent can somehow move to Spec,Agr, then, when embedded clauses come in, it will also be possible in those clauses to move a topicalized constituent to Spec,Agr and the verb to Agr. Thus there will be V2 effects in subordinate clauses—but, as we have already seen, there aren't any. Third, although Zwart doesn't discuss negation, presumably Neg will appear as it does in Chomsky 1992, that is, between Agr and Tense. The ILNC model therefore makes the same mispredictions about the eight relevant sentences that TANC makes. Fourth, movement of a topicalized constituent to Spec,Agr is against the entire spirit of Zwart's IL model, in which topics must move into a special [+operator] position.

We conclude that a model without C has no hope of accommodating the V2 facts in child grammar, whether adult grammar has the inflectional categories on the left or on the right of VP. The robustness of these empirical conclusions, over a range of theoretical analyses of V2, lends strong support to the view that any child who shows the patterns of Andreas must have a complementizer category.[34]

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[34] Rizzi 1992 suggests that children at this early stage optionally take IP rather than CP to be the root of the sentence, and explains null subjects in early child language on the basis of this assumption—namely, null subjects in child English and French are possible only when they are in the root category, i.e. when there is no CP level. If this assumption is correct, it might relate to our conclusions. If CP does not exist in a phrase marker, then topicalization of a constituent won't be permitted. If [−finite] clauses lack the CP level, then topicalization won't be permitted in these clauses. It has often been suggested that inflection and complementizers are closely related. Suppose that a [−finite] matrix sentence must lack a complementizer for the child. This would be an alternative way of explaining why there is no topicalization in infinitival sentences. We cannot strengthen the hypothesis to a biconditional; that is, we cannot assume that the sentence is infinitival if CP is missing. If this were true, it would imply that a finite sentence must have a CP level. Such an assumption for the child would imply, according to Rizzi's analysis, that finite sentences may not have null subjects in child English and child French, a false prediction. In fact there are fewer null subjects in finite than in infinitival matrix sentences in children (see Pierce 1989 and compare our tables 7 and 8). This would be consistent with the assumption that infinitivals must be missing the CP level; every infinitival will then be eligible for a null subject, whereas among finite sentences only those without CP will be eligible for null subjects. In general, one might be able to work out a theory in which the child uses some kind of minimal functional structure that satisfies certain properties (see also Grimshaw 1992, Weissenborn 1992); but then what are those properties? At the very least they must be properties concerning theta-roles. What else remains an open question.

[32] See Wexler 1993 for discussion of the role of Tense in early grammar. Wexler suggests that formal tense distinctions may not be available to the child at this age.

[33] Zwart also has a second Agr position, the Agr-object position, which we ignore here.

5.4.2. PROBLEMS WITH THE SYNTACTIC ACCOUNT OF TANC. Not only does TANC have a number of empirical problems with respect to acquisition data and learnability phenomena, but it is not at all clear that the fundamental model in 24 is correct on syntactic grounds, aside from the issue of C. Specifically, if one adopts the Split-Infl hypothesis for German, AgrP must be above TP; otherwise Baker's 1988 Mirror Principle and Travis' 1984 Head Movement Constraint would be violated.

Consider the inflectional paradigm for German weak verbs in 27 and 28.

(27) PRESENT TENSE:

ich spiel-e	*wir spiel-en*
du spiel-st	*ihr spiel-t*
er/sie spiel-t	*sie spiel-en*

'I/you/he/she/we/you/they play'

(28) PAST TENSE (imperfective/simple past, suffix -*t*):

ich spiel-t-e	*wir spiel-t-en*
du spiel-t-est	*ihr spiel-t-et*
er/sie spiel-t-e	*sie spiel-t-en*[35]

'I/you/he/she/we/you/they played'

Notice that in 28 the tense-marker /t/ is the first affix on the stem; the person/number agreement affixes attach outside of the tense marker. According to Baker's Mirror Principle, this ordering of morphemes provides a mirror image of the heads the verb passed through. This implies that the verb, in its derivation from D-structure to S-structure, moves through the inflectional heads in the order Tense first, then Agreement. In other words, in a Split-Infl phrase structure, AgrP must be hierarchically located above TP, so that the verb can pick up the Tense and subsequently the Agreement morphemes.

TANC also violates Travis' 1984 Head Movement Constraint and, by extension, Economy (Chomsky 1989). If TP were higher than AgrP, the verb would initially have to raise from its (VP-internal) D-structure position to T (skipping over Agr), then lower to Agr, and finally raise to C, skipping over T. The first step in the derivation violates the head-movement constraint, and the second step violates whatever restrictions bear on lowering. Finally, both steps are inconsistent with the Mirror Principle.

We conclude from this that, if one wants to maintain a Split-Infl hypothesis for German, minimally AgrP must be located above TP in order to conform to the constraints discussed. Even if this condition were met, the existence of a head-initial AgrP would make incorrect predictions about word order in subordinate clauses. The phrase-structure model for German described in §2 is therefore the model that best accounts for the phenomena.

5.4.3. THE FULL COMPETENCE HYPOTHESIS. In §5 we have argued that the Full Competence Hypothesis correctly predicts a wide range of Andreas' data,

including sentences with topicalized objects and adverbs and sentences with negation and nontopicalized adverbs. By contrast, hypotheses without C— including the One Functional Category Hypothesis and the T, AGR, No C Hypothesis—mispredict a number of Andreas' word orders. Furthermore, hypotheses that assume the nonexistence of C in the young child predict mistaken V2 orders in embedded clauses when C emerges. In short, the Full Competence Hypothesis conforms well to Andreas' data, and quite a bit better than no-C hypotheses.

We have argued that the data that reflect Andreas' grammatical knowledge are consistent with the predictions of the Full Competence Hypothesis of clause structure. What is the scope of this hypothesis? What we mean by the FCH is that, at an age at which Andreas produces clause-like structure, he has full knowledge of the universal principles and processes that underlie clause structure. In particular, he knows the abstract functional categories and the principles and processes that govern them, for example the process of head movement. The one feature that seems to distinguish Andreas' knowledge of German from an adult's knowledge of German is that Andreas optionally allows infinitives as matrix verbs. Wexler 1993 proposes that this difference between children and adults may reflect a difference in tense features. Whether this difference is to be characterized as syntactic or semantic (if either) is not yet clear.

What we mean when we say that the child is producing clause-like structures is that the utterances have the property of compositionality—that is, in some intuitive sense, the words combine in meaningful formal ways to form clauses. In short, the FCH says that, at the stage at which the child knows how to combine words to yield larger rule-governed meaningful units, she has full competence with respect to the principles and processes governing the clause. Therefore, on the Full Competence Hypothesis, it is impossible for the child who is producing significant combinations of words to be lacking the capacity to instantiate functional categories.

It is not clear what to say about the one-word stage of language, that is, the stage before the compositionality property is instantiated. As soon as words are put together, however, the FCH makes predictions. Of course, the child's two-word utterances are very often not adult utterances, at least not adult utterances in the language that the child hears around her. The FCH, however, says that all the resources of UG that pertain to clause structure (lexical and functional categories, certain movement processes, etc.) may be recruited by the child in order to represent an utterance. Thus the two-word utterance will be represented by the child with a clause structure that is consistent with UG. If UG demands a functional category of a particular kind, then the child will represent that functional category.

Although we have presented evidence concerning agreement and V2 that is consistent with the FCH, the hypothesis may be too strong. There may be other grammatical processes relating to clause structure that the child does not have. Further research will be needed to determine whether the hypothesis must be circumscribed.

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[35] We follow Johnson's 1990 analysis of the Mirror Principle, the inflectional paradigms of German, and the hierarchy of heads.

Conclusions

6. The descriptive result is that the grammar of Andreas, a linguistically normal child significantly younger than 2;6, does show the effects of the availability of functional categories. The more important theoretical claim is that the best model for the grammar of Andreas is one which includes the functional projections IP and CP. Similar conclusions have been argued for by Weissenborn 1990 and Hyams 1992.

The upshot of our results is that children at a remarkably young age know some very abstract properties of grammar, including head movement, the properties of inflection that require head movement—in particular from V to I to C—and properties forcing a constituent to move into Spec,C. It is extremely difficult to see how such complex syntactic computations could be learned, especially at an age when other (nonlinguistic) cognitive capacities of the child (e.g. in mathematics) seem so limited. The only realistic conclusion seems to be that the principles which underlie these computations are built into the system.

Although we have learned much about the early inflectional system in German, there are many open questions for future research. The question of how learning takes place is still unanswered. That is, how does the child determine that German is an SOV/V2 language? The input data are of course relevant. Analyses such as the ones presented in this paper provide important constraints on this problem. Specifically, we know that the child develops the particular properties of German quite early, so that learning theory will have to allow the development to take place quickly. Moreover, the fact that learning takes place so quickly means that the principles must be in place even earlier, so that they can provide the basis for the learning (whether parametric or lexical) that must take place.

The result of this paper (and many other papers) that demonstrates a difference between the child and the adult is the existence of grammatical infinitives in early child language. Why does the child give SOV sentences with no finite verb? It is sometimes suggested that the reason is that the child hears such sentences in the input. That is, there appear to be some special circumstances in which adults use such sentences. However, these circumstances are indeed very special. There are no examples of matrix infinitives spoken by the adults in the Andreas corpus, although the number of adult utterances is large. What DOES occur with high frequency in the input to the child is a sentence with a V2 finite verb, or with a finite modal or auxiliary and an infinitive at the end, or an embedded sentence with a final finite verb. Why aren't these the only sentences that the child models? In other words, it seems to us that the grammatical infinitives arise from the developing grammar at work, not from the input. An explanation of this process will go a long way towards achieving the goal of a fairly transparent and elegant model of the acquisition of German.

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